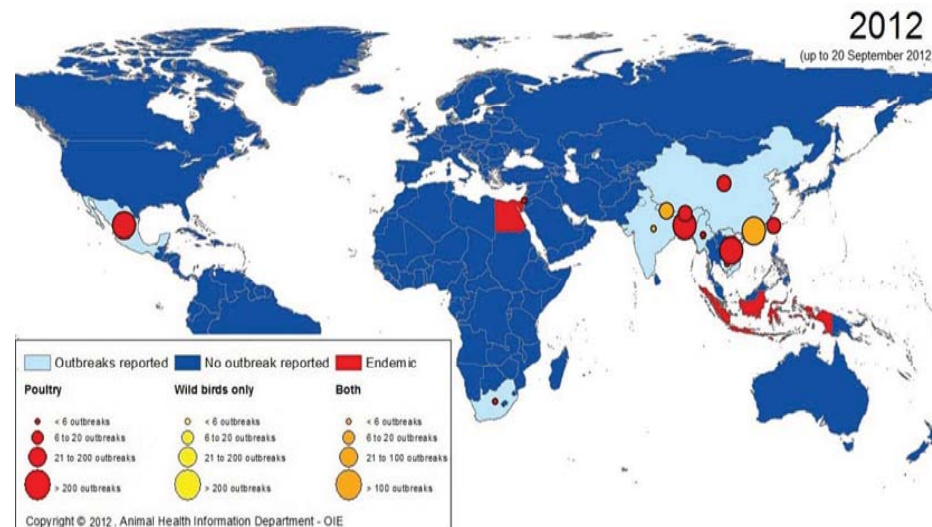


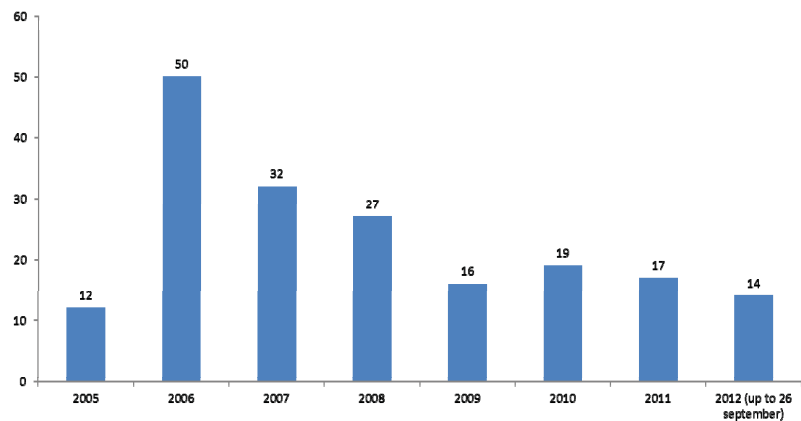
Current global situation on HPAI and OIE's initiative on HPAI control

The 5th OIE Regional Meeting on Strengthening Animal
Health Information Networking for HPAI control and
prevention in Asia
Hanoi, Vietnam
October 2-3, 2012

Gounalan Pavade
Scientific and Technical Department



Number of countries that reported the presence of HPAI serotype
H5N1



OIE priority concepts for HPAI prevention and control

- **Veterinary Services:** International public good concept
- Setting up of **International Standards** for good Governance and Quality of Veterinary Services (including legislations)
- Relevant infrastructures and resources of Veterinary Services for strict implementation of legislation
- Early detection and Rapid Response (including transparent and timely Notification)
- Reliability of rapid diagnostic confirmation of suspects, and Surveillance (OIE Standards on laboratory procedures)

OIE priority concepts for HPAI prevention and control

- **Stamping out** under OIE animal welfare standards and pathogen confinement
- Safety of movements of animals and animal products (and Zoning and Compartmentalization)
- When and how to use **vaccines** (Vaccine Quality: OIE Manual for vaccine manufacturing)
- **Bio-security** measures
- Evaluation of Veterinary Services
- Sustainability of resources invested



Reporting animal influenzas as OIE listed diseases

Legal obligation to report:

- Poultry – subtypes H5 and H7 and highly pathogenic viruses (based on IVPI or HA cleavage site)
- Wild birds – HPAI (LPAI in annual reports)
- Horses – equine influenza
- Influenza viruses in any species that qualify as a new and emerging disease e.g. pandemic H1N1 2009



OIE Resolution

- All OIE members signed up to an OIE resolution 'sharing of avian influenza viral material and information in support of global avian influenza and control'
- Adopted by the International Committee of the OIE on 29 May 2008 at 76th OIE General Session
- OIE members should agree to share avian influenza viral material and information about viruses through OFFLU with the international scientific community



OIE Codes and manual



Avian influenza chapters and documents

OIE Code

- Volume 2, Chapter 10.4: Avian Influenza (NAI, HPNAI, LPNAI, importation, surveillance strategies, free status)

OIE Manual

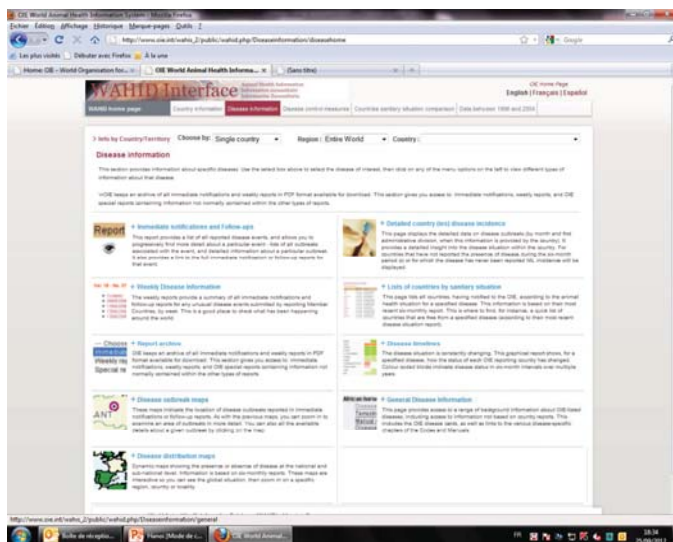
- Chapter 2.3.4. Avian influenza (Diagnostic techniques and vaccine requirements)

OIE - WAHID

- The WAHID Interface provides access to all avian influenza outbreak data held within OIE's World Animal Health Information System (WAHIS)
- http://www.oie.int/wahis_2/public/wahid_nhn/Wahidhome/Home

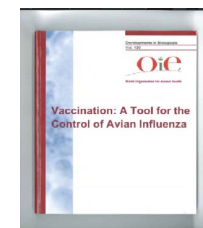


AI disease information



OIE avian influenza vaccine bank

- 2006 - Regional vaccine bank for avian influenza vaccines in Africa
- 2007 - Global vaccine bank for AI
- 62, 017 million H5N2 doses were delivered: Mauritania, Senegal, Egypt, Mauritius, Ghana, Togo and Vietnam
- Egypt : 28 million
- Vietnam: 26.7 million
- EU funded HPED vaccine bank programme to asia
- 40 % for Avian influenza



Laboratory Twinning Program

Each OIE Laboratory Twinning Project...

- Is a link between OIE Reference Laboratory or Collaborating Centre (Parent) and national laboratory (Candidate)
- **Objectives**
 - build their capacity and scientific expertise potentially to become an OIE Reference Laboratory
 - transfer of knowledge, training and expertise ('North' to 'South')
 - build bridges between laboratories and scientists that extend beyond the terms of the project



OIE twinning: Avian Influenza Current status (Sept. 2012)

Projects completed to date:

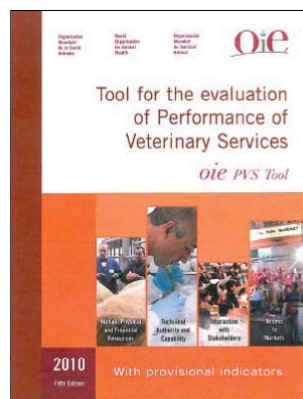
- Italy with Cuba
- Italy with Russia
- USA with Brazil

Projects approved and underway:

- Australia with Malaysia
- Canada with Colombia
- Germany with Egypt
- Italy with Iran
- UK with Botswana
- UK with South Africa
- USA with Chile



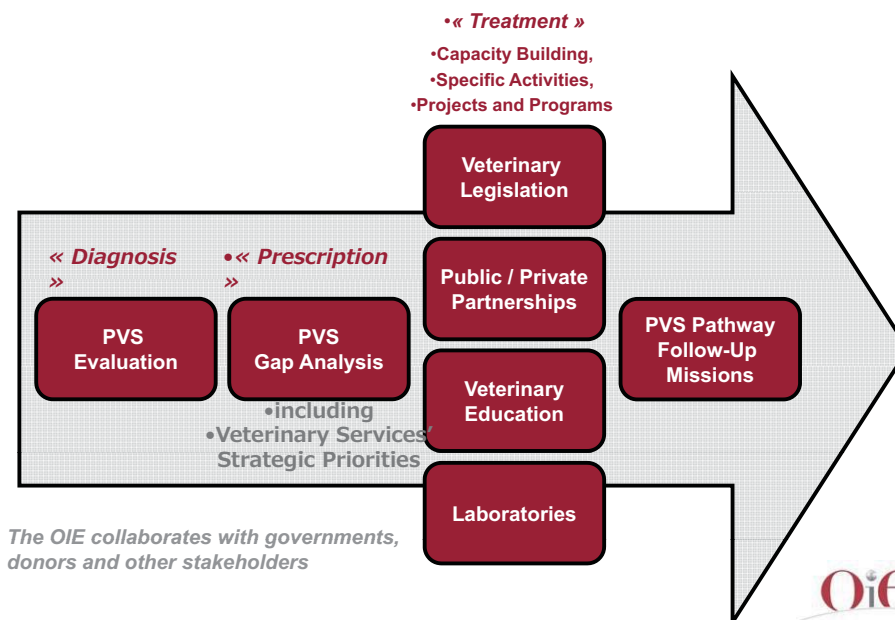
The OIE-PVS Tool



•Evaluation of the Performance of Veterinary Services

- a tool for Good Governance of Veterinary Services

The OIE PVS Pathway





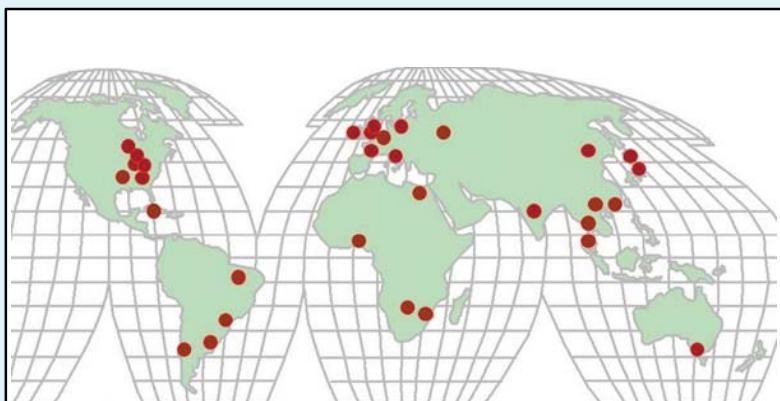
OFFLU OIE-FAO network of expertise on animal influenza

OFFLU objectives

- To exchange scientific data and biological materials (including virus strains) within the network, to analyse such data, and to share such information with the wider scientific community.
- To offer technical advice, training and veterinary expertise to Member Countries to assist in the prevention, diagnosis, surveillance and control of animal influenza.
- To collaborate with the WHO influenza network on issues relating to the animal-human interface, including early preparation of human vaccine.
- To highlight influenza research needs, promote their development and ensure co-ordination



OFFLU network animal influenza experts



Including OIE Reference Laboratories for avian influenza and for equine influenza, FAO Reference Centres for avian influenza, and OFFLU regional laboratory contacts for avian influenza, and current members of OFFLU SIV group



OFFLU Technical activities

- Applied epidemiology group*
- Biosafety*
- Standard H5 antisera
- RNA standard for PCR
- Proficiency testing /Ring trial*
- Commercial diagnostic kits evaluation
- Vaccination
- MTAs and code of conduct*
- OFFLU research agenda
- Training
- OFFLU Swine influenza virus group*

*involves public health (WHO) representation



OFFLU Surveillance strategy

Strategy document for surveillance and monitoring of influenzas in animals

- Domestic poultry
- Wild birds
- Pigs
- Horses
- New and emerging influenza viruses – Pandemic H1N1 2009 (pH1N1) - Pigs

-Poultry

- Available in offlu website

<http://www.offlu.net/fileadmin/home/en/publications/pdf/OFFLUsurveillance.pdf>



OFFLU Research Agenda

- In November 2010, OFFLU experts convened to develop a list of current animal influenza research priorities
- A comprehensive list of research priorities on avian influenza (poultry and wild birds), swine influenza and equine influenza available online at offlu website
- Enumerates research priorities on
 - ☐ Control and education
 - ☐ Diagnostics and surveillance
 - ☐ Ecology and epidemiology
 - ☐ Immunology and immune responses
 - ☐ Pathogenesis
 - ☐ Transmission
 - ☐ Vaccines and vaccination
 - ☐ Virus characteristics and evolution



OFFLU Training TA

☐ AI sampling procedures and laboratory testing (Video posted at website)

- Personal protective equipment
- Necropsy
- Sample collection in live birds
- Sample shipment
- AGID
- ELISA
- HI
- RNA extraction
- RT-PCR
- Agar gel electrophoresis
- Real time PCR



OFFLU Ring trial

- Enhance diagnosis of avian influenza worldwide through consistency in diagnostic testing
- First OFFLU ring trial 2011 completed
- FLI prepared 10 specimens for molecular testing and 6 specimens for subtyping for 9 OIE/FAO reference labs. Results were analyzed and presented at the OFFLU Technical Meeting in London April 4, 2012.
- Second OFFLU ring trial initiated.



OFFLU Projects

- LAMP (Loop mediated isothermal AMPLification) project: Aims at improving diagnostic capacity for early and rapid diagnosis of AI in developing countries
- OFFLU Indonesia and Egypt project: Advice to Egypt and Indonesia on selection of avian influenza vaccine strains using antigenic cartography
- OFFLU review of avian influenza surveillance and epidemiological projects in some European, African, and Asian countries
- OFFLU review of Global Avian Influenza control strategies for poultry including AI vaccines and vaccination (David Swayne). Two papers published in OIE Scientific and Technical Review so far
- Universally usable RNA standard initially for H5 avian influenza virus targeted PCR assays



OFFLU sources of information for VCM

Genetic data

- OFFLU avian influenza laboratories (Reference laboratories/centres)
- Publicly available databases
- FAO national and regional offices

Antigenic data

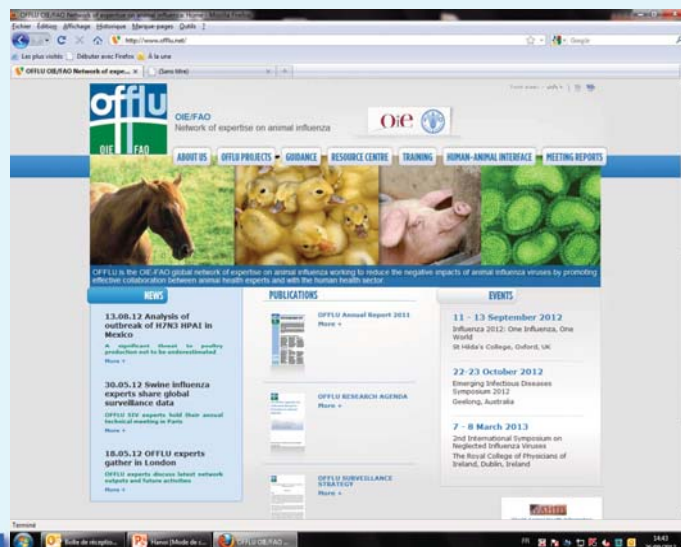
- HI data in collaboration with WHO CC St Jude's Children's Hospital

Epidemiological data

- FAO (empres i) and OIE (WAHID) databases



www.offlu.net



OFFLU future activities

- Advocate for sustainable broader animal influenza surveillance
- Improve data on avian influenza H9 subtypes
- Discuss data presentation (linking genetic-epi data, human-animal data etc)
- To study the WHO PIP framework implications for AH labs
- OFFLU code of conduct alternative to MTA



OFFLU future activities

- Provide expert input for development of risk assessment frameworks (EFSA and CDC)
- Consider integrating risks to animal health in risk assessment frameworks.....
- Training: E-learning study, train the trainers program, videos
- Standard nomenclature for naming of novel influenza viruses
- Vaccination handbook
- OFFLU vaccination and annual technical meetings



Thank you for your attention



Organisation mondiale
de la santé animale

World Organisation
for Animal Health

Organización Mundial
de Sanidad Animal

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FAO's initiatives on HPAI control in Asia

Subhash Morzaria

Regional Manager
Emergency Center for Transboundary Animal Disease
FAO Regional Office for Asia and the Pacific
(ECTAD-RAP)

OIE Sub-commission for FMD in Southeast Asia
Hanoi, Vietnam
2-3 October 2012

ECTAD Emergency Centre
for Transboundary Animal Diseases



Overview

- FAO's context - mandate & strategic objectives
- Establishment of ECTAD-RAP and structure
- Ongoing activities
- Lessons learned, challenges and way forward

ECTAD Emergency Centre
for Transboundary Animal Diseases



FAO -Goals

1. Reduction of the absolute number of people suffering from hunger
2. Elimination of poverty
3. Sustainable management and utilization of natural resources

ECTAD Emergency Centre
for Transboundary Animal Diseases



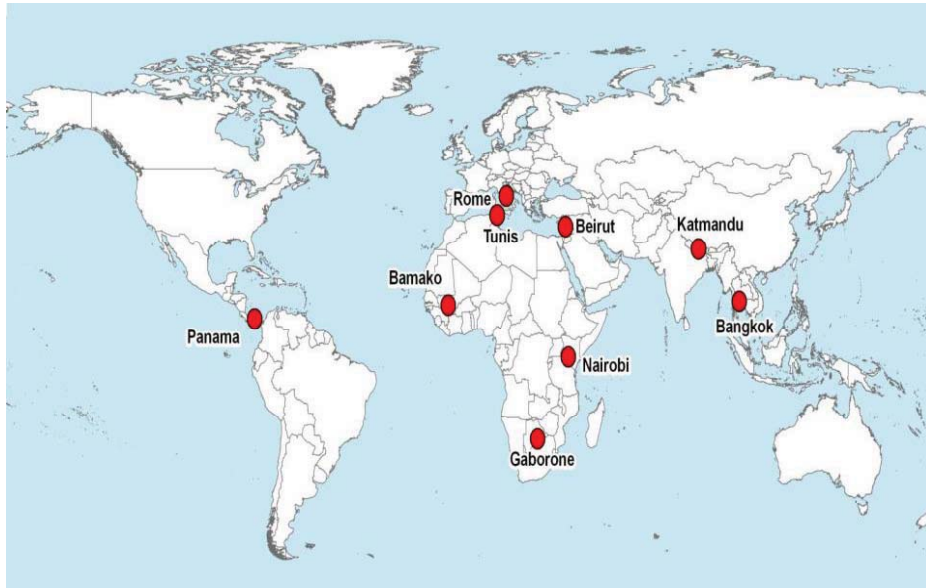
FAO's 11 Strategic Objectives *development agenda*

- Increased sustainable livestock production
- Improved quality and safety of foods at all stages of food chain
- Improved preparedness, and effective response to food and agriculture threats, and emergencies

ECTAD Emergency Centre
for Transboundary Animal Diseases

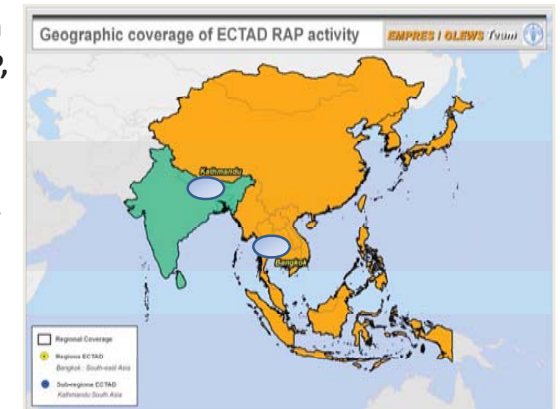


ECTAD: Response to HPAI-2004



Regional ECTAD

- ECTAD-RAP established in December 2005 in FAORAP, Bangkok
- Sub-regional ECTAD in September 2007 in FAOR – Kathmandu, Nepal
- 11 countries in Asia
– 9 countries in 2012
- Focus on HPAI



HPAI initiatives



ECTAD-RAP activities

REGIONAL
Strategy development
Regional Organizations
Lab and Epi networks
FETV Programme
Dis information platform

COUNTRIES
Ministries of Agriculture
Strategies and Policies
Surveillance, reporting, response,
diagnosis, lab., technical advice

Capacity building integrated into the programme
(training, hardware, communication, advocacy, PPP)
Building partnerships



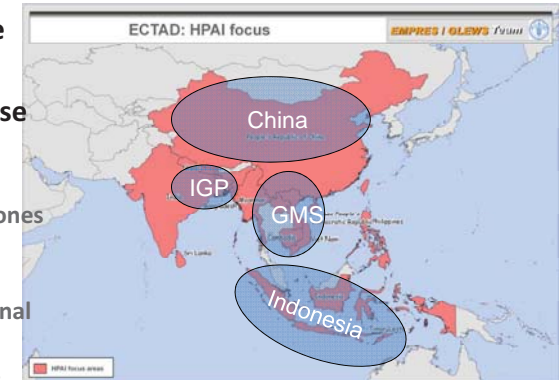
Regional Strategy for HPAI

- 2006:
 - First strategy 'The Strategic Framework for HPAI Prevention and Control in Southeast Asia'
- 2009/10:
 - Second strategy 'The FAO Regional Strategy for HPAI and other EIDs of animals in Asia and the Pacific'
 - Consultative process



Regional Strategy

- A revision and an update
- Considers evolving disease situation
 - HPAI spread to South Asia
 - Development of endemic zones
 - The need for long term approaches
 - The need for stronger regional approaches
 - Emergence of new diseases



