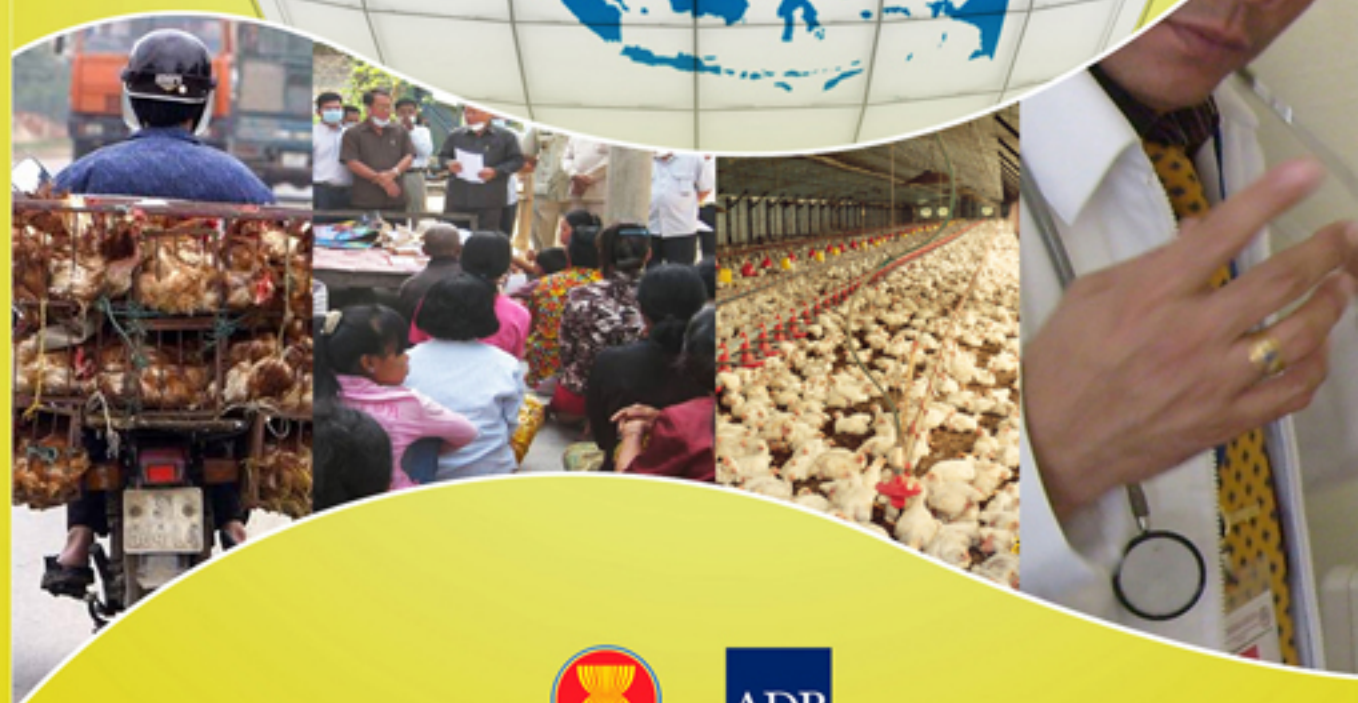


PREVENTION, CONTROL AND ERADICATION OF AVIAN INFLUENZA IN ASEAN

Strategies and Success Stories



ONE VISION, ONE IDENTITY, ONE COMMUNITY
www.asean.org





Prevention, Control and Eradication of Avian Influenza in ASEAN

Strategies and Success Stories

August 2010

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The Member States of the Association are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. The ASEAN Secretariat is based in Jakarta, Indonesia.

For inquiries, contact:

The ASEAN Secretariat

Public Outreach and Civil Society Division

70A Jalan Sisingamangaraja

Jakarta 12110

Indonesia

Phone : (62 21) 724-3372, 726-2991

Fax : (62 21) 739-8234, 724-3504

E-mail : public.div@asean.org

General information on ASEAN appears online
at the ASEAN Website: www.asean.org

Catalogue-in-Publication Data

Prevention, Control, and Eradication of Avian Influence in ASEAN

Strategies and Success Stories

Jakarta: ASEAN Secretariat, September 2010

614.518

1. Diseases – Influenza – Virus

2. ASEAN – pandemics – pathogenic

ISBN 978-602-8411-53-0

The text of this publication may be freely quoted or reprinted with proper acknowledgement.

Copyright Association of Southeast Asian Nations (ASEAN) 2010

All rights reserved

Table of Contents

Table of Contents	3
Acronyms and Abbreviations	4
Foreword	5
Executive Summary	6
1. State of Avian Influenza in the ASEAN Region	9
Status of HPAI in ASEAN Member States	10
Categorisation of ASEAN Member States Based on Current HPAI Status	12
Risk Factors for Occurrence and Persistence of HPAI	13
Risks of Domestic Animal-to-Animal Transmission	13
Cross-Border Risks	14
Intra AMS Risks	16
2. Prevention, Control and Eradication of Avian Influenza in ASEAN	17
ASEAN Regional Cooperation and Responses to HPAI	18
National Animal Health Capability	22
Legislative and Institutional Support	27
Laboratory and Diagnostic Capability	29
Public Awareness and Risk Communication	30
Emergency Preparedness and Contingency Planning	33
Compartmentalisation and Biosecurity	34
Stamping out and Compensation Policies	36
Vaccines and Vaccination Strategy	37
Animal-Human Health Interface	39
Coordination, Cooperation and Partnership	40
3. The Way Forward: Long-Term and Sustainable Strategies	41
Roadmap for HPAI-Free ASEAN by 2020	42
Regional Coordination Mechanism on Animal Diseases and Zoonoses	43
Private Sector Engagement	44
Research and Development	44
Narrowing the Development Gap	44
4. The ASEAN HPAI Taskforce	45
5. Acknowledgement	46

Acronyms and Abbreviations

AAHTF	ASEAN Animal Health Trust Fund
ADB	Asian Development Bank
ADIC	Animal Disease Information Centre
AMAF	ASEAN Ministers on Agriculture and Forestry
AMS	ASEAN Member States
ASEAN	Association of Southeast Asian Nations
ASEAN TWG-PPR	Technical Working Group on Pandemic Preparedness and Response
ASEC-ONE Health	ASEAN Secretariat Working Group on ONE Health
ASWGL	ASEAN Sectoral Working Group on Livestock
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DOH	Department of Health
FAO	Food and Agriculture Organisation
FMD	Foot and Mouth Disease
HPAI	Highly Pathogenic Avian Influenza
HPED	Highly Pathogenic Emerging Diseases
IEC	information, education and communication
JICA	Japan International Cooperation Agency
LBM	live bird markets
LBVD	Livestock Breeding and Veterinary Department
LGUs	local government units
MARD	Ministry of Agriculture and Rural Development
NSWP	National Strategic Work Plan for the Progressive Control of HPAI in Poultry
OIE	World Organisation for Animal Health
PDSR	Participatory Disease Surveillance and Response
PPP	public-private partnership
R&D	research and development
RCM	regional coordination mechanism
SMS	short messaging services
SOPs	standard operating procedures
TADs	transboundary animal diseases
WHO	World Health Organization



Foreword

Animal health issues are important concerns to ASEAN as they have serious impact to our regional growth and development, as well as to our community-building efforts. We have seen that when the first outbreak of the H5N1 Highly Pathogenic Avian Influenza (HPAI) occurred in 2003, the problem devastated the region: no less than 200 million poultry were culled, which led to economic losses of over US\$ 10 billion to our poultry sector. About 330 people contracted the infection, of which 200 of them died. Panic and fear spread all over the region, which also caused some degree of political and socio-cultural tensions.

But through our collective efforts, we were able to manage and control this dreadful disease. This has been due to the multi-sectoral cooperation led by the livestock and public health sectors; the establishment of regional work plans and mechanisms such as the HPAI Taskforce and strategic plans; and the continued support of and cooperation with technical and development partners.

ASEAN Member States have also developed and implemented an array of mechanisms, strategies and approaches to address HPAI, both at the national and regional levels. Member States have also generated lessons and best practices relevant to their own contexts and situations. In the spirit of our unity, I am pleased to share with you this showcase of strategies and success stories on HPAI prevention, control and eradication in ASEAN.

This reference book will serve as a source for in-depth information on the ASEAN's efforts to control and eradicate HPAI in the region. Strategies, obstacles, as well as achievements are highlighted in this book. Beyond the messages of existing experiences, possible replication and future development and implementation of the efforts are also highlighted. Potential cooperation on animal-human health cooperation by mainstreaming it with the progressive control of transboundary animal diseases (TADs) and zoonoses in the broader context of One World, One Health initiative is also underscored.

I personally commend the members of the ASEAN HPAI Taskforce and the ASEAN Sectoral Working Group on Livestock for sharing their strategies and success stories so that others may learn from our experiences. I would like to take this opportunity to convey my sincere appreciation to the Asian Development Bank (ADB), through the ASEAN-ADB HPAI Project, for their continued support in strengthening ASEAN's regional coordination capacity in controlling and eradicating HPAI and other disease threats.

My vision has always been a safer and more progressive region and ecosystem for all ASEAN citizens – for our peoples to enjoy the fruits of our cooperation and collaborative efforts. May the stories of our collective efforts in addressing HPAI and other disease threats may inspire all of us to ensure an HPAI-Free ASEAN by 2020.

Dr. SURIN PITSUWAN

Secretary-General of ASEAN

Executive Summary

ASEAN has been at the frontline of the battle against the highly pathogenic avian influenza (HPAI) since 2003. As a community of nations, ASEAN raised to the challenge of addressing HPAI collectively, with one vision: investing in sustainable prevention, control and eradication strategies at the animal level (at-source) to reduce the threat to humans and to the economic and social development of nations.

Through unified efforts, ASEAN was able to achieve milestone-setting and long-term mechanisms to ensure sustainable progression of efforts to eradicate the disease. These initiatives focused on national actions to improve veterinary/livestock services, as well as regional activities for a unified and coordinated action to address this priority disease.

Through its long history of fighting HPAI, ASEAN Member States have become the bastion of in-depth information of various successful strategies and lessons learned to control and eradicate HPAI in the region. In the spirit of knowledge management and information sharing, this publication highlights key strategies, obstacles and achievements that can possibly be replicated and implemented according to local contexts.

Status of HPAI in ASEAN

Since HPAI H5N1 was officially declared on 24 January 2004, Cambodia, Indonesia, Lao PDR, Malaysia (Peninsular), Myanmar, Thailand and Viet Nam have experienced outbreaks, while Brunei Darussalam, Philippines and Singapore remained HPAI-free.

ASEAN's Regional Response and Commitment to Control and Eradicate HPAI

Over the years, ASEAN responded to the threat of avian influenza situation collectively while individually, Member States have applied concerted efforts to prevent, control and eradicate the HPAI-H5N1 at-source. The HPAI Taskforce was established by the Twenty-sixth Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF), to serve as a network to formulate and help in the implementation of definite measures and areas of cooperation in the control of H5N1.

The Taskforce formulated the Regional Framework for the Control and Eradication of HPAI in ASEAN that consisted of eight components, namely: 1) disease surveillance; 2) containment measures; 3) stamping out and vaccination policy; 4) diagnostic capability; 5) establishment of disease-free zones/compartments; 6) information sharing; 7) emergency preparedness plans; and 8) public awareness and communication. The framework was subsequently converted into a specific time-line period of Regional Strategy (Year 2008-2010) that has been developed using a set of identified gaps and recommendations.

The ASEAN Animal Health Trust Fund (AAHTF) was established as an important vehicle for promoting the implementation of unified and harmonised animal health programmes in ASEAN, and for ensuring sustainability of efforts. The ASEAN Animal Health Trust Fund is managed by the ASEAN Secretariat and has contributions from the Member States and dialogue partners.

