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Overview OIE/JTF project on HPAI control in Asia and other related programs by the OIE Asia-Pacific

**The 5th OIE Regional Expert Group Meeting for Implementation of the Programme
on Surveillance of Wild and Domestic Birds along Migratory Flyways
under the OIE/JTF Project for Strengthening HPAI Control in Asia**

**Tokyo, Japan
13-14 December 2012**

**Itsuo Shimohira
Regional Representative for Asia and the Pacific**



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- 1. Introduction of Work Plan for RR Asia-Pacific**
- 2. Outline of OIE/JTF project for HPAI control in Asia (Programme H)**
- 3. Others related to HPAI control under the JTF (Programme A and F)**

1. Introduction of Work Plan for RR Asia-Pacific

- Work plan
(in reference to the OIE 5th Strategic Plan)
- Programme related to HPAI controls activities

Strategic Objective in OIE 5th Strategic Plan (2011-2015)

SO 1. ANIMAL DISEASE AND ZONOSIS INFORMATION

SO 2. DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFICALLY
BASED STANDARDS AND GUIDELINES

**SO 3. PREVENTION, CONTROL AND ERADICATION OF
ANIMAL DISEASES, INCLUDING ZONOSSES**

SO 4. ENSURING THE SCIENTIFIC EXCELLENCE OF INFORMATION
AND ADVICE

**SO 5. CAPACITY BUILDING FOR NATIONAL VETERINARY
SERVICES**

**SO 6. STRENGTHENING THE ORGANISATION'S
INFLUENCE ON POLICY DESIGN, APPLIED
RESEARCH AND GOVERNANCE**

Relationship between Programme for 2012-2013 and Strategic Objective

4 Programmes (Activities) in 2012- 2013 (Work Plan) under JTF

OIE 5th
Strategic Plan

Programme A:

: Support for activities to improve animal health situation in the Region

- Co-organization of the regional workshops for recent topics with APHCA or FAO
- Publication of the OIE/NACA Quarterly Reports on Aquatic Animal Diseases (QAAD).
- Development of the OIE/NACA WAHIS Regional Core
- **Provide the information on Animal health by the OIE Regional Web site etc.**

SO 1

SO 6

Programme F:

: Strengthening of diagnostic capacity of national laboratories with OIE Reference Laboratories.

- **Training courses on surveillance and diagnostic techniques at OIE Reference Centres**
- Short term hands-on training course in collaboration with OIE Reference Centres etc.

SO 5

Programme G:

: Prevention and control of major transboundary animal diseases.

- **The Regional GF-TADs Steering Committee Meeting, jointly co-organised with FAO**
- Coordination Committee Meeting for FMD control in Asia under the OIE/JTF project
- Field study and Surveillance FMD virus under the OIE/JTF Project on FMD Control in Asia etc.

SO 3

Programme H: (To be completed at the end of FY 2012)

: Prevention and control of Avian Influenza at source

- **Regional Meeting on Strengthening Animal Health Information Networking in Asia.**
- **Expert Group Meeting for Implementation of Surveillance**
- **Surveillance of wild birds and domestic animals in Asia**
- **Wrap up meetings on the activities for HPAI control in Asia under the OIE/JTF project etc.**

SO 3

* **Blue highlighted** parts are related to the HPAI activities



2. OIE/JTF project for HPAI control in Asia (Programme H)

- 1) Background and the HPAI projects since 2006
- 2) Components of the OIE/JTF project (5 year project)

Programme H

: Prevention and control of pandemic Avian Influenza

- Regional Meeting on Strengthening Animal Health Information Networking in Asia.
- Expert Group Meeting for Implementation of Surveillance
- Surveillance of wild birds and domestic animals in Asia
- Wrap up meetings on the activities for HPAI control in Asia under the OIE/JTF project

etc.