Engagement with ASEAN and SAARC

- Regional Organizations are a legal entity
 - Consensual organization
 - Obligations as members to comply with the charter
 - Essential for TADs issues

➔

- Commitment at highest level
 - Sustainability



Capacity of ASEAN and SAARC

- Establishment of Regional Support Units (RSU)
- ASEAN RSU in Bangkok and Jakarta
- SAARC RSU in Kathmandu
- Mentorship programme
- Establish regional coordination mechanisms for control of TADs and EID
- Supported by the EU-HPED Programme



Key capacity development

- Regional Epidemiology Unit
- Regional Laboratory network
 - Leading Laboratories
 - National Laboratory network
 - Diagnostic and Surveillance networks
- Regional Epidemiology network
- Regional Coordination Mechanisms
 - e.g. ACCAHZ in ASEAN



FAO-ASEAN-SAARC Cooperation on HPAI

- Communications
 - Provide regular disease situation updates, including weekly disease situation
 - Provide executive summaries and presentations on HPAI situation



FETPV

Strengthening regional and national epidemiology capacity through Field Epidemiology Training Programme for Veterinarians (FETPV)

- Launched in 2008 through financial support from USAID and other donors for programme development
- Thai Department of Livestock Development hosts the coordination and training centre
- FAO provide technical inputs
- Collaboration with Thai Ministry of Public Health and USCDC
- Participating countries include GMS countries plus Philippines, Indonesia, Malaysia, China and India

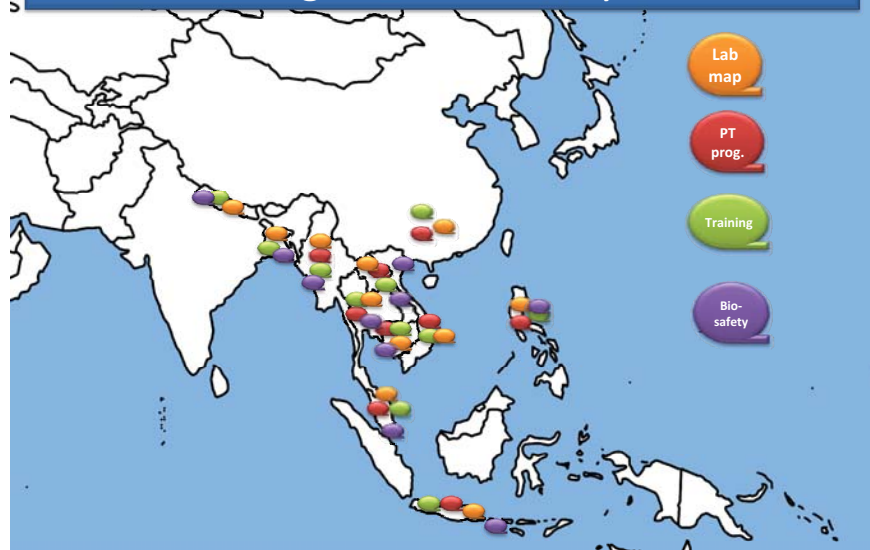


Regional Laboratory Network for HPAI Diagnosis

- Network of labs and people
- Capacity development
 - Virus identification and molecular characterization
- Sharing of samples
 - Submission of samples to regional reference laboratory
- Sharing of information
 - Epidemiologic information
 - Laboratory information
- Quality Assurance
 - Standard protocols and reference reagents
 - Proficiency testing



2012-13 Regional laboratory activities

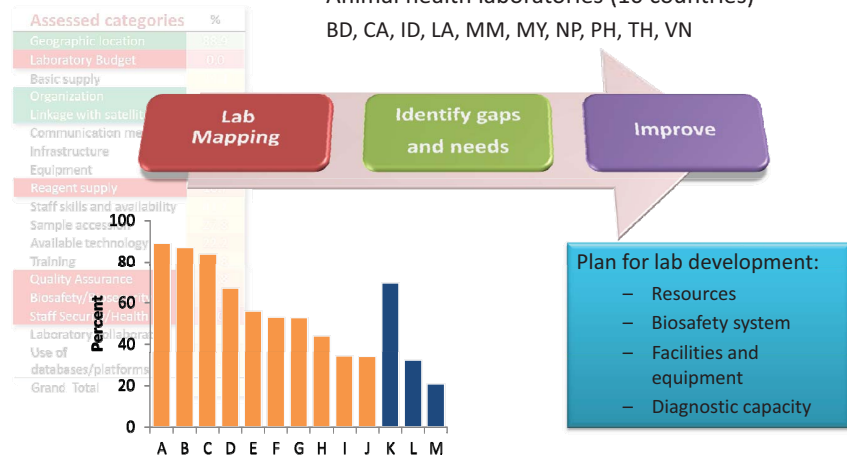


Strengthening of the laboratory capacity

2012 Laboratory Capacity Assessment

Animal health laboratories (10 countries)

BD, CA, ID, LA, MM, MY, NP, PH, TH, VN



Assure the quality of laboratory services

Proficiency Testing program

- To assure quality laboratory services
- Activities include:
 - Training
 - PT Testing
 - country visit by international lab experts
- 2012 Regional training workshop on diagnosis of priority diseases
 - CSF, PRRS, ASF (RAHO6, HCMC, VN)
 - ND/ Rabies (NIAH, THA), Aug 2012

2011	2012
1. Flu A 2. H5-AI 3. H5 HI 4. CSF 5. PRRS	1. Flu A 2. H5-AI 3. H5 HI 4. CSF 5. PRRS
	6. ASF (PCR) 7. ND (PCR/HI) 8. Rabies (Ag/Ab)



Assure the quality of laboratory services

Laboratory biosafety strengthening

- Biosafety assessment
- Biosafety cabinet testing and certification
- Biosafety training/workshop
- Follow up **provision of equipment/supplies** and technical assistance based on findings and recommendations



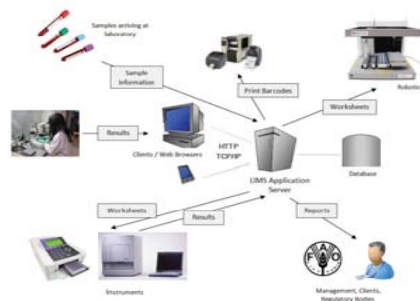
Sectors	Number of laboratories	Country
Animal health	23 laboratories	BD, CA, ID, LA, MM, MY, NP, PH, TH, VN



The development of Laboratory Information Management System (LIMS)

Laboratory Information Management Systems: Workshop to Identifying Needs, Resources, and Ways Forward

– 8 - 9 December 2011, Phuket, Thailand



Facilitate laboratory networking

- **Technical Advisory Group (OIE/FAO)**
 - 30-31 July 12, Bangkok, Thailand

Upcoming meetings

- **Laboratory Directors' Forum (OIE/FAO)**
 - 10-11 October 2012, Nha Trang, Viet Nam
- **WHO/OIE/FAO Meeting on Laboratory Strengthening for Emerging Infectious Diseases in Asia Pacific Region**
 - Time: TBD, Malaysia

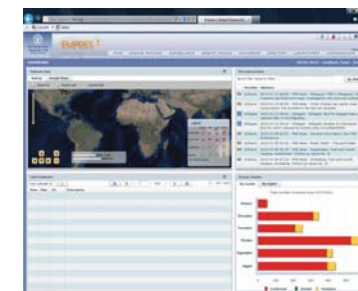


EMPRES-i: Information–intelligence–intervention

- **A Global animal disease information system :**
 - FAO initiative - first released in 2003
 - Web-based secure Information System
 - Password-protected with individual privileges
 - Accessible to FAO staff and public
 - Hosts outbreaks data of EMPRES priority diseases (TADS and emerging diseases)
 - **Access to other FAO datasets:**
 - **Livestock population /density layers (GLiPHA/FAO)**
 - LAND USE, ELEVATION, SOCIO-ECONOMICS, ANIMAL HEALTH, TRADE
 - **Other environmental layers (Geonetwork/FAO)**
 - **Genetic data (Openflu database)**
 - **Maps, tables and charts**

EMPRES-i: Internal site (con't)

- **Modules:**
 - **Disease Event :** Disease outbreak and historical data.
 - **Surveillance :** Data from FAO active surveillance projects.
 - **Genetic:** Links genetic sequence data to H5N1 outbreaks data
 - **Mobile:** Access to disease outbreaks reported via the mobile application and users of the application
 - **Documents:** list of documents associated with disease records
 - **Directory :** Contact details of CVOs, Natl and Ref labs



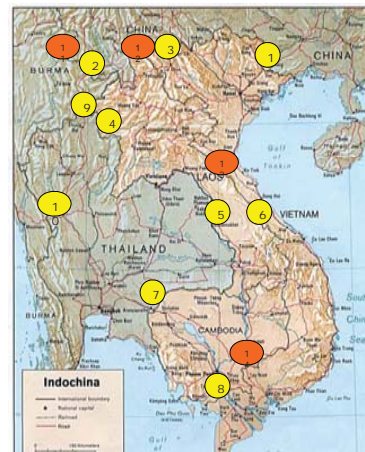
EMPRES-i: Public site

- Modules:
 - **Disease Event** : Disease outbreak data.
 - **Library**: Publications and images (clinical signs, lesions...)
 - **Directory** : Contact details of CVOs, experts
 - **Laboratory**: Contact details of national Veterinary laboratories and Reference Laboratories.
 - **Mobile**: Access to disease outbreaks reported via the mobile application and users of the application



TWO REGIONAL COURSES

Current Regional Activities



- **Cross border in GMS**
 - Viet Nam and China
 - Viet Nam and Lao
 - Lao and China
 - Myanmar and China
 - Cambodia and Vietnam
- **Cross border in SA**
 - India - Bangladesh
 - India - Nepal
 - Bangladesh – Myanmar
 - India - Myanmar

Value chain, production system, socio- economics, epidemiology, virus isolation and characterization

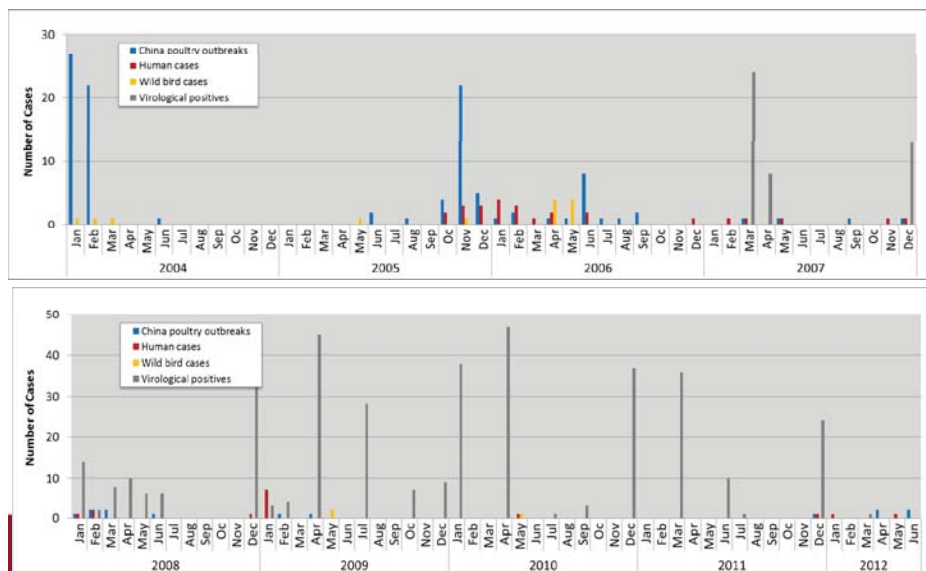
Value chains-observations

- Animal movements significant
- Price differential is a major driver, but others too
- Spread and exchange of viruses cross-border
- Cross border value chains are dynamic and need to link with intra-country chains
- Critical points can be defined for interventions
- The disease outbreak reporting, mapping and linking with molecular characterization provide a powerful tool for transmission dynamic
- Need for greater cross border dialogue

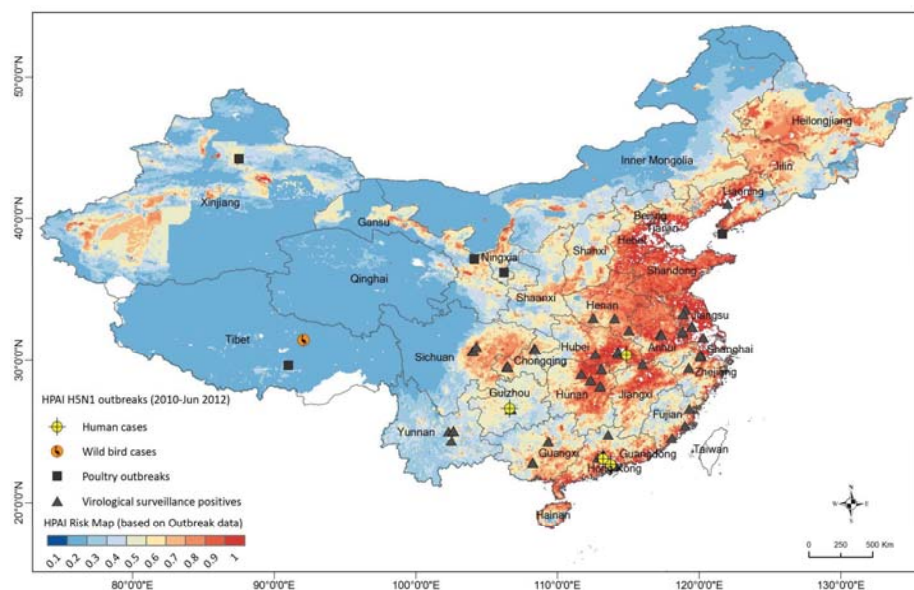
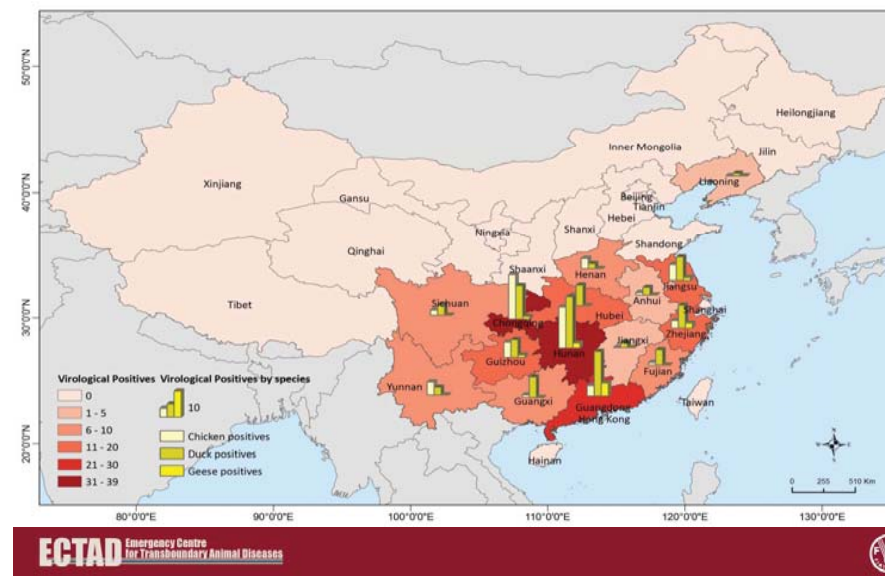
Country Examples



HPAI events in China since 2004



Number of positive results by province (2010-2011) By species (a) chicken (b) ducks and (c) geese



HPAI H5N1 risk map and HPAI outbreaks (2010 - June 2012).

Vaccination for HPAI

- High coverage for vaccination (~90%)
- Concern the some vaccines may not be effective against Clade 2.3.2.1.
 - New vaccines developed to contain this virus clade (late 2010)
 - New vaccines have been prepared and have passed all the efficiency tests and received an approval in China after a scientific review.
 - Waiting for the final approval and release on the vaccine market

Emergence of Clade 2.3.2.1C in Vietnam

- Claims that it is more pathogenic in poultry and in humans (no evidence of either)
- Claims in Vietnam that large numbers of 'spent hens' informally cross the border
- The same strains are present in both countries
- Results of a study on the movements of poultry (including spent hens) done in China by FAO ECTAD in 2009



Spent hens import to Guangxi from other provinces



Spent hens market in Nanning, Guangxi Province



What does this mean?

- Confirm these movement patterns
- Spent hens are only a small proportion of the poultry
- High degree of mixing of waterfowl and poultry in the markets
- Most spent hens likely to be partially immune
- But could pick up viruses, including new clades (with poor vaccine matching) along the way
- Will finally be slaughtered but could pass through markets or contaminate trucks/crates etc along the way
- The risks are probably quite low but the numbers of movements provides the potential for introduction of new strains.



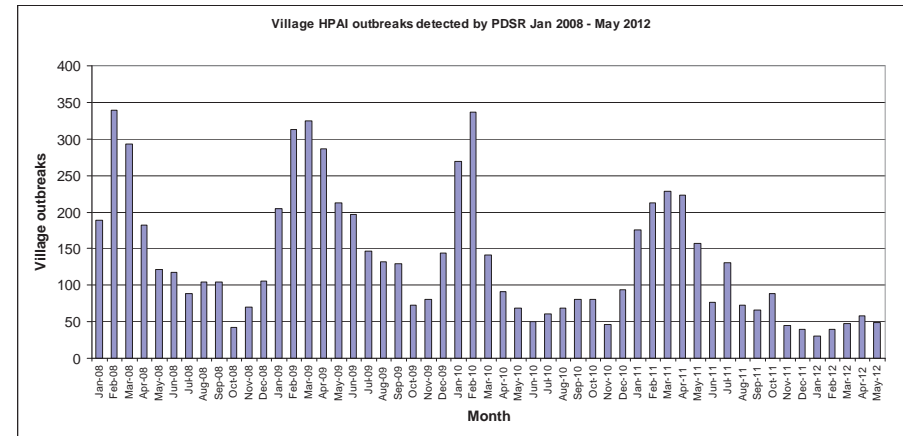
Way forward?

- These viruses are shared between two countries
- The evolution occurs at more than one location
- Traditional management of cross border is not possible
- Needs collaboration to improve safe trade and minimize the risks

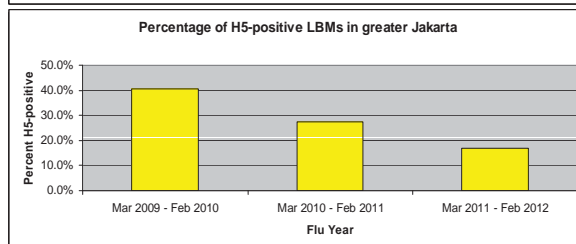
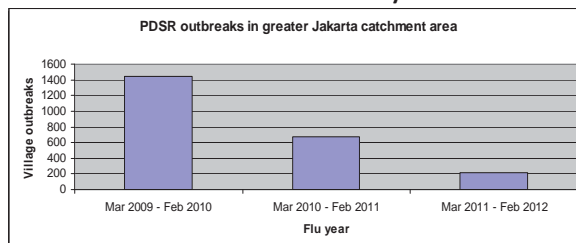


Indonesia

Village HPAI outbreaks detected by PDSR by month – all provinces



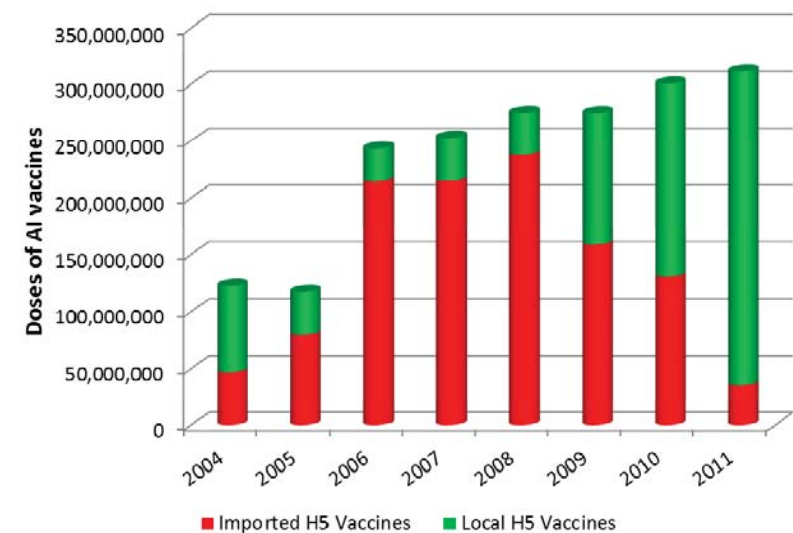
PDSR outbreaks and LBM H5 prevalence by
“flu year”



	Change since 2009
PDSR village outbreaks	-85%
H5-positive live bird markets	-59%



Source of AI vaccines used in the
Indonesian poultry Industry (2004 - 2011)



Progress in HPAI control in Indonesia

- **Marked decrease in viral load over past 3 years**
 - Decrease in PDSR-detected outbreaks
 - Decrease in H5-positive live bird markets in greater Jakarta area
 - Decreased anecdotal reports of HPAI outbreaks from commercial industry
 - Improved control most evident in highly-endemic areas (e.g. Java island, Lampung)
- **Preliminary assessment indicates that improving AI vaccination practices may be a main contributor to improved control**
 - Until 2009, majority of vaccines sold were poorly matched vaccines using foreign strains
 - Majority of vaccines now sold use closely matched local strains
- **Continued high risk of epizootics due to spread from endemic islands**
 - As overall risk of HPAI decreases, farmer vigilance also decreases, particularly in low-risk areas
 - Improvement in inter-island movement control and strengthened passive surveillance and rapid response recommended for low-risk areas



Improving effectiveness of vaccination

- **Two-pronged approach**
 - 1. Improve quality of vaccine product**
 - Via the OFFLU and Influenza Virus Monitoring for Animal Health (IVM-AH) programmes, circulating field strains monitored regularly for changes in antigenicity.
 - DGLAHS vaccine registration policy updated based outputs of Indonesia-OFFLU collaborative efforts.
 - H5 sequences from 2011-2012 isolates were similar to the previously sequenced strains of H5N1 in Indonesia.
 - Serological results indicate no significant antigenic variation between the current isolates when tested against the OFFLU Indonesia H5N1 reference panel.
 - 2. Improve quality of vaccine application by farmer**
 - On-farm collaboration to better understand and address challenges faced by farmers.
 - Ideal vaccination schedule for layers and breeders developed based on longitudinal serological monitoring.
 - Critical gaps in vaccination application identified and now being actively addressed through advocacy and training programmes.