ASEAN facilitated partnerships among various sectors, under the principle of One World One Health to ensure synergy and complementarity of collaboration taking into account comparative advantages of stakeholders.





ASEAN Member States' Response to Control and Eradicate HPAI

National Animal Health Capability

Strengthening veterinary services is a prerequisite for sustainable capacity development to effectively control and mitigate the risks of HPAI and other transboundary animal diseases. Various capacity-building projects have also been cited in the different Member States that involve improving surveillance and response systems, veterinary legislation and governance, emergency preparedness and response, animal health communication, and laboratory diagnosis and networking.

Legislative and Institutional Support

Animal health legislation is a key element of effective animal disease control. With the legislative and institutional support provided by the national governments, veterinary authorities were able to enforce disease prevention or control measures. Many Member States have enacted and modernised its veterinary laws in the light of its HPAI prevention, control and eradication approaches.

Laboratory and Diagnostic Capability

Numerous efforts by national governments and international agencies were implemented and towards improving the laboratory and diagnostic capability of ASEAN Member States. Laboratory capabilities were enhanced with procurement of equipment, reagents, field investigation vehicles, expansion and construction of new laboratories, etc. Capacities of field personnel and laboratory technicians were also upgraded through various training, workshops and seminars.

Public Awareness and Risk Communication

Good progress has been observed in the Member States in public awareness and communication through public campaigns and educational activities. The strategies, approaches and contents used by the national governments in ensuring partnership with the general public varied from one country to another, based on the social and economic situations.

Emergency Preparedness and Contingency Planning

ASEAN Member States have been working with many partners to combat HPAI and other TADs through joint actions and programmes. The ASEAN Secretariat itself has been engaging with several partners and countries in pandemic preparedness and contingency planning.

Compartmentalisation and Biosecurity

Biosecurity refers to all measures taken to ensure that the HPAI virus stays out of poultry farms and any other premises that keep poultry or birds. Given the widespread nature of the virus in countries where HPAI is prevalent, enhanced biosecurity is important for farms and other bird-keeping premises to remain free from HPAI.

Stamping out and Compensation Policies

Stamping out is the most important part in managing outbreaks. Policies on culling are noticeably different among Member States. They range from infected poultry only, infected flock only, infected and in-contact flocks and poultry in infected zone (zone also varies in size, from a village to an identified area up to two kilometre-radius from the index case). Decision on the size is based on available resources and concentration of chickens in the area. Country decisions have been based on disease epidemiology. For example, culling of poultry based on zone has been successfully implemented in Malaysia and Thailand.

Vaccines and Vaccination Strategy

Member States recognise poultry vaccination to be amongst the important HPAI control measures currently available. However, the adoption of vaccination policy would be in accordance to each country's situation, taking note of the extent and risk of HPAI transmission, the levels and type of poultry production and the capacity to apply and monitor vaccination.

Animal-Human Health Interface

The interrelated issues that affect HPAI prevention and control call for collaboration and leadership across multiple disciplines and institutions at the local, national and global levels. This also calls for the development and implementation of an integrated strategy for improved public health based on the principles of One Health.

Many Member States have put in place some form of national zoonotic committees/ collaboration mechanisms, participated by both animal and human health sectors. There also exists regional work plan for animal-human health collaboration. Maintaining such momentum and sharing of experiences in animal-human health interface and dialogues need continued efforts and long-term support.

Coordination, Cooperation and Partnership

Inter-agency coordination and multi-level collaboration (local, sub-national, national and regional levels) have been progressing at the national level. Various Member States have initiatives for the harmonisation and collaboration of HPAI control and eradication approaches across the countries and by various development partners and donor agencies.

Moving Forward with Long-Term and Sustainable Strategies

The strategic thrust for ASEAN in to move towards ensuring institutionalisation and sustainability of current programmes and better coordination of initiatives and projects being implemented by donors and development organisations. Some of the strategies currently undertaken towards this direction include the development and implementation of the Roadmap to control and eradicate HPAI by 2020; and the establishment of a regional coordination mechanism on animal health and zoonoses.

At all levels, engagement and partnership with the private sector will have to be strengthened by establishing and sustaining constructive mechanisms for dialogue, consultation, joint initiative and support. Research activities have to be prioritised and should constantly address demand for information that supports further capacity building and the application of cost-effective and science-based interventions and control measures.

Enhancing regional and sub-regional cooperation frameworks would pave the way towards reducing the development gap in ASEAN, and in ensuring that the region would address HPAI in a united and coordinated way.



1. State of Avian Influenza in the ASEAN Region



In 2003, Highly Pathogenic Avian Influenza (HPAI) viruses of the H5N1 subtype appeared among poultry in several nations in Southeast Asia. The continuing outbreaks that began in late 2003 and early 2004 have been disastrous for the poultry industry in the region; by mid-2005, more than 140 million birds had died or been destroyed and losses to the poultry industry are estimated to be in excess of US\$10 billion.

Although at times this epidemic appeared to be under control, eradication was never complete. The outbreaks continued to smoulder and spread, and eventually Asian lineage H5N1 viruses reached other parts of Asia, Europe, Africa and the Middle East. The strains responsible for this epidemic appear to be unusually virulent. They have been found in many species of wild birds, which is unusual, and numerous deaths have been reported in these species.

HPAI is mainly an animal health problem, however, as of January 2010, these viruses have also been responsible for approximately 470 human infections, generally as the result of close contact with poultry; about 60% of these cases were fatal. Asian lineage H5N1 viruses have caused disease in other mammals and there are fears that an Asian lineage H5N1 virus could eventually become adapted to humans, resulting in a severe human pandemic.

Since its emergence, H5N1 HPAI has attracted considerable public and media attention because the viruses involved have been shown to be capable of producing fatal disease in humans. While there is fear that the virus may mutate into a strain capable of sustained human-to-human transmission, the greatest impact to date has been on the highly diverse poultry industries in affected countries. In response to this, HPAI control measures have so far focused on implementing prevention and eradication measures in poultry populations, with more than 175 million birds culled in Southeast Asia alone.

The economic and public health implications of HPAI and other Highly Pathogenic Emerging Diseases (HPED) are REAL threats to the national prosperity of the Member States and the regional development of the Association of Southeast Asian Nations (ASEAN). Since 2003, seven ASEAN Member States (AMS) were affected with HPAI H5N1 and the outbreaks have caused considerable losses of production, and loss of livelihoods of vulnerable people.

As a community of nations, ASEAN is addressing HPAI with one vision: investing in sustainable prevention, control and eradication strategies at the animal level (at-source) to reduce the threat to humans and to the economic and social development of nations.

Status of HPAI in ASEAN Member States

In Asia, HPAI/H5N1 was first detected in late 2003 in a family from Hong Kong that had recently travelled to Fujian Province in China. Within the first six months of 2004, H5N1 was reported among poultry in Korea, Thailand, Viet Nam, Cambodia, Lao PDR, Japan, and Indonesia. Between July 2004 and July 2005, H5N1 was repeatedly detected in poultry in Thailand, Indonesia, Viet Nam and Cambodia. Outbreaks of HPAI H5N1 in poultry in Asia are unprecedented in their geographical scope, rate of spread and range of susceptible hosts.

The situation faced by individual Member States is characterised by both urgency and uncertainty. Since HPAI H5N1 was officially declared on 24 January 2004, Cambodia, Indonesia, Lao PDR, Malaysia (Peninsular), Myanmar, Thailand and Viet Nam have experienced outbreaks, while **Brunei Darussalam, Philippines** and **Singapore** remained HPAI-free.



Cambodia had 25 outbreaks of H5N1 from 2004 to February 2010 and there are nine human cases of H5N1 (seven deaths) from 2005-2010. Although the government managed to solve the problem in 2006, significant reductions in price in poultry products were seen during the first two months of 2004, followed by a complete recovery in prices. Unfortunately, the outbreaks re-occurred in 2009 and 2010, and are yet to be resolved.

In **Indonesia**, 15 out of 30 provinces were affected in 2003 and early 2004 with 16.2 million poultry dead or stamped out in control efforts, excluding those lost from backyard farms. The value of birds lost was between US\$16.2 to 32.4 million. In addition to farm level impacts, there were drops of 45 to 60% in the demand for day old chicks and feed inputs during the outbreak and a reduction of just over a third in the employment in the poultry industry. In 2006, HPAI became prevalent in the country, based on Indonesia's report to the World Organisation for Animal Health (OIE).

In **Lao PDR**, although the total reported losses were only 3% of the national flock, the impacts were highly localised, with nearly 80% of the reported loss in commercial farms in Vientiane province. Since the majority of poultry farming in Lao PDR is on a small scale, this means that the small commercial producers suffered badly.

HPAI outbreak was first reported in Peninsular **Malaysia** in August 2004, and it occurred in one 60-bird flock of free-range village chickens in the village of Pasir Pekan, Kelantan State, located 22 km from the border with Thailand. The subtype has been identified as H5N1, the same subtype that caused significant outbreaks in Southeast Asia in late 2003 and early 2004 and continues to circulate.

The first wave of HPAI outbreak in **Myanmar** happened in 2006 where it affected 545 farms in 13 townships, followed by another outbreak in February 2007 that covered ten townships and affecting 60 farms. The first human case was recorded during the third wave of HPAI outbreaks in November 2007. Though there had been no outbreaks in 2008 and 2009, the disease is reoccurring starting February 2010.

In January 2004, HPAI virus of the H5N1 subtype was first confirmed in poultry and humans in **Thailand**. Control measures, e.g., culling poultry flocks, restricting poultry movement, and improving hygiene, were implemented. Poultry populations in 1,417 villages in 60 of 76 provinces were affected in 2004. A total of 83% of infected flocks confirmed by laboratories were backyard chickens (56%) or ducks (27%). Outbreaks were concentrated in the Central, the southern part of the Northern, and Eastern Regions of Thailand, which are wetlands, water reservoirs, and dense poultry areas. More than 62 million birds were either killed by HPAI viruses or culled. H5N1 virus from poultry caused 17 human cases and 12 deaths in Thailand; a number of domestic cats, captive tigers, and leopards also died of the H5N1 virus.

In **Viet Nam**, HPAI caused by viruses of the H5N1 type was first identified as a cause of serious disease in the winter of 2003-2004. Between December 2003 and March 2004, 24% of Viet Nam's communes and 60% of towns were affected, in 57 out of Viet Nam's 64 provinces; 45 million poultry were culled or have died, comprising around 17% of Viet Nam's poultry population. The threat to human and poultry health continues in Viet Nam with outbreaks confirmed in 18 provinces in 2009. Human fatalities have decreased from a high of 20 in 2004 to 5 in 2009; however there have already been two deaths from six cases in 2010. The largest losses were felt by small scale commercial chicken producers with limited numbers of other livestock. Many had borrowed money to fund poultry production and found themselves in debt when their birds died or were culled.

Table 1 shows the HPAI situation of ASEAN Member States based on emergency reports submitted to the OIE and the subsequent final reports reflecting if the disease had been eradicated.

Location	Virus Type	Emergency report submitted to OIE	Final Report Submit to OIE						
			2004	2005	2006	2007	2008	2009	2010
Cambodia	H5N1	24/01/2004 13/04/2006 12/04/2007 28/12/2009 05/02/2010	NI	NI	04/09	NI	NI	NI	New
Indonesia	H5N1	02/02/2004	NI	NI	26/9*	NI	NI	NI	NI
Lao PDR	H5N1	27/01/2004 04/08/2006 19/02/2007 13/02/2008 25/02/2009	NI	NI	04/08	NI	28/12	04/08	-
Malaysia (Peninsular)	H5N1	19/08/2004 23/02/2006 08/06/2007	NI	03/01	19/06	07/09	-	-	-
Myanmar	H5N1	12/03/2006 08/06/2007 24/10/2007 05/02/2010 05/03/2010	- - -	-	04/09	16/10	20/04	-	New
Thailand	H5N1	23/01/2004 23/01/2008	NI	NI	Nil	NI	16/02	27/02	
Vietnam	H5N1	08/01/2004 12/03/2008 01/04/2008 10/04/2010	NI	NI	Nil	NI	NI	NI	New

Source: Data are from OIE website: www.oie.int, * Indonesia submitted report to OIE stating the disease status has changed to endemic/prevalent.

