Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia

Bangkok, Thailand
24 -25 June 2013

Disclaimer

This report does not necessarily represent the views of the organizations that supported the meeting or the views of the Royal Thai Government who hosted the meeting.

Executive Summary

On 31 March 2013, the authorities of the People's Republic of China first reported three human cases of infection with a novel avian influenza, A (H7N9) in Eastern China in accordance with International Health Regulations to the World Health Organization. The three infected people died following an illness similar to severe respiratory disease including severe pneumonia. While the source of avian influenza A (H7N9) has not yet been confirmed, the large scale of virological surveillance has shown evidence of the presence of infection in chickens, ducks and pigeons. The disease is still emerging as new information on its epidemiology and ecology is being generated. While there is no evidence that the virus has spread beyond the twelve provinces in Eastern China, and Taiwan Province of China (dated 22 July 2013), the potential for the virus to spread widely is high given poultry value chain linkages with a number of bordering countries. In addition, it is not possible to predict how this virus will evolve. Thus the control of the virus with a potential to trigger a pandemic should be a major concern for the international community. USAID, in collaboration with the Government of Thailand, and, with the technical and logistical support from the Food and Agricultural Organization, organized a meeting on "Technical and Policy Discussions on the Prevention and Control of Avian Influenza A (H7N9) in Asia" to provide a platform for sharing experiences and lessons learned from both the highly pathogenic avian influenza (HPAI) H5N1 in the region as well as those learned from the H7N9 interventions implemented by the Government of China (GoC).

The meeting objectives are:

1. To share the lessons learned from actions undertaken by the GoC in preventing and managing the situation of H7N9 influenza infections in poultry and humans as well as monitoring H7N9 influenza viral evolution;
2. To discuss specific unresolved issues related to viral transmission, surveillance, risk assessment and management as well as appropriate and practical interventions for H7N9 influenza infection based on capacity developed from H5N1 crisis;
3. To discuss risks and scenarios of the H7N9 situation in the region and the possible mitigation measures in short-, medium- and longer-term;
4. To identify the opportunities for synergies of the human health, animal health and other sectors among the countries in the region and between the countries and the relevant international organizations.

Dr. Subhash Morzaria, Regional Manager of Emergency Centre for Trans-boundary Animal Disease, FAO Regional Office for Asia and the Pacific (ECTAD-RAP), began the meeting by inviting distinguished guests to give opening remarks. Speaking on the behalf of the Royal Thai Government, H.E. Dr. Yukol Limlaemthong, Deputy Prime Minister and Minister of Agriculture and Cooperatives extended his welcome to all the

delegates. He spoke of the emergence of H7N9 in China and commended the Government of China for their efforts in controlling the outbreaks, and for the sharing of valuable information that allowed the global community to take timely and appropriate actions to prevent any incursion of the H7N9 influenza virus. Dr. Yukol stated that the existing surveillance program for all relevant sectors in Thailand has been modified and strengthened with the aim to rapidly detect any possible incursions of H7N9 for humans and animals. Specifically, existing influenza surveillance systems, through the detection of influenza-like illness (ILI) and severe acute respiratory illness (SARI), have been intensified through networks of health volunteers and hospitals.

The first session was a situational update on avian influenza A(H7N9), which consisted of three panels. The first panel described the situation in China by explaining the course of events of the outbreak, the surveillance and identification of the H7N9 virus, and the impact on animal and human populations. The second panel was an update on the scientific knowledge about H7N9, its epidemiology, and the latest information on the molecular analysis of the virus, including development of diagnostics and testing, and results of experimental modeling. The third panel was a regional report of H7N9 outside of China. The presentations given by WHO and FAO describe the emergency surveillance and preparedness plans implemented by these organizations across the region.

The next session was an exploration of lessons learned, with an emphasis on the "toolbox", and what tools are available and which tools still need to be developed. The examination of value chains and clade mapping as a surveillance tool was described by FAO. The need to maintain human surveillance in the form of household surveys, ILI surveillance, SARI surveillance and pathogen-based surveillance was stressed by WHO. A presenter re-iterated what is already known about prevention and control by using market closures, movement control, and "intelligent de-population" (culling). The PREDICT project described using the toolbox to target wild bird surveillance. Lessons learned about behavior change and communication were reviewed.

In the session on international guidelines and standards presenters from WHO, FAO, and OIE provided technical recommendations and guidelines on how to monitor, how to do surveillance, and how to implement control measures when H7N9 breaks out in other countries.

At the beginning of day two, participants were asked to separate into country groups determine what they would consider the H7N9 status of their country. The groups then formed into clusters determined by risk. The clusters were: 1) Low risk – Philippines, Sri Lanka, Thailand; 2) Medium risk - Bangladesh, Bhutan, Cambodia, Egypt, Indonesia; and 3) High risk - China, India, Laos, Myanmar, Nepal, and Vietnam, ,. Based on the situation in China, and the information about value chains and other information available at this stage, the clusters were asked to describe the possible scenarios of H7N9 incursion into their countries and describe activities to

prevent and manage the H7N9 situation that might occur. They were also asked to present the issues and challenges to implement the plan.

The final session of the meeting was composed of three panels: 1) Surveillance options and approaches, 2) Intelligent de-population, and 3) Middle East Respiratory Syndrome-Coronavirus (MERS-CoV).

In the closing session, Dr. Dennis Carroll stressed how these were unprecedented discussions. An emerging viral threat is being addressed in a way that has never happened before. Based on past experience with H5N1/H1N1 (2009), countries and agencies are working together to begin developing the plans of action should H7N9 re-emerge.

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Acronyms Used

AFRIMS	Armed Forces Research Institute of the Medical Sciences
APHIS	Animal and Plant Health Inspection Services (US)
ASEAN	Association of Southeast Asian Nations
ASWGL	ASEAN Sectoral Working Group on Livestock
AI	Avian influenza
ARI	Acute respiratory infection
ASEAN	Association of Southeast Asian Nations
AVET	Applied Veterinary Epidemiology Training
BCC	Behavior change communications
CAHEC	China Animal Health and Epidemiology Center
CBS	Community-based surveillance
CBT	Cross-border trade
DoC	Day-old chicks
ECTAD	Emergency Centre for Trans-boundary Animal Diseases (FAO)
EID	Emerging Infectious Diseases
EPT	Emerging Pandemic Threats
FAO	Food and Agriculture Organization of the United Nations
FETP	Field Epidemiology Training Program
FETP-V	Field Epidemiology Training Programs for Veterinarians
GoC	Government of China
HPAI	Highly pathogenic avian influenza
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
IHR	International Health Regulations
ILI	Influenza-like illness
IPC	Infection prevention and control
LBM	Live bird market
LPAI	Low pathogenic avian influenza
MERS-CoV	Middle East Respiratory Syndrome-Coronavirus
MOA	Ministry of Agriculture
MOH	Ministry of Health
OFFLU	OIE-FAO Network of Expertise on Animal Influenza
OIE	International Organization for Animal Health
PCR	Polymerase chain reaction
RDMA	Regional Development Mission, Asia (USAID)
SAARC	South Asian Association for Regional Cooperation
SARI	Severe acute respiratory infection
SARS	Severe Acute Respiratory Syndrome
UN	United Nations
US CDC	United States Centers for Disease Control and Prevention
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

WHO	UN World Health Organization

Background to the meeting

On 31 March 2013, the authorities of the People's Republic of China first reported three human cases of infection with a novel avian influenza A (H7N9) in Eastern China in accordance with International Health Regulations to the World Health Organization. The three infected people died following an illness similar to severe respiratory disease including severe pneumonia. Since then, the Chinese Ministry of Health is reporting new cases almost daily. While the source of avian influenza A (H7N9) has not yet been confirmed, the large scale of virological surveillance has shown evidence of the presence of infection in chickens, ducks and pigeons. In addition, a number of environmental samples collected from several live bird markets (LBMs) have been found to be positive. So far the virus has not been found in wild birds and swine. The mode of infection in humans is believed to be through the oro-pharyngeal route, causing a range of clinical signs from sub-clinical to mild disease to severe pneumonia. The case fatality rate is estimated to be at 32%., (134 confirmed, 43 deaths, dated 22 July 2013).

The influenza A (H7N9) virus is unique in that it does not cause any disease or apparent production loss in the poultry population but has high infectivity for humans. Thus this low pathogenic influenza A (H7N9) has a significant potential to spread widely in poultry populations without being detected. To date there has been no evidence of sustained human-to-human transmission.

Laboratory analysis regarding the genetic make-up of this virus is of heightened concern. It is a new re-assortant derived from at least 4 avian influenza viruses, and has shown affinity for mammalian cells. Therefore, other mammalian animal species have the potential to be infected and act as secondary reservoirs. Current surveillance and epidemiology data suggest that LBMs, particularly wholesale markets, have high levels of virus present in the environment and the major source of the virus in markets is domestic poultry brought in from various farms much further away from markets. The LBMs seem to be the major source through which the virus appears to spread in humans. These are preliminary assumptions based on limited data and, it cannot be stressed enough that there remains significant knowledge gaps regarding the animal source of the virus and the geographical distribution.

The Government of China (GoC) has responded to the situation with the implementation of vigorous control measures that have included culling of poultry and compensation, closure of LBMs, and bans on movement of poultry from infected provinces. These measures have had a significant negative impact on poultry producers. In addition to the concerns related to human illness and loss of life, economic losses in the first three weeks since the novel virus emerged have been estimated at USD 1.6 billion. However, there is also evidence that the aggressive measures undertaken by the GoC are taking effect, as the human cases have

significantly declined following the closure of the LBMs in the municipality of Shanghai.

The disease is still emerging as new information on its epidemiology and ecology is being generated. While there is no evidence that the virus has spread wider than the twelve Provinces in Eastern China, the potential for the virus to spread widely is high given poultry value chain linkages with a number of bordering countries. In addition, it is not possible to predict how this virus will evolve. It could either mutate into a low pathogenic virus in humans or acquire the ability to transmit easily between humans and flare up into a potential pandemic. Thus the control of the virus with a potential to trigger a pandemic should be a major concern for the international community and thus remains a public good.

Lessons learned historically across the globe and more recently with H5N1 in Asia indicate that the dynamics of poultry movement lead to risky human behaviour and potentially further spread of the virus/disease within China and outside China in a number of 'at risk' countries in Asia. At this early stage of the emergence of the H7N9 virus, there is a unique opportunity for the national and international public and animal health sectors and other key stakeholders in the region to consider technical and policy issues related to range of options that might lead to preventing further spread and to controlling the disease. The experience and the lessons learned from the swift and transparent action of the GoC so far in addressing this emerging problem may be helpful for the global community.

Thus, USAID, in collaboration with the Government of Thailand, is organizing this meeting on "Technical and Policy Discussions on the Prevention and Control of Avian Influenza A (H7N9) in Asia" to provide a platform for sharing experiences and lessons learned from both the HPAI H5N1 in the region as well as those learned from the H7N9 interventions implemented by the GoC.

The meeting will have the same format and similar level of participation as the two earlier ones organized by the USAID. The first of these was held in 2010 in Bali, Indonesia to address technical and policy issues related to prevention and control of H5N1 HPAI among the highly affected countries. The experience in best practices and lessons learnt from HPAI control was shared among those countries. The Second Technical and Policy Discussion for Prevention and Control of H5N1 HPAI was organized as a follow-up in April 2012 in Ho Chi Minh City, Viet Nam to discuss the revision of the control strategies for HPAI H5N1 in endemic countries (Bangladesh, China, Egypt, Indonesia, and Vietnam) as well as in four countries (Cambodia, Laos, Myanmar, and Thailand) with regular but sporadic incursions of the virus.

Meeting Objectives:

1.1 To share the lessons learned from actions undertaken by the GoC in preventing and managing the situation of H7N9 influenza infections in poultry and humans as well as monitoring H7N9 influenza viral evolution;
1.2 To discuss specific unresolved issues related to viral transmission, surveillance, risk assessment and management as well as appropriate and practical interventions for H7N9 influenza infection based on capacity developed from H5N1 crisis;
1.3 To discuss risks and scenarios of the H7N9 situation in the region and the possible mitigation measures in short-, medium- and longer-term;
1.4 To identify the opportunities for synergies of the human health, animal health and other sectors among the countries in the region and between the countries and the relevant international organizations

Summary of proceedings

Session 1 - Opening and Introduction

Dr. Subhash Morzaria, Regional Manager of the Emergency Centre for Trans-boundary Animal Disease, FAO Regional Office for Asia and the Pacific (ECTAD-RAP), acting as the master of ceremony, started with a briefing on the meeting. Eight distinguished guests were invited to give the opening remarks and other distinguished guests were acknowledged.