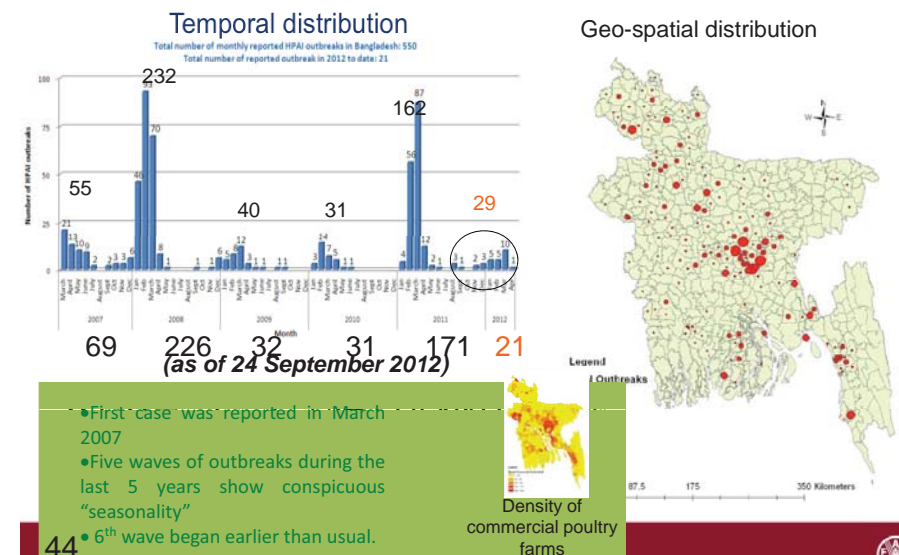


Key challenges going forward

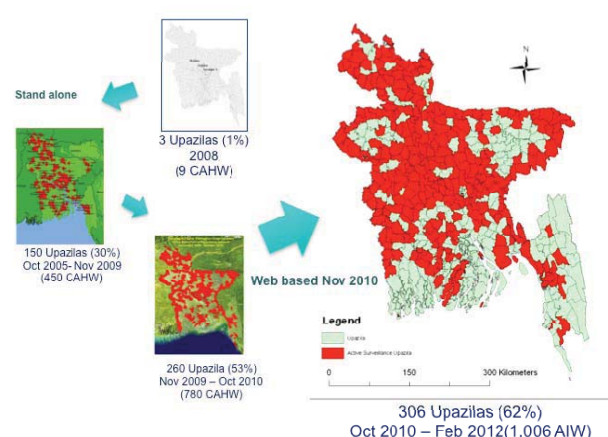
- **Effective control within village-based sector 4 poultry remains significant challenge**
- **Reduced donor support places greater responsibility on central and local governments to financially support ongoing disease control and surveillance activities**
- **Timely and effective viral characterization remains challenging**



HPAI H5N1 Bangladesh Situation



Active surveillance using Web-based SMS Gateway



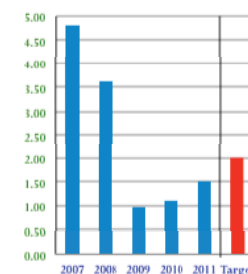
The active surveillance system initiated by FAO ECTAD Bangladesh has been successfully transferred to a government project “AIPRP” and further expanded

The coverage of Upazilas by Active Surveillance using SMS Gateway system has evolved over the last 4 years from 1% to 62 %



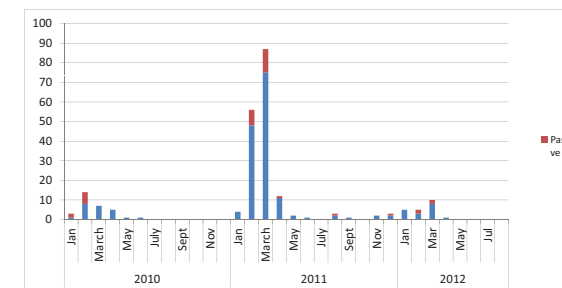
Outcome/Impact from Active Surveillance on H5N1 HPAI using web-based SMS Gateway

Response Time reduced



Outbreak response capacity continued to improve: from 4.8 days in 2007 to 1.43 days in 2011 (from report to culling)

Early Reporting



More than 86% (2011) of outbreaks were reported by Active surveillance using SMS Gateway ahead of passive surveillance system



Vaccination in Bangladesh?

- Economic decision – food security and incomes
- Political and commercial lobby groups
- Vaccination being planned to be tested in 2 Districts
- At least 4 different vaccines will be used
- Careful planning process is required
 - Circulating virus strains and cross protection
 - Capacity to delivery, monitor
 - Legislation
 - Ability to develop based line and post vaccination monitoring to determine efficacy
 - Possible generation of carriers, and emergence of new clades
- FAO testing its planning tools



Some trends...

- Disease situation improving
- Capacity in the region enhanced
 - Grass roots surveillance improved through CAHW/FETPV
 - Better early detection and response capacity
 - Laboratories well equipped, most laboratories can make diagnosis
 - Greater south- south collaboration
 - Greater human capacity in the field of HPAI and other TADs and EIDs
 - Greater awareness of HPAI in the region and countries



Broad lessons and challenges

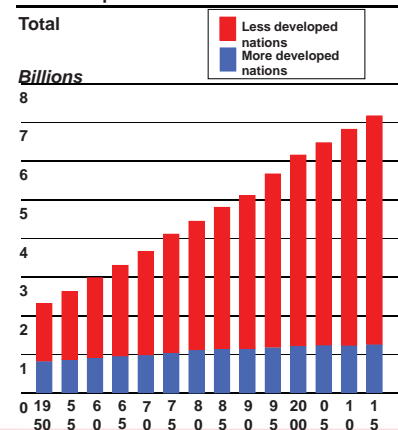
Non technical

- **Poverty and disease**
 - farming systems, inability to respond, entrenchment
 - addressing socio-economic issues beyond the mandate of line Ministries
- **Economics – VS important but of low priority**
- **Livestock revolution**
 - Population growth, demand for meat, rapid intensification
 - Poor biosecurity
 - Movement of animals (Asia is highly linked)



Drivers for *emergence and spread* (Human factors)

Global Population: 1950-2015



Source: US Bureau of the Census
ECTAD Emergency Centre
for Transboundary Animal Diseases

- >90% population growth in Africa, Asia and L. America
- Poverty on the rise
- Rapid economic development
- Huge demand for livestock
- Rapid evolution of farming systems



Lessons and challenges

- **Different infected countries with different epidemiological situations**
 - Indonesia, China, Viet Nam, Bangladesh, West Bengal
 - What strategies for these situations?
- **Risk factors**
 - High poultry/human population density
 - Large duck/chicken mixed populations
 - Poor biosecurity of production units in small commercial farms
 - Sector 4
 - Inadequate regulation of market chains
 - LBM
 - Cross border spread (blame game)



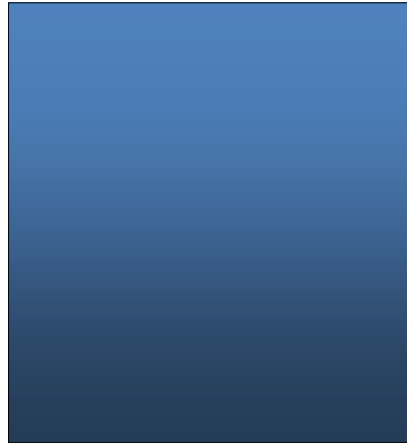
Future

- HPAI fatigue both national and global
- Funding declining
- More interest in other EIDs
- Other influenzas
- Long term approaches – progressive control
 - Good farm management and practices
 - Safe food production
 - Economic opportunities through farming
 - Integrated approach through OH



Partners

- **Governments**
- **Regional Organizations**
 - ASEAN and SAARC
- **International agencies**
 - OIE, WHO, UNICEF, UNSIC
- **Donor Agencies**
 - Australia, Canada, China, Germany, Japan, Netherlands, New Zealand, Sweden, USAID, USDA
 - ADB, EC, WB,



Overview of the previous discussions in 2008-2011

OIE/JTF Project for Strengthening Information Networking in Asia

5th OIE Regional Meeting on Strengthening Animal Health
Information Networking in Asia
(Hanoi, Vietnam, 2-3 October 2012)

Kenji Sakurai

OIE Asia-Pacific

1

Strengthen the Animal Disease Information Networking



- 1st Meeting in Tokyo, Nov 2008
- 2nd Meeting in Tokyo, Sep 2009
- 3rd Meeting in Tokyo, Sep 2010
- 4th Meeting in Chiang Mai, Thailand, Sep 2011

Annual Meetings

2

Strengthen the Animal Disease Information Networking

● Main objectives:

- Share up-to-date information about the animal health information networking, and experience in the disease control and prevention in Asia
- Discuss how to improve animal health information networking



3

Questionnaire survey in 2008

Questionnaire was sent to **24 OIE members in Asia** in August 2008 to collect information on animal health to strengthen animal disease control in Asia.

● Respondent: 19 Members (79%)

● Main areas

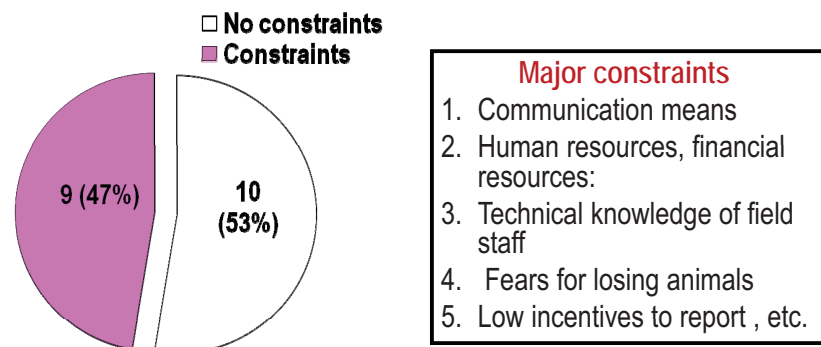
1. Legislation support on Animal Health
2. Animal Disease Information Reporting mechanism
3. HPAI Control & Prevention
4. Diagnostic Capacity of HPAI

4

Animal disease information reporting mechanism

“Almost 50 % of the respondents consider that their animal disease reporting system has some constraints.”

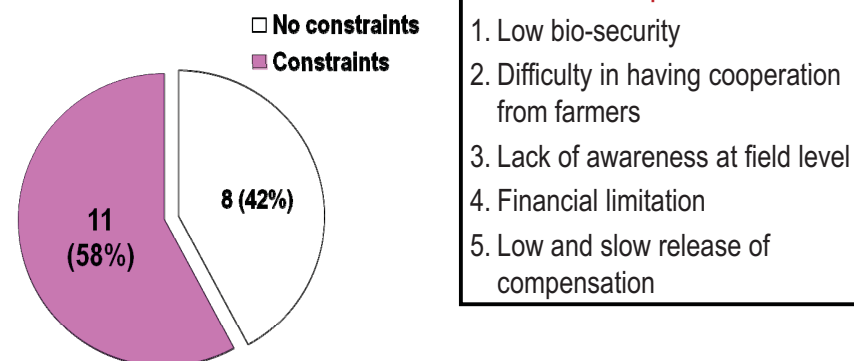
Question : “Any constraints in animal disease reporting system?”



5

HPAI Control

(Q) “Any constraints during the implementation of HPAI control measures?”



6

Previous Discussions in 2009-2011

Participants were invited to discuss how to improve the animal disease notification system and to identify the following points in each stage of the disease notification flow/network.

1. Problems
2. Causes
3. Possible solutions



7

4th OIE Regional Meeting in Thailand, 2011

Vietnam



Brunei



Cambodia



Bangladesh



C. Taipei

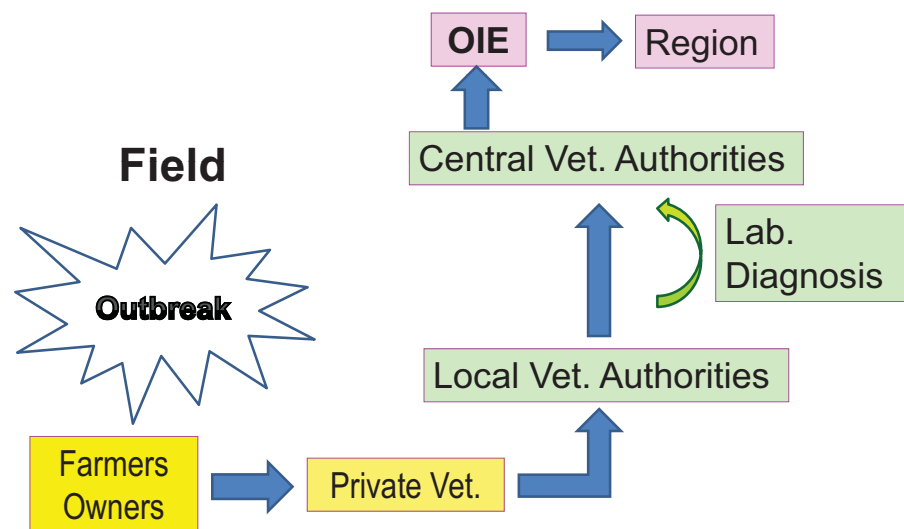


Malaysia



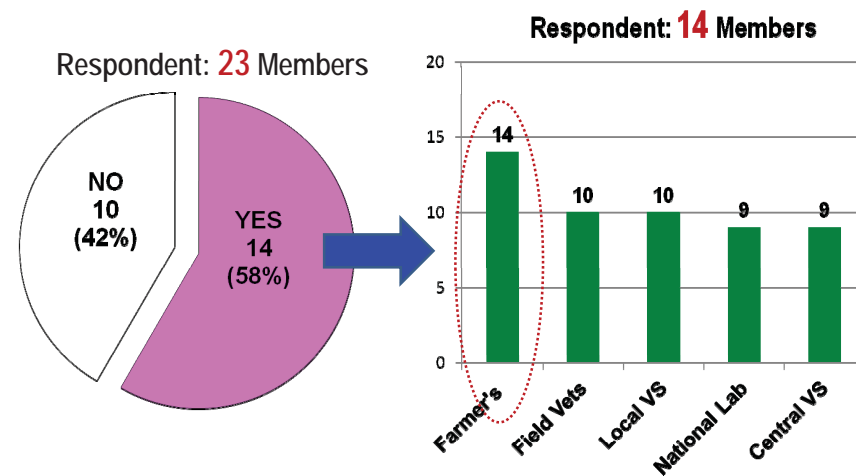
8

Flow of disease notification



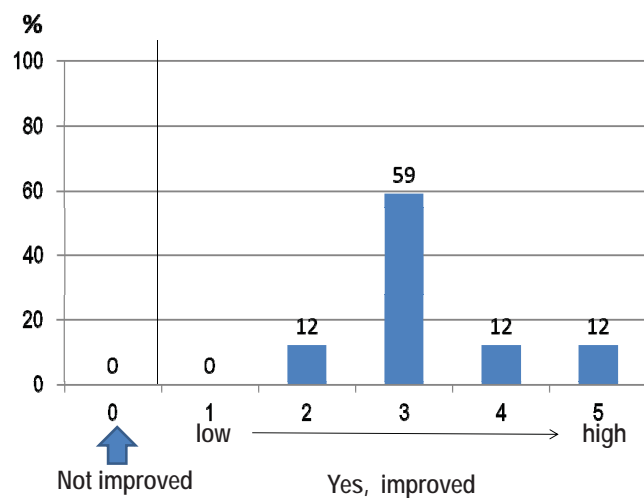
9

"Your information networking system work well?"

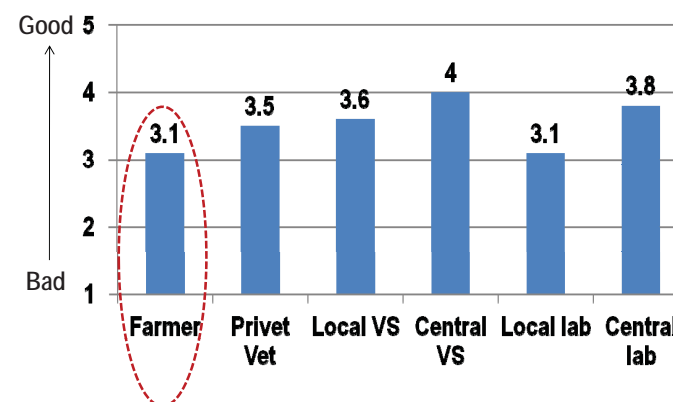


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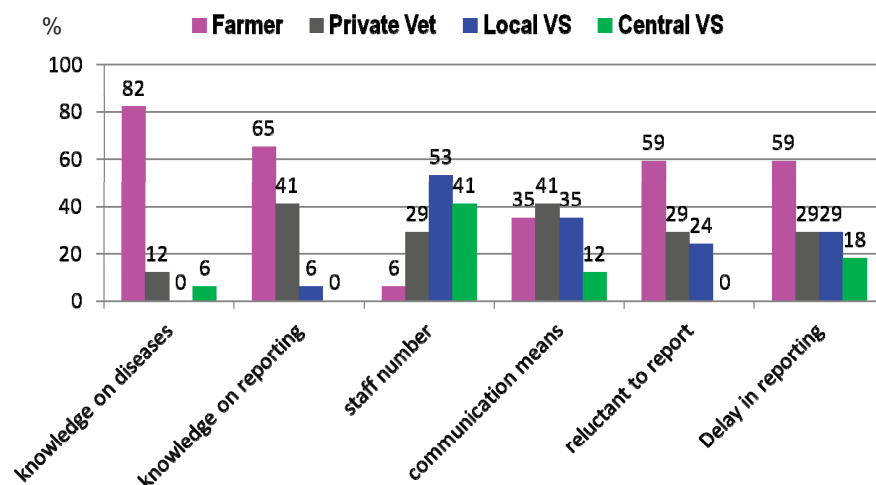
Has the situation been improved over the last year? (from Sep 2010 to Sep 2011)



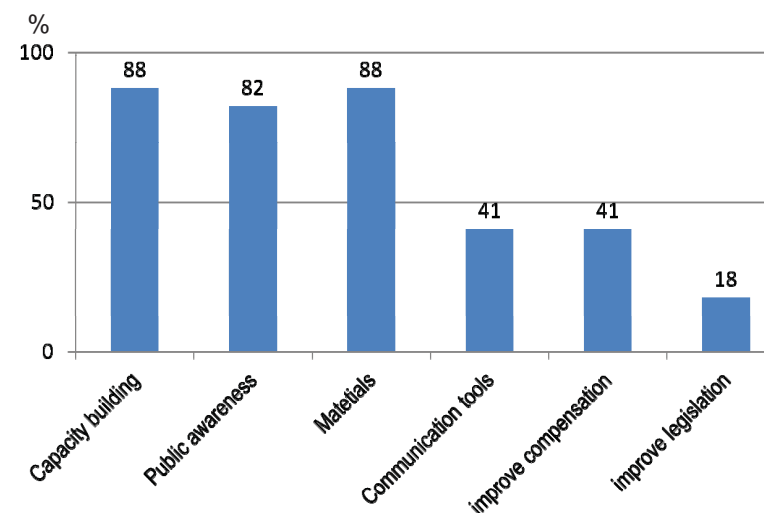
Current situation of the animal Info. Systems



Current situation of the animal health info. Systems -Main problems-



Actions expected to be undertaken over the next year at a farmer's level



Extract of Conclusions and Recommendations

(4th OIE Regional Meeting in Thailand, in Sep 2011)

Constraints still exist in animal health information networking due mainly to the following.

1. Limited knowledge in animal diseases and notification
2. Delay in reporting
3. Limited incentive to report diseases, for example, inadequate compensation mechanism
4. Limited capacity to identify infectious diseases of animals and collection of appropriate specimen at field level for diagnosis
5. Limited capacity in diagnostic laboratories at local and central levels and laboratory networking
6. Limited legislation support
7. Limited logistic support and financial resources

Some key facts recognized from the previous discussions

1. Animal disease notification/information systems have not been working well in 50 to 60 % of OIE Members in Asia.
2. The challenges/problems are most likely to be observed at a farmer's level (lack of relevant knowledge, etc.) .
3. Capacity building and raising awareness are the priority areas to be focused on to improve the information networking at a farmer's level.
4. Most of the OIE Members in Asia have made efforts to undertake various activities to improve the animal disease information in the last few years.
5. Efforts were made at all stages in the information networking flow to improve situation.

Key element to improve animal health situation in Asia

- Efforts should be continued focusing on a farmer's level.
- There are various areas to be focused on such as, 1) improvement of their knowledge on animal diseases and disease notification, 2) improvement of biosecurity level, etc. on a farmer's level.
- To lead the efforts to be a successful ones, activities should be undertaken in close collaboration with rural communities as well as the rural development authority.



Thank you for your attention.