Background and HPAI Control Projects since 2006

- Big concern of the disease in the Region:

HPAI: Resurgent and continuously reported since 2003 and even in 2009 and 2010 and negative economic impacts and risks to animal and human health

1. OIE/J(S)TF Project for the Region

OIE Project of HPAI control in Southeast Asia

(2006-2007: **Phase I**)

2. Epidemiological changes of HPAI in Asia

OIE/J(S)TF Project for strengthening HPAI control in Asia

1) 5 year Project for Asia (2008-2012)

2) 2 year Project for Asia (2008-2009 : **Phase II**)

for East and South Asia and Mongolia

OIE/JSTF Project for strengthening HPAI Control in Asia (Phase II)

(1) Capacity building of HPAI diagnosis and surveillance

- National Hands-on Workshop on **Real-Time PCR** for diagnosis of HPAI in 2009 - 2010
- Regional Training course for the staff of National laboratories on **Genetic analysis** technologies for HPAI in March 2010

(2) Procurement of Laboratory equipment and materials

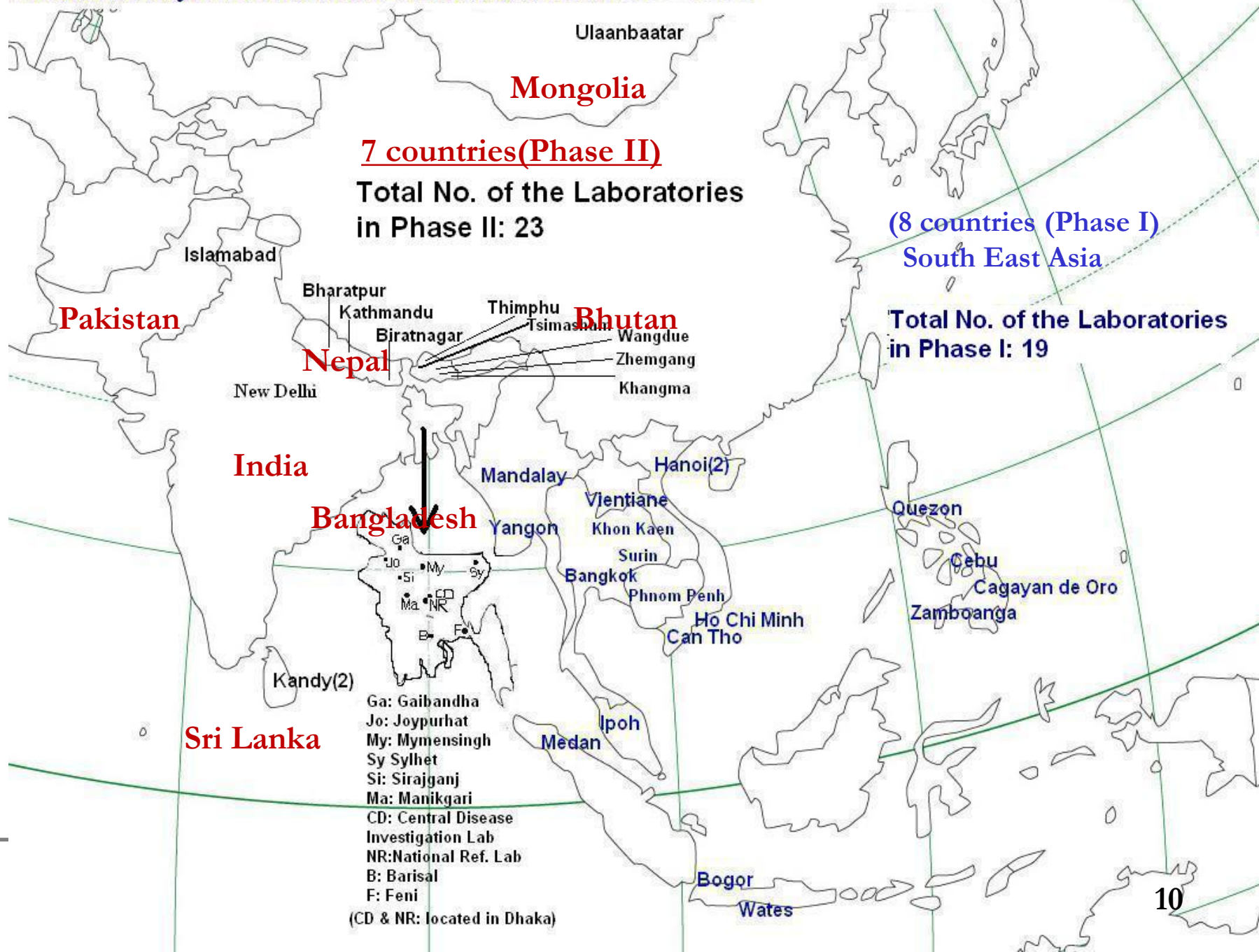
To support (1) above; Laboratory capacity building

Phase II: 7 countries (East and South Asian countries)