The opening remarks were delivered by:

1. Dr. Michael Yates – Mission Director, Regional Development Mission, Asia (RDMA), USAID
2. H.E. Hiroyuki Konuma – Assistant Director General and Regional Representative, FAO Regional Office for Asia and the Pacific
3. Dr. Richard Clive Brown – Regional Advisor, WHO South East Asia Regional Office
4. Dr. Joseph Domenech – Charge de Mission, World Organization for Animal Health, Paris
5. Dr. Rubina Cresencio – Chair of the ASEAN Sectoral Working Group on Livestock
6. Dr. Ranjani Hettiarachchi – Chair of SAARC Chief Veterinary Officers, SAARC
7. H.E. Dr. Pradit Sintavanarong – Minister of Public Health, Royal Government of Thailand
8. H.E. Dr. Yukol Limlaemthong – Deputy Prime Minister and Minister of Agriculture and Cooperatives, Royal Government of Thailand

Acknowledging the presence of:

1. Professor Dr. Prasit Chaitaweesub – Chair Person, National Committee of Emerging Infectious Diseases
2. Dr. Tritsadee Chaosuancharoen – Director General of the Department of Livestock Development, Ministry of Agriculture and Cooperatives of Thailand
3. Dr. Pornthep Siriwanaransan – Director General of the Department of Disease Control, Ministry of Public Health of Thailand
4. Dr. Dennis Carroll – Director, Pandemic Influenza and Other Emerging Threats Unit, USAID Washington
5. Dr. Aye Aye Thwin – Director of Public Health, RDMA, USAID, Thailand
6. Dr. Juan Lubroth – Chief Veterinary Officer, FAO
7. Dr. Hirofumi Kugita – Regional Representative, OIE Asia-Pacific Region

8. Real Admiral Dr. Stephen C. Reid – Director of Influenza Coordination Unit, CDC

Speaking on the behalf of the Royal Thai Government, H.E. Dr. Yukol Limlaemthong, Deputy Prime Minister and Minister, Ministry of Agriculture and Cooperatives extended his welcome to all distinguished delegates to the Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia. He spoke of the emergence of avian influenza A (H7N9) in China and commended the GoC for their efforts in controlling the outbreaks, and for the sharing of valuable information that allowed the global community to take timely and appropriate actions to prevent any incursion of the H7N9 influenza virus. The relevant authorities in Thailand, including Ministry of Public Health, Ministry of Agriculture and Cooperatives, and Ministry of Natural Resources and Environment, have joined forces under the National Committee for Emerging and Re-emerging Infectious Diseases.

Dr. Yukol further stated that the existing surveillance program for all relevant sectors has been modified and strengthened with the aim to rapidly detect any possible incursions of H7N9 for humans and animals. Specifically, existing influenza surveillance systems, through the detection of influenza-like illness (ILI) and severe acute respiratory illness (SARI), have been intensified through networks of health volunteers and hospitals. Such emphasis on rapid detection of human infection is a prerequisite for effective case management. Ongoing surveillance for Avian Influenza (AI) in domestic and wild animal species, which has been extremely effective against highly pathogenic avian influenza A (HPAI), has also been reinforced and modified, giving a particular focus on a risk-based approach.

The Deputy Prime Minster took the opportunity, on behalf of the Royal Thai Government, to thank USAID, FAO, OIE, WHO, ASEAN, SAARC, and other relevant international organizations for their leadership during this time and to commend and thank the countries that are presenting here, and to demonstrate the Thai government's commitment and solidarity to address the common concern, as a global public good.

He then declared the Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) opened.

Dr. Michael Yates, Mission Director, USAID, RDMA, welcomed the members of the meeting for attending and thanked the hosts, the Royal Government of Thailand, for organizing the meeting. He pointed out that in the short time that H7N9 was first detected, experts from the region, especially China and the international community, have dramatically slowed the spread of the virus and the number of human infections. He pointed at three reasons for this success: 1) Improved systems of detecting and responding to infectious disease threats, 2) cross-sectoral collaborations between

Ministries of Agriculture and Health have made it possible for these groups to better work together, and 3) rapid collection and sharing among experts of information—such as human case data, genetic sequences, and surveillance results in animals. However, there is still work to be done regarding the H7N9 virus. Dr. Yates reiterated that the U.S. Government maintains a strong commitment to strengthening in-country capacities to detect and respond to infectious disease threats, in Asia and in other parts of the world.

The remaining opening remarks may be seen in the Annex.

Dr. Dennis Carroll then provided the introduction to the meeting. After a brief background on the outbreak in China, he described the purpose of the meeting was to provide an opportunity for those gathered to understand where we are, what we know, and what we still do not know about H7N9. What do we know about the tools that have been developed over the last decade that may help provide an effective response to H7N9 in an effective and timely manner? The meeting presents the opportunity to organize ourselves to do something we have never done before: Stop a global threat while it is still local.

Session 2 – H7N9 Situational Update

Moderator: Dr. Rick Brown

Panel 1: Situational update in China

Speakers: 1. Dr. Zhou Suizan, US CDC in China
2. Dr. Huang Bao Xu, China Animal Health and Epidemiology Center (CAHEC)

Dr. Zhou Suizan:

"H7N9 Situational Update in China – Human"

The first human H7N9 cases are described as three patients, a father and two sons, with severe lower respiratory infections, who were hospitalized in Shanghai from 20-26 February 2013. Two of them, with acute respiratory distress syndrome (ARDS), died 13 days and 17 days after illness onset. One patient recovered. Later, similar cases appeared in Shanghai. A timeline is described:

- 24 March, Shanghai CDC sent pharyngeal swabs of two patients to China CDC.
- 25th, Anhui CDC sent pharyngeal swab from another patient to China CDC.
- 26th, H7N9 positive determined by real-time PCR.
- 28th, viruses were isolated.
- 29th, completed sequence analysis and identified a novel Avian-Origin Influenza A (H7N9) virus.

- 30th, diagnosed three human H7N9 infections and report to WHO according to International Health Regulations (IHR).
- 31 March, official announcement by Chinese Government.

As of 31 May, two months after the initial report, 11 provinces reported lab confirmed H7N9 human infections. The total cases reported reached 132, with 39 deaths, 14 still being treated in hospitals, and 79 cases recovered.

One of these cases was reported in Taiwan. In this instance the case had a history of recent travel from Jiangsu province. There are four confirmed clusters, but no case of confirmed human-to-human transmission.

In addition, Beijing reported one asymptomatic infection.

The case fatality proportion reached approximately 29%, but the number of the mild cases is unknown.

From June onwards, the Chinese Government will make publish monthly H7N9 updates.

Demographic information for cases describes that animal exposure status for 86 of 128 cases is unknown. Of the remaining 42 cases, 26% were poultry workers and 40% were exposed to an environment with poultry. The age and gender distribution of cases indicates a median age for males at 62 years, and for females at 59 years. In general, cases were more likely to be elderly males. Clinical features of human H7N9 infection were well described in a recently published article in the New England Journal of Medicine.

The source of human infection remains unknown, but findings suggest that human infection appears to be related to exposure to live poultry or contaminated environments, based on:

- The virus found in humans is genetically similar to that found in birds and in the environment, primarily at animal markets that sell poultry.
- Most human cases reported history of exposure to birds, mainly chicken.
- The virus has been detected in poultry in live bird markets (LBM) that sell poultry.
- The number of new case reports of the disease has decreased after the implementation of public health measures, which included closure of live bird markets and increasing public awareness.

Current evidence does not support sustained human-to-human transmission.

In summary:

- Human infection with novel influenza A (H7N9) virus, could result in severe and the fatal diseases.
- More male and elderly patients.
- Exposure to poultry and live bird market is considered to be possible risk factor.
- No sustained human-to-human transmission, and limited human-to-human transmission was not excluded.

Dr. Huang Boo Xu:
"Emergency Response of Animal A Influenza (H7N9) in China"

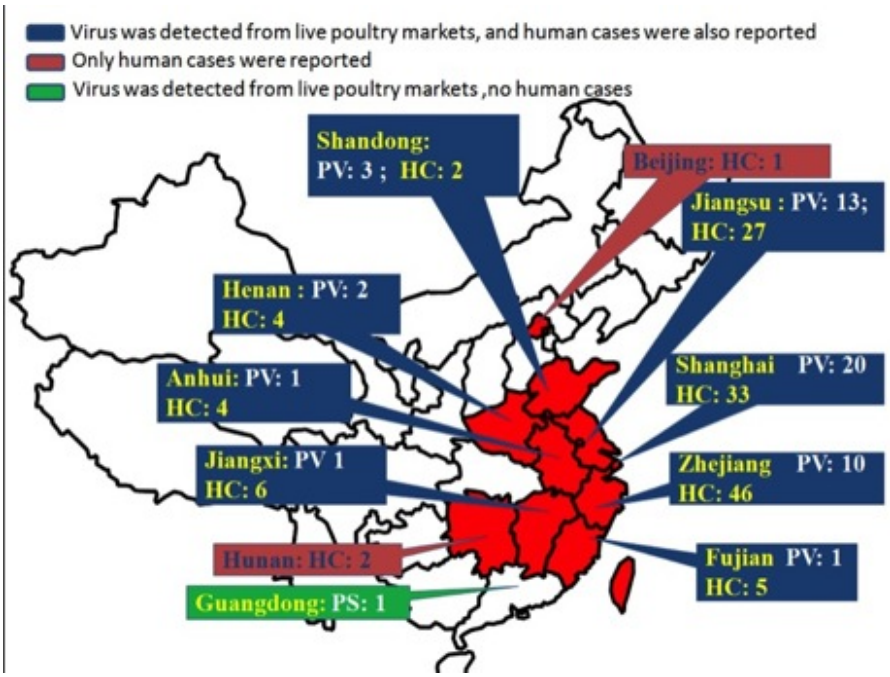
Once the outbreak was identified the Chinese government responded with control measures. The MoA responded by setting up a H7N9 working panel headed by the Vice Minister to guide and support local veterinary staff and to facilitate effective responses.

All of this was done first through rapid confirmation of poultry infection. After receiving the notification of suspicious human cases from the MoH on 29 March, the MoA immediately sent experts to Shanghai and Anhui. Emergency epidemiological investigation, surveillance, and sampling work were completed on 31 March. The National AI Reference Lab of China then confirmed novel H7N9 virus present in a sample from the wholesale market in Shanghai. On 4 April, and even though it is a low pathogenic virus in poultry, the MoA released public notification to raise the response to H7N9 AI as category one animal disease for prevention and control, which is the highest response level in China, thus allowing the release of resources to carry out extensive surveillance and response work.

The emergency surveillance program in China categorizes all provinces into core, key, and ordinary surveillance areas. This map shows the core surveillance area in red where human cases were reported. The yellow areas are the key surveillance areas, and the white areas are ordinary surveillance zones. This slide shows the situation in May 2013.

Both human cases and isolated virus from LBMs were confirmed in eight provinces (marked in blue in the map below). The three provinces such as Beijing, Hunan and Taiwan had confirmed human cases but no bird infections in LBMs. There was H7N9

virus isolated from LBMs but no human case found in Guangdong province (green mark).



The results of surveillance indicate:

- H7N9 virus was only detected in chicken, duck and pigeon populations, but not found in pigs or other animals.
- Almost all H7N9 positive animals were found in live bird markets. Positive samples were found in only 18 markets with 7,264 markets sampled.
- Samples were collected from 30,200 poultry farms in 31 provinces but there were no confirmed positive results from any of these farms.

Based on these findings, the following measures were instituted:

- For provinces with human cases or animal infections of H7N9, the inter-province movement of commercial live birds would be temporarily prohibited.
- Without animal health certificates proved by H7N9 AI testing, breeding poultry or day-old breeding birds were not allowed to be transported around the country. Even then these certified birds could only be sold from farm to farm, and were not allowed to enter the live bird market.
- Local authorities were asked to increase the practice of slaughtering of live birds at a slaughterhouse and then selling frozen or fresh poultry meats in the market.