Categorisation of ASEAN Member States Based on Current HPAI Status

Control and eradication strategies formulated are based on the current HPAI status. The figure below reflects the status of each country categorised as follows:

HPAI-Free States (Brunei Darussalam, Philippines and Singapore)

Since the countries are free of the disease, main efforts are focused on prevention of introduction of the disease agent and preparedness for early detection of infection.

States that Regained HPAI-Free Status (Malaysia and Thailand)

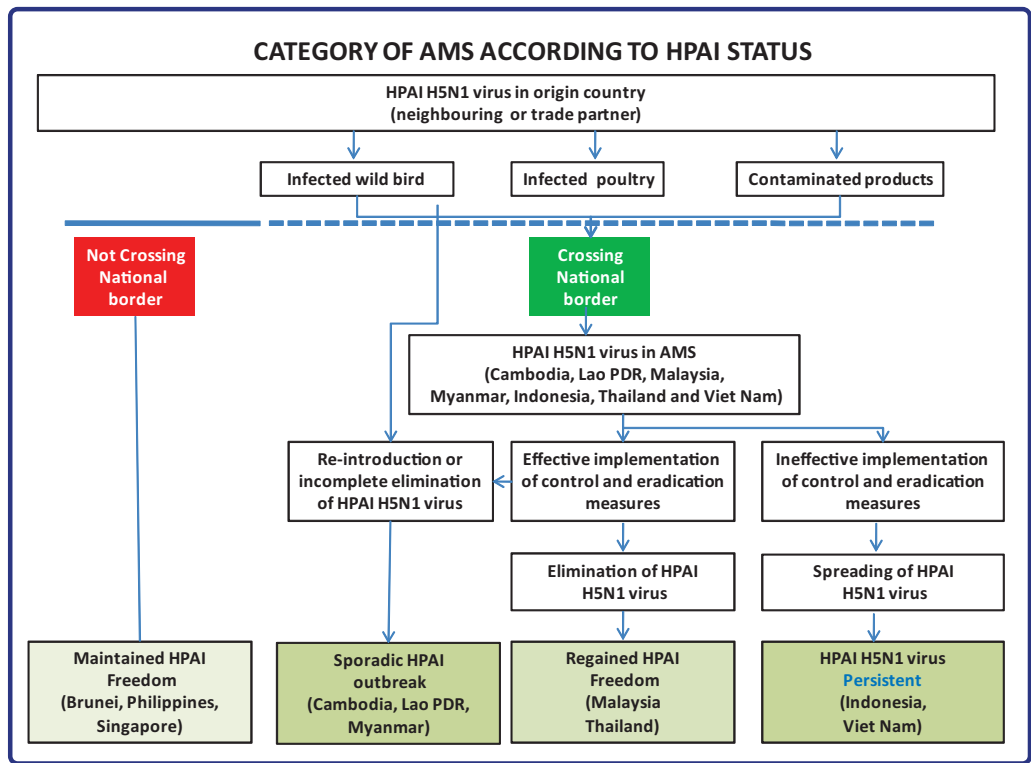
Both countries experienced HPAI outbreaks and efforts should focus on further enhancing existing strategies implemented. Valuable lessons learned from previous outbreaks should enable governments to ensure that the regained status is maintained.

States with Sporadic Outbreaks (Cambodia, Lao PDR and Myanmar)

The poultry industry in these countries is less developed and sporadic outbreaks occur as a result of re-occurrence of uneliminated virus or re-introduced through cross-border movement of infected birds. Strengthening of veterinary services for early detection and response is a key area of improvement and investment.

HPAI-Persistent States (Indonesia and Viet Nam)

The disease is widespread in both countries. Controlling and eradicating HPAI in Indonesia and Viet Nam pose the biggest challenge and may take a longer period of time. Thus, initiatives would be heavily reliant on the regional ability to control the disease in these States.



Risk Factors for Occurrence and Persistence of HPAI

HPAI is a devastating disease in poultry that can spread rapidly, devastate the poultry industry, result in severe trade restrictions, may be transmitted from birds to humans, and it is a potential source of future human influenza pandemics. Approximately 6,500 H5N1 poultry outbreaks have been reported thus far, resulting in hundreds of millions of poultry culled. Most outbreaks have been reported in Asia (>60% of the outbreaks reported), and to a lesser extent in Africa, the Middle East and Europe.

Given the magnitude of the threat, it is important to identify factors or risks that may be associated with the introduction of disease agent into the Member States. It allows specific mitigation measures to be implemented, such as risk analysis of importation, targeted surveillance along the border, strengthening border control and other measures to reduce risks of cross-border disease transmission.



Risks of Domestic Animal-to-Animal Transmission

Live markets are an important reservoir for H5N1, as seen in outbreaks in Viet Nam and Thailand. Movements of domestic poultry may also play a substantial role in viral spread. A study of the spatial distribution of HPAI outbreaks in Thailand showed a strong relationship between free grazing ducks in rice fields and viral spread. Large bodies of water such as lakes that serve as resting places for wild aquatic birds may also play a role in transmission.

It is also possible that trade of commercial and domestic poultry and poultry products, often occurring across long distances is responsible for transmission between and within countries. Transmission is also likely to be occurring between wild and domestic bird populations in both directions. Live bird markets (LBM) are common in Asian countries because of a cultural preference to consume freshly slaughtered meat. The dense concentration of live birds and a high turn-over rate of birds (i.e., hosts) in these markets provide ample conditions for virus amplification and may be an important reservoir for HPAI or “hub” for circulation. Additionally, LBM may be an ideal environment for transmission of avian influenza viruses from poultry-to-humans since they are frequented by large numbers of people.

The close contact with live animals at live bird markets has been identified as a risk factor for HPAI/H5N1. It has been demonstrated from investigations of past and current outbreaks and from HPAI surveillance programmes in Viet Nam, Thailand and Cambodia. It can also be assumed that HPAI/H5N1 may be circulating undetected in the markets of many other countries.

Domestic Threats in Thailand

The Thai epidemic shows that the virus continues to circulate in the country. The immediate challenge is, therefore, to control avian influenza in free-ranging animals in rural areas, particularly in backyard chickens and free-grazing ducks. However, control of outbreaks in these types of poultry is difficult because of traditional farming practices.

Cross-Border Risks

Three of the Member States (Lao PDR, Myanmar and Viet Nam) have land borders with a neighbouring country with high persistence of HPAI H5N1 virus. These three countries have a high risk level of getting infection or recurrence of HPAI outbreaks. It is then important to address the cross border movement between countries and active surveillance along the borders. Specific border initiatives such as Upper Mekong Project for Foot and Mouth Disease (FMD) can be initiated for HPAI as well.

As for Lao PDR, previous risk of introduction and re-introduction of HPAI H5N1 virus was associated with ducks and day-old chicks traded with a neighbouring ASEAN Member State. The risk was multiplied by the difficulty of border control along the Mekong River, making intra-AMS border initiatives an absolute necessity for control and prevention of the disease.

Cambodia is dependent on the importation of inputs including day-old-chicks and poultry products from neighbouring States that are still infected. This increases the risk of virus re-introduction. Release of ducklings which are imported into newly planted rice fields in the River Mekong Valley has been associated with outbreaks occurrence. Limited and weak border movement controls are also risks to be considered.



When we address avian influenza, it is very important to have a good surveillance system to monitor the situation continuously and closely. We also need to have policy so that all stakeholders, especially farmers, voluntarily participate in this effort. All these need strong support from the government. Prevention is more important and participation of the farmers is crucial. One country alone cannot control avian influenza effectively. Certainly, we need strong regional and international cooperation.

Dr. Cau Duc Phat
Minister, Ministry of Agriculture
and Rural Development
Viet Nam



Previous HPAI outbreaks in Myanmar were associated with migratory birds and importation of fertile eggs and day-old chicks from a neighbouring country. These two factors are expected to be the main risks for re-occurrence of HPAI outbreaks. This is due to the availability of vast wetland and water reservoir in Myanmar and the ongoing trade relations. Applicable mitigation measures must be formulated to address these problems.

Viet Nam faces the greatest challenge of border threat. Repeated introduction and re-introduction of HPAI H5N1 virus from neighbouring countries are common. Study on HA gene of HPAI H5N1 viruses showed that Viet Nam has six out of the 10 clades present in neighbouring countries as compared with other Member State (Thailand) with two clades at the most. This reflects the active cross-border movement of poultry and related products from neighbouring country to Viet Nam. Thus, border initiatives between Member States will be an important part of the regional strategy.

Local Risk Factors (Indonesia Context)

- Decentralisation of policy to provincial and districts authority
- Epidemiology of HPAI not fully understood
- Uncontrolled poultry trade and movement
- Poor biosecurity at markets, slaughterhouses and farms (Sector 3)
- Not all provinces and districts covered by Participatory Disease Surveillance and Response (PDSR) system
- PDSR is village (not case) reporting system and poor in disease control and elimination aspect
- Large number of Sector 4 poultry population
- Limited information on disease situation in Sectors 1 and 2



Intra AMS Risks

Understanding the disease risk at national level is important in order to progressively control and eradicate the disease in countries where HPAI is persistent. The situation is complex in both Indonesia and Viet Nam.

Viet Nam implemented large-scale vaccination since 2005 to reduce the transmission of the disease to humans and to control the occurrence of epidemic. This experience shows that enhancing the control and eradication programme with the exit strategies for vaccination is required, taking into consideration the following factors:

- Traditional, extensive, free-grazing/scavenging duck production system
- Introduction of non-vaccinated new live animals
- Fomites (human, animal, vehicle, etc.) due to active movement from production to market places
- Tet festival (February) increases the volume of poultry being marketed and thus increasing the risk of spreading the disease

The situation in Indonesia is also unique. The disease is still detected in most of the provinces of the country. Although national vaccination was one of the important strategies in the attempt to control the disease, the government suspended its implementation, and is currently evaluating the suitability of local field isolates as vaccine candidates. Unlike Viet Nam, Indonesia HPAI H5N1 is only caused by the virus clade 2.1.

For countries where HPAI is persistent, the strategy to control and eradicate the disease must be based on the risk factors identified. The option available for countries where HPAI is persistent is through progressive zoning.



Indonesia is a big country, thousand of islands and many areas of unguarded borders making it hard to stop illegal movement of poultry. Although our neighbouring countries are free from avian influenza, the threat is still there. This is why we need to work together with our neighbours, donors, and international agencies to control and eradicate avian influenza. We value our ASEAN membership as it brings together the neighbouring countries so we can share our experiences, knowledge, solutions, and resources.

Ir. H. Suswono
Minister, Ministry of Agriculture
Indonesia

2. Prevention, Control and Eradication of Avian Influenza in ASEAN



Since 2003, seven of the ASEAN Member States have been affected with HPAI H5N1. Numerous efforts by national governments and international agencies were implemented and completed while some of them are still on-going. These efforts improved capacity and capability of the Member States in handling the disease. Laboratory capabilities were enhanced with procurement of equipment, reagents, field investigation vehicles, expansion and construction of new laboratories, etc. Capacities of field personnel and laboratory technicians were also upgraded through various training, workshops and seminars.

Currently, almost all Member States are capable of making diagnosis and confirmatory tests for HPAI H5N1 virus infection. As a result, response time from notification to stamping-out operation has significantly improved.

Good progress and achievements in certain key areas in the prevention, control and eradication of HPAI in the ASEAN region were made in the ASEAN Member States through various country initiatives and support from technical and development partners. This section describes some of the key strategies and narrates some of the success stories.