Introduction for Session III

-Poster presentation session-



Dr Kenji Sakurai
OIE Asia-Pacific

Occurrences of H5N1 HPAI outbreaks in Asia

	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12
Bangladesh					★	→	→	→	→	→
Bhutan								★→		→
Cambodia		★	→	→	→	→	→	→	→	→
PR China		★	→	→	→	→	→	→	→	→
Indonesia		★	→	→	→	→	→	→	→	→
India		★	→	→	→	→	→	→	→	→
Japan	★				→	→	→	→	→	→
RO Korea	★			→	→	→	→	→	→	→
Laos		★		→	→	→	→	→	→	→
Malaysia			★	→	→	→	→	→	→	→
Mongolia			★	→	→	→	→	→	→	→
Myanmar				★	→	→	→	→	→	→
Nepal							★	→	★	→
Pakistan				★	→	→	→	→	→	→
Thailand		★	→	→	→	→	→	→	→	→
Vietnam		★	→	→	→	→	→	→	→	→

H5N1 HPAI status in Asia

H5N1 status	EA	SEA	SA
1. Persistent	PR China	Indonesia Vietnam	Bangladesh India
2. Sporadic		Cambodia Laos Myanmar	
3. Intermittent introduction	Japan (2011) RO Korea (2011) Mongolia (2010)		Bhutan (2012) Nepal (2012)
4. No report since 2009		Malaysia (2008) Thailand (2009)	Pakistan (2009)
5. Never reported	C. Taipei	Philippines Singapore Brunei	Maldives Sri Lanka

EA: East Asia, SEA: Southeast Asia, SA: South Asia

Figure in parenthesis: year of the last H5N1 case

Actions done

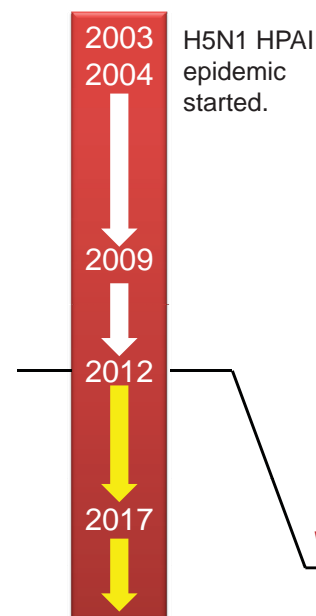
- Early detection and early response
- Notification system
- Education and awareness campaign
- Training
- Vaccination
- Strengthen active surveillance
- Improvement of bio-security, etc.

Achievement/outcomes

- Declined the number of cases (animal & human)
- Strengthened Lab diagnostic capacity
- Strengthened VSs
- Improved understanding/knowledge of the disease
- Information/data sharing, etc.

We are still situated amid the risk of H5N1.

What are the next steps and actions ?



● Fact

We are still standing amid the risk of H5N1 HPAI in our region.

● Questions

(Q1) Why HPAI H5N1 virus has continued circulating in the environment in our region despite our efforts?

(Q2) What are the key elements that have the virus maintain its circulation in the environment in Asia?

(Q3) How we could break the virus circulation gradually and steadily to reduce the risk of H5N1 in Asia at a regional level?

(Q4) What actions should be undertaken in the next 5 years in Asia at a regional level?

● Objective of the session

- Exchange views and information on H5N1,
- Learn lessons, experiences and findings on the H5N1 control and prevention,
Mainly focusing on:
 - (1) Live poultry markets and backyard poultry
 - (2) Surveillance
 - (3) Control measures (vaccination and Stamping out policy)

Group-A

From 8 countries, for 45 min

- **Bangladesh** (Dr Musaddique Hossain)
- **PR China** (Dr Chen Jiming)
- **India** (Dr Hans Raj Khanna)
- **Indonesia** (Dr Muhammad Azhar)
- **Vietnam** (Dr Quang Minh Phan)
- **Laos** (Dr Watthana Theppangn)
- **Japan** (Dr Noriyoshi Ojima)
- **RO Korea** (Dr Soon Hyun Kim)

Group-B

From 9 countries, for 45 min

- **Bhutan** (Dr Lokay Thapa)
- **Nepal** (Dr Nar Bahadur Rajwar)
- **Mongolia** (Dr Odbileg Raadan)
- **Hong Kong SAR, China** (Dr Thomas Sit)
- **Malaysia** (Dr Azri Bin Adzhar)
- **Thailand** (Dr Orapan Pasavorakul)
- **Philippines** (Dr Emelinda L. Lopez)
- **Sri Lanka** (Dr A. M. U. W. Adikarinayake)
- **Chinese Taipei** (Dr Wen-Yuan Yang)



Controlling and Prevention of HPAI in Vietnam

Vietnam Department of Animal Health

Hanoi, 2-3 October 2021

1

Outlines

- **HPAI situation during 2010-2012**
- **A summary on HPAI active surveillance programmes in Vietnam in last 5 years**
- **Live bird market surveillance results during 2011 - 2012 in brief**
- **Wild bird and domestic bird surveillance of OIE Asia Pacific conducted in Mekong river delta for 2011 – 2012**
- **Lessons learnt**

2

Outlines

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- **Lessons learnt**

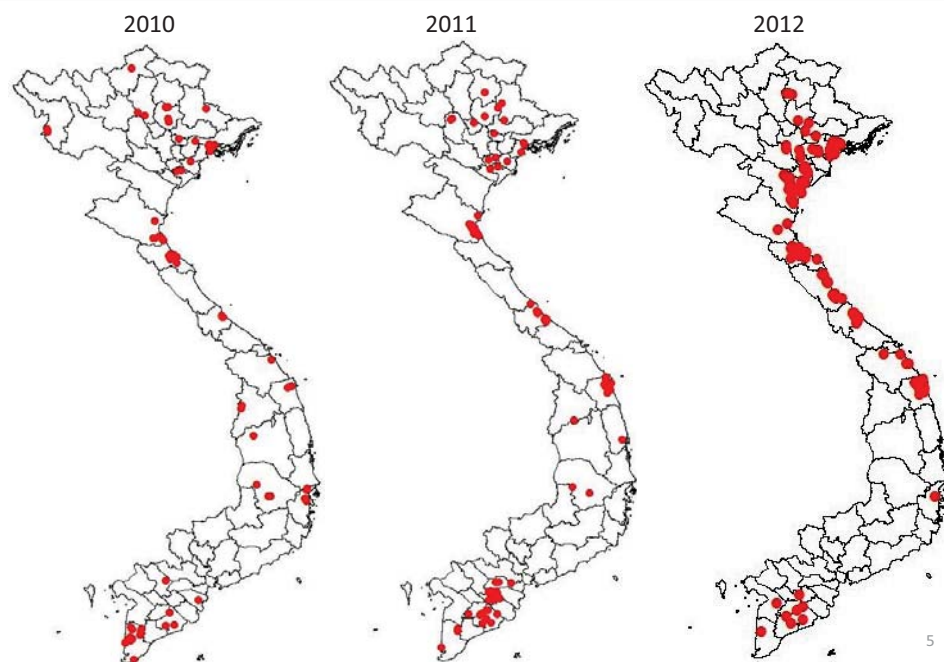
3

Recent HPAI H5N1 outbreaks in domestic birds

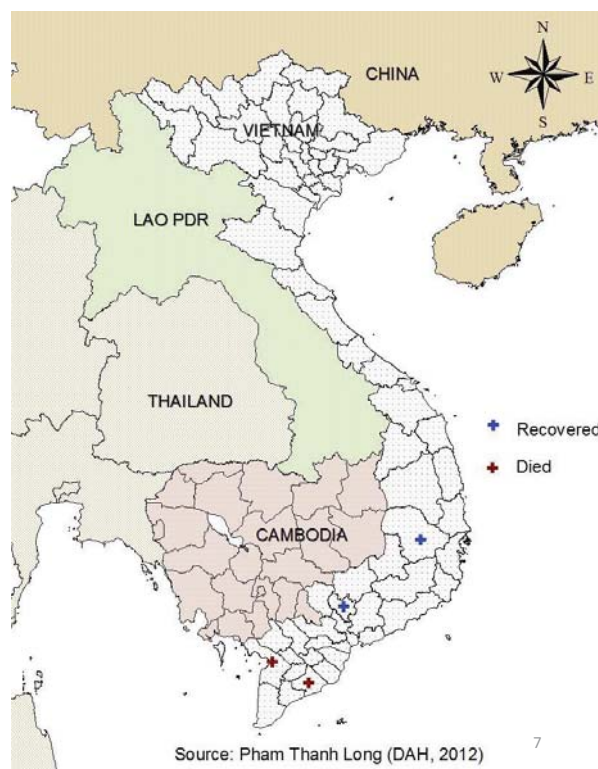
- **2010**: HPAI H5N1 outbreaks recorded in 56 communes, 33 districts of **19** provinces; 75,970 birds culled; ducks (57.90 %), chickens (38.20%), Muscovy ducks (3.90 %).
- **2011**: HPAI H5N1 outbreaks recorded in 76 communes, 40 districts of **21** provinces; 103,452 birds culled; ducks (57.29 %), chickens (41.70 %), Muscovy ducks (1.01%).
- **2012 (up to 13 Sep.)**: HPAI H5N1 outbreaks recorded in 164 communes, 72 districts of **25** provinces; 139,347 birds culled; ducks (82.60 %), chickens (14.60 %), Muscovy ducks (2.80%).

4

Spatial distribution of HPAI H5N1 affected communes in Vietnam from 2010 to 2012



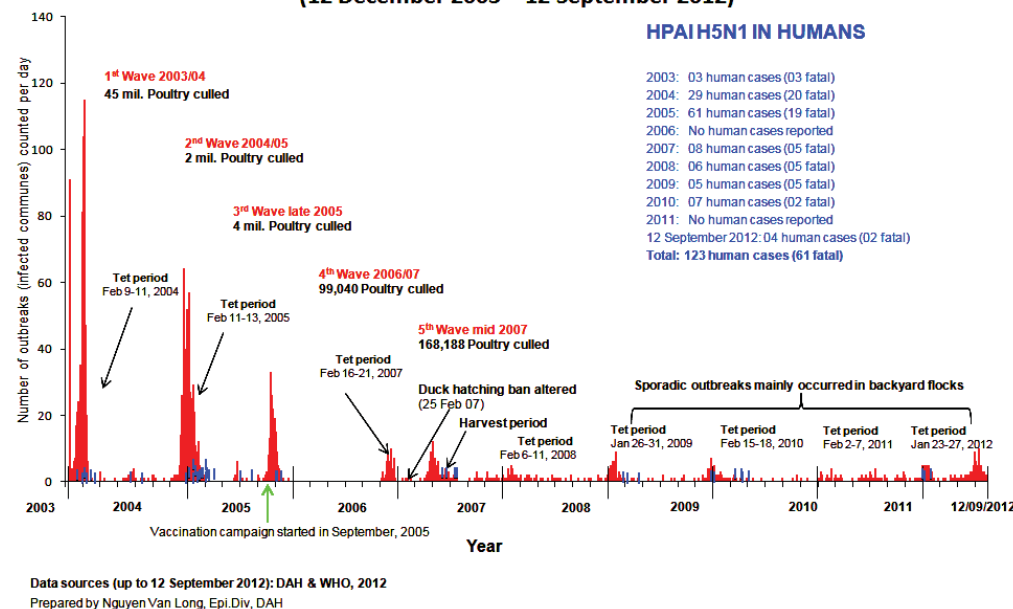
- ❑ In 2012, there were 4 human cases of H5N1 infection (2 fatalities, all in January, 2012) from Kien Giang, Soc Trang, Binh Duong & Dak Lak provinces.
- ❑ The two fatalities in Kien Giang and Soc Trang provinces were confirmed as H5N1 *clade 1.1* infection by Pasteur Institute of HCMC.



Source: Pham Thanh Long (DAH, 2012)

7

A TIMELINE OF HPAI H5N1 IN VIETNAM (12 December 2003 – 12 September 2012)



6

Summary of H5N1 virus strains in Vietnam

Year	North	South
2003-05	Introduction of HPAI H5N1 viruses to Vietnam Clade 1 virus were the majority.	
2007-08	Complete shift of clade from 1 to 2.3.4 Clade 7 virus detected in smuggled chicken	Clade 1 virus remains as majority, and continues to evolve.
2009	Multiple sub-lineages of clade 2.3.4 virus were identified	
2010	The introduction of clade 2.3.2 which is similar to Mongolia, Hong Kong, etc.	
2011	Complete shift from clade 2.3.4 to 2.3.2	Clade 2.3.2/2.3.4 were occasionally detected.
2012	Clade 2.3.2 virus remains as majority	
		Clade 1 virus remains as majority

Source: NCVD, 2012

8

Epidemiological features

- Outbreaks identified in unvaccinated flocks, particularly in ducks. No reports of disease in fully vaccinated poultry.
- Recent marked increase in duck population.
- Backyard poultry has been seen as the most vulnerable group though it is more likely to detect outbreaks from Sector 3.

9

Disease control and prevention

- Control measures applied to contain the disease
 - Destruction of affected flock(s)
 - Movement control
 - Disinfection
 - **Vaccination**

10

National vaccination plan

- The National vaccination plan for HPAI control
 - Phase I (2005 – 2006),
 - Phase II (2007 – 2008);
 - Phase III (2009 – 2010)
 - Phase III (2011 – 2012).
- Mass vaccination by two main campaigns per year.
- Central Government provides vaccines free of charge for small scale farms; local governments contributes vaccination costs, including costs of meeting, training and payments for vaccinators.

11

Disease control and prevention (cont.)

Surveillance programmes for HPAI

- Clinical surveillance:
 - Early detection
 - Timely reporting
- Virus surveillance
 - Live bird markets in high risk areas
- Post vaccination survey

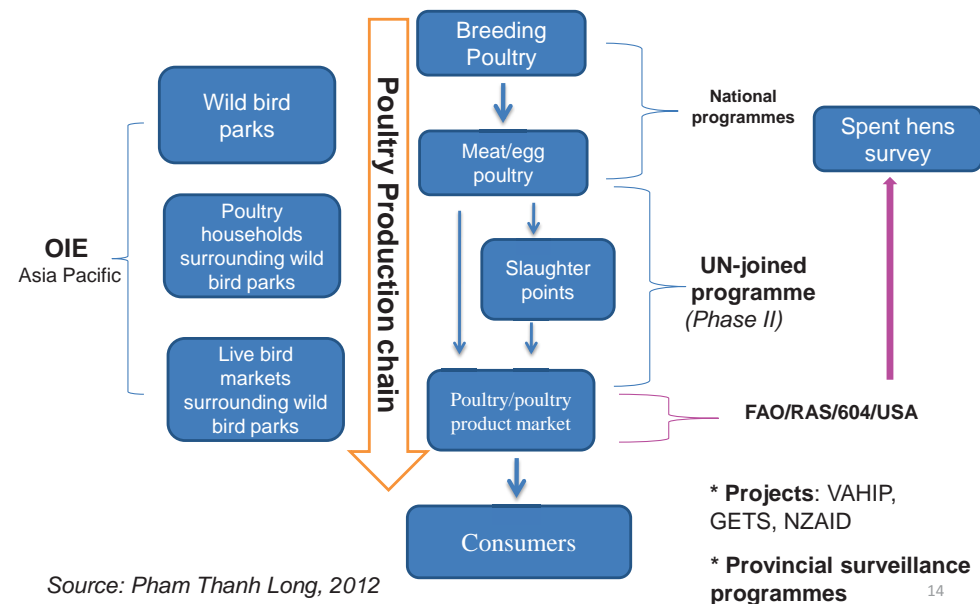
12

Outlines

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13

AI active surveillance in Vietnam from 2007 to 2012



14

Outlines

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- **Lessons learnt**

15

Results of live bird market surveillance period 2011 – 2012 (in brief)



16

Objectives

- To determine the presence of HPAI H5N1 virus in ducks at markets
- To determine the temporal and spatial distribution of influenza A and HPAI H5N1 virus in ducks at markets
- To collect HPAI H5N1 data with a standardized methodology, so future progress against control the disease can be monitored

17

Study design

• *Surveillance for H5N1*

Location:

- **250 Live-bird markets** of **125 districts** in **30 provinces, cities:** Dien Bien, Ninh Binh, Phu Tho, Nam Dinh, Hanoi, Bac Giang, Bac Ninh, Quang Ninh, Lang Son, Thai Nguyen, Hai Duong, Hai Phong, Thanh Hoa, Nghe An, Ha Tinh, Quang Tri, Quang Nam, Quang Ngai, Long An, Tay Ninh, Tien Giang, An Giang, Bac Lieu, Ca Mau, Dong Thap, Hau Giang, Kien Giang, Soc Trang, Tra Vinh and Vinh Long.
- Target specie: **duck**
- Type of samples: **oro –pharyngeal swab**
- Time: **4 consecutive months** (from Sep. 2011 to Feb. 2012)
- Frequency: each LBM was sampled **every month**.
- Sample size: **20 samples/LBM**, pooling 5 single samples into 1 test sample

18

Study design (*cont'*)

Testing method:

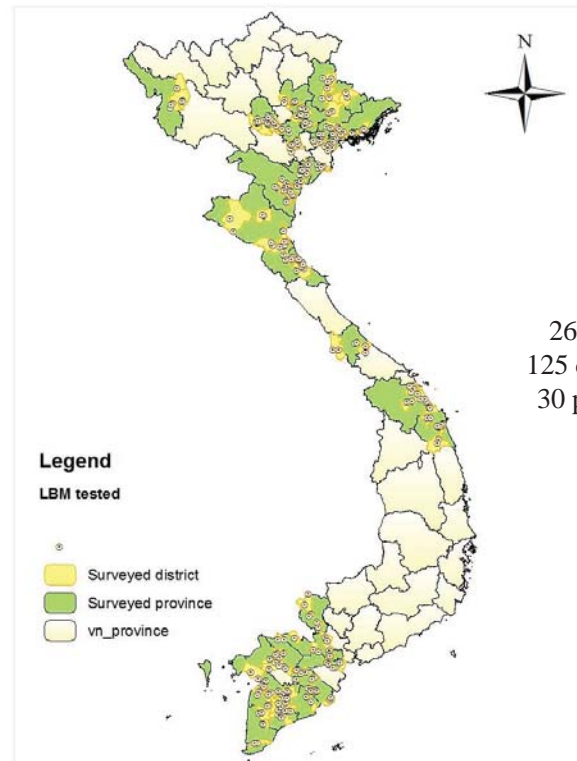
- Real-time RT-PCR following procedure in the document No. 1955/TY-DT dated on 09/11/2011 of DAH.
- For: M, H5 & N1 genes from pooled swabs
- All swabs and RNA positive with M gene were submitted to NCVD for further analysis.

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Results

- The surveillance was conducted in
 - **268 LBMs** in 276 communes of **125 districts** of **30 provinces** and cities from 9/2011 – 2/2012.
 - Totally, **19,760** poultry sold at LBMs were sampled & **3,952** pooled swab samples (*3,896 samples of ducks, 33 samples of Muscovy ducks, and 23 samples of chickens*) were tested for AIV detection by Real-time RT-PCR technique.

20



21

Proportion of AI virus detection

	Total number	Influenza A	%	H5	%	H5N1	%
Province	30	29	96.67	23	76.67	20	66.67
District	125	107	85.60	53	42.40	47	37.60
Commune	276	185	67.03	78	28.26	69	25.00
LBM	268	187	69.78	79	29.48	69	25.75
Poultry	3,952	743	18.80	187	4.73	161	4.07

Source: Pham Thanh Long (DAH, 2012)

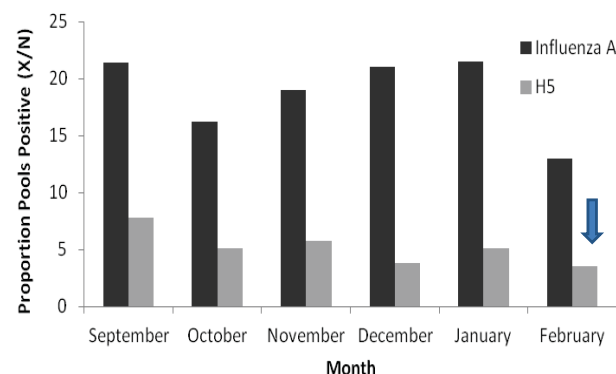
22

Results (cont')

- **3,896 oro-pharyngeal samples were collected** from ducks at live bird markets (n=250) encompassing **30 provinces in 125 districts**.
- **743 oropharyngeal samples were influenza A positive**
 - ✓ **187 were HPAI H5 positive**
 - ✓ **161 were N1 positive**

Overall monthly scenario

- The proportion of positive Influenza A and HPAI H5 samples significantly differed by month in Viet Nam ($\chi^2 = 24.41$, $p < 0.001$; $\chi^2 = 10.60$, $p < 0.058$)
- Lowest proportions shown by blue arrow



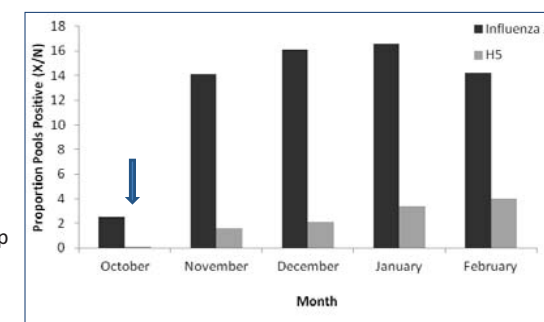
Source: Jennifer, 2012 (FAO VN)

23

Results (cont')

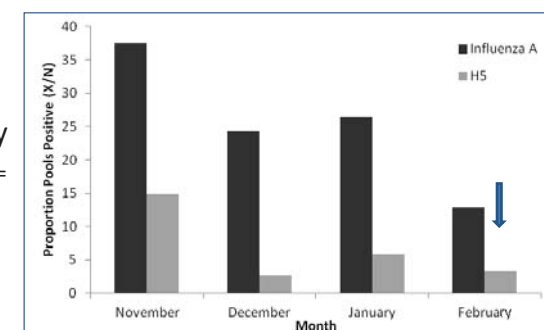
Northern Region Scenario

- The proportion of samples positive for Influenza A and HPAI H5 significantly differed by month ($\chi^2 = 42.41$, $p < 0.001$; $\chi^2 = 41.06$, $p < 0.001$).



Central Region Scenario

- The proportion of samples positive for Influenza A and HPAI H5 did not significantly differ by month ($\chi^2 = 6.4438$, $p = 0.168$; $\chi^2 = 6.31$, $p = 0.177$).



Source: Jennifer, 2012 (FAO VN)

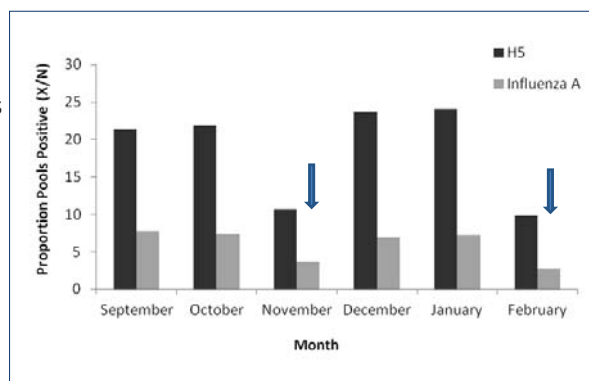
Results (cont')

• Southern Region Scenario

- The proportion of samples positive for Influenza A significantly differed by month ($\chi^2 = 30.92$, $p < 0.001$).