Since 20 May 2013 these restrictions have been lifted. However, upon re-opening the LBMs, Shanghai Municipality and Zhejiang province require:

- All LBMs to strictly adhere to health regulations.
- No wholesale markets are to be located in the city property.
- If there are risks for human or animal infection, the market will be closed again.
- Inter-province transportation of live birds is tightly restricted.
- All live bird shipments must be traceable.
- Encourage practice of same day sell-out of all live birds, with strict daily cleaning and disinfection mechanism for cages and booths.
- Live birds sold to consumers must be slaughtered at the LBM.
- The mechanism of 3-4 poultry-free rest days per month should be practiced in each wholesale and retail market.

Panel 2: Update on scientific knowledge about H7N9

Speakers: 1. Prof. Dr. Malik Peiris, Hong Kong University, Pasteur Research Centre.
2. Peter Daniels, CSIRO-AAHL, Australia.

Prof. Dr. Malik Peiris:

"*Update on novel A/H7N9*"

Presented on the human infection aspect of H7N9. The virus has some very unusual characteristics. It does have some changes in the haemagglutinin that potentially allows this virus to easily cross species from birds to humans. Data presented are also in two papers published online in the Lancet on 24 June 2013[1]. In summary:

- There is a very different age distribution between H7N9 and H5N1 cases.
- Low human-to-human transmissibility (only two family clusters, intensive follow-up of 2500 contacts with only 4 potential secondary infections identified).
- A substantial "clinical iceberg", i.e., substantial proportion of mild influenza A (H7N9) cases.
- Overall severity less than initially perceived, but still much higher than 2009 pandemic.
- Increased chance for adaptation to human transmission.

An interesting difference is the exposure to poultry. Comparing H7N9 with H5N1 in this table, it is clear that exposure to poultry is a risk, but unlike H5N1, exposure to

Comparison of human H7N9 vs. H5N1 in China
Source of Infection

	Human H7N9 (N=130)	Human H5N1 (N=43)
Any exposure to poultry	92/123 (75%)	29/41 (71%)
Occupational exposure to poultry	6/130 (5%)	4/43 (9%)
Visited live poultry market	43/84 (51%)	23/41 (56%)
Exposure to sick / dead poultry	3/123 (2%)	16/41 (39%)
Exposure to backyard poultry	19/71 (27%)	21/41 (51%)

Cowling et al Lancet 2013 On line

[1] DOI: 10.1016/S0140-6736(13)6120

dead or backyard poultry does not appear to be a risk.

Dr. Peiris continues by discussing what is known from the experimental data. Based on ferret models, H7N9 virus is somewhat more transmissible to humans than H5N1. It is also more able to cross from birds to humans than any other of the avian viruses known to date. There is evidence to indicate that the virus might become resistant to Tamiflu, zanamivir, and some of the anti-virus agents that are currently available. So although H7N9 is no longer causing human disease, and no longer being detected in poultry, there is no time to be complaisant. If for no other reason we do not yet know if, like H5N1, H7N9 will turn out to be seasonal. So, the fact that H7N9 has apparently disappeared may not mean that it has completely disappeared from the reservoirs, probably in poultry, and it might come back again in the winter.

Finally, the point is made that live poultry markets do sustain and amplify AI viruses. They are also the source of re-introducing the virus back into the live poultry farms, so thereby sustaining transmission. Once a virus gets into these live bird markets, it can stay there a few weeks or for months. It has also been shown that a rest date in live bird markets, that is one day where the market is closed and empty of poultry, dramatically reduces virus activity or virus persistence in live bird markets.

Peter Daniels:
"Scientific Update on Avian Influenza A (H7N9) - Animal Health Aspects"

This presentation is on behalf of OFFLU, a FAO-OIE network of experts on animal influenza, looking at the toolkits of information and tests to be developed in the animal health sector covering:

- Update on PCR diagnostics.
- A review of data.
- Update by FAO/AAHL on distribution of reagents for regional surveillance.
- Serological testing.
- HI data with homologous and heterologous reagents.
- Is there a need for N9 serology?
- Animal experiments.
- IVPI, shedding, seroconversion.
- Transmission studies.
- Other toolkit considerations.
- Vaccines.
- Lab network coordination issues.

For PCR diagnostics, the overview can be summarized as:

- M-gene (FLU A): 'classic' protocols in the region are sufficiently sensitive to detect avian influenza A (H7N9) strain.
- H7:

Some classic protocols are not sufficiently sensitive (e.g. USDA North American, AAHL Australian protocols).

- There are useful H7 protocols available (FLI, CODA/FLI, AHVLA , IZSVe, CNIC-H7).
- Early comparisons identified the FLI test to be adequately sensitive, no need to change.
- Chinese H7 protocol is not specific for the H7N9 virus.

- N9:
  - China CNIC-N9 protocol works.
  - Attention may usefully be given to the reaction conditions.

While PCR works for the virus, serology is also important for H7N9, hence a summary of serology options:

- Avian Influenza A (H7N9) has broad cross-reactivity with other H7 strains globally.
- H7N9 picked up by 'classic' panels of antisera.
- An HI test has been prepared from avian influenza A (H7N9) for distribution in the region.
- HI H7 will not discriminate between H7N9 and other H7's.
- Need for NAI N9 test or N9-ELISA.

A short discussion of animal experiments was given with a summary of observations in poultry studies:

- No clinical signs reported in any study in any avian species.
- Shedding mainly from the respiratory tract, less so from cloaca (gallinaceous species).
  (CTs of the order of 20 from oropharyngeal swabs compared with cloacal swab CTs of 35 – SERPL).
- These findings repeated at AAHL in infections of 16-week-old fowls.
- Quail excrete to a very high titer, chickens less so, and pigeons to a comparatively low level.
- Ducks and geese have shown only low shedding and no direct transmission.

Finally, the current gaps in the "tool box" include:

- Definition of the animal reservoir.
- Epidemiology in poultry/animal reservoir.
- Activation of study designs, as per the FAO Guidelines for Emergency Risk Based Surveillance document.
- Confirmation of agreed laboratory testing strategies, and targeted capacity building support.
- Followed by PT and supporting QA.
- Animal virus availability for confirmatory studies.

- Recognition of the value for internationally coordinated preparedness of submissions to designated reference laboratories.

Panel 3: Regional Report: H7N9 outside China
Speakers: 1. Dr. Rick Brown, WHO SEARO
2. Dr. Subhash Morzaria, FAO, ECTAD-RAP

Dr. Rick Brown:
"Preparedness for H7N9 in South-East Asia / Western Pacific Regions"

In order to increase preparedness, WHO first had to assess the levels of preparedness in the region. To that end WHO prepared a survey for countries in the Western Pacific and Southeast Asia region. The questions included:

1. What is routinely done in the country for surveillance of acute respiratory infections in humans?
2. Following the H7N9 event in China, was anything done to enhance surveillance and if so, what?
3. What is routinely done in the country for surveillance of influenza viruses in animals?
4. Following the H7N9 event in China, was anything done to enhance the surveillance in animals and if so, what?
5. Has the country initiated any travel or trade related measures?

Responses indicated that there is a high level of concern. There are a number of different types of actions that are being taken in different countries, including updating pandemic preparedness plans, information dissemination, trainings of health care workers, strengthening surveillance, including routine surveillance and event-based surveillance. Many countries are trying to strengthen laboratory capacity, particularly to equip their labs with the capacity to diagnose H7N9. A number of travel and trade related measures were reported, including screening at points of entry, and some countries have placed restrictions on the importation of live poultry.

WHO is assisting in developing a framework for action for national authorities, and they have an existing strategy that is designed to strengthen preparedness at the national level for an event like H7N9 that has these six pillars:

1. Surveillance, risk assessment and response.
2. Laboratory.
3. Zoonosis.
4. Clinical management and infection prevention and control.
5. Public health interventions and emergency preparedness.
6. Risk communication.

Discussions of these pillars and how WHO can assist national governments is continuing with a series of bi-regional activities:

- Technical Advisory Group for the Asia-Pacific Strategy for Emerging Diseases (APSED) will meet on July 15, 2013, in Kathmandu, Nepal.
- Bi-regional APSED meeting for National IHR Focal Points and EID Programme Managers, July 16-18, 2013, in Kathmandu, Nepal.
- Internal WHO planning meetings, July 19, 2013, Kathmandu, Nepal.
- The plan is to discuss how to better focus bi-regional strategic actions based on H7N9, MERS-CoV threats.

Dr. Subhash Morzaria:
"Influenza A (H7N9): Emergency Surveillance in South and Southeast Asia"

Dr. Morzaria describes what FAO ECTAD-RAP has done in relation to influenza A (H7N9) in the region. FAO conducted a rapid surveillance study to gauge the possible spread of the virus in the region. The objectives were to determine if H7N9 had spread to countries in South and Southeast Asia, and if found to be present, to determine the extent of the spread of the virus. The secondary objective was to support ongoing capacity building in diagnostics and surveillance methodology.

The surveillance study design can be summarized as thus:

- Three high-risk countries (Myanmar, Lao PDR, and Viet Nam) and five moderate risk countries (Bangladesh, Bhutan, Cambodia, Indonesia, and Nepal,) in Asia are selected.
- Emergency risk based surveillance.
- Both retrospective and prospective study designs are developed.
- Retrospective samples collected from:
  -LBMs, poultry and environmental samples,
  -Pigs,
  -Ducks, wild birds, other poultry.
- Prospective samples collected from:
  -LBMs, chickens and environment.

The conclusions from the study include:

- No evidence of H7N9 in the tested samples.
- This is a work in progress; further analysis will be done after completion of sampling and testing.
- Previous H5N1 experience helpful.
- Diagnosis, value chains, field capacity.
- OFFLU supported standardization/availability of tests.
- Sampling is risk-based, but variable among the countries.
- Assumption of risks-based on H5N1 value chains.
- Value chain dynamic and may have changed due to conditions in China.

- Expected prevalence was not available for precise sample size.
- Tracing source of poultry in the markets was difficult to achieve.
- Negative laboratory results may not infer absence of infection.

In terms of ways forward, Dr. Morzaria concluded:

- Diagnosis
- Validation of serological tests,
- Further information from China,
- Further analysis of flu A positive and H7 negative.
- Regional Surveillance
- Virology and serology,
- Longitudinal medium to long term risk-based approach (value chain),
- Consider next flu A season and migratory birds,
- Include more countries,
- Guidance from the participants.
- Strengthen capacity
- Routine surveillance,
- Preparedness for next possible wave of disease(s).

Session 2: Discussion

The work in China was commendable, and their surveillance systems were able to help find both animal and human cases. But, how many countries don't have the same types of systems and resources in place? How will they be able to track outbreaks? We like to say that we need to tackle the disease at the source. However, in the case of H7N9 in China, we have not been able to find that source. What should we be doing in this type of situation?

Questions were asked that tried to clarify the medical conditions that put older men at risk. In general, the risks were the diseases of older people: Diabetes, respiratory diseases, renal disease, and heart disease.

The closure of the live bird markets was shown effective. Is it practical and reasonable to close the wholesale market one day per week, and the retail markets for one day every two weeks? A question was asked why close the markets? Do we know why this works? What is the reason for the break in disease? Was it disinfection, or breaking the cycle by removing birds for a day. Most likely it was the result of no live animals in the market overnight. As an effective intervention, market closures should be given more study, including the economic impact on vendors.

The rise of MERS-CoV is a concern. It is placing a burden on resources in the Middle East, particularly Egypt, where H5N1 work is on going and the concern over H7N9 is real. There are worries about how to handle this year's Hajj travelers and how to

prepare and manage the human mass movement. Poultry trade with China and the Middle East is increasing. Although there is no sign of H7N9, nor is it likely to emerge, the threat cannot be neglected. There will be a need for coordination with governments and international organizations such as FAO, OIE and WHO. A participant from Egypt was impressed with all he heard, but was skeptical about how well it could work in his country. Responses stressed that it is possible for animal health inspectors and institutions to enforce necessary actions in Egypt, but to also keep in mind that if there is an AI outbreak in country, consumers will not want to eat infected meat, so that will lower the demand for poultry.

Session 3 – Lessons Learned

Moderator: Dr. Subhash Morzaria

What's in the toolbox?