ASEAN Regional Cooperation and Responses to HPAI

The HPAI problem is not just a problem of individual countries, but of the entire ASEAN region. Over the years, ASEAN responded to the threat of avian influenza situation collectively while individually, Member States have applied concerted efforts to prevent, control and eradicate the HPAI–H5N1 at-source.

Establishment of the ASEAN HPAI Taskforce

The HPAI Taskforce was established by the Twenty-sixth Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF), which was held on 7 October 2004 in Yangon, to coordinate cooperation for the prevention, control and eradication of HPAI in the region. The 4th Meeting of the ASEAN Ministers on Agriculture and Forestry Plus Three (ASEAN+3), held on 8 October 2004 in Yangon, also expressed support for the formulation of the HPAI Taskforce to share experiences and expertise in HPAI control. The HPAI Taskforce serves as a network to formulate and help in the implementation of definite measures and areas of cooperation in the control of H5N1.

"ASEAN countries need to work together, collaborate and cooperate in order to control and eradicate this disease threat effectively."



Dr. Kamarudin Md. Isa
Chairperson, ASEAN HPAI Taskforce
Malaysia

The Taskforce is under the auspices of the ASEAN Sectoral Working Group on Livestock (ASWGL) and represented by each of the Member States. Respective National Focal Point is drawn from the national veterinary authorities to act as national coordinator for internal consultation among the Ministries concerned.

The HPAI Taskforce is currently chaired by Malaysia, represented by Dr. Kamarudin Md. Isa, Director, Livestock Resources and Technology Development Division, Department of Veterinary Services, Malaysia.



Development of the Regional Strategy for the Control and Eradication of HPAI

The Taskforce formulated the Regional Framework for the Control and Eradication of HPAI in ASEAN. The Regional Framework was formally endorsed by the Twenty-seventh Meeting of the AMAF in Manila on 29 September 2005 which also provided the directive for the formulation of the detailed Work Plan and the sourcing of project funds. The Regional Framework consisted of eight components, namely: 1) disease surveillance; 2) containment measures; 3) stamping out and vaccination policy; 4) diagnostic capability; 5) establishment of disease-free zones/ compartments; 6) information sharing; 7) emergency preparedness plans; and 8) public awareness and communication.

The framework was subsequently converted into a specific time-line period of Regional Strategy (Year 2008-2010) that has been developed using a set of identified gaps and recommendations. The output came about from a series of three ASEAN workshops that were conducted through the collaboration of the Asian Development Bank (ADB), Food and Agriculture Organisation (FAO), OIE, ASEAN HPAI Taskforce and concerned ASEAN governments, and other stakeholders.

Key Elements of the ASEAN Regional Strategy for the Control and Eradication of HPAI

The Regional Strategy that was supported by the First Phase of the ASEAN-ADB HPAI Project covered the following strategies:

- 1) strengthening of regional cooperation through sustained coordination and partnership with stakeholders;
- 2) pursuing regional arrangements adopted at ministerial level;
- 3) developing short-, mid- and long-term strategies to eradicate HPAI in ASEAN taking into account the regional and global strategies;
- 4) enhancing capacities and capabilities, including sharing of experiences through training workshops, country visits, etc.; and
- 5) research and development (R&D).

The ASEAN HPAI Strategy provided a cooperation framework of facilitating national implementation, and regional cooperation (bilateral, sub-regional and regional levels).



Establishment of the ASEAN Animal Health Trust Fund

The Establishment of ASEAN Animal Health Trust Fund (AAHTF) is an important vehicle for promoting the implementation of unified and harmonised animal health programmes in ASEAN, and for ensuring sustainability of efforts. At its inception in 2003, the aim of setting up the AAHTF was to enhance the effort of ASEAN to ensure that the region will become FMD-free zone. However, when avian influenza started to destroy the poultry industry in early 2004, the purpose of establishing the Fund took on a broader and more regionally-relevant animal disease control and eradication perspective.

The ASEAN Animal Health Trust Fund is managed by the ASEAN Secretariat and has contributions from the Member States and dialogue partners.

Facilitating Multisectoral Coordination

The multidimensional nature of HPAI necessitates the involvement of a wide range of stakeholders and strengthened collaboration and partnerships across various disciplines, sectors, departments, ministries, institutions and organisations at country, regional and international levels. ASEAN facilitated partnerships among various sectors, under the principle of One World One Health to ensure synergy and complementarity of collaboration taking into account comparative advantages of stakeholders.

Coordination between the public health and animal health sectors have been strengthened through joint undertakings in most countries. There were also other sectors involved depending on the focus area, such as the Ministry of Trade in ensuring trade facilitation arrangements, Ministry of Information to facilitate information dissemination and community education; and the various private sectors (poultry and livestock industry, veterinary associations, etc) in implementing control and eradication activities on-the-ground.

In dealing with HPAI, we need to invest in preventive and control strategies at the animal level to reduce the threat to humans and to the world, which will be a highly cost-effective effort in the long term. This can be done by improving disease intelligence, surveillance and emergency response systems at national level through strong and stable animal health services and effective communication strategies. If we are able to stop the disease at source, we would be able to prevent disease emergence, spread and persistence. This would be better than trying to cure the symptoms.



S. Pushpanathan
Deputy Secretary General
ASEAN Secretariat

At the regional and international levels, ASEAN strengthened collaboration with technical and development organisations (FAO, OIE, WHO) as well as dialogue (Plus Three countries – China, Japan and Republic of Korea) through established frameworks and regional networks on diagnosis, surveillance, research and development, and socio-economic issues.

Strengthening Capacities

The implementation of activities at regional- and country-levels, and the sharing of outcomes of various initiatives enabled countries and the region to learn and build on existing expertise and experiences and strengthen capacities in various ways, especially pertaining to early disease detection and response to outbreaks, and the delivery of national veterinary services.

The Regional Framework for the Control and Eradication of HPAI in ASEAN effectively provided the regional direction and expectations in addressing the problem and allowed for regional sharing and exchanges of knowledge and lessons learned. Member States have been made more aware of their respective HPAI control deficiencies and gains and have thus been encouraged to take the necessary actions to conform to regional expectations. The significant progress in areas of disease surveillance, containment measures, stamping out and vaccination policy, diagnostic capability, establishment of disease-free zones and compartments, information sharing, emergency preparedness, and public awareness have consequently also improved the overall regional capacity.

ASEAN Secretary General's Call for Action Towards the Eradication of HPAI in ASEAN

-- I call on the relevant Ministries of the ASEAN Member States to continue our full political support and commitment by adopting supportive policies to eradicate Highly Pathogenic Avian Influenza in ASEAN;

-- I ask our technical partners and stakeholders to join us in launching a coordinated and robust campaign to fight this disease;

-- I encourage our private sector to work with us as partners, as part of our common commitment for a healthy and prosperous ASEAN;

-- I invite the donor community and dialogue partners to join us in building the ASEAN community and help our region to eradicate the disease that could affect our economic growth and social development; and

-- Most of all, I express my personal commitment that ASEAN will spare no efforts to eradicate this disease, and with your help, we will succeed in this common endeavour.

Our vision is to establish an ASEAN Community by 2015, built on three pillars: political security, economic, and socio cultural. In order to achieve that community, social progress and economic development must also be strengthened. With this, we need a healthy population and the campaign to eradicate the highly pathogenic avian influenza will certainly contribute to making the region safer, and contribute to our food safety and food security. This will be a big boost in achieving our overall goal of having an ASEAN Community that is robust, healthy, progressive and secure.



Dr. Surin Pitsuwan
Secretary-General of ASEAN

National Animal Health Capability

Strengthening veterinary services is a prerequisite for sustainable capacity development to effectively control and mitigate the risks of HPAI and other transboundary animal diseases. Various capacity-building projects have also been cited in the different Member States that involve improving surveillance and response systems, veterinary legislation and governance, emergency preparedness and response, animal health communication, and laboratory diagnosis and networking.



Active Surveillance in Brunei Darussalam and Lao PDR

Although Brunei Darussalam has not reported any case of HPAI, it maintains an active surveillance of commercial and backyard farms since the first outbreak in ASEAN in 2003. To systematise its prevention and eradication approaches, it has developed procedures for specific issues such as on public awareness, emergency response, zoning of infected areas, standard operating procedures (SOP) for quarantine of zones and stamping out, animal movement control, disease surveillance and monitoring procedures inclusive of laboratory methods, and compensation for farmers.

The country has also put in place containment measures that include procedures to reduce cross border spread of disease, harmonisation of quarantine regulation procedures with neighbouring ASEAN Member States, regular bilateral meetings between Brunei Darussalam and Malaysia to discuss border issues, and encouraging farmers to implement biosecurity programmes.

Lao PDR adopted an ongoing active and passive surveillance on HPAI. The reporting system of the suspected case is done through technical line and hotline 166 numbers made available in the country. It has also upgraded the capacity on the disease surveillance and epidemiology through the field training course on disease recognition and reporting.

The current priority focus of the country is on transferring the technology on the information on transboundary animal diseases to the province and district level, improving collaboration with other institution involved in the surveillance and epidemiology, and increasing the animal and human health interface for information sharing.

Continuous Vigilance to Maintain HPAI-Free Status in Philippines and Singapore

The Philippines remains HPAI-free but the country remains vigilant in the identification of potential source of infection as avian influenza may reach the country through illegal trade of live poultry and exotic birds, migratory bird habitats and human cases from other countries. With this premise, specific measures are in place to respond to the risks:

- Strict monitoring of wildlife trade through agreements (Memorandum of Agreement) with 14 other government agencies; banning of importation of poultry and its products from affected countries
- Surveillance of poultry populations especially in the 20 critical areas wherein migratory birds frequent and in areas with high concentration of ducks
- Screening of passengers from infected countries in airports (being undertaken by the Department of Health)

Singapore, on the other hand, has a multi-layered control strategy that strikes a balance between the need to import food and keeping HPAI out of Singapore. The proactive risk-based approach that aims to maintain its HPAI-free status has several layers, such as: control measures at source, border control measures, local control measures and emergency preparedness.