• Summary Scenario

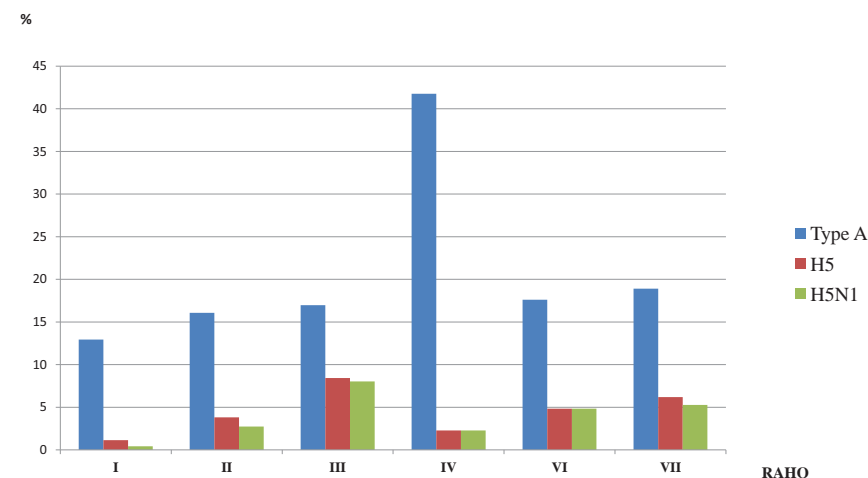
- A monthly pattern is not consistent and differs by region
- Central provinces are almost 2 times more likely to have a duck in a market positive with influenza A virus compared to North and South Provinces.



Source: Jennifer, 2012 (FAO VN)

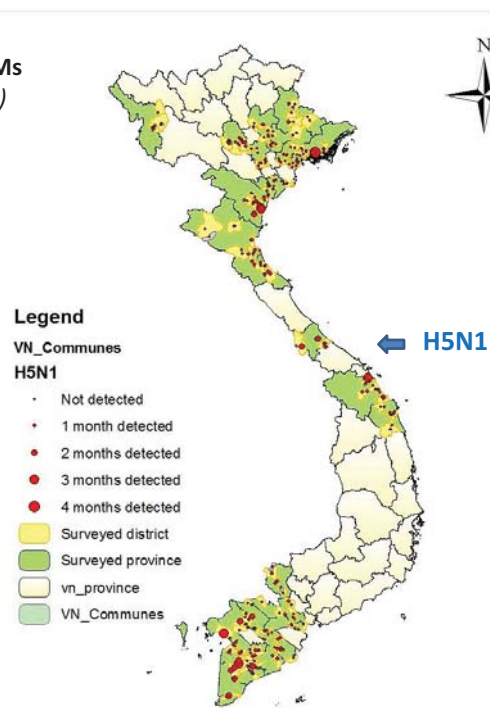
25

Proportion of avian influenza virus detection by regions



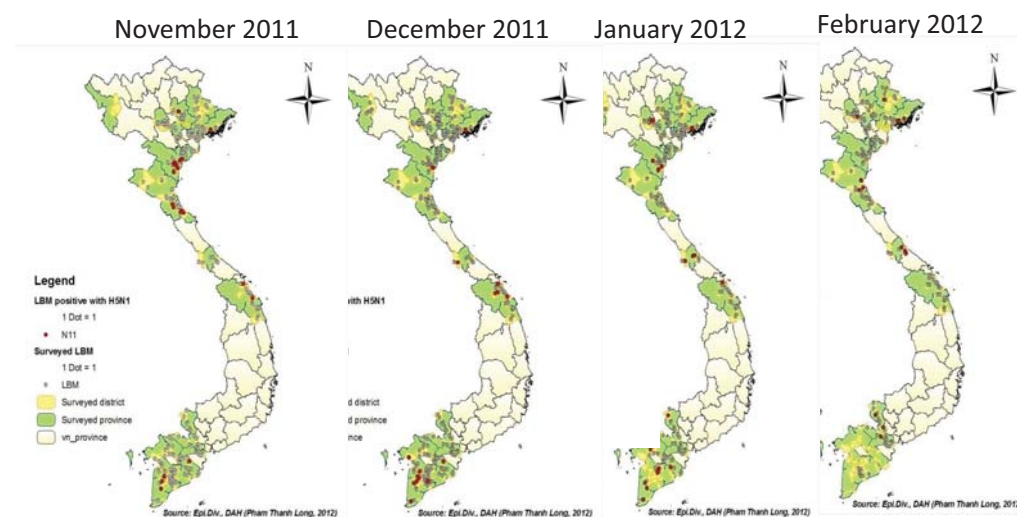
26

Spatial distribution of H5N1 in LBM (September 2011 to February 2012)



27

Spatial and temporal distribution of H5N1 in ducks at live bird markets in Viet Nam



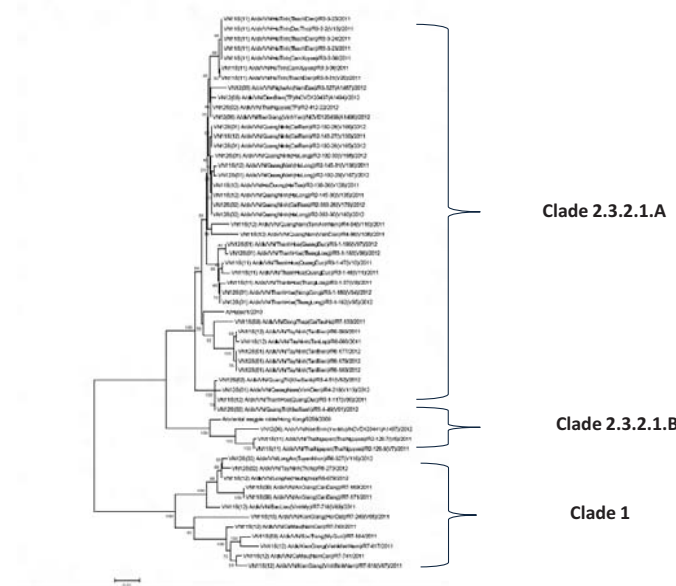
28

Provinces H5N1 positive for 1 or more months

1 month	2 months	3 months	4 months
Nam Dinh	Ha Noi	Quang Tri	Quang Ninh
Ninh Binh	Tay Ninh	Thanh Hoa	Ca Mau
Phu Tho	An Giang	Quang Nam	Kien Giang
Bac Giang	Dong Thap		
Bac Ninh	Soc Trang		
Hai Duong	Tra Vinh		
Lang Son	Vinh Long		
Thai Nguyen			
Hai Phong, Ha Tinh, Nghe An, Quang Ngai, Long An, Tien Giang, Bac Lieu and Hau Giang			



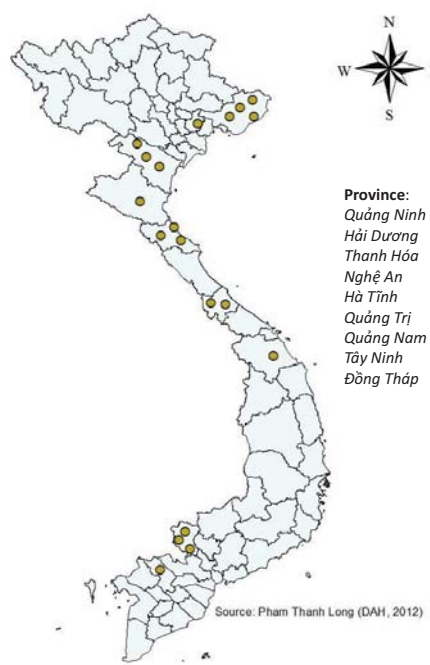
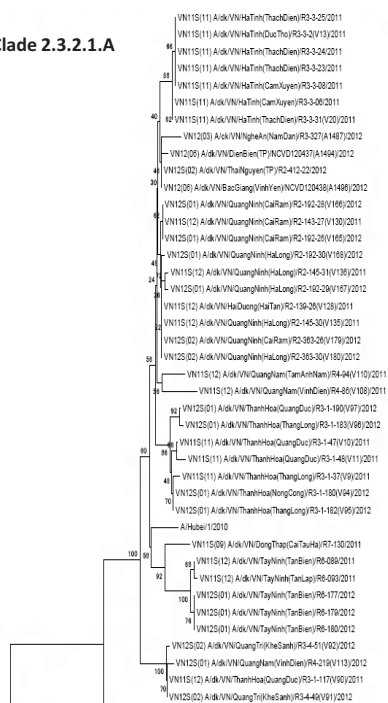
H5N1 virus clade distribution from LBM surveillance samples from Sep., 2011 – Feb., 2012



Source: DAH, 2012

- In Ha Long city (Quang Ninh) a market was HPAI H5N1 positive for 4 months
- Most H5N1 positive markets were detected in one or two months

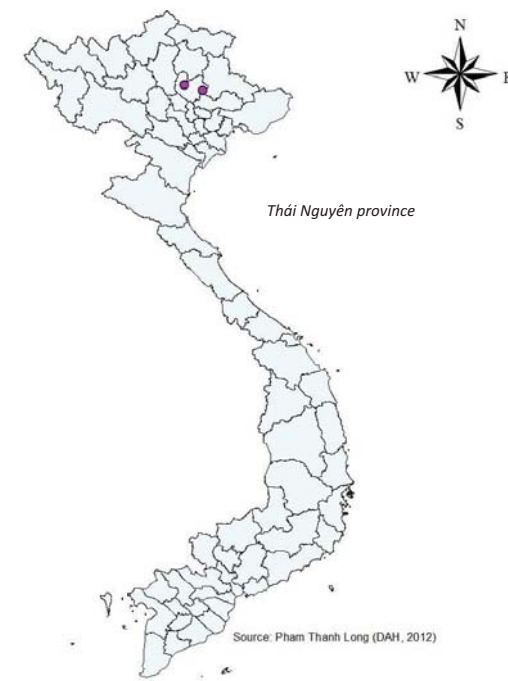
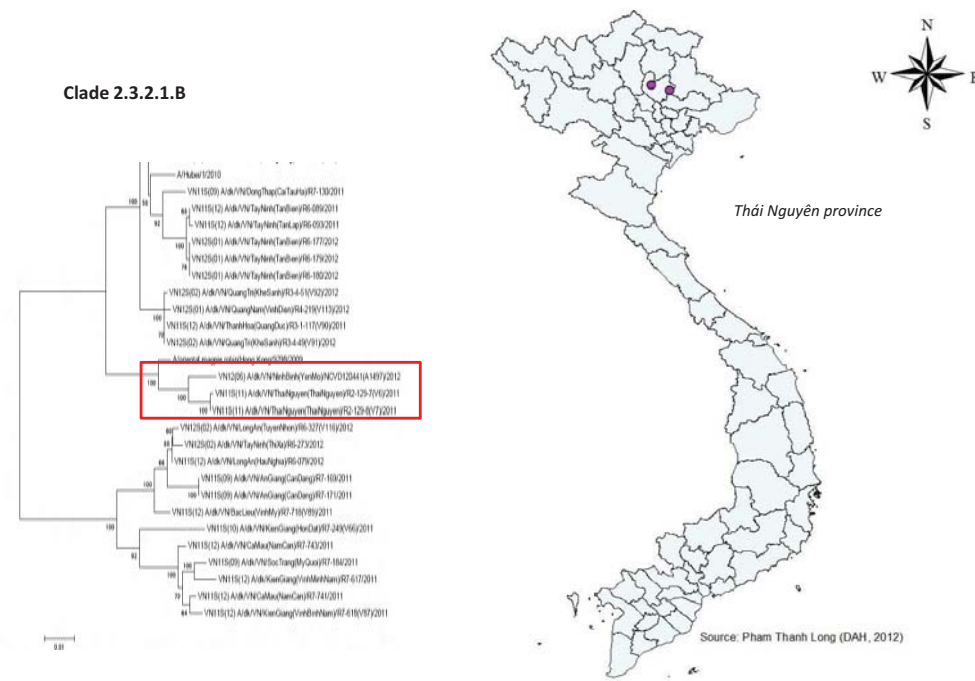
Clade 2.3.2.1.A



Province:
Quang Ninh
Hai Duong
Thanh Hoa
Nghe An
Ha Tinh
Quang Tri
Quang Nam
Tay Ninh
Dong Thap

Source: Pham Thanh Long (DAH, 2012)

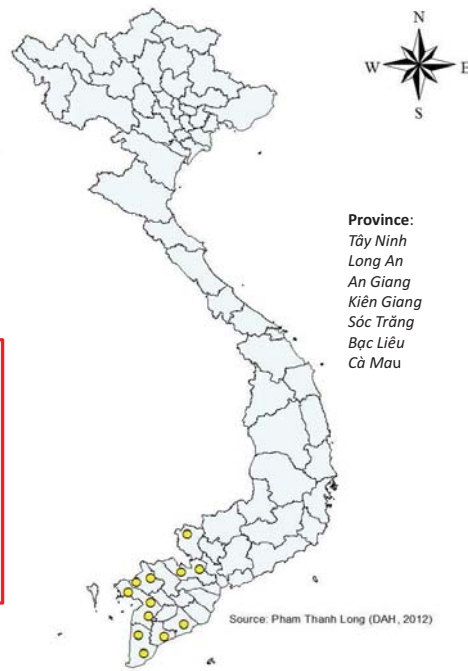
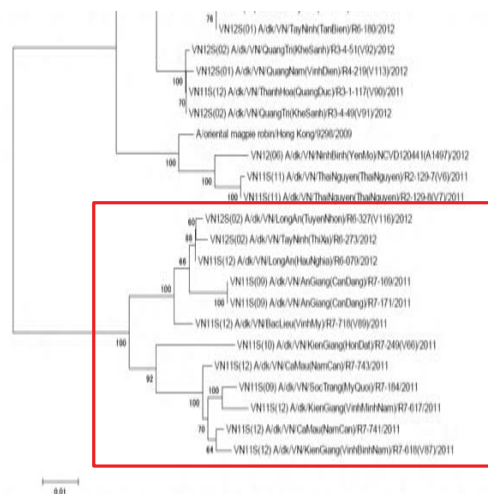
Clade 2.3.2.1.B



Thai Nguyen province

Source: Pham Thanh Long (DAH, 2012)

Clade 1

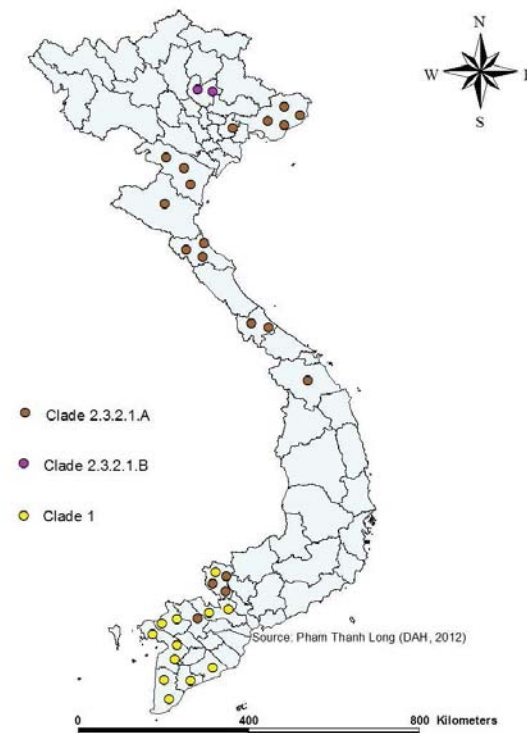


Province:
Tây Ninh
Long An
An Giang
Kiên Giang
Sóc Trăng
Bạc Liêu
Cà Mau

Source: Phạm Thanh Long (DAH, 2012)

33

H5N1 virus clade distribution from LBM surveillance



● Clade 2.3.2.1.A
● Clade 2.3.2.1.B
● Clade 1

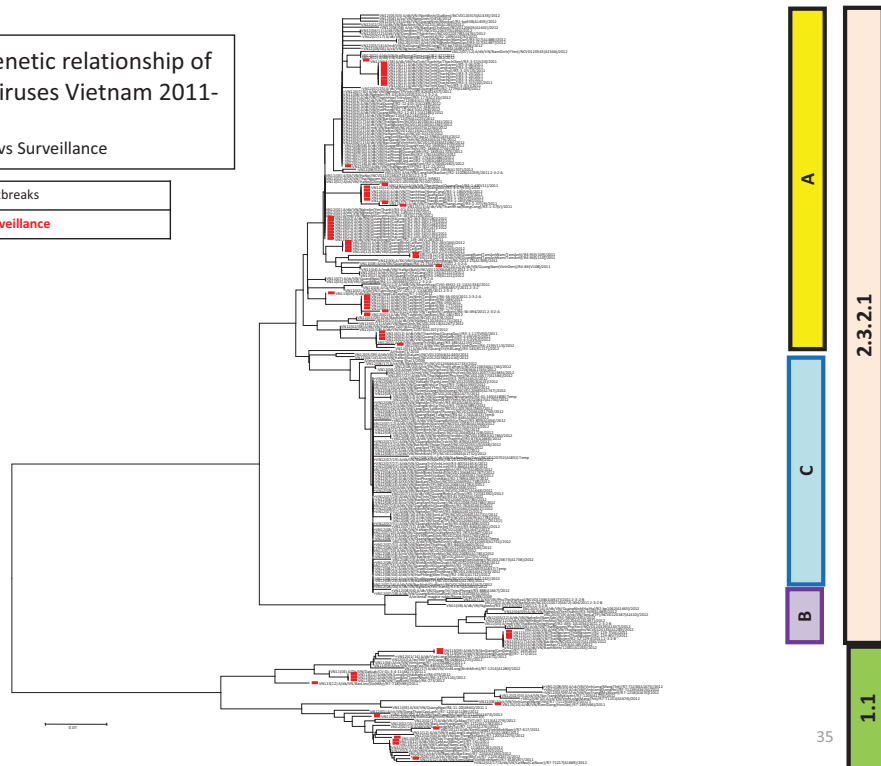
Source: Phạm Thanh Long (DAH, 2012)

34

Phylogenetic relationship of H5N1 viruses Vietnam 2011-12

Outbreak vs Surveillance

	Outbreaks
■	Surveillance



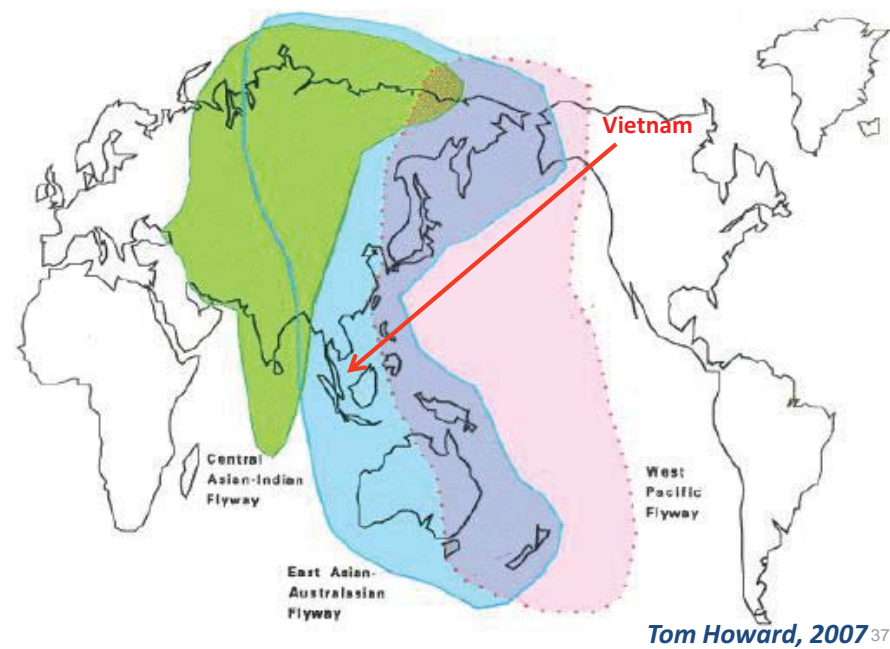
35

Outlines

- HPAI situation during 2010-2012
- A summary on HPAI active surveillance programmes in Vietnam in last 5 years
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- Lessons learnt

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Figure 2-1: Asian Migratory Bird Flyways



Asian countries affected by the H5N1 AIV in wild birds since 1996

Country	Year	Remark
Afghanistan	2006	
China	1996	Including Hong Kong and Tibet
Iran	2006	Not yet detected in domestic birds
Japan	2004	
Kazakhstan	2005	
Korea, Rep of	2003	
Malaysia	2004	
Mongolia	2005	Not yet detected in domestic birds & humans
Pakistan	2006	
Thailand	2003	

Source: FAO, 2007

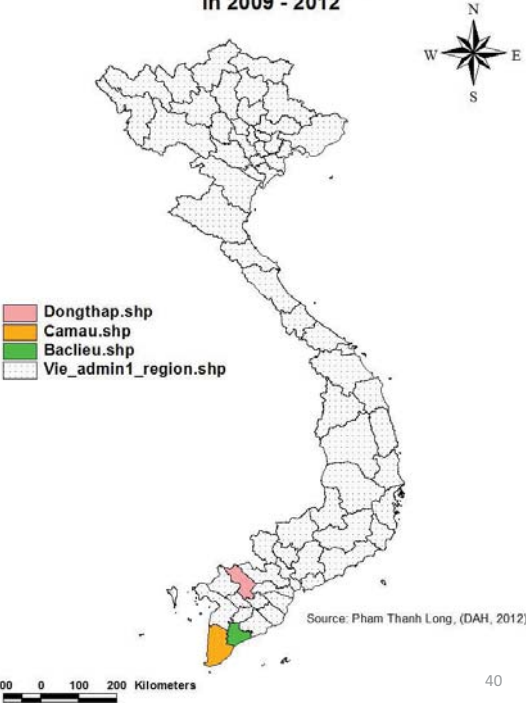
OIE’s surveillance in Vietnamese Mekong region