Speakers:
1. Jan Hinrichs, FAO
2. Steve Redd, US CDC
3. Les Sims, FAO Consultant
4. Jonna Mazet, PREDICT
5. CY Gopinath, FAO

Jan Hinrichs:

"Using value chain data to target animal surveillance and 'trade and clade analysis'"

FAO has experience in assessing poultry value chains in Asia. Combined with maps of sub-clades, these two methods of study can be brought together to target animal surveillance. First, conducting surveillance along value chains requires decisions to be made on the following variables:

- Areas: Consumption or production centers with existing live bird trade links to China.
- Locations: Farms, vehicles with poultry, poultry stock houses/holding areas, live bird markets, slaughter places.
- Products: Breeding stock, chicks (layer or broiler DoC), broiler, layer, spent hens, feathers, feces, mud, water used to clean carcasses.
- Owners & permissions: Farmer, collector, middlemen, vendors, slaughterers and market authorities.

Combining value chain studies and clade analysis can yield insights and explanations as to the dynamics of virus circulation in the region:

- Value chain information together with molecular characterization of viruses explains the virus circulation route and direction in the region.
- Understanding poultry value chains is essential for risk-targeted surveillance.
- Assessment of value chain actor incentives and behaviors is a basis for developing sustainable and acceptable risk reduction interventions.

Stephen Redd:
"Influenza-like illness and Severe Acute Respiratory Illness Surveillance for Influenza"

There is much experience with influenza surveillance in the US. Those same systems are similar to systems used in other parts of the world. Therefore similar issues and questions can be shared. There are two very critical issues: 1) Laboratory testing is essential, and without laboratory testing there is no surveillance, and 2) The need to communicate the results of this surveillance is crucial in order to inform the policies that will be implemented, which is true on both the animal and the human side.

A "pyramid" of stages of illness is described with mild cases on the base, then outpatient cases, then hospitalized cases and then death at the top of the pyramid. The question is how much of the pyramid base is exposed? How many mild cases are being observed? Surveillance to help determine this comes in many forms: Household surveys, ILI surveillance, SARI surveillance and pathogen-based surveillance. How this is done in the US and globally is important because ILI and SARI surveillance data drives policy & response. Also, there is a need for reputable local champions within countries with whom you share the data. If you do not engage the local stakeholders then the collection of the data and its analysis serves no purpose.

Les Sims:
"Controlling the spread of H7N9 in animals using market closures, movement control, and culling"

H7N9 virus has been contained, but it is unlikely to have been eradicated. It is likely to re-appear, and it is likely to cross borders, although there is no telling when this will happen. In the meantime it is necessary to revisit the preparation plans and contingency plans which are in place now, such as improving biosecurity. In terms of biosecurity, traders, live poultry stocks, and the means of transport all represent the most likely threat at present. Preventing incursions should be the goal of all. Short-term and long-term control measures are listed, such as:

Short-term

- Temporary market closures.
- Intelligent depopulation.
- Investigate all cases fully, including tracing (but beware local transmission in markets).
- No H7 vaccination, very low H7 infection in poultry, so serology very valuable tool for investigations.

Long-Term

- Appropriate modifications to marketing practices – need to look after consumers and traders.
- Better controls on sources of poultry.

- Market rest days.
- Better hygiene.
- Better design.
- Beware development of parallel market chains.

It is possible whether the emergence of H7N9 could have been prevented, since it has been known for a long time about the importance of places where poultry mix, as points where viruses can get together and mix and re-assort. We also know that there are opportunities for those viruses to find their way into the markets, and therefore, get together with other influenza viruses and re-assort.

Jonna Mazet:
"Using the toolbox to target wild bird surveillance for the Novel H7N9"

We know that novel H7N9 strains have likely evolved from four different origins, and multiple combination events, and that it is incredibly rare in birds. So there is a need to better target our surveillance. However, H7N9 is rare, and clinical signs have not been observed in domestic or wild birds. In order to detect one positive case it is likely to require a sample of 30,000 wild birds, which is very expensive to conduct. A better strategy is to consider those interfaces where wild birds are mixing with poultry, swine, and people. We also need to continue sampling at the LBMs. Especially those where wild animals are present, and where biosecurity is poor. Examination of other interfaces should be explored, such as where multiple species, people and environments come together. One Health teams are a good resource to get the animal, human, and environmental samples all at once, and this may provide more pieces of the H7N9 puzzle.

CY Gopinath:
"Communication"

Evaluation Results from H5N1 Efforts:
- Increased knowledge and awareness have not translated into changes in behavior or bio-secure farming practices.
- Low perception of risk from HPAI and other EIDs.
- Poor community level understanding of transmission, infection and disease emergence.
- Community perceptions of illness, risk and security are poorly understood.
- The community perceives communication as prescriptive and top down.

Lessons:
- Economic benefits of biosecurity prevention should be communicated in addition to health benefits.
- Weaknesses in message delivery process should be addressed.

- Basic community education module should be a part of message delivery.
- Messages should be socio-culturally relevant locally.

Guidelines:

- Move away from single-disease focus.
- Regional advocacy strategy.
- Identify minimum messages
- Revive country-level communication working group.
- Adapt messages locally with community participation.
- Develop policy and structural interventions upstream on the value chain.

Next steps: Short term,

- Adaptation and production of communication materials.
- Develop guidelines for local adaptation of messages and community engagement.
- Regional advocacy meeting.
- Messaging to high-risk audiences in high-risk areas.

Next steps: Long term,

- Messaging to general audiences to improve and strengthen general biosecurity and reporting practices.
- Strategic advocacy with regional governments to align policies, systems and communication.
- Strengthen inter-sectoral collaboration within governments and between countries.

Session 3: Discussion

This session raised many questions. Where should we target surveillance? For how long do we keep it up, and for what animal species? By the time the virus is detected, this means the virus is already present, so what are the options for dealing with endemic H7N9 given the potential of this virus?

There is a need to target our surveillance? How can we find the needle in the haystack? Unfortunately we do not have an idea about the prevalence rate for H7N9, and nor do we know the denominators at the moment. Therefore, what is the best sampling frame to use? Because it is a rare disease, sentinel surveillance may be a good option at this time. Finding proxy indicators would also be helpful. We need to find the correct indicators as well. There is a question as to whether nasal swabs from birds should be collected, and not cloacal swabs. Lessons learned from H5N1 instruct us to monitor the systems already in place, such as the value chain and live bird markets. Environment samples from markets can include drinking water used by the animals, as this was useful in finding H9N2 samples. Based on what is known about H7N9, should more serological testing be conducted?

The fact that the source is still not known presents a challenge. Even with all the efforts and work on surveillance in China, once you realize how large the industry is, then it becomes clear how this work only scratched the surface. Therefore, there is a need to target our efforts. While we need to continue studying and observing the markets, the source has to be on the farms somewhere, but where? The source of the virus is probably a long way from where the human cases arise. There are many different sectors in the industry upstream from the live bird market, so there is a high chance we have not even seen the source yet. New regulations will help. For example, every flock now coming to market has to be traceable.

Session 4 – International Guidelines and Standards

Moderator: Dr. Kumnuan Ungchusak

This was the first session on Day Two. Dr. Kumnuan introduced this session by explaining to participants that presenters from WHO, FAO and OIE will provide technical recommendations and guidelines on how to monitor, how to conduct the surveillance and how to implement control measures when H7N9 breaks out in other countries. The technical presentations were technical and detailed. Outlines are provided here.

Technical Recommendations and Guidelines for Monitoring and Controlling H7N9 in Humans and Animals

Speakers:
1. Rick Brown, WHO
2. Juan Lubroth, FAO
3. Joseph Domenech, OIE

Rick Brown:

"Monitoring and controlling H7N9 in humans"

Since the emergence of this virus, WHO has been working under the International Health Regulations to provide information to member states. WHO is also working with international partners to coordinate the global health response, including risk assessment, the provision of updated information on the situation, guidance to health authorities and technical health agencies on interim surveillance recommendations, laboratory testing of cases, infection control, and clinical management. Surveillance and investigation is contingent on which scenario is in play. The scenarios are described here:

- Scenario 1: No locally acquired case of human infection with avian influenza A (H7N9) in country.
  - No evidence for infection in human/animal.

- May find an imported human case.
- Need to be confident that this is the true situation

- Scenario 2: Sporadic cases of human avian influenza A (H7N9) infection in country.
  - One or more sporadic cases in a country (but primary source in animals).
  - Limited human-to-human transmission?
  - Need to protect individuals, monitor situation and learn more.
- Scenario 3: Sustained human-to-human transmission of avian influenza A (H7N9) in country.
  - Sustained human-to-human transmission.
  - Need to detect as early as possible.

Dr. Brown then provides a detailed presentation covering:

1. Surveillance
2. Case Definitions
3. Surveillance for Clusters of SARI: For all countries
4. SARI Surveillance in Affected Countries and Areas Bordering Affected Countries
5. Sample collection and transport
6. Transport of Biological Substances/Specimens
7. ILI Surveillance
8. Laboratory diagnosis
9. Serological Testing
10. AI A (H7N9) Diagnostic Testing
11. Further investigation when a case is confirmed
12. Reporting of Confirmed cases
13. Clinical Management guidance
14. Infection Prevention and Control (IPC)
15. Vaccines

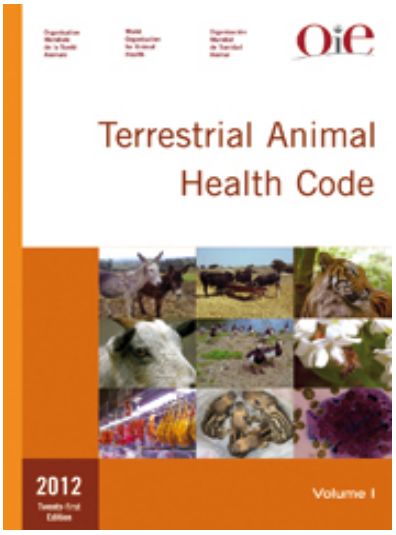
Juan Lubroth:
"Guidelines and recommendations for prevention, monitoring and controlling H7N9"

Since the virus was first reported in humans at the end of March, FAO has been working with national veterinary and human health authorities in Asia as well as with international partners such as the World Health Organization, the World Organization for Animal Health and the international scientific community to: 1) better understand risk factors; 2) identify the animal source of this new virus and its geographical extent; and 3) learn more about the characteristics of the virus itself.

FAO continues to provide technical support to member countries. In Asia, FAO is assisting countries to: 1) assess the risk of introduction and spread of the avian influenza A (H7N9) virus; 2) enhance biosecurity; and 3) plan and prepare an effective response.

FAO has also issued recommendations for government authorities and veterinary services to guide decision-making in managing the response to the H7N9 situation. "Addressing the avian influenza A (H7N9) emergency," is a series of four publications based on extensive expert consultation in FAO and with top international experts. The publications are entitled: 1. Risk management along the food chain; 2. Guidelines for emergency risk-based surveillance; 3. Emergency risk assessment summary; and 4. Laboratory protocols and algorithms.

Joseph Domenech:
"Technical recommendations and guidelines for monitoring and controlling H7N9 in animals – OIE position"



The OIE is fully involved in the collective global effort to manage new risks presented by the influenza virus A (H7N9). The OIE also develops standards relating to the rules that its Member Countries can use to protect themselves from the introduction of diseases and pathogens through the trade in animals and animal products, while avoiding unjustified trade barriers. The World Trade Organization (WTO) recognizes OIE standards as reference international sanitary rules. The relevant normative texts are available in the OIE Terrestrial Animal Health Code (Chapter 10.4.). The strict application of the rules in the OIE Code is crucial to avoid the virus being spread worldwide through the international trade in birds and their products.

Session 4: Discussion

Earlier, in Session 2, there were questions about the applicability of policies and regulations that work in one place (China, for example) but may not work in another (Egypt). There was also interest in how international organizations like FAO and WHO can help in coordinating a response to MERS-CoV. These issues come up again in this session. Regulations about zoning and compartmentalization for prevention and containment were questioned.

On how to manage H7N9 and MERS-CoV, the comment was made that it is important to have a risk based approach. There needs to be work raising the awareness of clinicians for acute respiratory illness, and conducting a patient risk assessment including asking about travel history. There was a recommendation that it would be sensible to start off by testing for influenza A, and then if it makes sense, test for H7N9. If not H7N9, then test for MERS-CoV. However, there is not enough known about MERS yet. WHO recommends if a patient presents with typical symptoms, but was not traveling, the clinician should still keep the possibility of MERS in mind.

Repeating earlier discussions, there is concern over how to respond depending on different scenarios. What do we do if there is no animal outbreak, but we find infected humans? While there are a number of possibilities, they all depend on different factors. The fact is that there is just not enough yet known about H7N9 to give a definitive response. And until we learn more about the source, and about the virus, we have to be open, flexible, and thoughtful in our response.