Successful Strategy: Keeping the Philippines HPAI-Free Through Quarantine and Border Control and Import Protocol

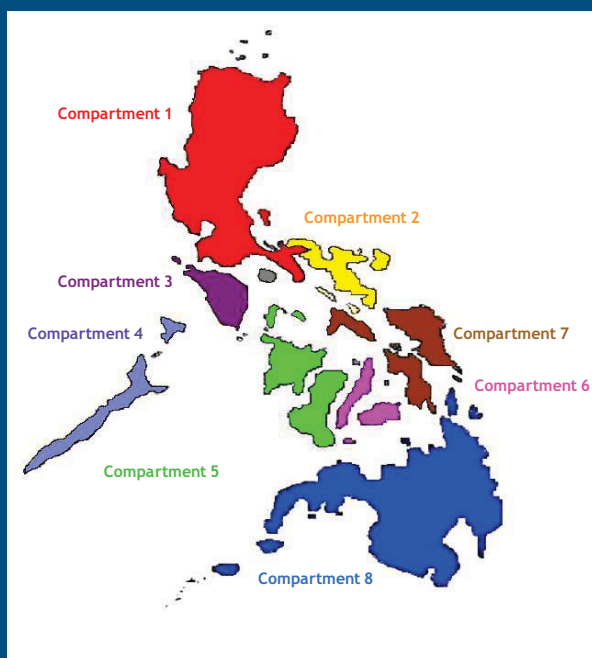
Has natural boundaries and/or a single entry-exit point to other compartments

Surveillance database

- Survey of all poultry holdings, species, population, disease profile
- Regular sampling and testing

Regulated movement between zones of live poultry and its by-products – through health certificates and shipping permits

Strategically-located check-points



Strategies

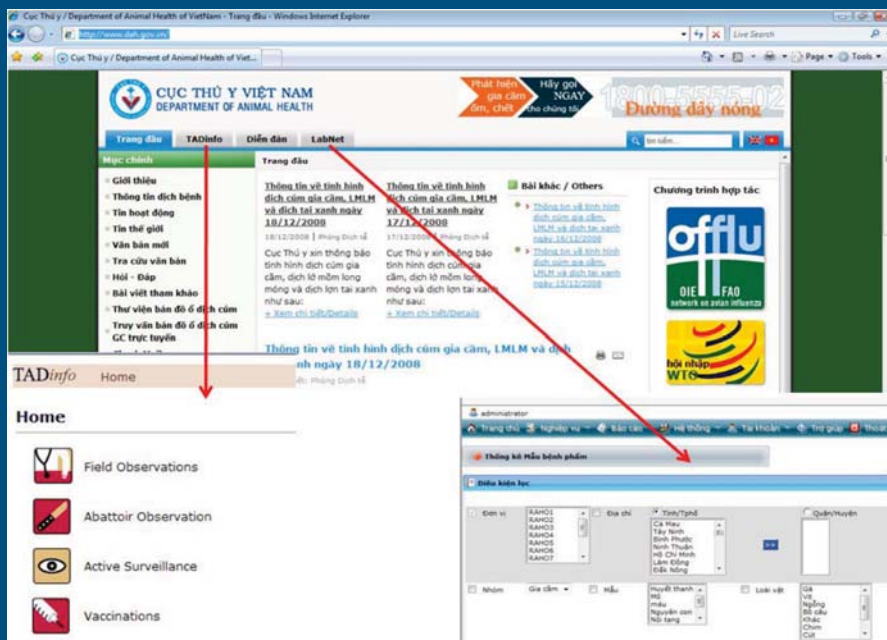
- Sustain ban on importation of live chickens and other poultry products from countries affected with avian influenza.
- Ban on importation of cage and pet wild birds from countries affected with bird flu
- Surveillance of domestic fowl, wild birds and humans
- Mobilisation of regional veterinarians and the local government units (LGUs)

Intensified Surveillance for Early Detection and Response in Viet Nam

Viet Nam is one of the most at-risk countries. Its surveillance system shows that HPAI outbreaks have always been identified in unvaccinated flocks, particularly in ducks. Thus, its intensified surveillance system focuses on emergency reporting system using telephones (hotline 1800 5555 02) and faxes; online reporting system (TADinfo) piloted to assist in HPAI information management; reporting hotline set up; revision of compensation policy; and outbreak containment procedures modified in the light of new knowledge and experiences.

Success Story: Viet Nam strengthens disease surveillance and response; dramatically reduces H5N1 outbreaks

At its peak in 2004-2005, outbreaks of H5N1 in poultry spread widely across Viet Nam. To reduce the impact of the disease, the Government took immediate actions to coordinate a national HPAI control policy to implement surveillance, detection, response, compensation, and vaccination strategies. To facilitate HPAI control activities, the Government made significant investments to train and enhance capacity of animal health staff across the country to conduct active surveillance and investigation. It also created joint surveillance and rapid response teams to decrease time between disease detection and response. Community engagement in H5N1 HPAI detection and reporting was encouraged through education campaigns on how to detect and report suspected cases of H5N1 HPAI using telephone hotlines, resulting in increased awareness and broader surveillance.



The Government and its partners invested in laboratory networks within Viet Nam to detect the virus. Now, nine animal health laboratories are well equipped and capable of rapidly diagnosing HPAI and other diseases, contributing to a better understanding of the sources of infection. Regular workshops are held within this laboratory network to ensure the most up-to-date technical knowledge on diagnostic procedures is shared.

These investments and coordination, combined with strong intersectoral cooperation among Government ministries, stakeholders including poultry farmers and others engaged in poultry trade, NGOs and international organisations made Viet Nam better prepared to manage HPAI.

The total number of outbreaks in poultry has dramatically reduced, with 124 outbreaks reported in 2009, compared to 2,587 in 2004 and nearly 2,000 in 2005. The gap between outbreak onset and reporting has also decreased from four days to two-and-a-half days, which has resulted to a faster response.

Source: Ministry of Agriculture and Rural Development and Ministry of Health. 2010. *Avian and Pandemic Influenza: Viet Nam's Experience*. Hanoi, Viet Nam.

Safeguarding Livelihoods from HPAI through Legislation in Cambodia and Myanmar

Animal production is an important livelihood for the Cambodian people and livestock products are a major source of food and nutrition for the country's population. Some of the prevention measures adopted by the government focus on legislation, including establishment of an Inter-ministerial Committee for Control of HPAI, with counterparts at the provincial levels. With an improved legislative framework, it was able to pass legislation (*prakas*) to establish temporary international border checkpoints and ban the importation, transportation, sale or purchase of live poultry, eggs, fresh and refrigerated poultry meat, and any products of both wild and domestic poultry origin from countries infected with HPAI.

Cambodia also improved its market surveillance to determine the presence of HPAI/H5N1 in the major duck producing regions of Cambodia as part of the national avian influenza surveillance programme. It also improved its laboratory/diagnostic capability through trainings and development of SOPs.

The government of Myanmar, on the other hand, hastened its policy on the prevention and control of HPAI coordinated by the Livestock Breeding and Veterinary Department (LBVD) under the Ministry of Livestock and Fisheries.

The agency is governed by and has authority under Animal Health and Development Law given by the State Peace and Development Council to implement the strategy for the control of HPAI focusing on aggressive surveillance and tracing source of infection; active searching for additional cases in the infected township; public awareness campaigns about HPAI, in partnership with other organisations; communication and information sharing among all stakeholders; and use the relief system instead of compensation.

Community Participation for Surveillance in Indonesia and Malaysia

The Indonesian government established a Participatory Disease Surveillance and Response systems (for Sector 4), complemented with the market chain surveillance for commercial poultry. These systems are coordinated by the Local Disease Control Centre. The long-term goal is to strengthen all existing programmes through public-private partnership.

Success Story: Participatory disease surveillance hastened understanding of HPAI in Indonesia

The government of Indonesia made a strong and increasing commitment to controlling HPAI at its source, that is, in poultry. One example of the government's commitment is the implementation of enhanced disease surveillance and response using a participatory epidemiology approach. The so-called Participatory Disease Surveillance and Response (PDSR) programme has gained the support of the district authorities (*kabupaten*). The implementation of this programme helped in recruiting and retraining of veterinary staff and provided transport, equipment and operating costs.



The success of the PDSR programme implementation in Indonesia has led to an understanding of how deeply entrenched HPAI is in much of Indonesia.

In the case of Malaysia, one of its initiatives for the prevention and control of HPAI is the implementation of a National HPAI and A/H1N1 Surveillance Programmes in all 14 states, focusing on poultry and wild birds, clinical and virology. Data is collated and analysed by Animal Disease Information Centre (ADIC) while early warning system for animal diseases is done using short messaging system (text messaging). The country also has a central monitoring of animal and its products movement between the states using e-permit.

Community Volunteerism for HPAI Surveillance in Thailand

Thailand's surveillance system for HPAI maximises the use of networking among the relevant national agencies and local administrative organisations. The country's 50,000 animal health volunteers and 827,845 public health volunteers are heavily involved in daily active clinical surveillance and reporting.

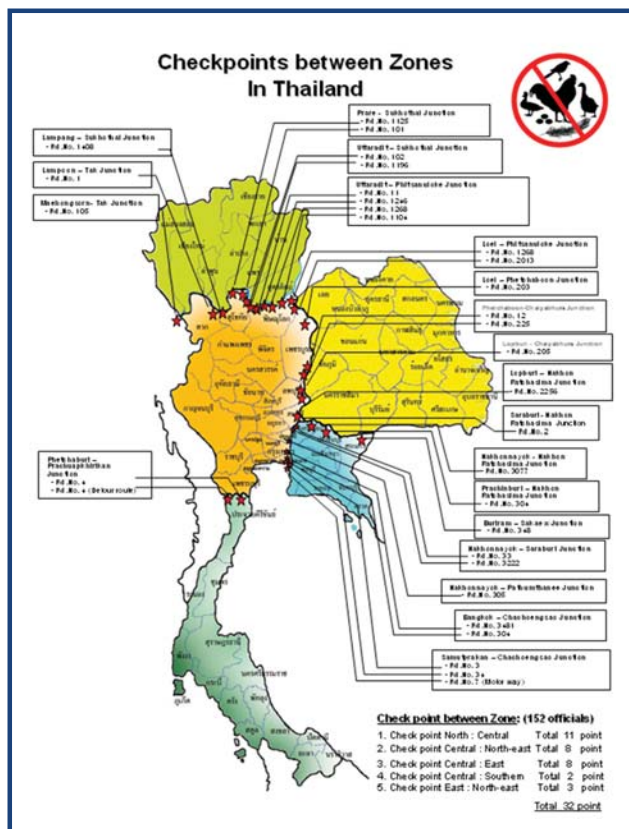


The Department of Veterinary Services is procuring an electronic based information system to improve animal disease reporting and managing the disease situation by monitoring its progress both at the state and central level, in a timely manner.

Intensive Surveillance through X-ray Campaign in Thailand

Following the HPAI cases in Thailand, several sessions of intensive surveillance or x-ray campaign was conducted to ensure early detection of new cases and detection of asymptomatic reservoir, as well as to evaluate and monitor the effectiveness of disease control measures implemented. In the design and planning of the x-ray campaign, three epidemiological principles were observed: animal population at risk; appropriate timing including incidence in the past; and locations at risk (classified as high, moderate and low risk areas).

Stamping out policy was applied to all cases with positive results, including contact poultry and cloacal swab test was applied to all flocks of poultry within 3km radius. Although costly, the x-ray campaign is considered an effective measure for early detection and as an alternative prevention measure in place of vaccination in Thailand.



Legislative and Institutional Support

Animal health legislation is a key element of effective animal disease control. With the legislative and institutional support provided by the national governments, veterinary authorities were able to enforce disease prevention or control measures. Many Member States have enacted and modernised its veterinary laws in the light of its HPAI prevention, control and eradication approaches.



Coherent Veterinary Law in Cambodia and Indonesia

Cambodia established an Inter-Ministerial Committee for Control of HPAI, with counterpart support at the provincial levels. It also drafted a Veterinary Law with 14 chapters that will fill the legislative gaps that currently exist for control of notifiable diseases; provide a robust legal basis for the activities of the private and government animal health services; and provide the means to reform and strengthen the enforcement structure for disease control.

The veterinary legislation in Indonesia focused on the establishment of a legal umbrella of veterinary policy, authority and administration through a New Law No. 18/2009. Its legislative experience showed that a gradual strengthening of veterinary policy, authority and administration would be the appropriate approach. It also facilitated the strong collaboration between animal and human health agencies at the district level, facilitating the transition from avian influenza to broader zoonoses approach.