Sampling method: AI virus study		
Wild bird	* Number:	100 birds
	* Sample:	2 swabs (cloacal & tracheal)
	* Species:	Anseriformes and other species of water birds
Domestic bird	* Number:	600 birds
	* Sample:	2 swabs (cloacal & tracheal)
	* Species:	Ducks, Muscovy ducks, chickens
	* Premise	Backyard farm & live bird market (within 30 km radius of wild bird capturing sites)
Environment	* Number:	10 samples
	* Sample:	fresh-droppings, carcasses, water in lake

Provinces in Mekong region joining OIE surveillance in 2009 - 2012

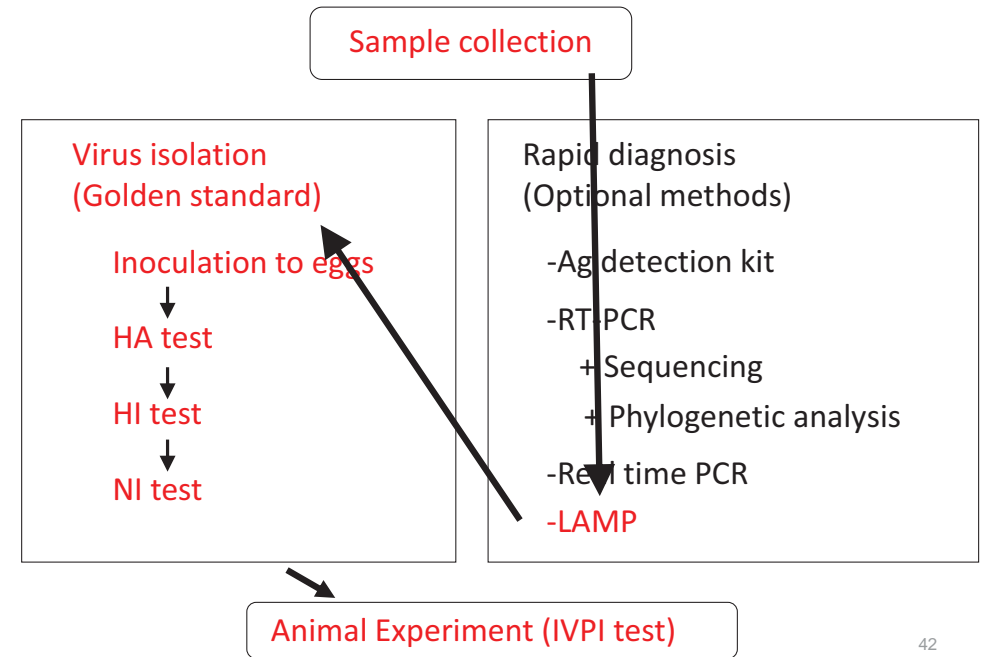
Time to conduct sampling in Mekong region:

- Bac Lieu: Apr., 2009
- Bac Lieu: Mar., 2010
- Bac Lieu: Oct., 2010
- Ca Mau: Feb., 2011
- Ca Mau: Oct., 2011
- Dong Thap: Feb., 2012
- Dong Thap: Oct., 2012 (last round)



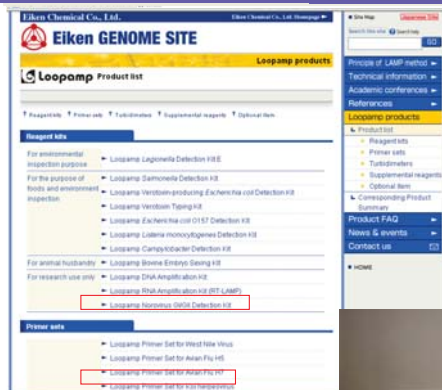


Diagnostic protocol used in this programme



42

Loop-Mediated Isothermal Amplification (LAMP) Method



<http://loopamp.eiken.co.jp/>

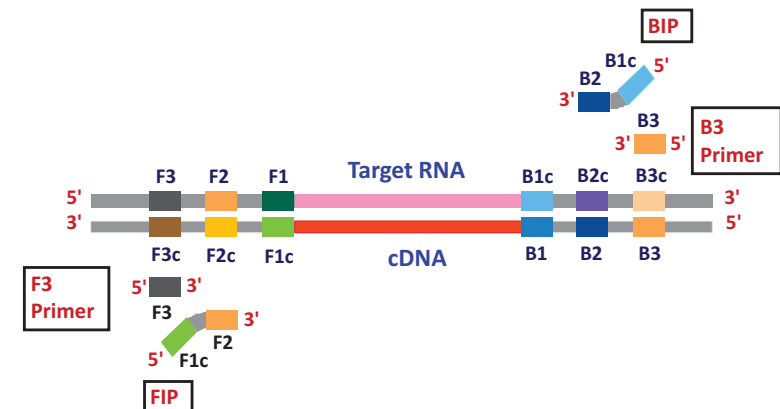


Source: Assoc.Prof. Dr. Sakoda, Hokkaido University

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The principle of LAMP method

LAMP primer design



Original Method: Four primers (FIP, F3 Primer, BIP, B3 Primer)

Rapid Method: Six primers (FIP, F3 Primer, BIP, B3 Primer + Loop Primer F, Loop Primer B)

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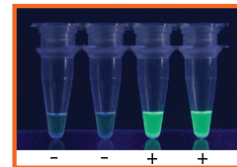
Procedure of the LAMP method

- Virus RNA
- Primer sets
- DNA Polymerase
- Buffer solution
- Reverse Transcriptase

62.5 °C, 30 min

LAMP reaction

Detection



UV light

Source: Assoc.Prof. Dr. Sakoda, Hokkaido University

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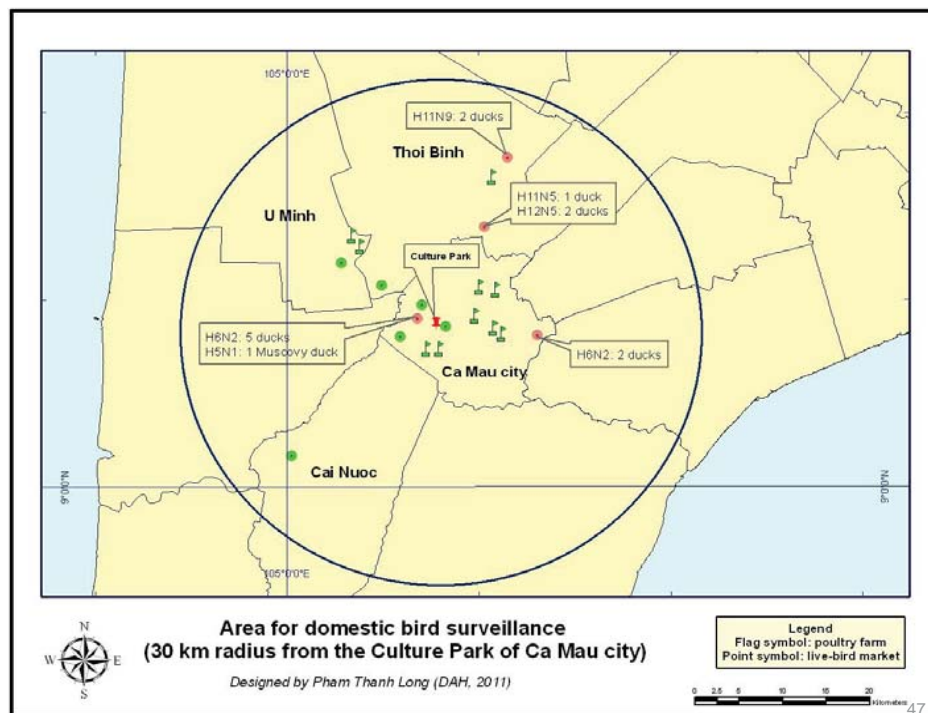
Results in Ca Mau in Feb., 2011

- 113 wild birds: Negative influenza A
- 28 environmental samples: Negative influenza A
- In 12 poultry farms: Negative influenza A
- In 10 live bird markets:
 - **H6N2**: 3,5%, (95%CI: 0.93% - 6.07%)
 - **H11N9**: 2,0%, (95%CI: 0% - 2.39%),
 - **H12N5**: 2,0%, (95%CI: 0% - 2.39%)
 - **H11N5**: 1,0%, (95%CI: 0% - 1.49%)
 - **H5N1**: 1,0%, (95%CI: 0% - 1.49%)

H5N1 virus isolated from Muscovy ducks was identified as highly pathogenic strain.

Source: Pham Thanh Long (DAH, 2012)

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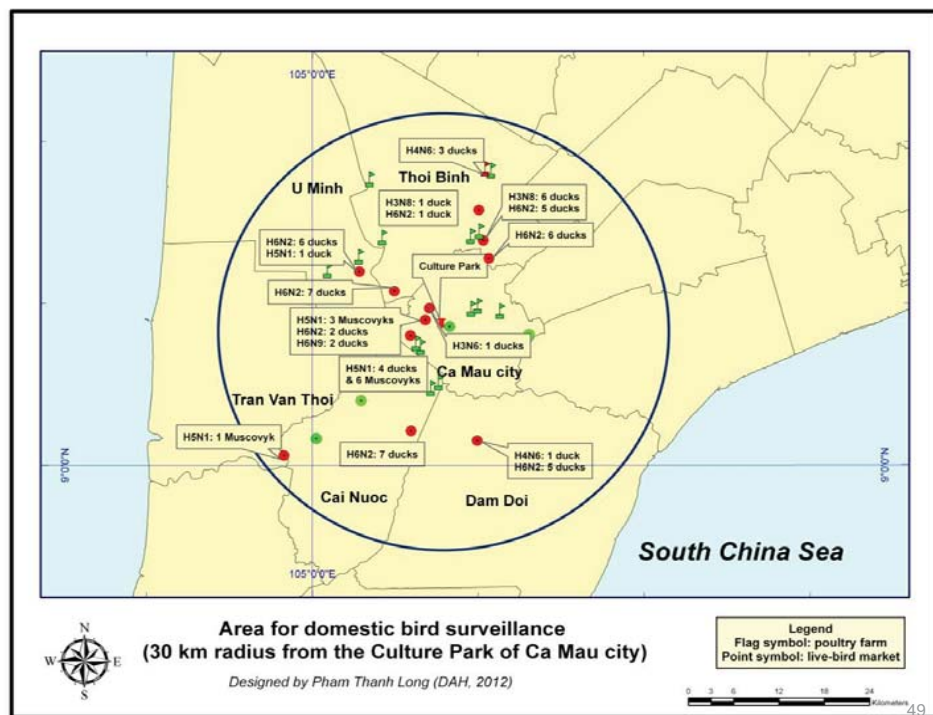
Results in Ca Mau in Oct., 2011

- In 1/15 poultry farms:
 - **H4N6**: 1,0% (95%CI: 0% - 2.13%)
- In 15 LBMs:
 - **H3N6**: 0,33%, (95%CI: 0% - 0.99%)
 - **H3N8**: 2,33%, (95%CI: 0.62% - 4.05%)
 - **H4N6**: 0,33%, (95%CI: 0% - 0.99%)
 - **H5N1**: 5,00%, (95%CI: 2.52% - 7.48%)
 - **H6N2**: 13,00%, (95%CI: 9.17% - 16.83%)
 - **H6N9**: 0,67%, (95%CI: 0% - 1.59%)

All H5N1 positive samples from ducks and Muscovy ducks were identified as clade 1.1 highly pathogenic strain.

Source: Pham Thanh Long (DAH, 2012)

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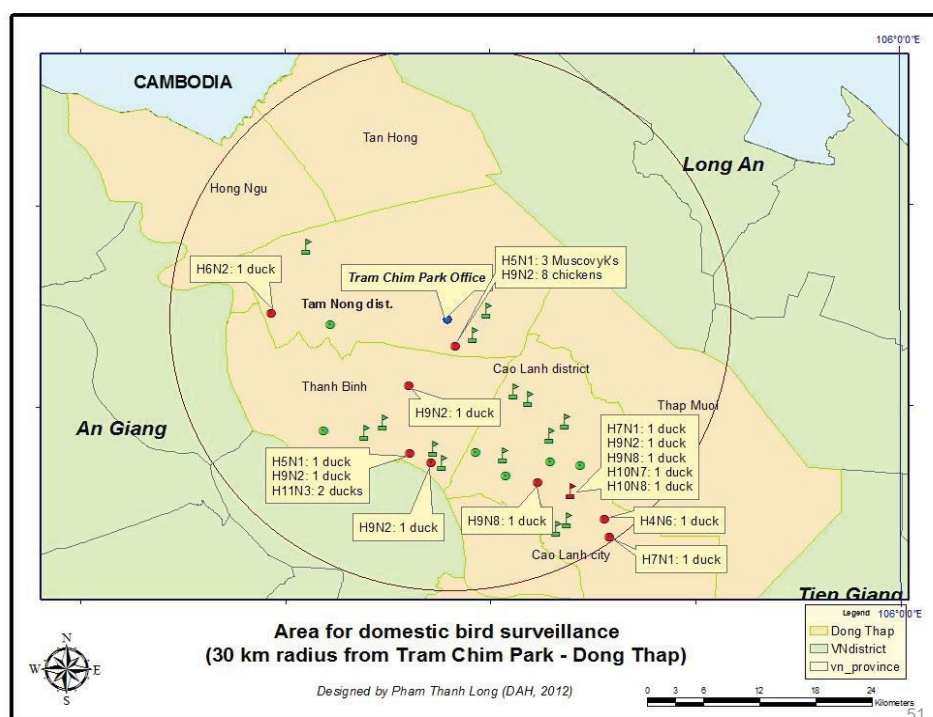


Results in Dong Thap in Feb., 2012

- 96 wild birds: Negative influenza A
 - 10 environmental samples: Negative influenza A
 - In 1/15 households: Positive 5 different 5 sub-types (*H9N2*, *H7N1*, *H9N8*, *H10N7* và *H10N8*)
 - In 15 LBMs:
 - **H5N1**: 1,33%, (95%CI: 0.03% - 2.64%)
 - **H9N2**: 3,67%, (95%CI: 1.53% - 5.81%)
 - **H6N2**: 0,33%, (95%CI: 0% - 0,99%)
 - **H4N6**: 0,33% (95%CI: 0% - 0,99%)
 - **H7N1**: 0,33% (95%CI: 0% - 0,99%)
 - **H9N8**: 0,33% (95%CI: 0% - 0,99%)
 - **H11N3**: 0,67%, (95%CI: 0% - 1.59%)
- All H5N1 positive samples from ducks and Muscovy ducks were identified as clade 1.1 highly pathogenic strain.

Source: Pham Thanh Long (DAH, 2012)

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A summary of OIE surveillance for period 2011-2012

	Feb. 2011	Oct. 2011	Feb. 2012
	Cà Mau	Cà Mau	Đồng Tháp
1. LBM	H5N1 (1,00%)	H3N6 (0,33%)	H4N6 (0,33%)
	H6N2 (3,50%)	H3N8 (2,33%)	H5N1 (1,33%)
	H11N5 (1,00%)	N4N6 (0,33%)	H6N2 (0,33%)
	H11N9 (2,00%)	H5N1 (5,00%)	H7N1 (0,33%)
	H12N5 (2,00%)	H6N2 (13,00%)	H9N2 (3,67%)
		H6N9 (0,67%)	H9N8 (0,33%)
			H11N3 (0,67%)
2. Farm	Negative	H4N6 (1,00%)	H7N1
			H9N2
			H9N8
			H10N7
			H10N8

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Clade



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- **HPAI situation during 2010-2012**
- **A summary on HPAI active surveillance programmes in Vietnam in last 5 years**
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- **Lessons learnt**

Lessons learned (cont.)

- The use of vaccination in combination with other control measures has resulted in a reduction in the number of HPAI H5N1 poultry outbreaks and human cases in Vietnam.
- Surveillance programmes are crucial to detect the presence of field virus in vaccinated flocks and to ensure that existing vaccine strains provide protection against field viruses

Lessons learned (cont.)

- **Challenges:**
 - Backyard poultry
 - Antigenic changes of H5N1 viruses
 - Vaccine products

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What next?

- Virus surveillance
- Evaluation of vaccine efficacy
- Reviewing vaccination strategy
 - Vaccine storage for emergency situation. Local authorities manage and organize vaccination campaigns.
 - The Government supports for AI vaccine research and production in the country.
 - Poultry owners will pay for vaccination (vaccine purchase and other fee).
- Application of various disease control measures including (early detection, prompt response, disinfection, movement control) to control and eliminate the disease.

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THANK YOU

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Epidemiology and Evolution of HPAI H5N1 viruses in Vietnam 2012



Nguyen Tung, Nguyen Thi Diep, Nguyen Hoang Dang, Nguyen Thi Vui, Do Thi Hoa, Hoang Thi Diep, and Nguyen Thi Trang



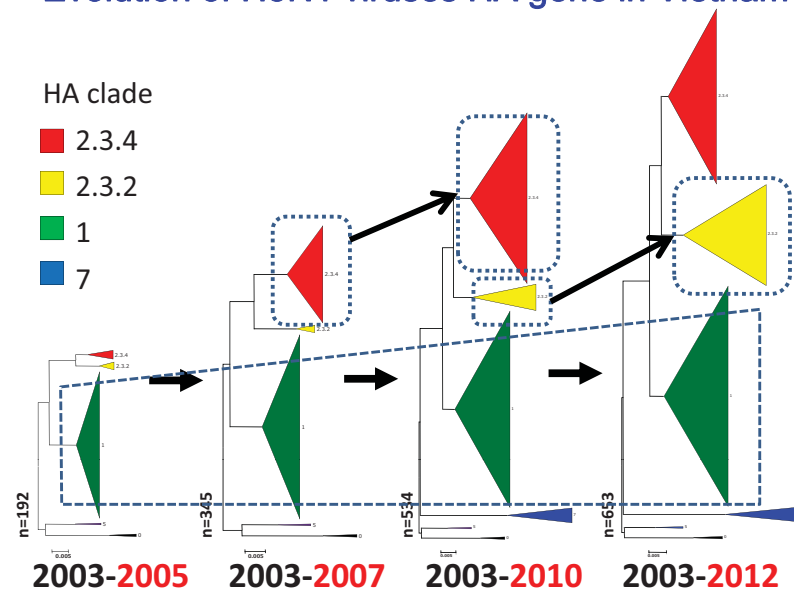
National Center for Veterinary Diagnosis
DAH, MARD, Hanoi, Vietnam



Outline

1. H5N1 virus evolution in Vietnam 2003-2012
2. Epidemiology of H5N1 in the north Vietnam 2008-2012
3. Epidemiology and evolution of clade 1 H5N1 viruses in the south Vietnam
4. Vaccine efficacy test











Evolution of H5N1 viruses HA gene in Vietnam



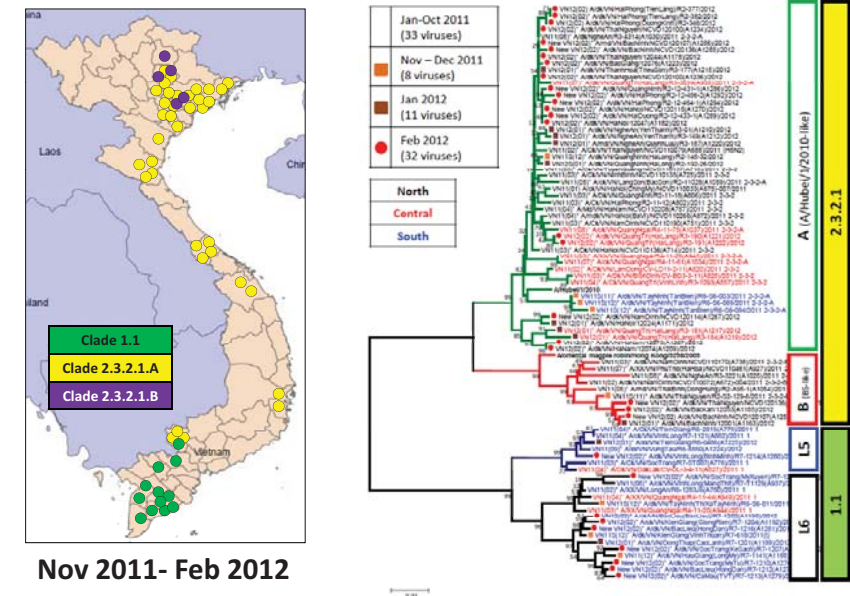
Change of H5N1 HA clade in Vietnam 2003-2012

Year	HA clade						
	0	1	5	2			7
				2.3.2	2.3.2.1	2.3.4	
2003		17	2				
2004		70					
2005	3	73		9		10	
2006		4					
2007		42				103	
2008		7				53	18
2009		19			3	30	
2010		12			22	18	
2011		23			63		
2012		11			32		





HA clade of Human cases in Vietnam 2003-2012

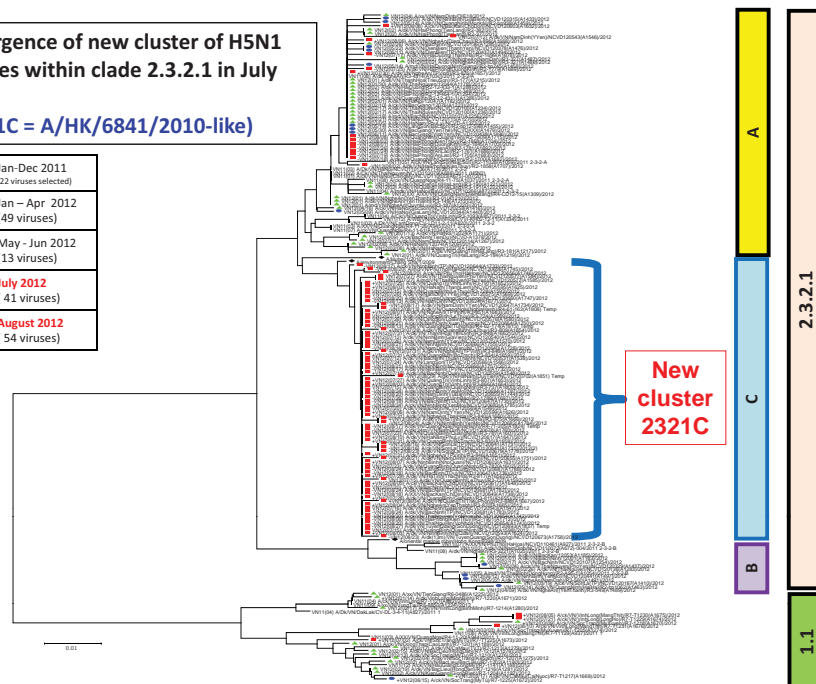
Year	HA clade						
	0	1	5	2			7
				2.3.2	2.3.2.1	2.3.4	
2003		 17	2				
2004		 70					
2005	3	 73		9		10	
2006		4					
2007		42				 103	
2008		7				 53	18
2009		 19			3	 30	
2010		 12			22	 18	
2011		23			63		
2012		 11			32		