India, Sri Lanka, Pakistan, Nepal, Bhutan and Bangladesh+ Mongolia

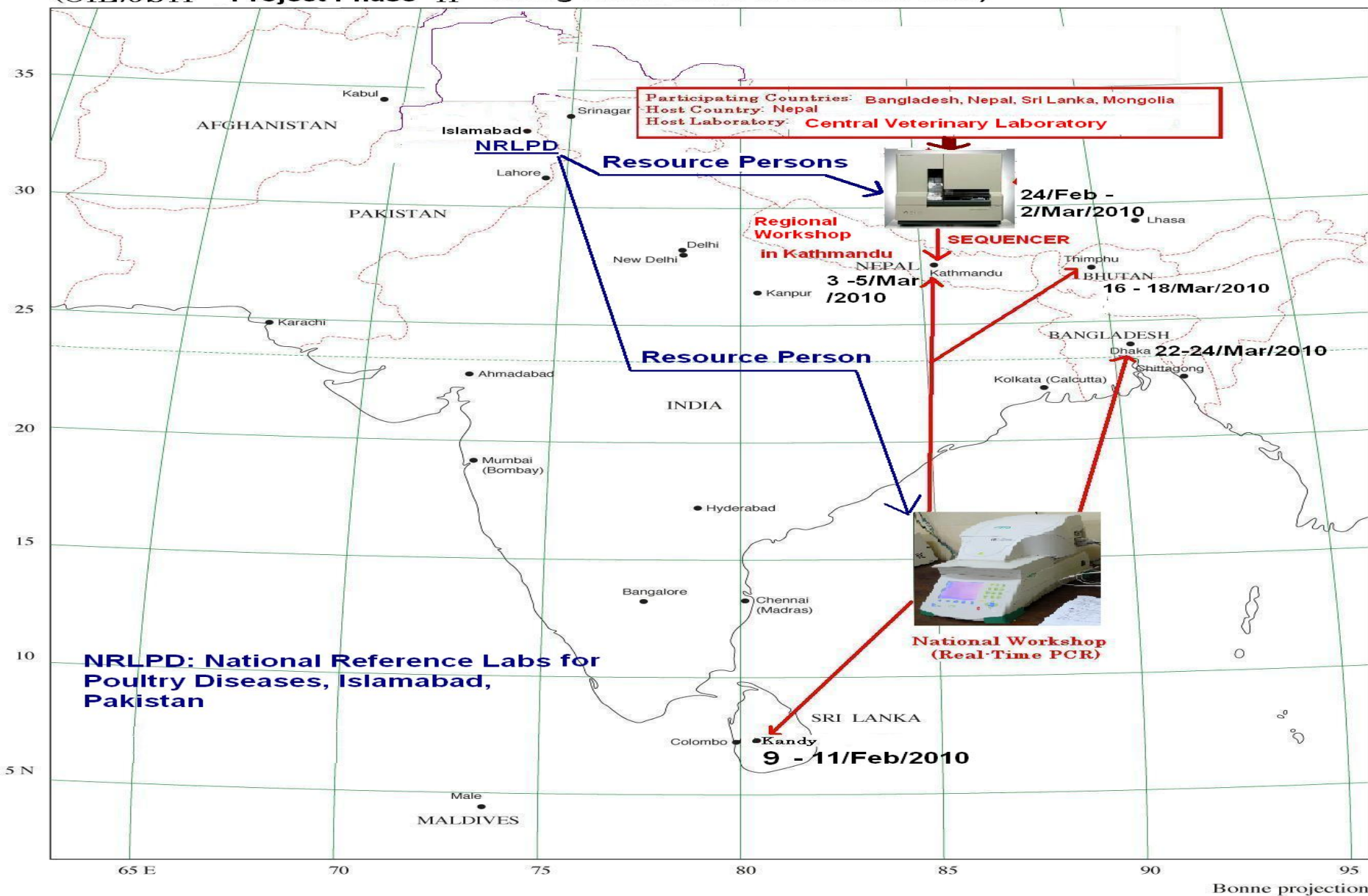
- Identification of national laboratories and listing the required laboratory diagnostic equipment and materials (2008)
(7countries, 23 Laboratories are selected)
- Procurement of the equipment and renovation of the laboratories(2009-2010)

Location of the National Veterinary Diagnostic Laboratories Strengthened Under OIE/JSTF Project Phase I (2006-2007) and Phase II (2008-2009)