Clear Policy Guidelines for HPAI Control and Eradication in Malaysia

For Malaysia, HPAI became a notifiable disease under the Animal Ordinance, paving the way for regulating the national surveillance programme under the legal framework. The policy guidelines in Malaysia relating to HPAI are outlined below:

Parameter	Policy
Eradication/Control method	Stamping out
Case definition	Detection of HPAI virus subtype H5 or H7 (w/wo CS) in bird population
Confirmation test	RT-PCR, rRT-PCR conducted by Veterinary Res. Institute
Compensation	Full compensation (poultry, ducks, birds, eggs)
Infected zone	One kilometre radius from index case
Control zone (surveillance zone)	10 kilometre radius (9 km from <i>infected zone</i>) Quarantine enforced for 42 days
Surveillance strategy	<i>Surveillance zone</i> : intensive clinical and virological (2X) within 42 days <i>Free zone</i> : Active (clinical and virological (3X) and passive
Type of tests	Surveillance sample: Egg Inoculation, HA, RT-PCR Suspect/RAT's samples: RT-PCR, rRT-PCR (Egg Inoculation, HA)
Freedom declaration	6 months after last culling and disinfection (2004) 3 months after last culling and disinfection (2006 & 2007)
Vaccination	Prohibited

Stronger Focus on Legislative Framework in the Philippines and Thailand

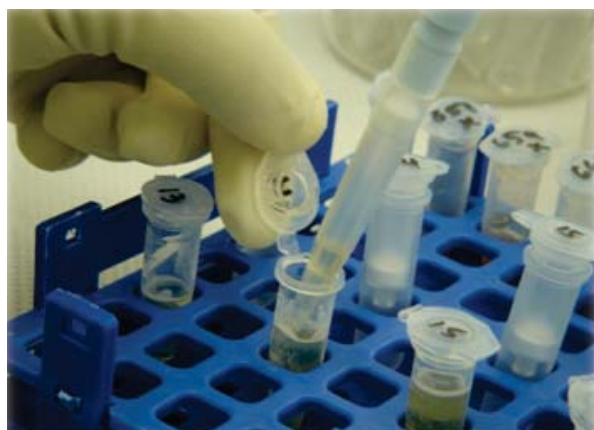
For legislative framework in the Philippines, the Office of the President signed an Executive Order No. 280 (2004), defining the roles and responsibilities of the Department of Agriculture (DA) and Department of Health (DOH) in response to avian influenza, as well as the enforcement of wildlife act under the purview of the Department of Environment and Natural Resources (DENR). The country also has a “no catch, no touch, no collection policy”, implements mandatory testing among commercial and backyard poultry farms, and developed procedures in the local transport of ducks and guidelines on duck production and management.

Thailand's legislative framework on HPAI is the Animal Epidemics Act B.E 2499 (1956) and its Regulations, Proclamations and Commands relating to disease control and animal health management. Government initiatives are also supported by the Provincial Emergency Fund for Disaster Management.

Laboratory and Diagnostic Capability

Numerous efforts by national governments and international agencies were implemented and towards improving the laboratory and diagnostic capability of ASEAN Member States. Laboratory capabilities were enhanced with procurement of equipment, reagents, field investigation vehicles, expansion and construction of new laboratories, etc. Capacities of field personnel and laboratory technicians were also upgraded through various training, workshops and seminars. Currently, almost all Member States are capable of making diagnosis and confirmatory tests for HPAI H5N1 virus infection. As a result, response time from notification to stamping-out operation has significantly improved.

The laboratory capability of Brunei Darussalam was upgraded for diagnostic and confirmatory test and training of laboratory personnel. It also derived benefits from regional and international cooperation through its collaboration with other ASEAN Member States (Malaysia and Singapore) for collaborative training of laboratory personnel.



Lao PDR, for its part, upgraded its HPAI testing facility to meet the minimum requirements for the BSL2, while a similar laboratory was also established in Myanmar for serological and virological investigation of HPAI. In addition to upgrading its laboratory capacity, the Philippines also conducted series of trainings on laboratory and molecular diagnosis, as well as on good laboratory practices.

Malaysia established a regional reference laboratory for HPAI and it also has eight diagnostic laboratories, including a university laboratory involved in HPAI testing. The country also facilitated training for capability enhancement for ASEAN Member States, for national proficiency, and for virus repository and gene bank.

Public Awareness and Risk Communication

Good progress has been observed in the Member States in public awareness and communication through public campaigns and educational activities. The strategies, approaches and contents used by the national governments in ensuring partnership with the general public varied from one country to another, based on the social and economic situations.



Grassroots Communication on HPAI in Cambodia and Lao PDR

A National Communication Strategy and Action Plan on AHI was developed in Cambodia to intensify its public awareness activities carried out at the central and provincial levels (district/provincial animal health officers and village animal health workers), and in cooperation with international agencies. Some of the activities conducted were meetings with farmers, village chief, religious leaders and teachers, as well as trainings of farmers, village animal health workers and journalists. Public outreach activities used mass media, community theatre and forum, brochures, leaflets and posters.

In Lao PDR, messages and approaches for the information, education and communication (IEC) activities targeted the traditional attitudes and practices of farmers, and in building the capacity of the animal health personnel in risk communication.



Towards Behaviour Change in Malaysia and the Philippines

The public awareness campaigns in Malaysia involved key stakeholders and focused on communicating with public on steps, measures and progress of control measures implemented by authorities to minimise negative impact of the disease outbreaks. The long-term aim of these campaigns is to promote behavioural changes in reporting the disease for early warning and practicing farm safety measures and biosecurity. It also encourages NGOs participation in awareness campaigns by involving them in planning and implementing the activities.

The Philippines' public awareness strategy focused on developing IEC materials developed for specific target audiences (training modules per stakeholder, instructional video on Personal Protective Equipment donning and doffing, posters, etc.). It also conducted Knowledge, Attitude and Practice Surveys and Live Bird Market Studies in identified areas in Regions 3, 7, 9 and 10, and drafted a communication plan. Series of workshop were held on "Facing the Media on AI". It also developed radio and TV plugs.



Tapping the New Media in Public Awareness in Brunei Darussalam and Singapore

The public awareness and communication activities for HPAI of Brunei Darussalam were done through road shows to ministries and government departments, educational institutions and private sectors. In addition to traditional media, like posters, TV advertisements and video showing in public places, short messaging services (SMS) on mobile phones were also maximised to inform the public on disease risks. The outcomes of the various initiatives on HPAI have resulted in the increased cooperation of the local community and decreased number of people keeping birds as pet animals.

Singapore ventured on social marketing for its public education initiatives, aimed for students and farmers. Its educational materials included posters, brochures, pamphlets, banners, billboards and booklets. It also had provisions for equipment for these educational campaigns.



Educational Campaigns on Holidays and Special Celebrations in Thailand and Cambodia

In recognition that risks from HPAI could potentially increase during holidays and special celebrations, Thailand launched special campaigns on safety consumption of poultry meat such as during the Chinese New Year Celebration. The messages include reduction of risks, advice on registration of poultry producers and traders and sanitation practices in slaughterhouses and market vendors.



Cambodia also conducted a special campaign on HPAI prevention during the national water festival celebrations.

Success Story: Outreach efforts promote healthy behaviours; reduce H5N1 transmission in Viet Nam

With the threat of widespread H5N1 HPAI outbreaks, the need to educate communities and promote healthy behaviours to limit disease transmission is a critical priority. The government faced the challenge by developing a National Strategic Framework for Avian and Human Influenza Communication, establishing a communication working group, and identifying target audiences for outreach ranging from poultry farmers to the general public.

Animal and human health workers were trained in outbreak communication to help inform community members about avian influenza. The government and its partners helped increase awareness about risks of infection using various outreach techniques, including mass media campaigns, community mobilisation, interpersonal communication, and special community events. These efforts contributed to an increase in preventive measures, including compliance with disease control policies, early reporting, and an increase in vaccination of poultry.

They also resulted in improved preventive practices, including hand washing before and after contact with poultry.

Research indicates these efforts have been successful; in target areas with regular exposure to poultry, community members report a 50% increase between 2008 and 2009 in practices to decrease risk of H5N1 HPAI infections in their flocks.

In the same period, 14% more people reported practicing key behaviours to limit risks for human H5N1 infection. In 2009, all animal health workers polled reported they are taking actions to prevent H5N1 transmission in poultry and that they are promoting healthy behaviours among their communities. These efforts are likely to have contributed to the reduction of the entry of the H5N1 HPAI virus into farms as well as transmission to humans.



Source: Ministry of Agriculture and Rural Development and Ministry of Health. 2010. *Avian and Pandemic Influenza: Viet Nam's Experience*. Hanoi, Viet Nam.

Emergency Preparedness and Contingency Planning

ASEAN Member States have been working with many partners to combat HPAI and other TADs through joint actions and programmes. The ASEAN Secretariat itself has been engaging with several partners and countries in pandemic preparedness and contingency planning.

Pandemic Preparedness at the Regional Level

To enhance and promote multi-sectoral coordination in addressing the inter-related issues of health (human, animals and the environment), the Executive Committee of the ASEAN Secretariat (EXCOMM) approved the establishment of ASEAN Secretariat Working Group on ONE Health (ASEC-ONE Health) in March 2008. The ASEC-ONE Health aims to coordinate the various health-related initiatives of ASEC to ensure coordination and integration thus maximising use of resources and promoting efficiency and integration. The Working Group also serves as the coordinating arm (Secretariat) to support the newly-established ASEAN Technical Working Group on Pandemic Preparedness and Response (TWG-PPR).



Emergency Preparedness at the National Level

Polices on emergency preparedness and contingency planning vary from country to country depending on disease status (i.e. HPAI-free or prevalent), economic circumstances and political commitment. Some Member States have national bodies or mechanisms (represented by both animal health and human health sectors) in place in addressing pandemic preparedness and responses. A number of them have conducted simulation exercises to enhance their preparedness.

Brunei Darussalam, for example, has a National Emergency Preparedness Committee and National Disaster Management Centre. Both the animal health and public health sectors play active roles as secretariat of the Committee. Inter-agency simulation exercises have been conducted to identify gaps and key issues in emergency preparedness and rapid response. Management Exercise held by Department of Agriculture in collaboration with Ministry of Health in November 2008 and National HPAI action plans have been reviewed and revised.

As part of its emergency preparedness and contingency planning, a Guide to Emergency Response and Outbreak Investigation was developed and regularly updated in Cambodia. A table-top simulation exercise was held in November 2008 to test the ability of the members of the taskforces (investigation and diagnosis, control measure and communication).

The potential occurrence of HPAI is considered a disaster in the Philippines and its contingency planning is coordinated by the National Disaster Coordinating Centre, in cooperation with its regional offices. Contingency plans have been prepared by some provinces and cities.

Thailand, on the other hand, has a well-defined outbreak response measures for HPAI that include the following elements: depopulation the affected premises; compensation equivalent to 75 % of the local market price; disinfection of premises and infected materials; disposal of carcasses, products and infected materials; quarantine of the suspected premises and surroundings; movement control in the radius of 10 km for 30 days; active surveillance in all poultry groups in risk areas; coordination with all authorities concerned; prohibition of HPAI vaccination in poultry; and public awareness.

Compartmentalisation and Biosecurity

Biosecurity refers to all measures taken to ensure that the HPAI virus stays out of poultry farms and any other premises that keep poultry or birds. Given the widespread nature of the virus in countries where HPAI is prevalent, enhanced biosecurity is important for farms and other bird-keeping premises to remain free from HPAI.



In the Asian context the poultry industry is divided into four sectors (as characterised by FAO) as follows:

- Sector 1 – large integrated commercial poultry farms with high biosecurity;
- Sector 2 – small to medium commercial poultry farms with moderate to high biosecurity;
- Sector 3 – small commercial poultry farms with low biosecurity;
- Sector 4 – backyard poultry with little or no biosecurity.

Most of the national initiatives on compartmentalisation and biosecurity range from introduction of basic biosecurity principles in the commercial poultry production and training of trainers in commercial industries.

The Philippines, for example, has established compartmentalised poultry zones to establish boundaries to prevent entry and limit or stop spread of avian influenza, facilitate surveillance, detection and control and ensure availability of disease-free production areas for export and local markets. On the other hand, Malaysia developed a Standard Operating Procedure (SOP) for Disease-Free Compartment and Zone for HPAI and disease index management.

Thailand initiated poultry compartmentalisation in 2006 and accredited farms with comprehensive surveillance including 1 km radius of buffer zone to each farm. As of 27 Jan 2010, there are 46 accredited compartments (279 farms; 3,356 houses; 74 million birds/crop), with additional 12 compartments to be approved (56 farms; 382 houses, 8 million birds/crop). It also developed its biosecurity plan. Thailand's poultry production is categorised based on farm management, biosecurity level and market orientation, as illustrated below.