Session 5 – Within and beyond borders

Moderator: Dr. Ronel Abila

Participants were asked to break into country groups and determine what they would consider the H7N9 status of their countries: 1) Infected country, 2) High risk uninfected country, 3) Moderate risk uninfected country, 4) Low risk uninfected country. Then the countries formed into three different risk clusters: 1) Low, 2) Medium and 3) High. Based on the current situation in China, and the information about value chains and other information available at this stage, the clusters were asked to describe the possible scenarios of H7N9 incursion. For each scenario, clusters described activities to prevent and manage the H7N9 situation that might occur. They were also asked to present the issues and challenges to implement the plan.

The clusters were: 1) Low risk – Philippines, Sri Lanka, Thailand; 2) Medium risk - Bangladesh, Bhutan, Cambodia, Egypt, Indonesia; and 3) High risk - China, India, Laos, Myanmar, Nepal, Vietnam,.

Each cluster produced a variety of activities depending on several different scenarios. The detailed matrices are located in the annex. As an illustrative example, the clusters identified the following activities for a scenario where no infection is present in country:

1) Low risk cluster.

- Surveillance (ILI-ongoing).
- Trade restrictions from infected countries/ strict animal movement control.
- Preparedness contingency plan (include stock piling of anti-viral medications and PPEs).
- Capacity building for personnel.
- Review of national strategy and technical guidelines.

2) Moderate risk cluster.

- Advocacy and create political commitment.
- Knowledge gaps.
- Building from the existing systems.
- Lessons learned from SARS, H5N1, H1N1 (2009), and H7N9.
- Risk and operational mapping in the region for resource allocation.
- Cross border issues and international trade and travel (export/import control including quarantine).
- Need support from reference labs.

3) High risk cluster.

- Prevention with emphasis of contingency plan.
- Enhance surveillance system (along borders).
- Information sharing.
- Improvement of biosecurity at farms and markets.
- Public awareness.
- Bilateral and multi-sector collaboration.

Session 5: Discussion

Representatives from international bodies were asked to make comments. ASEAN agreed that there is a need to emphasize the role of international organizations for coordination and participation. SAARC recognized that their countries were at low risk for now, but wanted to help in managing any crisis.

FAO felt a need for robust health systems, which unfortunately are not yet in place. There is a need for targeted approaches and capacity building, including working with

market chains. Intelligent culling needs to be thought out more, while animal control movement is quite difficult, so there is a need to change the mindset into animal movement "management".

OIE would have liked to hear about more involvement with the private sector, since that is such a big player. It is also necessary to have systems in place, and this is what veterinary services do. One recommendation was made to combine activities, not only for efficiency, but to also to engage and motivate staff so that they are not tracking one disease at a time.

WHO wants to stress importance of surveillance, but while the focus is on ILI and SARI, we also need to have event-based surveillance. It's very important, so when the clinical signs are there, staff will recognize and record it. Since H7N9 will not show up in birds, human health staff will need to be the monitors.

An individual from China pointed out the difficulty when the country has aspects of low, moderate and high risk. Risk in Tibet is low, but in Hong Kong it is high. There are also industry differences around the country. So compartmentalization could be practiced in poultry and poultry products trade. A Bangladeshi was asking about any international strategies for compensation, for animal movement, and for trade between countries. His call was for a broader Asia specific recommendation. Someone from Lao PDR agreed and said there should be harmonized contingency plans across countries. A variety of respondents described disparate animal movement management in their countries, making it clear that this practice differs from place to place and is constrained by free trade policies and OIE guidelines.

Session 6 – Looking Beyond H7N9

Moderator: Dr. Dennis Carroll

Dr. Carroll introduced the session by reminding participants that the first day of the meeting covered the science around H7N9, what is known, not known, what is in the toolbox, and what new tools need to be added. This last session of the meeting is composed of three panels: 1) Surveillance options and approaches, 2) Intelligent de-population and 3) Middle East respiratory syndrome coronavirus (MERS-CoV).

Panel 1 - Surveillance

Carlene Trevennec:

"H7N9 and other AI subtypes surveillance" (medium and long-term strategy)

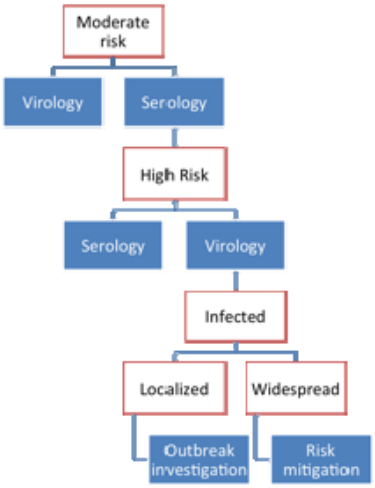
Objectives:

1. Early detection (uninfected area).
2. Assess the extent of H7N9 infection.
3. Early detection of emerging AI viruses.

4. Improve preparedness.

Expected outputs

1. Estimates of prevalence of AI and trends of subtypes changes (serological profiles).
2. Sequences.
3. Identify risk factors and at-risk compartments for H7N9.
    a. Monitoring approach once/month – moderate risk
    b. Early warning approach once/week - high
    c. Localized – outbreak investigation (snowball protocol) once/week // widespread once/month - - - infected.



Steve Redd:
Dr. Redd provided two lists:

Human Surveillance:

1. Systems need to be in place to detect and respond to H7N9 or other viruses.
2. System for conducting the diagnosis: a) a system to identify patients that might be infected, b) a system to collect samples and then, c) a system to get samples to a reference lab.
3. Communications plan in the event a positive case is identified.

Three different situations that may arise

1. Detection of a single human case, which then requires the identification of the source of infection, particularly the animal source.
2. Detection of animal infection. Is it a single case, or a larger problem? Is there an infected human somewhere?
3. A cluster of human cases is found.

Jonna Mazet:
"Tool Box Follow-up: How to Target Surveillance:

Dr. Mazet provided a brief outline:
To prevent entry and early control,

1. Ascertain human cases.

2. Target LBMs with yellow (cross-breed) chicken.
3. Test day old chicks of yellow chicken parent.
4. Attempt One Health sampling.
5. Broaden testing to all Influenza A subtypes.
6. Improve understanding of diseases, their transmission & their prevention.

Once endemic,

1. Identify human cases & characterize epidemiology.
2. Monitor poultry workers & provide prevention measures.
3. Poultry surveillance.
4. Continue some proportion of One Health sampling focusing on all Influenzas.
5. Strengthen biosecurity to protect people & prevent introduction of new genetic material from wild birds & chickens from different areas.
6. Demand-driven control: Collaboration with poultry industry to develop certification schemes for H7N9 free & safe chicken.
7. Improve understanding of diseases, their transmission & their prevention.

Panel 2 – Intelligent depopulation
Les Sims:

Dr. Sims spoke that culling has an important role to play, but we need to be smarter about how to do it. Market surveillance may not get results for a few weeks. By the time the test results are in, the birds have gone from the market. We need to be smart and sensible about when to take samples. For example, collect samples the day before the rest day, and then clean up the market after the collection.

Must consider the implications. To the farmers and vendors it's not clear why the need to cull all poultry in the market, that tested positive for H7N9 virus, especially if, with H7N9, the birds are not sick. A policy of killing chickens results in the farmer not reporting.

There is a body of knowledge and experience that informs how to move forward, but that does not help with guidance, and we should be able to help national authorities with these examples when they put together their guidelines. Working with FAO that can help the work of the national agencies.

Panel 3 – MERS-CoV
This meeting was about H7N9. However, this is not the only active threat. MERS-CoV is another area of concern. Steve Redd (CDC) and Kott Vandermeld (WHO) were asked to speak for a few minutes on MERS-CoV.

Steve Redd:
A few points: 1) The systems we will use to work with MERS-CoV will be the same as with the influenza virus, but there are differences between CoV and influenza viruses.

For MERS-CoV the reservoir will be people, and this raises questions about the animal reservoir in Arabian countries. 2) Detection and response: a) we need lab systems and reagents; b) we need systems to identify potential cases. We need to be able to rapidly detect possible cases and then rapidly control of cases. This requires quick isolation of confirmed cases. And as mentioned before, we need good communication systems ready and in place to respond when the cases show up.

Kott Vandermeld:
The method of detection is very important. With severe respiratory disease you need to take a sample. Although in H5N1 or H7N9 you might not see positive result, you probably will see a positive result in MERS-CoV. We have the same people and laboratories conduct influenza and CoV testing, so having this capacity ready will be very helpful.

Session 6: Discussion

The two-day meeting on H7N9 was thought provoking and perhaps raised more questions than answers. A caution went out that despite the desire, and need, to have surveillance guidelines to help with the study of H7N9, there is not enough validated, peer-reviewed data to generate solid recommendations on study design and sample sizes. In the meantime, it was noted, that it would help to have some frameworks for studies in wholesale and retail markets. This final session's discussion repeated questions made over the past two days, and demonstrates the weight of these concerns: We don't have enough data; we need guidelines on what to do depending on different scenarios; and, we need to build more capacity to handle this larger challenge to our surveillance systems.

Conclusions and Closing Remarks

Royal Thai Government and FAO representatives made closing remarks and thanks.

Dennis Carroll made a final comment. These were unprecedented discussions. In this meeting we are discussing how to prevent something, rather than react to it. Having seen the unfolding of an emerging threat in China we have learned a lot about avian influenza A (H7N9) because of that work. We are in a better spot than we could have been, although we don't know if it will re-emerge. And while we do not know the primary reservoir, we do know more than we would have. And this is due to the work we have been doing for the last 10 years. The last two days have brought forth discussions on issues and actions we could not have spoken about before. Today we are laying out a way forward. We are working together to begin developing the plans of action should H7N9 re-emerge in October. Together we make an effective partnership.

Meeting is closed.

Annexes

Meeting Agenda

Technical and Policy Discussion on
The Prevention and Control of Avian Influenza A (H7N9) in Asia

Bangkok, Thailand
24 -25 June 2013

Time	Topics	Moderator/Speakers
Day 1 – June 24 2012		
Session 1 – Opening and Introduction		
09:00 - 09:45	Welcome and Opening Remarks	Representatives of: - Thai government - US Government - FAO, OIE, WHO - ASEAN and SAARC
09:45 – 10:15 Group Photo and Coffee Break		
10.15 – 10.25	Introduction to the meeting	Dennis Carroll
Session 2 – H7N9 Situational Update – Moderated by Rick Brown		
10:25 – 11:15	Situational update in China	Huang Bao Xu Zhou Suizan
11:15 – 12:00	Update on scientific knowledge about H7N9	Malik Peiris and Peter Daniels
12:00 – 13:00	Regional Report: H7N9 outside China	Rick Brown/Subhash Morzaria
13:00 – 14:00 Lunch		

Session 3 – Lessons Learned – Moderated by Subhash Morzaria		
14:00 – 15:30	What's in the Tool Box? A series of plenary presentations and general discussions on: • *Using "value chain" data to target animal surveillance and "trade and clade analysis"* • *Improving detection of H7N9 influenza virus infections in humans using existing ILI/SARI systems for detection influenza infections* • *Controlling the spread of H7N9 in animals using markets closures, movement control, and culling* • *Monitoring for the spread of H7N9 in wild birds*	Jan Hinrichs Ken Inui Steve Redd Les Sims Jonna Mazet Kama Garrison/GV Gopinath

15:30 – 16:00 Coffee Break		
Session 4 – International Guidelines and Standards – Moderated by Kumnuan Ungchusak		
16:00 – 17:30	Technical Recommendations and Guidelines for Monitoring and Controlling H7N9 in Humans and Animals	Rick Brown, WHO Juan Lubroth, FAO Joseph Domenech, OIE
17:30 End of Day 1		
18.00 – Welcome Reception hosted by Thai Government		
Day 2 – 25 June 2013		
08.45 – 09.00	Briefing of Day 2	
Session 5: Within and beyond the borders – Moderated by Ronel Abila		
09:00 -10.00	Country discussion: How can countries apply the lessons learned and existing platforms of H5N1, other influenza and EIDs to improve prevention, surveillance and preparedness for H7N9 incursion?	Break-out by country

10:00 -11:00	Country cluster discussion: How can countries improve H7N9 surveillance and control to diminish the likelihood of the virus spreading from country to country?	Country clusters by risk: - High risk - Moderate risk - Low risk
11:00 – 11:30 Coffee Break		
11:30 – 13:00	Panel Discussion: Issues/ challenges a) Country b) Regional	Ronel Abila
13:00 – 14:00 Lunch		
Session 6: Looking Beyond H7N9 – Moderated by Dennis Carroll		
14:00 – 15:30	General discussions: *Opportunities for synergies between the human health, animal health and other sectors among the countries in the region and between the countries and the relevant international organizations*	
15:30 – 16:30 Coffee Break		
16:30 – 17:15	Conclusions and Recommendations	
17:15 – 17:30	Closing Remarks	

Technical and Policy Discussion on the
Prevention and Control of Avian Influenza A (H7N9) in Asia
June 24-25, 2013
Bangkok, Thailand

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OPENING REMARKS

Dr. Michael Yates, Mission Director, USAID RDMA

His Excellencies, distinguished participants, ladies and gentlemen, friends:

Good morning, and welcome all. I am very pleased to be able to offer some opening remarks at this important meeting, in which many experts and policy makers from across Asia have come to discuss the way forward with an emerging public health threat, that could have global implications. Thank you all for taking time out of your very busy schedules to be here.