Organisation of Regional Workshop and National One
(OIE/JSTF Project Phase II During Fiscal Years of 2008 and 2009)

0 500 1000
 Km



OIE Hands-on Technical Training in SAARC Region under OIE/JSTF Project Phase II (2008 – 2009)

National Training



Diagnosis with Real-Time PCR

in 4 countries

(Nepal, Bangladesh, Bhutan, Sri Lanka)

Regional Training



DNA Sequencing

in Kathmandu, Nepal

Resource Person : Dr Zaheer Ahmed and Dr Naila Siddique,

From Pakistan: National Reference Lab for Poultry Diseases

Outline of the OIE/JTF Project for Strengthening HPAI control in Asia

I Strengthening Information Networking in Asia

To facilitate animal health information exchange and regional cooperation and alliance for disease control

II Strengthening capacity of Legislation and Veterinary Services

For good governance of VSs, and thus early detection and rapid response for disease control

Training on legislation and diagnostic technologies for HPAI control

III Surveillance of wild birds and domestic animals along migratory flyways

Epidemiological Information

To provide supportive information for awareness and effective control measures

- Surveillance of AI viruses, and epidemiological study related to flying routes of migratory birds

Test results

Samples

Database

Monitor and characterize the virus for preparedness and effective control

- **Establishment of a database for AI virus to be accessible by OIE Members**

Virus characterization



AI viruses



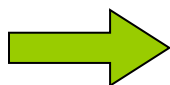
Diagnosis

Capacity building for diagnosis

- National laboratories

↕ Collaboration

- **OIE Reference Laboratory (Hokkaido University)**



HPAI control in Asia

Meeting related to OIE/JTF project for HPAI Control Projects in Asia

1. Inception Meeting, Tokyo

April 2008 :

- To start and consultation on the Project
- To discuss the frame work of the Project
- To discuss the outline of the activities

2. Expert Meeting, Tokyo (Component III)

1st :October, 2008

2nd : May 2009

3rd :June 2010

4th :June 2011

5th :December 2012

Implementation of Surveillance of Wild Birds and
Domestic Animals along Migratory Flyways

- To discuss the implementation plan (frame work)
- To define the countries to be focused for surveillance
- To discuss the field surveillance activities
- To share the information of achievement by the project

3. Information Networking Meeting, (Component I)

1st : November, 2008,(Tokyo)

2nd : September, 2009,(Tokyo)

3rd :September 2010, (Tokyo)

4th :September 2011 (Chiang Mai)

5th :October (Hanoi)

- To share up-to-date information of HPAI control strategy including the Vaccination strategy
- To discuss and share the experience of animal health information Network development

The 5th Regional Meeting for Strengthen Animal Health Information Network in Hanoi, Vietnam 2-3 October 2012



Main recommendation of the 5th OIE Regional Meeting for Strengthen Information Network

- Technical partners (OIE,FAO etc.) should support existing platforms for sharing and exchanging information about HPAI situation and experience in controlling the disease in Asia.
- Members should consider all HPAI control strategies including vaccination when and where appropriate.
- Attempts should be made to consolidate experiences in reducing risks in the poultry market chain and to identify good practice guidelines and options for disease control.
- Members should strengthen field studies and surveillance programme to monitor and better understand the HPAI H5N1 situation in their territories

Surveillance of Wild bird and Domestic animals along migratory flyways (Component III)

Objective

- To provide supportive information for awareness and effective control measures on HPAI
- To understand the possible role of wild birds in the transmission or spread of HPAI H5N1 virus in the Region