- Sector 1: Industrial integrated system with high level biosecurity
- Sector 2: Integrated system moderate biosecurity
- Sector 3: Small commercial poultry production with low biosecurity
- Sector 4: Backyard poultry with minimal or no biosecurity

Successful strategy: Ensuring food quality and health safety through biosecurity in Cambodia

The biosecurity measures that have been taken to ensure food quality and health safety in Cambodia are intimately related to the management of poultry and poultry products movements at all levels of the poultry chain. Having information about the poultry systems and trade patterns helped equip the veterinary and border services to control and detect the disease and respond to outbreaks in border areas, as well as trade routes that cross borders.

The direct goal is to improve the understanding of HPAI, and help the Cambodian Government to identify the most vulnerable areas to the epidemic and impose customised controls and increase the safety of the products.

Strengthening veterinary services capacity in dealing with the HPAI virus infection and distribution is intended to improve the management of other transboundary animal diseases which cause significant economic losses with consequences on food insecurity and threaten public health.



Stamping out and Compensation Policies

Stamping out is the most important part in managing outbreaks. The objective of stamping out is to eliminate the disease agent completely from the population. In stamping out, infected animal and in-contact susceptible animals are culled or destroyed. Elimination of the host (infected and in-contact) will subsequently eliminate the disease agent.

Policies on culling are noticeably different among Member States. They range from infected poultry only, infected flock only, infected and in-contact flocks and poultry in infected zone (zone also varies in size, from a village to an identified area up to two kilometre-radius from the index case). Decision on the size is based on available resources and concentration of chickens in the area. Country decisions have been based on disease epidemiology. For example, culling of poultry based on zone has been successfully implemented in Malaysia and Thailand.

Compensation is a crucial element for successful stamping out operation. A compensation scheme with acceptable rates facilitates and improves effectiveness of the stamping out operation.

Presently, some of the Member States have no compensation scheme in place. In countries where compensation is available, the compensation rates varied from a token to 50%, 70% or full market value. Although a full market value compensation rate is ideal, any rates that are acceptable to the farmers are sufficient.

Cambodia does not have a policy for compensation. Stamping out is not an applicable method, therefore, selective culling is used to control HPAI with a system to alert provincial relevant government agencies of any suspected outbreaks developed.

The Cost of HPAI Control: Thailand Experience

Thailand adopts a modified stamping-out at-site where only selected flocks are stamped out based on epidemiological risk areas. The compensation is equivalent to 75% of the local market price. The cost of the HPAI control in Thailand since 2004 is summarised below:

Cost of HPAI Control in Thailand since 2004

	Numbers of outbreak	Poultry Destruction	Compensation Baht (US \$)	Numbers of collected & tested samples*	Budget allocated for AI control Baht (US \$)
2004	1740	60,811,081	5,196,231,843 (\$ 148,463,767)	150,648	3,559,040,000 (\$ 101,686,857)
2005	194	3,694,423	195,129,620 (\$ 5,575,132)	253,960	333,209,100 (\$ 9,520,260)
2006	2	393,430	51,681,810 (\$ 1,476,623)	900,334	555,949,700 (\$ 15,884,277)
2007	4	110,022	6,011,258 (\$ 171,750)	788,611	3,031,139,500 (\$ 85,603,986)
2008	4	63,081	3,233,400 (\$ 92,383)	778,382	506,954,200 (\$ 14,484,406)
2009	0	20,728	1,189,200 (\$ 36,036)	54,083	333,590,500 (\$ 10,108,803)
2010					323,818,600 (\$ 9,963,649)

Vaccines and Vaccination Strategy

Member States recognise poultry vaccination to be amongst the important HPAI control measures currently available. However, the adoption of vaccination policy would be in accordance to each country's situation, taking note of the extent and risk of HPAI transmission, the levels and type of poultry production and the capacity to apply and monitor vaccination.



Malaysia, for example, has no vaccination programme but has a clear policy for stamping-out with compensation, as well as sufficient resources to implement such policy for disease eradication.

Currently, only Indonesia and Viet Nam have adopted targeted vaccination across all poultry production sectors, and some vaccines used have been produced from local field strains (Indonesia). Amongst the concerns in using vaccination are vaccine quality assurance and monitoring, training of personnel, and inadequate capacities and resources (including local vaccines). Post-vaccination monitoring is done using unvaccinated sentinel birds. The eight Member States not vaccinating have found their present control measures to be adequate.

Indonesia, for example, implemented a targeted vaccination policy and encouraged community self-reliance, aimed at gradually reducing dependency on the government. It piloted the strategy in 10 districts in three provinces.

The programme generated the following lessons, such as the need for improvement of cold chain and vaccine logistic management; increasing the involvement of community and farm workers as vaccinators; developing willingness of communities to pay for vaccination; and reducing death among the vaccinated flocks.

Viet Nam has recognised that it would be importantly to continue the implementation of the adjusted project which uses vaccine to control and eradicate HPAI/H5N1. Thus, the Ministry of Agriculture and Rural Development (MARD) has approved "AI vaccination programme in 2009". Accordingly, the third massive national programme for post-vaccination surveillance was carried out in 28 provinces and AIV monitoring in 16 provinces.

Success Story: Poultry vaccination as a control measure for HPAI in Viet Nam

Vaccination of poultry against HPAI was introduced in Viet Nam with the objective that it would reduce the level of infection in poultry and in turn the risk of human exposure and human disease caused by avian influenza virus. A mass vaccination campaign paid for by the government with support from donors was first organised in the autumn of 2005 to increase the immunity of the national poultry flock prior to the higher risk winter period. A second round of mass vaccination was also conducted in the spring and since then two rounds of vaccination have been held in each subsequent year.

The vaccination strategy includes post-vaccination monitoring and surveillance that has been conducted to ensure that vaccination is producing an appropriate immune response in vaccinated poultry and to detect any changes in viruses that might have arisen as a result of vaccination. Central government coordination was required to ensure that mass vaccination was implemented across all provinces initially and subsequently optional in less-risk provinces and compulsorily in maximum risk provinces. Poultry movement for trading was permitted with proper vaccination certificates. Cold storage and cold-chain maintenance at the local level was an essential prerequisite for vaccination as was training of local veterinary staff and animal health workers on the use of the vaccine.



In conjunction with the vaccination programme, other control measures that would assist in preventing infection with H5N1 viruses were implemented across Viet Nam. These included improvements to live poultry markets, better biosecurity measures on farms and improved reporting and response to suspect disease cases.

With the reduced level of infection in poultry now seen in Viet Nam, the government is now moving to the next phase of its control strategy that includes targeting the vaccination programme using a risk-based approach. Since 2009, a targeted vaccination strategy has been tested in five provinces and the result of the project is intended to provide evidence to the government in assisting in making a choice of future vaccination strategies.

Source: Ministry of Agriculture and Rural Development and Ministry of Health. 2010. Avian and Pandemic Influenza: Viet Nam's Experience. Hanoi, Viet Nam.

Animal-Human Health Interface

The spread of H5N1 avian influenza globally demonstrates the fact that animals and people are linked. Of the 1,461 diseases now recognised in humans, 60% are due to multi-host pathogens that affect multiple species, while approximately 75% of newly emerging human infectious diseases originate in animals.

The interrelated issues that affect HPAI prevention and control call for collaboration and leadership across multiple disciplines and institutions at the local, national and global levels. This also calls for the development and implementation of an integrated strategy for improved public health based on the principles of One Health.



Many Member States have put in place some form of national zoonotic committees/collaboration mechanisms, participated by both animal and human health sectors. There also exists regional work plan for animal-human health collaboration. Maintaining such momentum and sharing of experiences in animal-human health interface and dialogues need continued efforts and long-term support.

With the concerns over the public health at the regional level, cooperation and collaboration between animal health and human health has been progressing. These collaborations should continue at even greater extent and in more defined ways, involving all activities related to the eradication and controlling zoonotic diseases, particularly in HPAI.

Success Story: Advancing Animal-Human Health Interface for Disease Prevention in Malaysia

In Malaysia, to promote interface of animal-human health (zoonoses), a Bilateral Zoonotic Diseases Committee and a Technical Working Group were organised, in partnership with the Ministry of Health. Partnership was also fostered with the Wildlife Department (HPAI and Biodiversity Conservation Surveillance Programme) and universities for joint surveillance and diagnosis.

As the way forward, inclusion of wildlife components in disease control requires systemic approach and strategies for the following aspects: technical and institutional capacity building, information sharing among sector at all levels, specific studies to access risks of disease emergence/transmission by wildlife, community or eco-region, and collaboration at the interface among human-animal and environmental health.



Coordination, Cooperation and Partnership



Inter-agency coordination and multi-level collaboration (local, sub-national, national and regional levels) have been progressing at the national level. Various Member States have initiatives for the harmonisation and collaboration of HPAI control and eradication approaches across the countries and by various development partners and donor agencies.

The Ministry of Agriculture of Indonesia has developed a National Strategic Work Plan for the Progressive Control of HPAI in Poultry (NSWP) 2006-2008 with the assistance of FAO and other donors such as the Governments of Australia and the Netherlands, as well as the Japan International Cooperation Agency (JICA). This strategic plan identified nine key elements necessary for an effective disease control programme. Elements included programme management with capacity building, enhanced disease control activities, improved surveillance and a better understanding of the epidemiology, improved laboratory diagnostic services, strengthened quarantine, more robust legislation, improving public awareness, and medium to longer term goals of industry restructuring and research and development needs.

Evaluation to HPAI control programme is conducted continuously to monitor the effectivity of the programme implemented and to determine appropriate policy to be applied in the field. This evaluation covers monitoring of virus dynamic, control action such as vaccination and depopulation, as well as the overall control strategy.

Singapore, on the other hand, fosters strong international collaboration with veterinary authorities, especially with the neighbouring countries. It also continues to strengthen national capacities through training courses (control, detection and surveillance), advice on outbreak response, building laboratory diagnostic capability and production of educational materials.

3. The Way Forward: Long-Term and Sustainable Strategies



Significant progress and achievements were made by the Member States in key areas in the prevention and control of HPAI in ASEAN. These are supplemented by the initiatives supported by development partners and agencies. Such efforts should be continued and intensified through further strengthening of veterinary services, regional coordination on animal health and zoonoses, greater animal-human health collaboration and enhanced partnership and cooperation among development partners. There is a need to enhance synergies and complementarities among the different stakeholders in the region to better manage and mitigate the risks and threats posed by dreadful diseases on animals and humans alike.

The strategic thrust for ASEAN is to move towards ensuring institutionalisation and sustainability of current programmes and better coordination of initiatives and projects being implemented by donors and development organisations. Some of the strategies currently undertaken towards this direction include the development and implementation of the Roadmap to control and eradicate HPAI by 2020; and the establishment of a regional coordination mechanism on animal diseases and zoonoses.

Roadmap for HPAI-Free ASEAN by 2020

As a community of nations, ASEAN is addressing HPAI with one vision: investing in sustainable prevention, control and eradication strategies at the animal level (at-source) to reduce the threat to humans and to the economic and social development of nations.

Despite the fact that there is no universal solution to control and eradicate HPAI, and that it is a complex task and differs between countries, the basic concept for the development of the Roadmap is that it is possible to build a phased programme for each country and/or cluster of countries taking into account their current status, to identify risks and implement appropriate approaches in a series of steps to progressively manage those risks. This would require an integrated approach targeted specifically to the situation in a country/cluster, based on risk management for the most significant transmission pathways.

The Roadmap for HPAI-Free ASEAN Community by 2020 provides strategic goals and actions to attain its vision and consists of strategic components that include strengthening of veterinary services, progressive zoning and cross-border management, vaccine and vaccination strategy, stamping out, surveillance, market chain management and biosecurity enhancement. In addition, cross-cutting strategies are also presented reinforcing the fact that controlling and eradicating HPAI as a multi-dimensional disease requires multi-disciplinary, multi-sectoral and multi-agency cooperation and collaboration.