First, I would like to thank our hosts, the Royal Government of Thailand, for organizing this meeting, and our colleagues at the Food and Agriculture Organization for providing technical and logistical support.

In the short time since the H7N9 influenza virus was first detected, a truly impressive effort by experts from the region, especially China and the international community, has dramatically slowed the spread of the virus and the number of human infections. This success was possible because of several factors.

First, China and other countries in the region have been steadily improving their systems for detecting and responding to infectious disease threats, including those that originate in animals. Experiences with SARS and H5N1 avian influenza have provided practical opportunities to "learn by doing."

Second, cross-sectoral collaborations between Ministries of Agriculture and Health have made it possible for these groups to work together, to quickly identify routes of transmission, and then to interrupt disease spread in animal and human populations.

And third, rapid collection and sharing among experts of information—such as human case data, genetic sequences, and surveillance results in animals— was key to bringing H7N9 influenza under control.

While these are all great accomplishments that should be applauded, it is important to remember that there is still work to be done regarding the H7N9 virus. Other influenza viruses that circulate in poultry often decrease dramatically during the summer months, only to reappear in the fall. We must ensure that we are prepared should the H7N9 virus follow a similar path. This means that all countries in Asia need to be vigilant–both for the presence of the virus, and viral evolution—and be prepared to respond.

In this room we have public health and veterinary experts from countries throughout Asia, and from numerous international organizations and donors. Using the lessons learned from China, and our collective expertise, countries will have an opportunity to discuss how to adjust their own surveillance and response mechanisms, to prepare for a possible resurgence of H7N9. In addition, countries will have an opportunity to meet with their neighbors, and coordinate plans.

The benefits of this strengthened collaboration across sectors, and boundaries, extends well beyond the immediate threat of H7N9; we expect that the sharing of information, and the coordination that takes place at this meeting, will lead to further improvements in infectious disease detection and response so that, as a global community, we are better prepared for immediate action and early containment, the next time a *new* disease emerges.

The U.S. Government maintains a strong commitment to strengthening in-country capacities to detect and respond to infectious disease threats, in Asia and in other parts of the world. We believe multi-sectoral partnerships are critical, and USAID, the Agency I represent, is pleased to work with other USG agencies such as the CDC, AFRIMS and APHIS, to help build capacity in-country to mitigate the public health, food security, and livelihoods impacts of infectious diseases. We look forward to participating in this very important technical discussion.

And we have within our collective capabilities the tools to end pandemics in our lifetimes; this challenge stands before us. By applying our collective insight, leveraging new technologies in parallel with foundational disease detection skills, and re-doubling our efforts, together we can make this vision a reality.

In closing, I wish to extend to our hosts, the Royal Thai Government, and to each of the countries and organizations represented here today, our sincere appreciation for your pro-active commitment. I wish you a very successful and productive meeting.

Thank you.

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OPENING REMARKS

by

Hiroyuki Konuma
Assistant Director-General and
FAO Regional Representative for Asia and the Pacific

His Excellencies, distinguished participants, ladies and gentlemen, friends:

A very good morning to you. First of all let me express my sincere appreciation to the Royal Thai Government and the Government of the United States for organizing this timely and important meeting on Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia. I would also like to thank them for inviting FAO to facilitate this meeting.

The emergence of a new influenza A H7N9 virus of avian origin in south-east China in February 2013 is alarming to China, the neighbouring countries, the Asian region and the global community at large.

There is increasing evidence that the main source of the infection in humans is domestic poultry. The extensive surveillance conducted by the Government of China clearly shows presence of the virus in the samples collected from chickens, ducks and pigeons from live bird markets. And the environmental samples from live bird markets have been shown to be contaminated with the virus.

The vigorous control measure undertaken by the Government of China, which included culling of poultry in infected live bird markets, enhanced biosecurity, movement control and closure of live bird markets, have had a significant impact on the incidence of the disease in humans. Fortunately, since the implementation of these measures the human cases have been declining significantly.

Government of China should be commended for their swift response to this emerging threat. The rapidity with which they have generated new information on this novel virus, and the lessons they have learned from implementing control measures are extremely valuable to the global community.

Because of our proximity to China, we in the Asia region are particularly worried about the implication of the emergence of this new virus. There are significant formal and informal trading links among the countries in Asia and the possibility the virus spilling over into the rest of Asia cannot be ruled out. Therefore those countries that are 'non-infected' need to be prepared to prevent the incursion of the virus and if the incursion occurs, to minimize its impact.

There are several properties of this virus that are cause for concern to the global community. The virus causes infection in both poultry and humans, but only causes disease in humans. Therefore the virus can spread silently in a poultry population, and raises the possibility of the infection spreading widely undetected over a large geographical area in the region through animal movement and trade.

The technical and policy issues of addressing a public health problem, the source of which is rooted in apparently healthy domestic poultry and possible involvement of wild birds calls for a multi-sectoral dialogue and collaboration. This is an opportunity to put in practice yet again the 'one health' principles that are being increasingly adopted in the region to address the complex problem of high impact emerging and re-emerging infectious diseases.

The Government of China has announced that the economic loss due to this virus since its first emergence is estimated to be over 6.5 billion dollars. FAO is therefore concerned not only for the public health impact, but the larger impacts on food security, livelihoods and poverty alleviation in the region.

FAO has had a significant experience of addressing high impact diseases. In the region, over the last 10 years FAO has played a leading role in addressing the avian influenza problem in poultry. Through these efforts and support from international donors and inputs from national governments, a good capacity in the field of prevention and control of infectious diseases has been established. FAO stands ready to assist countries in the region to draw on this capacity to address the impending threat by H7N9.

Since the emergence of the novel H7N9 virus, FAO has been actively involved with the Government of China and the countries in the region in coordination, disease intelligence, communication, development of guidelines for risk assessment and risk management and development of protocols for risk based surveillance and diagnosis. A number of these activities have been conducted in close collaboration with our international partners and OFFLU, the OIE/FAO network of expertise on animal influenza.

As an immediate reaction, FAO, through is technical cooperation programme, has committed financial resources to support global and regional initiatives to address the threat of H7N9. In this regard, I am pleased to announce that two regional emergency TCPS to support those SAARC and ASEAN countries that are at risk of incursion of H7N9 virus.

I note that the meeting participation includes high-level representations from Ministries of Agriculture and Ministries of Health of China, Cambodia, Indonesia, Lao PDR, Myanmar, Thailand, Vietnam, Bangladesh, Bhutan, India, Nepal, and Egypt. In addition, there are representatives from regional and international organizations, including SAARC, FAO, WHO, OIE, USAID, AusAID, ADB, US CDC, AAHL, USDA, and research institutions.

We hope that this meeting will provide an opportunity for both the public and animal health sectors of the countries in Asia to discuss collaborative efforts to address the threat of H7N9 in the region. In your discussions I sincerely hope that you will consider how we can advocate for stronger political support and make the prevention and control of high impact emerging infectious diseases in this region more sustainable. In this connection, I wish to suggest that continuity pandemic plan be reactivated with clear identification of roles and responsibility of each actor and we should build a strong resilience and preparedness to potential threats.

We as FAO would like to assure our partners that we are ready to assist in supporting actions to control and mitigate the impact of this new virus.

Once again, I would like to thank GoT and USAID in organizing this meeting, representatives from various countries, donors and international organizations in participating in the important meeting.

I wish you a constructive dialogue and outcome from this meeting.

OPENING REMARKS

Dr. Richard Clive Brown

His Excellencies, distinguished participants, ladies and gentlemen, friends:

I would also like to take this opportunity to thank the Royal Thai Government for hosting this important meeting, also to acknowledge and thank the support of USAID and the logistical support of FAO in making the practical arrangements.

In common with these colleagues, colleagues and sister UN agencies, national governments and all of the partners, WHO viewed this H7N9 event with great concern as it unfolded. Also, in common with many others, we are also very concerned about the likelihood that this disease will return.

So, and I am sure you will hear this many times over the course of the next two days, we feel it is important to stress that there is no room for complacency, rather that we need to regard this apparent lull in disease in animals and in humans as an opportunity to take some time to think about the key steps that need to be put in place.

In doing so, we feel important to stress the need to build on the strong, inter-sectoral partnerships in the region, as well as the significant experiences of dealing with Avian Influenza H5N1. So, what should be the priority actions? I think we would perhaps highlight three things.

Firstly, it is going to be important to gather together all key information that we already had and take stock. In doing this, we would also like to take the opportunity to once more thank and commend the Government of People Republic of China for the prompt and complete sharing of information on this event. But by consolidating the information we have, we may be able to establish a kind of baseline or foundation of knowledge to build upon.

Secondly, we need to further develop joint animal-human health tools and mechanisms to work cross-sectorally, including for communication between sectors, for joint investigation of events, and joint risk assessment.

Lastly, we should work to build these activities into regional strategies that facilitate this business of working together, using the animal health and human health expertises to assess and reduce the risks. However, I am confident that if we work together we will soon be much better place to protect the communities of which we are all apart.

Thank you.

OPENING REMARKS

Dr. Joseph Domenech

His excellencies, distinguished guests, colleagues, friends:

It is my pleasure to be here and to represent the...OIE. We meet again to address an important problem, again and again, emergency an emergence of a new virus, which could become pandemic. We all...(25.50) other influenza crisis, particularly H5N1, and I think that this meeting is a timely because we know the virus and immediate and strong response has taken place from Chinese Government. And some researches have already been taken place, so all these thank to the transparent information and important reaction from the Government of China, which has to be again congratulated as other speakers did.

Also, international and regional FAO, OIE, WHO and their regional offices immediately responded it the...platform, the joint FAO-OIE-WHO platform, and also made a lot of works, several missions...and tele-conferences, and now you

Do we have a reservoir? Where risk of spread, of threat, effective surveillance and response, and many others. OIE has a position which...assist...OIE Standard...to prevent spread; I will repeat that this afternoon.

Notification is important of course, for virus ...All the works we do are based on surveillance and immediate response, on regional and international cooperation, and of course on top that, an approach called “One Health”, as you all know, we have partners from very sectors and disciplines. OIE will continue to support its member countries, notably full capacities building in national and regional levels. It is an emergence of a virus with a potential to trigger to pandemic, so prevention and control is a public good. Agenda is very well prepared according to clear objectives. We hope that this meeting will be very fruitful.

Again, thanks to the Government of Thailand and USAID for organizing this meeting, as well as FAO and the Government of China for their very valuable contributions.

Thank you very much.

OPENING REMARKS

Rubina O Cresencio
ASWGL Chairperson

His Excellencies, distinguished participants, ladies and gentlemen, friends:

It is indeed an honour for me to represent the Association of South East Asian Nations (ASEAN) in this auspicious occasion of the opening session of the Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia.

Taking this opportunity on behalf of ASEAN Member States, I would like to personally express my sincere and grateful appreciation to The Government of Thailand and the United States Agency for International Development (USAID) for their leadership in organizing this workshop. I'm confident that this meeting will provide an opportunity for ASEAN Member States to share experiences and lessons learned, to discuss specific issues, and to identify opportunities for synergy and further collaboration.

Since the first report of human infection in late March this year, concerns on the potential pandemic of Avian Influenza A (H7N9) were raised at the global stage across both human and animal health sectors. This is primarily due to its possibility of having an interface in the human and animal populations.
In response to this potential threat, ASEAN, whose aim is to enhance cooperation and promote collaboration among its members and partners, has undertaken some initiatives to strengthen and improve the measures to ensure concerted and coordinated efforts among the Member States at the country and regional levels.