Geographical distribution of H5N1 viruses and their HA clade in Vietnam (from Nov 2011 till Feb 2012)



Emergence of new cluster of H5N1 viruses within clade 2.3.2.1 in July 2012 (2321C = A/HK/6841/2010-like)

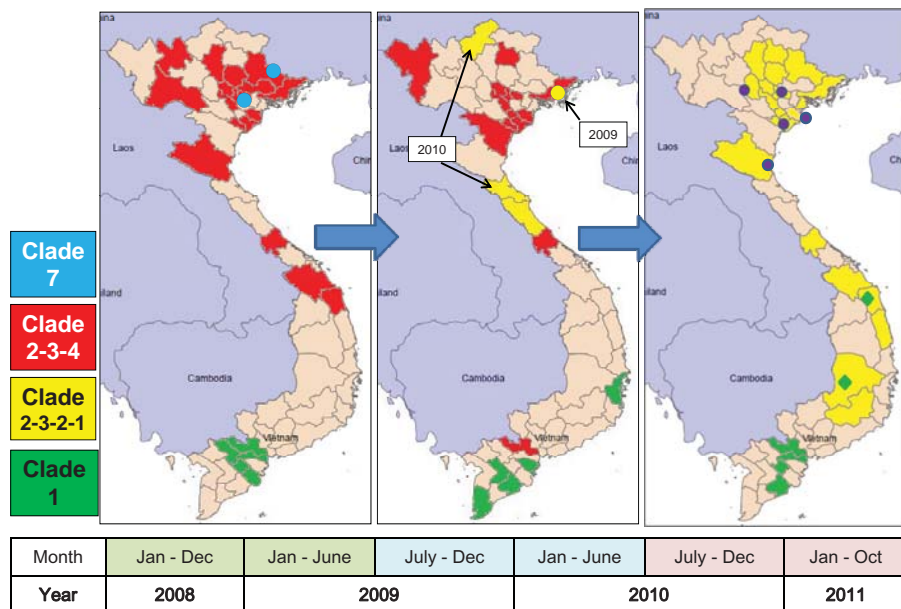
	Jan-Dec 2011 (22 viruses selected)
	Jan-Apr 2012 (49 viruses)
	May-Jun 2012 (13 viruses)
	July 2012 (41 viruses)
	August 2012 (54 viruses)



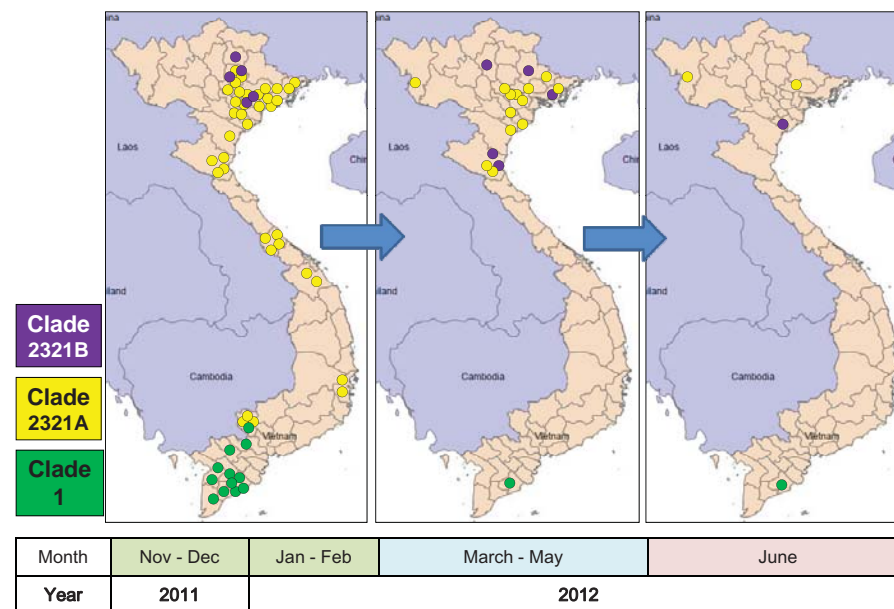
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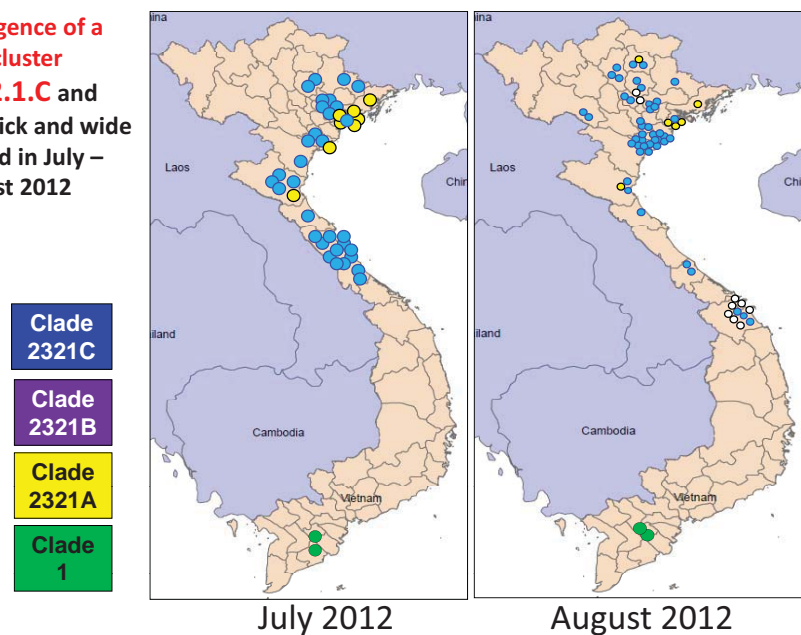
Change of HA Clade in the North Vietnam during 2008-2011 (Oct)



Change of HA Clade in the North Vietnam during 2008-2011 (Oct)

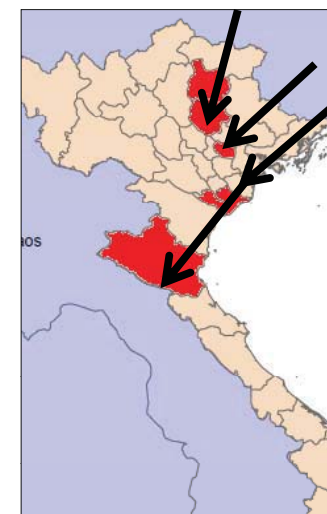


Emergence of a new cluster 2.3.2.1.C and its quick and wide spread in July – August 2012



Possible routes for frequent virus incursions 5 provinces where all A, B, and C were detected

No.	Province	Clade virus			Total
		2.3.2.1A	2.3.2.1B	2.3.2.1C	
1	Son La		1	2	3
2	Thai Nguyen	3	2	4	9
3	Tuyen Quang			3	3
4	Lang Son	1		3	4
5	Bac Kan	1	1	2	3
6	Dien Bien	1			1
7	Bac Ninh	2	2	8	12
8	Bac Giang	3			3
9	Ha Nam			3	6
10	Ha Noi	5			5
11	Hai Duong	3			3
12	Hai Phong	8		2	10
13	Nam Dinh	2		10	12
14	Ninh Binh	1	1	10	12
15	Phu Tho			2	2
16	Quang Ninh	4	1		5
17	Thanh Hoa	1		1	2
18	Ha Tinh			2	2
19	Nghe An	5	2	5	12
20	Quang Binh			11	11
21	Quang Nam	1			1
22	Quang Ngai			3	3
23	Quang Tri	4		4	8
Total		48	10	75	133



H5N1 Virus Circulation and Incursion in the north Vietnam



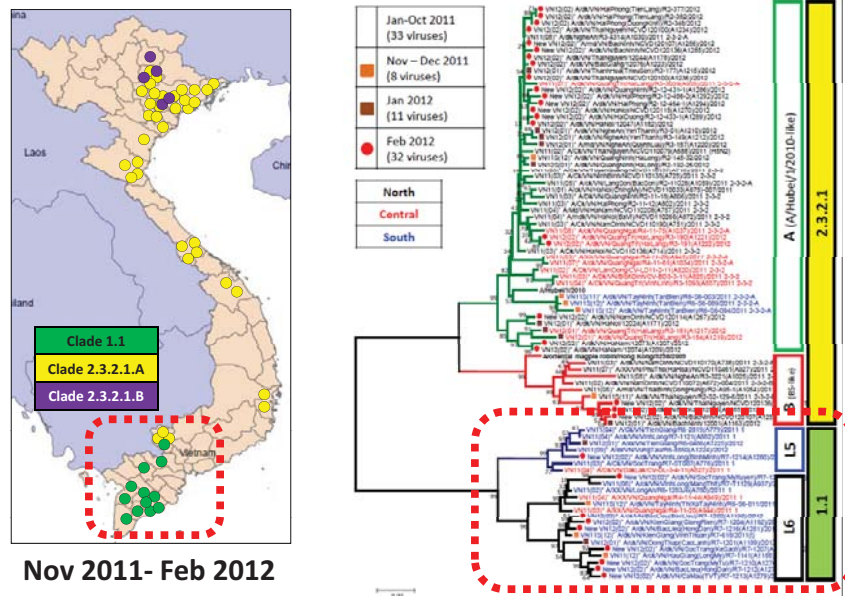
Frequent incursions of H5N1 viruses into the north Vietnam

The introduced virus spread and circulate locally resulting in the small local epidemic, but eventually dies out.

Outline

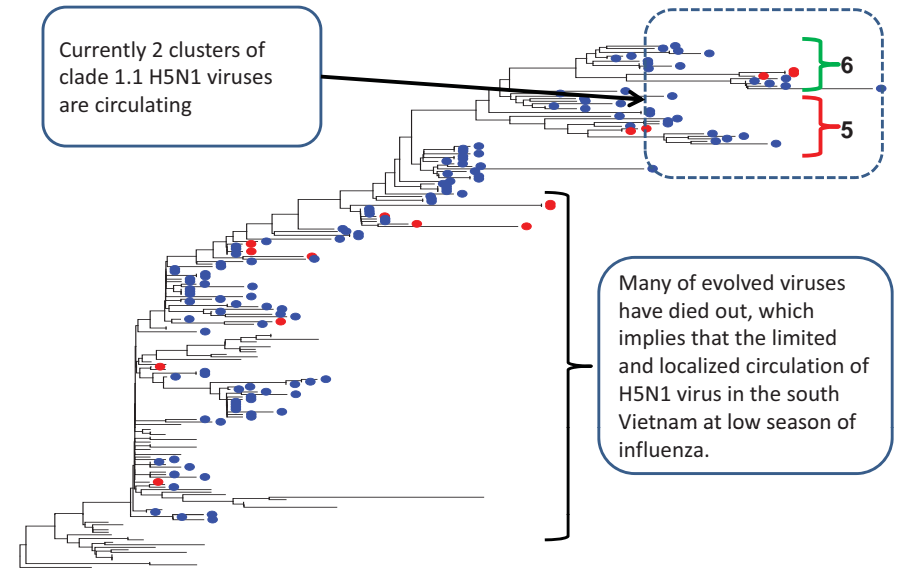
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Geographical distribution of H5N1 viruses and their HA clade in Vietnam (from Nov 2011 till Feb 2012)



Clade 1 H5N1 viruses in Vietnam and Cambodia

Currently 2 clusters of clade 1.1 H5N1 viruses are circulating



Clade 1 H5N1 viruses 1996-2011

Countries	Year										
	1996-2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
China											
Vietnam (North)											
Laos											
Vietnam (South)											
Cambodia											
Thailand											

- Clade 1 H5N1 virus was prevalent in south China early 2000s.
- It was introduced to Indochina in 2003, and has caused a severe epidemic during 2003-05 in Vietnam, Laos, Cambodia, Thailand.
- Now (2009-2012) it is confined to lower Mekong delta region i.e. south Vietnam and Cambodia.

H5N1 Virus Circulation and Incursion in the south Vietnam



Clade 1 virus introduced in 2004 has kept circulating in the lower Mekong Delta. Incursion of H5N1 virus to this area is a rare event.

Clade 1 virus keeps circulating and evolving in the south Vietnam

Summary and Discussions

- The present study highlights the on-going change of H5N1 viruses in Vietnam both by new introductions and their mutations.
- Epidemiology of H5N1 is different between the north and the south of Vietnam.
- In the north Vietnam, there has been at least 3 major introductions of H5N1 viruses identified (2.3.2.1.A, B, and C) during 2009-2012.
 - 2321A; introduced in 2009, and still circulating
 - 2321B; introduced in 2011, and has not been detected for the last 3 months
 - 2321C; first detected in July 2012, and quickly spreading to the south
- In the south Vietnam, Clade 1 H5N1 virus that was introduced in 2003-4 has kept circulating for the last 7-8 years.
 - Many of evolved viruses have died out, and currently 2 clusters of clade 1.1 are circulating. This implies that the limited and localized circulation of H5N1 virus in the south Vietnam at low season of influenza.

Outline

- H5N1 virus evolution in Vietnam 2003-2012
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H5N1 Vaccine Efficacy Tests against Recent Viruses in Vietnam



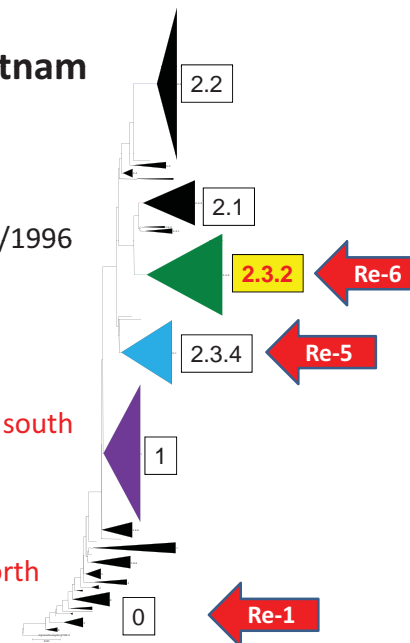
Vaccinated

Non-Vaccinated

This work was supported by USAID/FAO project.

H5N1 vaccines used in Vietnam

- **Re-1:**
 - clade 0
 - Strain: A/goose/Guangdong/1/1996
 - Used **2006-2010**
- **Re-5:**
 - clade 2.3.4
 - Strain: A/duck/Anhui/1/2006
 - Used in **2011-12 mainly in the south**
- **Re-6:**
 - Clade 2.3.2.1
 - Strain name: unknown
 - Maybe used in **2012- in the north**



Vaccine Efficacy Test: challenge protocol

- **Birds**
 - Vaccinated twice (**2wk + 6wk**)
 - **Challenge 3wks after 2nd shot** (or 4wks after 1st shot)
- **Challenge**
 - Challenge virus; propagated in embryonated egg, titrated on CEF
 - Inoculate **intranasally** 10^6 TCID₅₀ of challenge virus
 - Clinical observation for 7-14 days
 - Collect OP swabs on day 3 (chicken), 4 (duck) and
 - PM for any dead birds



Difference in antigenicity among H5N1 viruses of different clades and sub-clades

HI antigen		HI antibody titer (log2) of pooled anti-sera to		
HA clade	H5 virus	Re-1 (clade 0)	Re-5 (clade 2.3.4)	Re-6 (clade 2.3.2)
1.1	A881/2010	7	6	3
	A1192/2012	8	7	3
2-3-2-1-A	A675/2011	7	5	7
	A1207/2012	7	5	7
2-3-2-1-B	A672/2011	3	4	8
	A1163/2012	2	3	7
2-3-2-1-C	A1544/2012	5	5	8
	A1648/2012	5	5	8

Summary outcome of vaccine efficacy test in chicken

Challenge virus (HA clade)	Mortality after challenge of chickens vaccinated twice with;		
	Re-1 (clade 0)	Re-5 (clade 2.3.4)	Re-6 (clade 2.3.2.1)
1.1	0%	0-10%	50%
2.3.2.1.A	0%	0%	0%
2.3.2.1.B	50%	70-90%	0%
2.3.2.1.C	ND	ND	0%

ND; not done

Amino acid changes in HA1 unique to 2-3-2-1 viruses compared with vaccine strains and their significance

Mature H5 HA	Vaccine		HA clade of H5N1 virus												Significance
			1	2.3.4				2.3.2.1							
	A			B		A		B		C					
	361	385		394	388	378	375	675*	820	674*	738	1163	1600		
72	N	.	.	.	.	.	.	.	.	D	D	D			
115	Q	.	.	.	.	.	R	.	.	.	R	R	R		
123	S	.	P	P	.	.	P	.	.	.	P	P	P	Antigenic site B	
124	N	D	S	S	D	D	D	D	D	D	E	E	D	Antigenic site B	
136	P	.	.	.	.	.	.	.	.	.	S	S	S	S	Antigenic site A
151	I	.	.	.	.	.	.	.	.	.	L	L	L	Antigenic site B, Receptor binding site	
154	N	.	.	.	.	.	.	.	D	G	D	D	D	D	Antigenic site B
159	T	.	.	.	.	.	.	.	.	.	I	I	I		
162	R	.	.	.	.	.	.	.	K	K	K	K	K	K	
165	N	.	.	.	.	.	.	.	.	.	K	K			glycosylation site
169	Q	.	.	.	.	.	.	.	.	.	K	K	R	R	
188	T	.	.	.	I	I	I	I	.	.	I	I	V		Antigenic site B
189	K	.	.	.	.	.	.	.	.	R	R	R	R	R	Antigenic site B, Receptor binding site
198	I	.	.	.	V	.	V	V	.	.	V	V	V		
212	E	K	R	R	K	K	K	K	K	K	R	R	R	K	Antigenic site D
266	K	.	.	.	.	.	.	.	.	.	R	R	R	R	
275	N	.	.	.	.	.	S	S	.	.	S	S	S		Antigenic site C
282	M	I	.	.	I	I	I	I	I	I	.	.	.	I	

Summary

1. H5N1 viruses in Vietnam 2012

- ◆ Clade 1.1 in the south
- ◆ Clade 2.3.2.1.A, B, and C in the north and the central

2. Vaccine efficacy against recent H5N1 viruses

- ◆ There is no vaccine that works for all 4 kinds of viruses
- ◆ The results in ducks are similar with those in chickens

Challenge virus (Clade)	Protection with the vaccines		
	Re-1	Re-5	Re-6
1.1	Yes	Yes	No
2.3.2.1.A	Yes	Yes	Yes
2.3.2.1.B	No	No	Yes
2.3.2.1.C	??	??	Yes

Acknowledgements

- These activities and studies were supported by many donors, institutions, projects, and people.
 - CDC (Atlanta, USA), OFFLU laboratories, USDA
 - FAO project OSRO/RAS/604/USA funded by USAID
 - Donors; World Bank, Japan, USA, EU, Australia
 - Our colleagues in Vietnam; Dept of animal health, Regional labs, Provincial dept of animal health, field vets, and farmers
- We would like to thank all the international assistance for Vietnam to fight against avian influenza.

H5N1 Vaccine Efficacy Tests against Recent Viruses in Vietnam



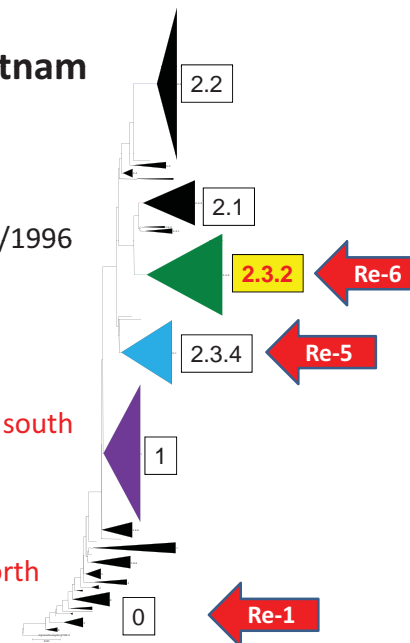
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	A			B		A		B		C					
	Re-1	Re-5		361	385	394	388	378	375	675*	820	674*	738	1163	
72	N	D	D	D		
115	Q	R	.	.	.	R	R	R		
123	S	.	P	P	.	.	P	.	.	.	P	P	P	Antigenic site B	
124	N	D	S	S	D	D	D	D	D	D	E	E	D	Antigenic site B	
136	P	.	.	.	.	.	.	.	.	.	S	S	S	Antigenic site A
151	I	.	.	.	.	.	.	.	.	.	L	L	L	Antigenic site B, Receptor binding site
154	N	.	.	.	.	.	.	.	D	G	D	D	D	Antigenic site B
159	T	.	.	.	.	.	.	.	.	.	I	I	I	
162	R	.	.	.	.	.	.	.	K	K	K	K	K	K
165	N	.	.	.	.	.	.	.	.	.	K	K		glycosylation site
169	Q	.	.	.	.	.	.	.	.	.	K	K	R	R
188	T	I	I	I	I	.	.	I	I	V	Antigenic site B
189	K	R	R	R	R	R	Antigenic site B, Receptor binding site
198	I	V	.	V	V	.	.	V	V	V	
212	E	K	R	R	K	K	K	K	K	K	R	R	R	K	Antigenic site D
266	K	R	R	R	R	
275	N	S	S	.	.	S	S	S		Antigenic site C
282	M	I	.	.	.	I	I	I	I	I	.	.	.	I	

Summary

1. H5N1 viruses in Vietnam 2012

- ◆ Clade 1.1 in the south
- ◆ Clade 2.3.2.1.A, B, and C in the north and the central

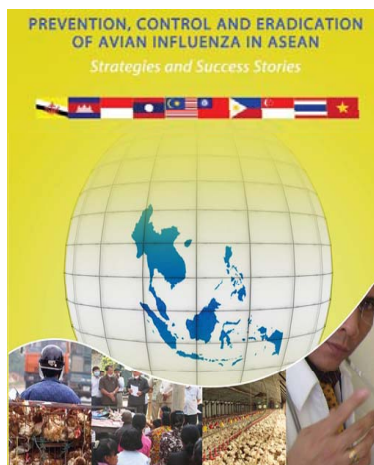
2. Vaccine efficacy against recent H5N1 viruses

- ◆ There is no vaccine that works for all 4 kinds of viruses
- ◆ The results in ducks are similar with those in chickens

Challenge virus (Clade)	Protection with the vaccines		
	Re-1	Re-5	Re-6
1.1	Yes	Yes	No
2.3.2.1.A	Yes	Yes	Yes
2.3.2.1.B	No	No	Yes
2.3.2.1.C	??	??	Yes

Acknowledgements

- These activities and studies were supported by many donors, institutions, projects, and people.
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 - Donors; World Bank, Japan, USA, EU, Australia
 - Our colleagues in Vietnam; Dept of animal health, Regional labs, Provincial dept of animal health, field vets, and farmers
- We would like to thank all the international assistance for Vietnam to fight against avian influenza.