The Roadmap also aims to mainstream HPAI into the broader context of ASEAN's initiative for the establishment of a regional coordination mechanism on animal health and zoonoses. This is also consistent with the ASEAN Charter that calls for strengthening regional solidarity to realise an ASEAN Community that is politically cohesive, economically integrated and socially responsible in order to effectively respond to current and future challenges and opportunities.

The implementation of the Roadmap will be coordinated by the ASEAN Secretariat and HPAI Taskforce by overseeing the implementation and alignment of action plans at the national level, and closely linked with the FAO/OIE Global Framework for the control of transboundary animal diseases (Global Framework for Transboundary Animal Diseases), in the short term, and will become the blueprint for the institutionalised regional coordination mechanism on animal health and zoonoses, in the mid- and long-term. Ultimately, the Member States which implement national programmes for HPAI and other HPEDs, will be the main implementers of the Roadmap.

Resource mobilisation will include funding mechanisms and sources at both national and regional levels. Most of the projects and programmes to be developed from the Roadmap are expected to be implemented through multi-agency and donor support. The ASEAN Animal Health Trust Fund, with contributions from Member States, will be a vehicle to draw resources from other ASEAN and non-ASEAN sources.



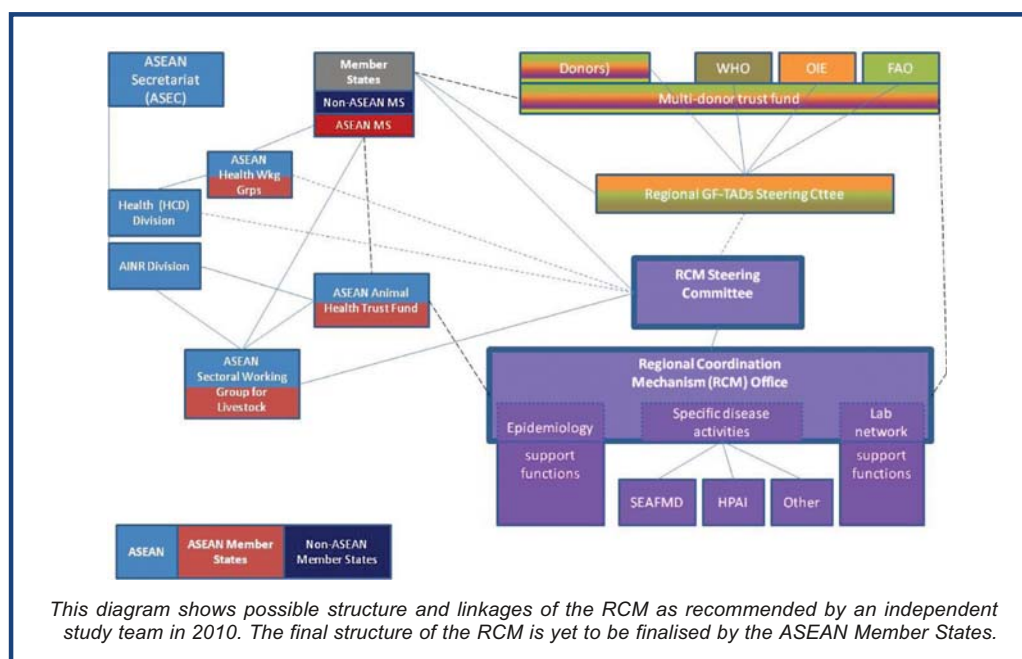
Regional Coordination Mechanism on Animal Diseases and Zoonoses

Regional coordination for transboundary animal diseases and emerging zoonoses is currently being delivered through a number of mechanisms that are linked in an ad hoc and unorganised way through structures that have grown over time, mainly in response to particular challenges. However, current activities are disease-specific, often associated with time-limited projects, and appear to be resourced and driven by donors and international agencies. As activities have grown and been added over time, the result is an increasingly complex web of relationships that is difficult to manage effectively, is not always efficient or sustainable, may not reflect ownership and is not well-suited to the anticipated demands of future emerging infectious diseases challenges including zoonoses and other emerging threats such as climate change.

Thus, multi-sectoral collaboration is expected to be further strengthened with the institutionalisation of a regional coordination mechanism (RCM) on animal health and zoonoses to consolidate regional capacity to address disease threats to animal and human health, food security, rural development and poverty alleviation in the region.

The RCM is viewed as a single structure capable of managing coordination activities for both vertical (disease-specific) and horizontal (cross-disease) activities. The RCM should be focused on coordination activities and not tasked with implementation of specific projects within the Member States. The principal activities and focus for an RCM include supporting annual meetings of Member States that can work on priority diseases for the region and the development of a regional roadmap strategy for each priority disease or activity. RCM staff will also be involved in drafting of technical advice on policies and strategies for consideration by appropriate regional bodies such as ASEAN.

The RCM is intended to provide a forum where all stakeholders and particularly Member States, international agencies and donors work in a harmonised and integrated manner to identify potential project areas that contribute to the needs of the Member States, are aligned with the regional strategy, and that link effectively and efficiently with activities of other donor agencies in the region. The RCM will be expected to take a leadership role in facilitating dialogue between Member States and donors and in identifying funding opportunities for priority activities.



Private Sector Engagement

Effective long-term public-private partnership (PPP) is necessary for the success and sustainability of the regional strategies and investments for HPAI prevention and control. This would involve a strong coalition of specialised international agencies, donors and various government ministries with the key private sector players composed of poultry and livestock producers, farmer cooperatives, input suppliers, traders, extension workers, etc.

At all levels, engagement and partnership with the private sector will have to be strengthened by establishing and sustaining constructive mechanisms for dialogue, consultation, joint initiative and support.



Research and Development

Research activities have to constantly address demand for information that supports further capacity building and the application of cost-effective and science-based interventions and control measures. This will be enhanced by identifying strategic research initiatives appropriate to the region and facilitate the engagement of national governments, research institutes, technical and development organisations, and private industry in collaborative research undertakings.

Priority research areas should include socio-economic assessments of risk factors and strategic interventions to improve understanding of impacts and benefit-cost ratios of various interventions from surveillance, capacity building and disease control options.

Narrowing the Development Gap

There are significant development challenges that need to be overcome for some ASEAN Member States in order to fully address HPAI at the national level. The regional initiative should acknowledge the social and economic differences among Member States and the realities that there are varying levels of resources allocated for HPAI.

Enhancing regional and sub-regional cooperation frameworks would pave the way towards reducing the development gap in ASEAN, and in ensuring that the region would address HPAl in a united and coordinated way.

4. The ASEAN HPAI Taskforce

BRUNEI DARUSSALAM

Hajah. Dahlia binti Haji Aliakbar
Senior Livestock Husbandry Officer
Department of Agriculture and Agrifood
Ministry of Industry and Primary Resources
Bandar Seri Begawan, 3510, Brunei Darussalam
Phone: +673-2388000
Fax: +673-2382226
Email: dahlia_akbar@agriculture.gov.bn

CAMBODIA

Dr. Sorn San
Director, National Veterinary Research Institute (NaVRI)
Department of Animal Health and Production
Ministry of Agriculture, Forestry and Fisheries
Trea Village, St. 371, Sangkat Steung Mean Chey,
Khan Mean Chey, Phnom Penh, Cambodia
Phone: +855-883-685
Mobile: +855-12 939629
Fax: +855-883-685
Email: sorn.san@gmail.com

INDONESIA

Dr. Agus Wiyono, Ph.D.
Director of Animal Health
Directorate General of Livestock Services
Ministry of Agriculture
Jl. Harsono RM No.3, Ragunan, Jakarta Selatan
Jakarta, Indonesia
Phone: +6221-7810090
Mobile: +62-81310782319
Fax: +6221-7815783
Email: agusrini@indo.net.id

LAO PDR

Dr. Watthana Theppangna, Ph. D.
Senior Veterinary Officer, National Animal Health Centre
Department of Livestock and Fisheries
Khounta Village, Sikhottabong District,
Vientiane, Lao PDR
Phone: +856-21-216380
Mobile: +856-20-6494592
Fax: +856-21-216380
Email: wtheppangna@hotmail.com

MALAYSIA

Dr. Kamarudin MD. Isa, Ph.D.
Director
Livestock Resources and Technology Development Division,
Department of Veterinary Services
Wisma Tani, Block Podium, Lot4G1, Presint 4,
Federal Government Administration Centre
62630 Putrajaya, Malaysia
Phone: +603 88702028
Mobile: +6019-6641744
Fax.No: +603 88885631
Email: kamar@dvs.gov.my; kamar57@yahoo.com

MYANMAR

Dr. Khin Maung Maung
Director, Border Area Development & Inspection Division
Livestock Breeding and Veterinary Department
Director General Office
Ministry of Livestock and Fisheries
Insein Township, 11011, Yangon
Union of Myanmar
Phone: +95-1-642453, 644271, 643127
Fax: +95-1-642927
Email: lbvd@mptmail.net.mm

PHILIPPINES

Dr. Rieldrin Gonzales Morales
Officer in Charge
Disease Control Section, Animal Health Division
Bureau of Animal Industry, Department of Agriculture
Visayas Avenue, Diliman, Quezon City 1100, Philippines
Phone: +63-2-9204061/9200421
Mobile: +63-918 907 5095
Fax: +63-2-9204061/ 9200421
Email: rgmorales@bai.ph

SINGAPORE

Dr. Leong Hon Keong
Deputy Director, Risk Analysis & Standards Division
Regulatory Administration Department
Agri-Food and Veterinary Authority, Singapore
Phone: +65-6325 7342
Mobile: +65-98322110
Fax: +65-62206068
Email: Leong_Hon_Keong@ava.gov.sg

THAILAND

Dr. Arunee Chaisingh
Senior Veterinary Officer
National Institute of Animal Health
Department of Livestock Development
Kaset Klang, Jajutak, Bangkok 10900, Thailand
Phone: +66-2-5738908-14 ext 312
Mobile: +66-8-3599 9777
Fax: +66-2-579 8918-19
Email: niah8@dld.go.th

VIET NAM

Dr. Mai Van Hiep
Vice Director, Department of Animal Health
521/1 Hoang Van Thu Street- Tan Binh
Ho Chi Minh, Vietnam
Phone: +84 838452528
Fax: +84 838444029
Email: hiepmaivan@yahoo.com

5. Acknowledgement

The ASEAN-ADB Project on Strengthening Regional Coordination in the Control and Eradication of HPAI acknowledges the contributions, updates and resources provided by the following ministries of the ASEAN Member States that became the basis of this publication:

Brunei Darussalam

Department of Agriculture and Agrifood,
Ministry of Industry and Primary Resources

Cambodia

Department of Animal Health and Production,
Ministry of Agriculture, Forestry and Fisheries

Indonesia

Directorate General of Livestock Services,
Ministry of Agriculture

Lao PDR

Department of Livestock and Fisheries,
Ministry of Agriculture and Forestry

Malaysia

Department of Veterinary Services,
Ministry of Agriculture

Myanmar

Livestock Breeding and Veterinary Department,
Ministry of Livestock and Fisheries

Philippines

Bureau of Animal Industry,
Department of Agriculture

Singapore

Agri-Food and Veterinary Authority of Singapore.
Ministry of National Development of Singapore.

Thailand

Department of Livestock Development,
Ministry of Agriculture and Cooperative

Viet Nam

Department of Animal Health,
Ministry of Agriculture and Rural Development

The Project also acknowledges the technical inputs, references and resources shared by the following partner and technical organisations:

- Asian Development Bank
- Australian Agency for International Development
- European Commission
- Food and Agriculture Organisation
- Japan International Cooperation Agency
- United States Agency for International Development
- World Bank
- World Health Organisation
- World Organisation for Animal Health