Ladies and Gentlemen,
As a specific response to assist in the preparedness of the livestock sector, the 13th Meeting of ASEAN HPAI Task Force held in Indonesia and the 21st ASWGL Meeting held in Philippines this year deliberated on the actions needed to prevent and control possible incursions and outbreaks of the H7N9 virus in animal population in ASEAN. These Meetings identified an urgent need to conduct a regional surveillance, coordination and collaboration in the sharing of pertinent information, raising public awareness, and taking necessary precautionary steps that will help in the implementation of definite measures and areas of co-operation in the control of H7N9 in high-risk countries in the ASEAN Region.

Strong partnerships between ASEAN and development partners, which have been built over the years especially since the outbreak of HPAI H5N1 in the region, have

once again been mobilised. A regional technical cooperation project in collaboration with FAO has recently been initiated. The project will provide technical assistance to the ASEAN Member States, with its prime objective to minimise the impact of propagation of avian influenza A (H7N9) on human health and livelihoods. The project will support a coordinated sub-regional surveillance and response to avian influenza A (H7N9) in poultry and other animal populations in high-risk countries.

Distinguished Ladies and Gentlemen,
This is why we gather here – to discuss specific policies and mechanisms with which ASEAN, Ministries of Agriculture and Health from Asian countries, development partners and other stakeholders including research institutions will develop a policy and collaborative platform in addressing this issue.

I wish to emphasise that ASEAN will continue to support and foster this collaboration. I hereby reaffirm ASEAN's commitment to safeguard the wellbeing of its people, and to strengthen the foundation for a sustainable livestock sector development. For the H7N9, please be assured that ASEAN will be standing by your side, hand-in-hand, joining you in the fight against this pertinent threat, similar to what we have been doing all these years for the HPAI H5N1.

Distinguished Ladies and Gentlemen,
With that highlights, I would like to conclude my remarks by thanking all participants for spending your precious time and to sharing your valuable views with us for the next couple of days. I hope all of us will utilize this precious time to come up with fruitful results for the benefit of the global community.

Thank you for your kind attention.

OPENING REMARKS

Dr. Ranjani Hettoarachchi

His excellencies, distinguished guests, ladies and gentlemen,

A very good morning to you. First of all, let me express my sincere appreciation to the Royal Thai Government and the Government of the United States for organising this timely and important meeting in Thailand on "Technical and Policy Discussion on the Prevention and Control of Avian Influenza A in Asia."

It is my pleasure indeed, to deliver the opening remarks as the Chair of the SAARC CVOs Forum. Food security has always been an important agenda under the regional cooperation activities of SAARC. Countries in SAARC and their leaders are committed to ensure food security in the region. The commitment towards food security is manifested by the adaption of important policy documents, such as SAARC Agricultural Vision 2020, Colombo Statement on Food Security, and Regional Food Security Strategy.

Over the years, the region has made commendable achievement to ensure food security for the people of the region, but the achievements made so far may be lost easily by the impending threat of trans-boundary animal diseases. Considering the important of livestock in food security, poverty reduction, and important of trans-boundary animal diseases for animal health and public health, SAARC countries have been arranging CVOs meetings since 2008. til date, CVOs of SAARC have met three times. This forum has emerged as an effective platform for discussing policy and technical issues, pertaining to livestock development and animal health, for taking coordinated regional approaches, for protecting improving food security. The forum is also instrumental for taking coordinated approach for the control of diseases of public health...(37.30), originating from animals. To reduce the potential risk of highly pathogenic emerging diseases, including "", SAARC with the technical assistant of FAO and financial support from EU have been implementing HPED project. The project has established a regional coordination mechanism for controlling HPED in the region. Roadmap for controlling major threats have been developed; lead laboratories have been identified and made functional; and information sharing mechanisms have been established.

SAARC has been working to mobilise funding to sustain the achievements made through the project. SAARC countries have recently developed, recently adopted SAARC Strategy for Prevention and Control of Communicable Diseases, which reflects the collective commitment towards One Health. Initiatives have been taken to control important zoonotic disease like Rabies, where One Health approach will play a central role. Some of the trans-boundary animal diseases, like Avian Influenza, pose serious threats to public health, and have the potential to create pandemic also. The

continue outbreak of highly pathogenic Avian Influenza H5N1 and recent outbreaks of H7N9 in China highlight the importance of continue vigilance for averting pandemic threat, lost of lives and livelihood.

USAID supported FAO country programmes for controlling HPAI have been instrumental in controlling HPAI in the SAARC region. These country programmes, along with the regional HPED programes, are proved effective for responding to recent H7N9 episode emerging in China. Recently launched FAO regional Technical Cooperation Program (TCP) for H7N9 control is a very timely initiative. SAARC countries will continue to collaborate with FAO and WHO in their initiatives to control any emerging diseases having impact on food security and human health.

I wish a constructive dialogue and outcome from this meeting.

Thank you for your kind attention please.

OPENING REMARKS

H.E. Pradit Sintavanarong

His excellencies, distinguished representative from regional and international organisations, ladies and gentlemen:

On behalf of the Ministry of Public Health of Thailand, I would like to extend my sincerest and warmest welcome to all distinguished delegates to the Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia.

Since the first report of human infection in late March this year, concern on the potential pandemic of novel avian influenza A (H7N9) were raised at the global stage, across both human and animal health sectors. In respond to this potential threat, Ministry of Public Health of Thailand, whose aims to ensure policy good health and safety, has undertaken certain initiative through the National Strategic Framework of Emerging Infectious Disease to refresh, strengthen, and improve the measures, to prevent and prepare to manage any situations in case of H7N9 incursion, using the lessons learnt from SARS and H5N1. Specifically for the public health sector, we have to strengthen the surveillance in human to upmost level, as H7N9 virus indifferent from H5N1 in not causing any clinical signs that can be used as the indicator. In addition, we are quite confident that, the capacity being built for H5N1 for case management would still be applicable, except the fact that the case has to be rapidly diagnosed.

Risk communication has to also be strengthened, to raise the awareness for those who are at risk since this seems to be one of the occupations of concern. However, this needs to avoid the public panic to minimal any unnecessary losses.

The most important aspect above all is we have to ensure concerted and coordinated effort among the relevant sectors at the country level. I am confident that this meeting will provide the opportunity for participants to share experiences and lessons learnt to discuss specific issues, and to identify opportunities for synergy and further collaboration.

Thank you very much for your kind attention.

OPENING REMARKS

Dr. Yukol Limlaemthong
Deputy Prime Minister cum Minister of Agriculture and Cooperatives

His excellencies, distinguished representative from regional and international organisations, ladies and gentlemen:

On behalf of the Royal Government of Thailand, please allow me to extend my sincerest and warmest welcome to all distinguished delegates to the Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia.

As highlighted by the other speakers, the emergence of influenza A (H7N9) of avian origin in China earlier this year has posed an alarming concern on a potential pandemic threat. While severity so far has been observed in human, increasing evidence has shown the potential interface with avian species, which may be related as the main source of the infection in human.

I would also like to join my colleagues here to commend the Government of China for their efforts in controlling the outbreaks, and for sharing of extremely valuable information that allows the global community, including Thailand, to take timely and appropriate actions to prevent any incursion of the H7N9 influenza virus.

For Thailand, when the H7N9 outbreak was firstly reported in China, it was felt as if the situation for this H7N9 influenza would be similar to the HPAI H5N1 situation, which has haunted us during the last decade with its devastating impacts. This matter was immediately considered as the national agenda. However, this virus is quite unique compared to the H5N1 virus as it appears not to cause any disease in poultry but has shown ability to provoke severe disease in humans that becomes even a bigger challenge to detect and control the virus in its animal reservoir.

Relevant authorities in Thailand, including Ministry of Public Health, Ministry of Agriculture and Cooperatives, and Ministry of Natural Resources and Environment, have joined forces under the National Committee for Emerging and Re-emerging Infectious Diseases. Collaborative efforts with integrated framework have been mobilized and taken into considerations the lessons learned from SARS and HPAI-H5N1.

The existing surveillance program for all relevant sectors has been modified and strengthened with the aim to rapidly detect any possible incursions of H7N9 for humans and animals. Specifically, existing influenza surveillance systems, through the detection of influenza-like illness (ILI) and severe acute respiratory illness, have been

intensified through networks of health volunteers and hospitals. Such emphasis on rapid detection of human infection is a prerequisite for an effective case management. Ongoing surveillance for Avian Influenza in domestic and wild animal species, which has been extremely effective against HPAI, has also been reinforced and modified, giving a particular focus on a risk-based approach.

While we are quite fortunate that there has not been a report of Avian Influenza A (H7N9) in Thailand, we remain vigilant in our stance and step up our preparedness to safeguard our people from such pertinent threat. We are mindful that there are still certain challenges ahead. The low pathogenic nature of the novel Influenza A (H7N9) virus in avian species makes it difficult to detect the infection in poultry population. The silent infection of H7N9 virus in poultry may prohibit the usefulness of using poultry as a sentinel prior to human infection, and also a main challenge for early detection in poultry population before the virus will cause disruption to livestock sector development. In any case, we believe strengthening the biosecurity system along the livestock production and market would still be valid not only for H5N1 or H7N9 but also for other potential emerging infectious diseases that may originate from livestock.

Fortunately, we have already seen a decline in number of human cases in China although I believe that we should not let our guards down. In addition, the public must still be made aware of the ongoing threat that could potentially hit us again anytime. There are works ahead of us to maintain the community awareness, without causing panic, and to sustain public trust to ensure participative and effective delivery of disease control program.

Distinguished ladies and gentlemen,

In this connection, I would like to take this opportunity, on behalf of the Royal Thai Government, to thank USAID, FAO, OIE, WHO, ASEAN, SAARC, and other relevant international organizations for their leaderships during this emergent need. Most importantly, I wish to commend and thank the countries that are presenting here, to demonstrate our commitment and solidarity to address the common concern, as a global public good.

I am very much delighted to be here this morning, welcoming all of you to the meeting, and yet importantly to Bangkok, Thailand. I am sure that the people of Thailand will also join me to welcome you to the heart of the beautiful land of smile. So while you are having productive and fruitful discussion in the meeting, please also take the opportunity to explore Bangkok, which have been ranked as the World's Top Destination City.

Ladies and gentlemen,

It is now an auspicious time, I wish to declare the Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) opened.

Press Release

Prevention and Control of Avian Influenza A (H7N9) the Focus of Multi-Country Dialogue in Bangkok

Bangkok, 25 June 2013 - China's H7N9 avian flu outbreak and its implications for ASEAN and SAARC countries were the focus of a two-day meeting in Bangkok, Thailand from 24-25 June 2013.

High-level technical representatives from Ministries of Health and Ministries of Agriculture from Bangladesh, Bhutan, Cambodia, China, Indonesia, Laos, Myanmar, Nepal, Thailand and Viet Nam met to discuss a coordinated, evidence-based approach to H7N9 prevention and control.

The H7N9 influenza virus is unique, compared with H5N1 avian influenza, in that it appears not to cause any disease in poultry but has shown ability to provoke severe disease in humans, challenging efforts to detect and control the virus in its animal reservoir.

Since March 2013, China has reported 132 laboratories confirmed human cases of H7N9 influenza to the World Health Organization, of which there have been 39 fatalities. Bird-to-human transmission is suspected, although risk factors for human exposure and the nature of viral movement amongst poultry populations are still under investigation. To date, there has been no evidence of sustained human-to-human transmission, an early indicator of a virus with pandemic potential.

The virus is still emerging as new information is being generated. While there is no evidence of spread wider than the ten Provinces in Eastern China, influenzas often follow a seasonal pattern, and representatives from the region discussed best practices to heighten targeted surveillance and rapidly implement context-specific control measures should the virus be detected outside of China.

Representatives agreed that close cooperation between human and animal health authorities is critical in containing this emerging virus at its source

Informed by nearly a decade of experience with avian influenza H5N1 in the region, the Bangkok meeting—jointly hosted by the Royal Government of Thailand and the U.S. Agency for International Development—presented a virtual tool kit of detection, diagnostic, and control options that countries can call upon in the campaign against H7N9 or future influenzas that threaten health and livelihoods in Asia.