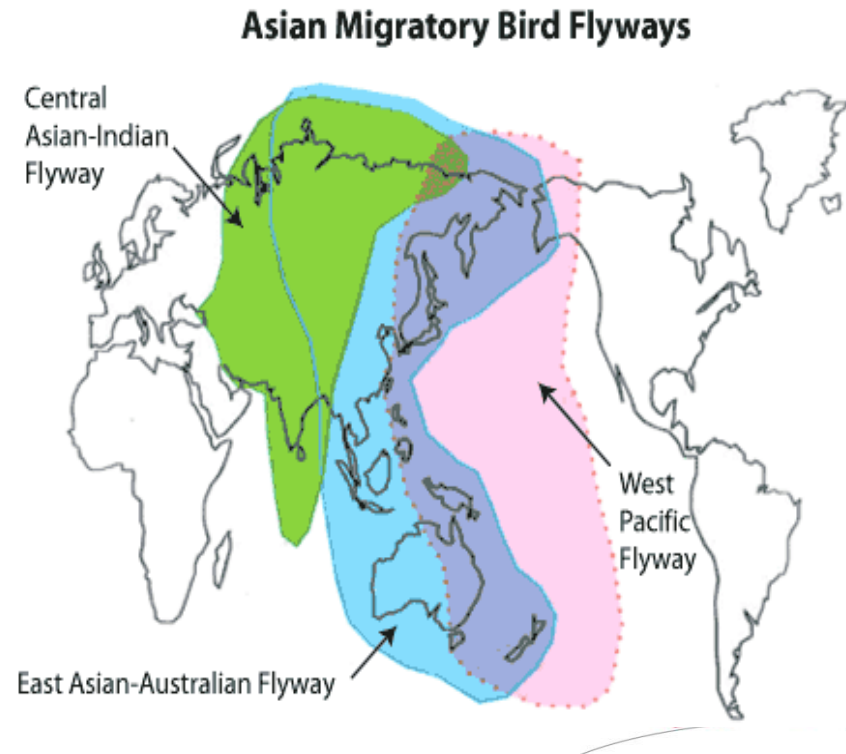
Activities

- Surveillance of AI viruses, and epidemiological study related to flying routes of migratory birds
 - Poultry (Back yard, Live Bird Market and Farm)
 - Wild bird **(Within a 30 km radius of wild bird capturing sites)**
 - Environment (Dropping, Lake water)
- Investigate Wild Bird flyways by telemetry study
- Analyze isolated viruses and establish the Data base of the viruses in Reference Laboratory (Hokkaido University)

Selection of Country for AI surveillance

How countries/territories were selected?

1. Recent HPAI H5N1 incidences
2. **Asian Migratory birds Flyways**
3. Provision of samples to OIE Reference Lab
4. Access to relevant information concerning migration of wild birds
5. Local experts on wild birds (ornithologists)
6. **Steady framework for cooperation**



Implementation procedure for AI Surveillance

Expert Group Meeting

- Annually convenes in Tokyo,
- To discuss the annual implementation plan,
- To share information, etc.



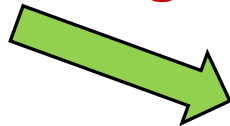
AI Study Mission

- Discussion with Authorities of Veterinary Services
- Field visit to identify candidate sites for wild bird capturing, etc.



Working Group Meeting

- At local level
- To start AI surveillance



Surveillance

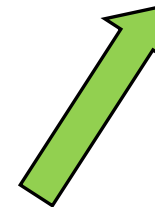
- Government official
- Provincial official
- Local veterinarians

AI virus study

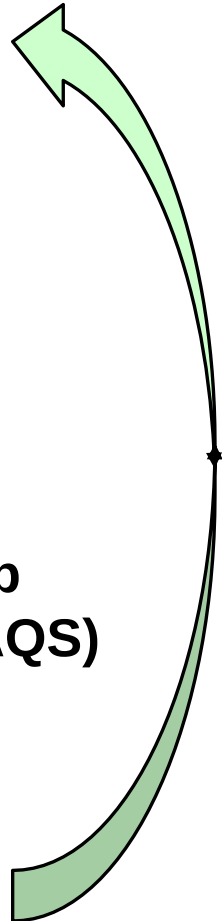
- OIE Reference Lab (Hokkaido Uni. and AQS)



Report



Samples



Selection of Countries for AI Surveillance

● 1st & 2nd year (April 2008- March 2010)

Region: East and Southeast Asia

- 1st year (2008-2009):
Hong Kong SAR, Vietnam(2sites)
- 2nd year (2009-2010):
Vietnam(2sites) , Laos and Mongolia (2sites)

● 3rd – 5th year: (April 2010-October 2012)

Focused Countries: Effective and consecutive surveillance

- 3rd year (2010-2011):
Vietnam (2 sites) and Mongolia(2sites)
- 4th year (2011-2012):
Vietnam (2 sites) and Mongolia (3sites)
- 5th year (2012):
Vietnam (2sites) and Mongolia (3 sites)

Surveillance of Wild bird and domestic animals along migratory flyways (Component III)

(Countries / territories surveyed studied)