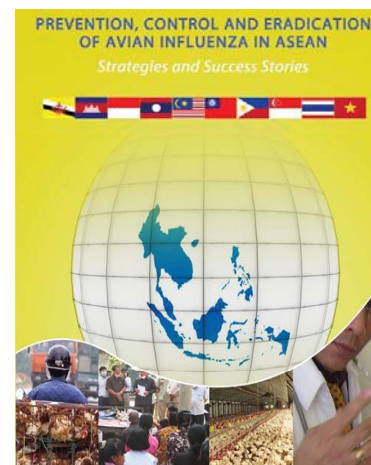


ASEAN'S INITIATIVE ON HPAI CONTROL

Dr Kamarudin Md Isa
ASEAN HPAI Taskforce



The 5th OIE Regional Meeting on Strengthening Animal Health Information Networking for HPAI Control and Prevention in Asia, 2-3 October 2012, Hanoi, Vietnam .



ASEAN'S INITIATIVE ON HPAI CONTROL

Presentation outline

- Introduction
- Previous discussion by ASEAN Taskforce
- ASEAN's Road map for HPAI eradication by 2020
- Challenges in HPAI control in Southeast Asia
- Way forward
- Acknowledgment



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Introduction

1. Since HPAI H5N1 was officially declared on 24 January 2004, Cambodia, Indonesia, Lao PDR, Malaysia (Peninsular), Myanmar, Thailand and Viet Nam have experienced HPAI outbreaks, while Brunei Darussalam, Philippines and Singapore remained HPAI-free .
2. Over the years, ASEAN responded to the threat of avian influenza situation collectively (through experiences, capacities and resources sharing and exchange) and individually, Member States have applied concerted efforts to prevent, control and eradicate the HPAI–H5N1 at-source.



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Establishment of the ASEAN HPAI Taskforce



- The HPAI Taskforce was established by the 26th Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF), which was held on 7 October 2004 in Yangon.
- 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 formation 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.
- The Taskforce is under the auspices of the ASEAN Sectoral Working Group on Livestock (ASWGL) and represented by each of the Member States National Focal Point.



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Member of ASEAN HPAI Taskforce

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• Representatives from Internal Agencies: FAO, OIE, and Donor Country/Institutions

• ASEAN Secretariat



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ASEAN HPAI Taskforce: Activities and milestones



- The Taskforce formulated the **Regional Framework** for the Control and Eradication of HPAI in ASEAN, which 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 Regional Framework was formally endorsed by the 27th Meeting of the AMAF in Manila on 29 September 2005 which also provided the directive for the formulation of the detailed Work Plan
- The framework was subsequently converted into a specific time-line period of **Regional Strategy (Year 2008-2010)** under the First Phase of the ASEAN-Asian Development Bank (ADB) HPAI Project. Focus Areas of the strategy include: 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 experiences through training workshops, country visits, etc.; and 5) research and development (R&D).

Under the **Second Phase of the ASEAN-ADB HPAI Project**, the development of the HPAI Roadmap was identified as one of its main components.



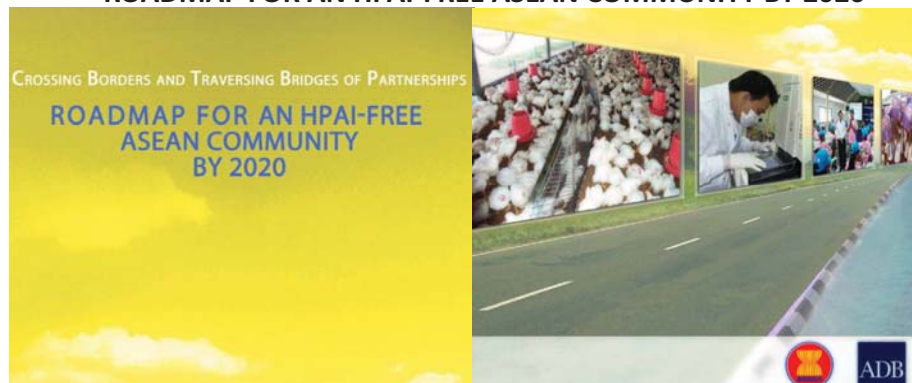
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ROADMAP FOR AN HPAI-FREE ASEAN COMMUNITY BY 2020



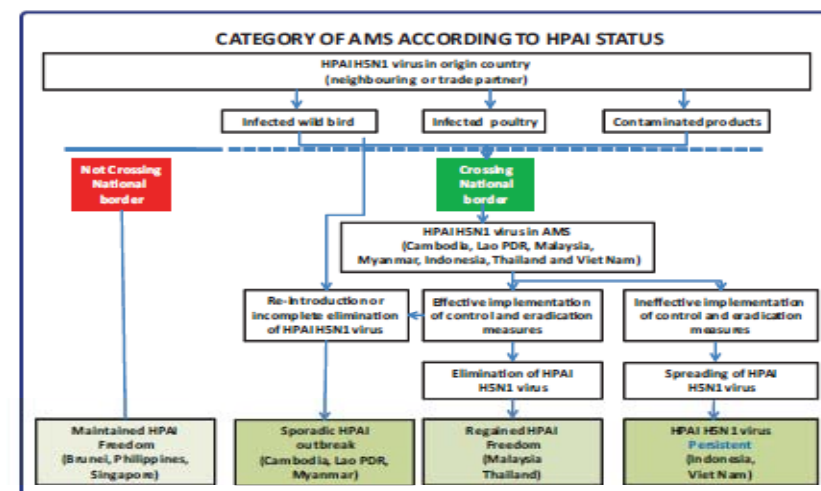
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ROADMAP FORMULATION: Strategies are based on AMs HPAI status



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ROAD MAP FORMULATION: Strategies are based on AMs HPAI status

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. **Progressive elimination via compartmentalization and zoning** are the likely options.



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ASEAN HPAI ROADMAP

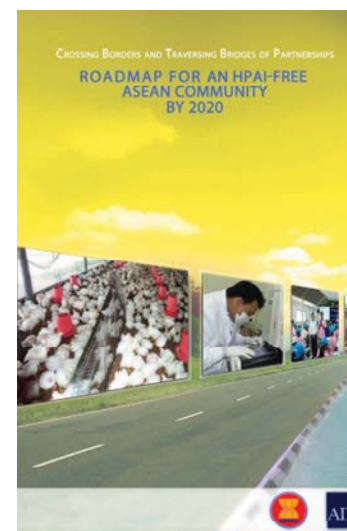
Vision

An ASEAN Community with enhanced capacity to progressively control and eradicate HPAI, in domestic poultry and humans, as well as other disease threats, towards food security and, public health safety.

Purpose

To define the long-term strategies and activities toward the control and eradication of HPAI and other HPED in ASEAN. Other purposes:

- to provide information to policymakers and stakeholders
- to guide disease control managers in developing or revising operational plans
- to demonstrate the need for sustained regional coordination and multi-sectoral collaboration in addressing disease threats
- to serve as a basis in strengthening veterinary services at all levels
- to provide evidence for appropriate approaches in managing HPED
- to serve as supporting document for resource mobilization from development partners and donor agencies.



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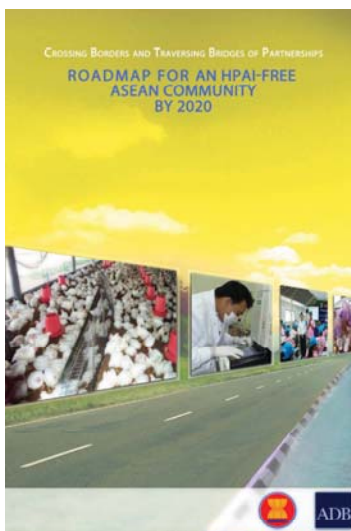
ASEAN'S INITIATIVE ON HPAI CONTROL

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•ASEAN HPAI ROADMAP : Scope and Linkages

- a directional and action-oriented long-term strategy to prevent, control and eradicate HPAI and other HPED in ASEAN.
- integrates lessons learned and key elements consistent with previous regional frameworks and ongoing regional initiatives such as the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TAD) and the ONE HEALTH approach.
- mainstream HPAI into the broader context of ASEAN's initiative for the establishment of a **regional coordination mechanism** on animal health and zoonoses.
- guided by the **Roadmap for an ASEAN Community 2009-2015**, the HPAI Roadmap is aligned primarily with the **ASEAN Economic Community (AEC) Blueprint** that envisages regional integration by 2015
- aligned with the **ASEAN Socio-Cultural Community (ASCC) Blueprint**, which represents the human dimension of ASEAN cooperation and upholds ASEAN commitment to address the region's aspiration to lift the quality of life of its peoples. (Section B.5 of the ASCC Blueprint under the heading of "Improving capability to control communicable diseases")



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ASEAN HPAI ROAD MAP:

Targets and Timeline for HPAI-Free Status

Progression of the campaign based on HPAI clusters in the region

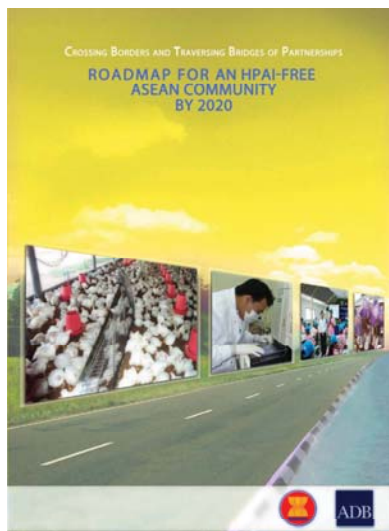
Cluster/Category	2010	2013	2016	2020
HPAI-Free (Brunei Darussalam, Philippines, Singapore)	Free	Free	Free	Free
Regained HPAI-freedom (Malaysia, Thailand)	Free	Free	Free	Free
Sporadic outbreaks (Cambodia, Lao PDR, Myanmar)	Sporadic	Sporadic	Free	Free
HPAI-Persistent (Indonesia, Viet Nam)	Persistent	Persistent	Sporadic	Free



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ASEAN HPAI ROADMAP

BROAD STRATEGIES

Roadmap focuses on three main broad strategies for prevention, control and eradication for the region.

- 1) to maintain existing freedom status through vigilant border controls and minimising risks of introduction, for HPAI-Free Member States.
- 2) to strengthen early detection capabilities and respond quickly and effectively once the disease agent is detected, for those countries with sporadic outbreaks.
- 3) gradually control and eradicate the infection through progressive zoning based on risk management for the most significant transmission pathways, for Member States where the disease agent is persistent in their duck and chicken population.



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

GOAL	Objectives (Year achievement)
1: Strengthening Veterinary Services for capacity development to prevent, control and eradicate animal diseases of economic and public health importance (Strengthening veterinary services)	<ol style="list-style-type: none"> 1. To align animal health legislation and governance for effective disease prevention and control (2015) 2. To strengthen the veterinary epidemiology capacity of the ASEAN Member States to detect, report, monitor, investigate & respond to disease threats and outbreaks (2015) 3. To strengthen the capacity of ASEAN Member States to diagnose, confirm and carry out virus characterization for HPAI (2012) 4. To strengthen the capacity of ASEAN Member States to conduct risk assessment (2015) 5. To enhance preparedness of ASEAN Member States to respond to HPAI outbreaks (2012) 6. To strengthen the capacity of AMs in establishing a system of farm certification and accreditation. (2015)



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

Goal	Objectives (Year achievement)
2: Achievement of a disease-free status in progressive manner at compartment, zone, region and country levels (Progressive zoning and crossborder management)	<ol style="list-style-type: none"> 1. To enable ASEAN Member States to achieve HPAI-free status and expand the free-status in zones and compartments within the respective countries (2018) 2. To strengthen capacity in mitigating risks of cross-border incursions and harmonising standard operating procedures (2016) 3. To enable ASEAN Member States to apply the compartmentalisation approach to HPAI as appropriate (2016)



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

Goal	Objectives (Year achievement)
Goal 3: Effective reduction of circulating HPAI virus in the environment leading to its progressive control and eradication (Vaccines and vaccination strategy)	<ol style="list-style-type: none"> 1. To strengthen the capacity of ASEAN Member States for pre- and post vaccination surveillance (2016) 2. To strengthen the capacity of ASEAN Member States in ensuring quality and availability of vaccines (2013) 3. To enable ASEAN Member States to develop sound vaccination programmes, including exit strategies (2013) 4. To strengthen engagement of relevant stakeholders, particularly the private sector, in implementing vaccination programmes (2013) 5. To ensure preparedness of ASEAN Member States to implement and operationalise effective vaccination strategies, especially in case of emergency (2013)



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

Goal	Objective (Year achievement)
4: Effective and rapid containment of infections and outbreaks in affected flocks or zones (Stamping-out/Culling)	<ol style="list-style-type: none"> 1. To strengthen existing policies and programmes based on the experiences of the ASEAN Member States (2014) 2. To reinforce capacity of ASEAN Member States in eliminating the virus from infected environment and facilities and preventing the spread of infection to other areas (2016) 3. To strengthen mechanisms within the ASEAN Member States to encourage reporting, cooperation of farmers and producers in implementing culling policies and facilitate the implementation of stamping-out measures (2013) 4. To strengthen the capacity of ASEAN Member States in minimising the negative impacts of HPAI and HPED on the vulnerable sector (2012)



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

Goal	Objectives (Year achievement)
5: Effective surveillance capacity to detect and respond appropriately to the presence of H5N1 virus infection and other disease threats (Surveillance and Monitoring)	<ol style="list-style-type: none"> 1. To strengthen capacity to recognise risk areas and products (carriers) in relation to the dominant poultry production sector in a country (2013) 2. To strengthen the capacity of ASEAN Member States to conduct cost effective surveillance system and launch appropriate and timely response at both the national and sub-national levels (2012) 3. To strengthen capacity to integrate/interface surveillance systems between animal and human health for policy and for disease mitigation (2012)



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

Goal	Objectives (Year achievement)
6: Sustainable market chain policies and interventions in reducing risks of spreading and contamination to poultry and human populations (Market - chain management)	<ol style="list-style-type: none"> 1. To strengthen the capacity of ASEAN Member States in better understanding of the market chain and the risks of disease transmission along the market chain (2012) 2. To enable ASEAN Member States to implement strategies and structural changes to manage risks in the production and market chains (2012) 3. To conduct socio-economic assessment as an ongoing activity for the market chains (2012)



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ASEAN HPAI ROADMAP: STRATEGIC GOALS

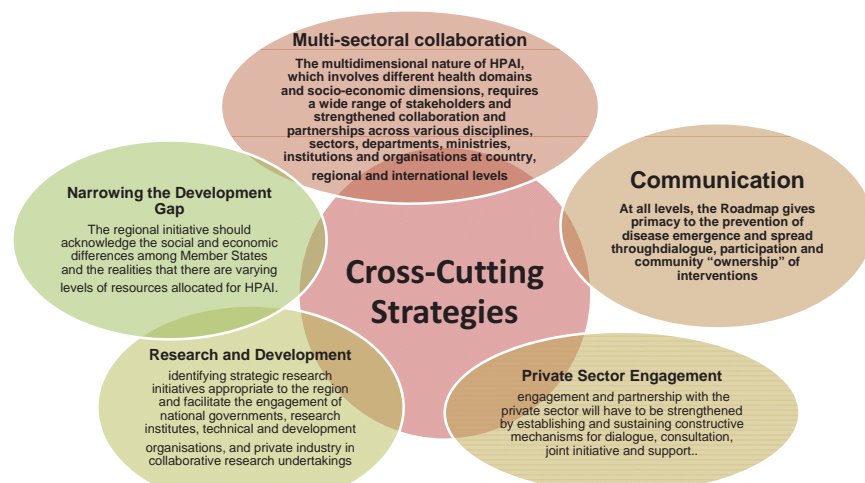
Goal	Objectives (Year achievement)
Goal 7: Enhancement and promotion of bio-security as a long-term, cost effective preventive measure to keep the HPAI virus out of the farms/flocks (Enhanced Bio-security)	<ol style="list-style-type: none"> 1. To strengthen the capacity of the ASEAN Member States to design and implement effective bio-security measures for Sectors 1-3 poultry farms (2013) 2. To enable ASEAN Member States to develop sound, practical and innovative bio-security measures for Sector 4 poultry (2014)



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ASEAN HPAI ROADMAP: Cross-Cutting Strategies



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ASEAN HPAI ROADMAP: Implementation Arrangements



Implementation Mechanism and Workplan

- In the short-term, 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 mid-and long-term, the Roadmap will become the blueprint for the institutionalised regional coordination mechanism (**RCM-ACCAHZ**) on animal health and zoonoses for the control and eradication of HPAI.
- Ultimately, the **Member States** which implement national programmes for HPAI and other HPED, will be the main implementers of this Roadmap.



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ASEAN HPAI ROADMAP: Funding Arrangements and Resource Mobilisation

Resource mobilisation will include funding mechanisms and sources at both national and regional levels (e.g. the **continuation of project/programmes-implementations through grants from dialogue partners, donors and collaborative arrangements with FAO and OIE**).

Most of the projects and programmes to be developed from the Roadmap are expected to be implemented through **multiagency 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 experts' utilisation will also be maximised



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ASEAN HPAI ROADMAP: Monitoring and Evaluation

- Progress in the implementation of the activities and programmes under the Roadmap will be monitored, reviewed and disseminated to all relevant stakeholders. The ASEAN Secretariat shall review and monitor compliance of implementing the Roadmap. Indicators and tools for evaluation will have to be identified to monitor progress.
- Monitoring and evaluating the progress of implementation of each elements of the Roadmap will be done through the establishment and maintainance of a set of performance indicators and regular progress reporting to all relevant stakeholders.
- This Roadmap is a living document and be reviewed periodically, taking into account dynamic regional and global developments, to ensure that the activities and programmes are focused on achieving its set goals.



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Challenges in HPAI control in Southeast Asia

Stamping out and compensation policies



- Policies on culling are 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, concentration of chickens and 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, therefore, selective culling which is less effective is used to control HPAI.



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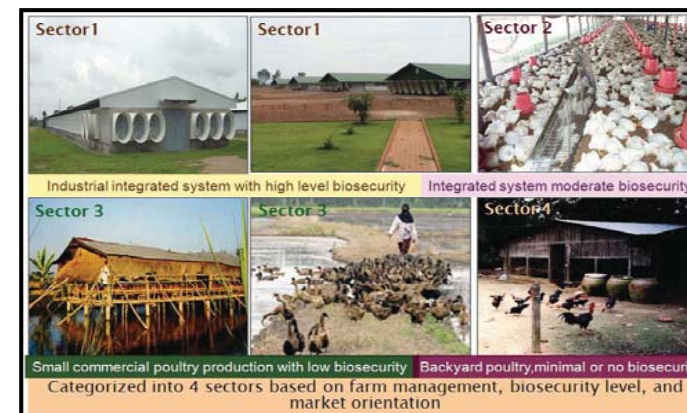
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Challenges in HPAI control in Southeast Asia

Sector 3 and 4 are dominating poultry populations



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Challenges in HPAI control in Southeast Asia

Cross-Border , Intra AMS Risks

Cross-Border Risks

Three of the Member States (Lao PDR, Myanmar and Viet Nam) have long 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. Therefore, the strategy in the Roadmap must address the cross border movement between countries and active surveillance along the borders. formulated to address these problems.

Intra AMS Risks

Traditional, extensive, free-grazing/scavenging duck production systems Introduction of non-vaccinated new live animals. Fomites (human, animal, vehicle, etc.) due to active movement from production to market places.



The 5th OIE Regional Meeting on Strengthening Animal Health Information Networking for HPAI Control and Prevention in Asia, 2-3 October 2012, Hanoi, Vietnam .

ASEAN'S INITIATIVE ON HPAI CONTROL

PREVENTION, CONTROL AND ERADICATION
OF AVIAN INFLUENZA IN ASEAN
Strategies and Success Stories



The Way Forward: Long-Term and Sustainable Strategies



- Significant progress and achievements were made by the Member States in key areas of prevention and control of HPAI . 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 establishment of a regional coordination mechanism (RCM-ACCAHZ) on animal diseases and zoonoses) and sustainability of current programmes and better coordination of initiatives and projects being implemented by donors and development organisations.



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4. Most of texts and pictures are from the following documents:
 - i) Crossing Borders and Traversing Bridges of Partnership: Roadmap for HPAI-Free ASEAN Community by 2020. ASEAN Pub.
 - ii) Prevention, Control and Dedication of Avian Influenza in ASEAN. Strategies and Success Story. ASEAN Pub.



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