“The ability of governments and their partners to quickly and effectively prevent, detect, and respond to the H7H9 virus has been greatly enhanced by the partnerships,

platforms and knowledge-base built across Asia over the past decade, responding to serial threats posed by SARS, the H5N1 avian flu and the pandemic H1N1 flu," said Dr. Dennis Carroll, Director of USAID's Emerging Threats Program. "This meeting is an opportunity to highlight these partnerships and forge a united way forward."

USAID is working with governments across the region and international partners to provide immediate technical assistance in developing evidence-based approaches to H7N9 prevention, control and containment.

Group Photo

Technical and Policy Discussion on the Prevention and Control of Avian Influenza A (H7N9) in Asia
Bangkok, Thailand
24 -25 June 2013

Country Cluster Scenarios

LOW RISK COUNTRIES (Philippines, Sri Lanka, Thailand)

SCENARIO	PLANNED ACTIVITIES	GEOGRAPHIC FOCUS	ISSUES AND CHALLENGES
1. Never occur in the country	• Surveillance (ILI-ongoing) • Trade restrictions from infected countries/ strict animal movement control • Preparedness contingency plan (include stock piling of anti-viral medications and PPEs) • Capacity building for personnel • Review of national strategy and technical guidelines	• Whole country	• Resources (financial and human) • Laboratory support • Risk communication limitations in any eventualities
2. SARI patients on further test for H7N9 (travelling abroad, family cluster at least 2 of them are positive), health care worker, or farmer, no established cause)	• ILI surveillance ongoing • Information sharing between human health and animal health sectors • Joint outbreak investigations (including retrospective contact tracing)	• Affected areas/borders	• Resources (financial and human) • Laboratory support • Risk communication limitations in any eventualities
3. H7N9 is reported in human as	• ILI and event based	• All international	• Timely detection of

imported case(s) and no connection with poultry in country	surveillance yield (+) result • Contact tracing • Information sharing between public health and animal health sectors • Risk communication • Joint outbreak investigations (including retrospective contact tracing)	ports, points of entry	asymptomatic individual • Resources (financial and human)
4. Illegal movement of poultry and products at the borders	• Border and road control • Strengthening border cooperation with other countries	• International borders (land borders)	• Resources (financial and human) in maintaining border control • Farmer/trader education • Collaboration between border control authorities
5. Detection of H5N1 and H7N9 in poultry during routine active laboratory surveillance (during movement and every 6 month routine practices)	• Disease investigation and control measures (include stamping out, quarantine, disinfection and other measures in place) • Risk communication	• Affected areas and surrounding areas	• Resources (financial and human) in maintaining border control • Farmer/trader education • Law enforcement • Laboratory support
6. H7N9 is detected in domestic poultry/other animals in the country but no human case is reported	• Intelligent stamping out w/compensation • Public awareness (risk communication)	• Affected areas (3 km radius/7 km quarantine zone)	• Industry resistance • Lack o human resource • Risk communication capacity is limited • Law enforcement
7. H7N9 is detected in domestic	• Isolation of human case and	• Identification of areas	• Industry resistance

poultry/other animals in country and at least one human case is reported	contact tracing • Sampling of exposed poultry (net effect of contact tracing)	visited (net effect of contact tracing)	• Risk communication capacity is limited
8. H7N9 is detected in wild birds but no cases detected in poultry and humans	• Wild bird surveillance in identified hotspots (AIPP)	• Hotspots identified in the preparedness plan	• Resistance of conservationist groups • Resources

MODERATE RISK COUNTRIES (Bangladesh, Bhutan, Cambodia, Egypt, and Indonesia)

SCENARIO	PLANNED ACTIVITIES	ISSUES AND CHALLENGES
1.Imported in human, no connection with poultry	• Surveillance • Lab diagnosis • Case management Note: (Built on existing ILI and SARI) IHR(2005) and APSED (2010)	Human health: • Lab diagnosis • Awareness • Capacity building • Travel advisory • Public health laws (quarantine) • Infection control in hospital
2.Wild birds, no poultry and human	• Surveillance in wild birds and poultry (Built on existing capacity) • Biosecurity • Awareness and capacity building • Interface with OH approach • Interface level poultry and wild birds	• Funding support • Collaboration with international organizations • Capacity
3.In domestic poultry, but no human case	• Intensify surveillance both human and animal • Import banned from infected countries • Surveillance in LBM and port of entry • Biosecurity • Depopulation at LBMs and positive flocks + compensation • Movement control • Improve multi-sectoral collaboration • Continue assessing the risk Prepare for human health case • Revise contingency plan • Increase surveillance ILI and SARI	• Rapid access to compensation funds • Close LBMs • No policy for depopulation and compensation • How to maintain the supply to consumers, and how to manage over supply • Funding support • Improvement LBM needed in the long term

	• Public awareness • Increase lab capacity	
4.Detected in both poultry and human	Planned activities as under Scenario 3 • Intensify ILI and SARI • Event based surveillance	
5. No human and poultry cases detected		• Advocacy and create political commitment • Knowledge gaps • Building from the existing systems • Lessons learned from SARS, H5N1, H1N1 (2009), and H7N9 • Risk and operational mapping in the region for resource allocation • Cross border issues and international trade and travel (export/import control including quarantine) • Need support from reference labs

Issues and challenges for Moderate group (Bangladesh, Bhutan, Cambodia, Egypt, and Indonesia)

- Gaps in knowledge of disease required for planning - transmission, risk
- Gaps in Implementation:

1. Overall capacity both animal and human health sectors in:
    - Lab diagnosis
2. Awareness
3. Travel advisory for any imported cases
4. Legislation related quarantine in public health sector
5. Prevention and control of infection in health facilities
   -Funding support
6. Depopulation:
    a. Rapid access to compensation funds

    b. No policy for compensation in some country
7. Close LBMs
    a. How to maintain the supply to consumers, and how to manage over supply
    b. Improvement LBM needed in the long term
8. Funding support
9. Advocacy and create political commitment

Notes:

1. Building from the existing systems
2. Collaboration with international organizations
    a. Lessons learned from SARS, H5N1, H1N1 (2009), and H7N9
    b. Risk and operational mapping in the region for resource allocation
    c. Need support from reference labs
3. Cross border issues and international trade and travel (export/import control including quarantine)

HIGH RISK COUNTRIES (India, Laos, Myanmar, Nepal, and Vietnam)
POSSIBLE SCENARIOS

Scenario 1	India: No detection of virus at all humans and poultry Laos: No infections in humans and in animals Myanmar: Disease detected in poultry, but no human cases Nepal: H7N9 detected in poultry, but no human cases Vietnam: Poultry come into Vietnam with H7N9 virus
Scenario 2	India: Detect virus in poultry but no human cases Laos: Detect virus in animals, but no in humans (based on active surveillance) Myanmar: Disease detected in poultry and human cases (at least one) Nepal: H7N9 detected in poultry, and at least one human case reported Vietnam: People come into Vietnam with H7N9 virus
Scenario 3	Laos: Detect virus in humans, but no in animals Myanmar: Disease detected in poultry, reported cases in humans but no contact with poultry Nepal: H7N9 detected in poultry, and extensive human cases reported Vietnam: Song birds come into Vietnam with H7N9
Scenario 4	Laos: Detect virus in both animals and humans Nepal: H7N9 detected in wild birds, but no detected in poultry and humans Vietnam: Wild birds come into Vietnam with H7N9 virus

ACTIVITIES

SCENARIO	PLANNED ACTIVITIES	ISSUES AND CHALLENGES
Scenario 1 Laos: No infections in humans	Laos: - Prevention with emphasis of contingency plan	Laos: - Joint outbreak investigation

and in animals	- Enhance surveillance system (along borders) - Information sharing - Improvement of biosecurity at farms and markets - Public awareness - Bilateral and multi-sector collaboration	- Human resources (insufficient) - Application OIE standards at entry points for monitoring and surveillance of movements into Laos - Education programs for farmers and traders for changing behavior - Collaboration between related sectors at the entry points
Myanmar: Disease detected in poultry, but no human cases	Myanmar: 1. Updated existing contingency plan 2. Capacity Building 3. Surveillance (EWARS) 4. Strengthen risk communication 5. Information Sharing 6. Market closure/Trade ban 7. Biosecurity 8. Multispectral collaboration 9. Bilateral and Multilateral collaboration 10. Case management and infection control (H) 11. Joint outbreak investigation and management	Myanmar: 1. Weakness in surveillance in both livestock and in humans 2. Legislation to be strengthened (for livestock) 3. Cross border dependency on poultry and poultry products 4. No policy on compensation 5. Risk assessment to be strengthened 6. Culling for H7N9 difficult 7. Funding gaps
Vietnam: Poultry come into Vietnam with H7N9 virus	Vietnam: - Direction from National Steering Committee for Controlling Infectious Diseases - Surveillance (virology and serology) - Control of poultry movements - Close infected markets once they are detected with H7N9 + apply policy that has been applied for	Vietnam: - Large number of samples to be taken and tested. - Difficult to stop illegal movements of poultry, but should think of legalize those infected poultry, even poultry movements within Vietnam

	H5N1 infection - Biosecurity and disinfection - Communication + sharing information - Collaborate with China to control of poultry movements and sharing information	
India: No detection of virus at all humans and poultry	India: - Surveillance: at high risk areas bordering China, target surveillance, market value chains - Contingency planning - Capacity building - Preparedness - Biosecurity	India: - Backyard poultry - Target surveillance is not easy (an issue) - Laboratory and epidemiology staff (man power) - .....
Nepal: H7N9 detected in poultry, but no human cases	Nepal: - Review and revise existing contingency plan for H5N1 > > > all activities will be included in the plan to be carried out - Surveillance of H7N9 - Biosecurity - Market managements	Nepal: - Funds - Technical - Human resources - Inadequate supports - Inadequate biosecurity measures - Inadequate coordination from poultry - Dependency on poultry and poultry products - Remote geographic areas
Scenario 2 Laos: Detect virus in animals, but no in humans (based on active	Laos: - As above, but PLUS:	Laos: - Convincing policy makers

surveillance)	- Capacity building (staff) - Joint responses in case detect virus in poultry and in humans	- Health care facilities - Compensation scheme - Budget constraints - Risk communication
Myanmar: Disease detected in poultry and human cases (at least one)	Myanmar: - Above activities PLUS - ILI and SARI surveillance (EWRS) - Disinfection and human case management and control - Joint outbreak investigation	Myanmar: - Above activities
Vietnam: People come into Vietnam with H7N9 virus	Vietnam: - Direction from National Steering Committee for Controlling Infectious Diseases - Surveillance and monitoring: Focus on ILI people in hospitals, sampling skills and transportation from sampling sites to laboratories - Quarantine and isolate suspect infected people - Strength diagnosis and treatment capacity at hospital and - Improve laboratory capacity of the national institutes - Collaborate with China to control of cross border quarantine	Vietnam: Large number of people to be monitored > > > large number of samples (clinical signs of infected people are similar to other season flu infected people and other respiratory diseases)
India: Detect virus in poultry but no human cases	India:	India: - Transparency in disease reporting

Nepal: H7N9 detected in poultry, and at least one human case reported	- As Above - Trade movement restriction/ market closure - Culling infected birds in infected zones - Biosecurity - Multi-sectoral co-ordination and collaboration - Bilateral and multilateral collaboration Nepal: - Above activities	- Exchange of information - Capacity building through Training of vets/ laboratory scientists of neighboring countries in India - Organization of bilateral / multi-lateral meetings at - Involvement of International organizations like FAO/ OIE/ WHO to lead the countries in the region to tackle the cross border issues Nepal: - Funds - Technical - Human resources - Inadequate supports - Inadequate biosecurity measures - Inadequate coordination from poultry - Dependency on poultry and poultry products - Remote geographic areas
Scenario 3 Laos: Detect virus in humans, but no in animals Myanmar: Disease detected in poultry, reported cases in humans	Laos: - As above Myanmar: As above	Laos: - As above Myanmar: As above

but no contact with poultry Vietnam: Song birds come into Vietnam with H7N9 Nepal: H7N9 detected in poultry, and extensive human cases reported	 Vietnam: Similar to scenario 1 Nepal: - Capacity building - Equipment - Reagents for diagnosis - Strength of laboratory by trainings - Establish multi-sector collaboration - Bilateral and multi-sector coordination	 Vietnam: Similar to scenario 1 Nepal: As above
Scenario 4 Laos: Detect virus in both animals and humans Vietnam: Wild birds come into Vietnam with H7N9 virus Nepal: H7N9 detected in wild birds, but no detected in poultry and humans	 As above	 Above