Countries/ Year	Vietnam	Mongolia	Lao PDR	Hong Kong
2009	Poultry (BY, LBM) Environment Wild bird	Poultry (BY, LBM) Environment Wild bird Telemetry study	Poultry (BY, LBM) Environment Wild bird	Virus isolated from National programmne and samples
2010	Poultry (BY, LBM) Environment Wild bird	Environment Wild bird Telemetry study	NT	NT
2011	Poultry (BY, LBM) Wild bird	Environment Wild bird Telemetry study	NT	NT
2012	Poultry (BY, LBM) Wild bird	Environment Wild bird Telemetry study	NT	NT

BY: Back yard poultry

LBM: Live bird market

Environment: Dead wild bird, Faces and lake water

Basic Methodology of Sample Collection

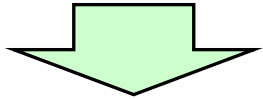
Wild bird	• Number : 100 birds • Sample : 2 swabs (cloacal & tracheal) • Species : Anseriformes (e.g. Northern Pintail, Bar-headed goose, Mallard, Whooper Swan) and other species of water bird
Domestic bird	• Number : 300-400 birds • Sample : 2 swabs (cloacal & tracheal) • Species: duck, goose, chicken • Premise: backyard, live bird market, farm, etc (Within a 30 km radius of wild bird capturing sites)
Environment	• Sample: dead wild birds, fresh droppings, lake water • Number: 10-100 samples

AI virus study

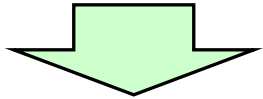
- **Target:** Influenza A virus (all serotypes: H1-H16)
- **Process:** OIE Reference Lab. (Hokkaido Univ.)
Chubu Diagnosis Center of AI :AQS

1. Screening testing

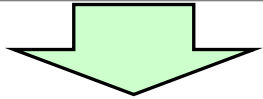
LAMP (Loop-mediated Isothermal Amplification)



2. Virus isolation



3. Isolated AI viruses were analyzed and establish the Data base in Reference Laboratory (Hokkaido University)



4. Others (Characterization of viruses)

Capacity building under the OIE/JTF project for HPAI Control Projects in Asia (Component II)

1. Regional training workshop on legislation and disease control strategies

September 2009 (Combined with 2nd Information Networking Meeting)

2. HPAI molecular Data analysis Workshop

May 2009 OIE Reference Laboratory (Hokkaido University)

3. Follow up Training for HPAI Diagnosis

(* Supported by programme F)

November 2010 - Follow up Hands on Training of DNA Sequencer in Myanmar

June & August 2011 - Based on the request from the Mongolia, the follow-up training for the HPAI surveillance was organised in collaboration with Reference Laboratory
August 2012

3. Others related to HPAI control under the JTF (Programme A and F)

Programme A

: Support for animal health services

- Co-organization of the regional workshops for recent topics with APHCA and FAO
- Publication of the Quarterly Reports on Aquatic Animal Diseases (QAAD)
- Development of the OIE/NACA WAHIS Regional Core
- Provide the information by the OIE Regional Web site etc.

Regional Disease Information related to HPAI

The Interface of program for **Regional Animal Health Information** (RAHIS) was developed in 2009 at OIE Asia Pacific Web Site

The information is extracted from WAHIS includes reports of outbreaks, outbreak maps, time series analysis, distribution maps and the latest control measures in particular for **HPAI** and **FMD**

Regional Animal Health Information System (RAHIS)

- ✓ Development of a new computer programme for regional information (since April 2009, HPAI & FMD)

The information on this web site is using a part of data reported by Members of the Asia-Pacific Region through the WAHIS and extracted directly from WAHID.

The image displays three overlapping screenshots of the OIE Regional Representation for Asia and the Pacific website, illustrating the RAHIS system.

Left Screenshot (Main Menu): The OIE logo is at the top left. The header reads "Regional Representation for Asia and the Pacific". A "MENU" sidebar on the left lists various categories, with a red arrow pointing to "RAHIS (HPAI & FMD) (>2005)". The main content area includes "Alerts - Disease Information", "Focus on..." (listing Avian Influenza, BSE, Foot and Mouth Disease, Pandemic H1N1 2009, Rabies, Animal Welfare, Food Safety), "Current Issues", "Disease Database" (with a red arrow pointing to "WAHID"), and "Recently Organized OIE Regional Events".

Middle Screenshot (Diseases Section): The header reads "OIE Regional Representation for Asia and the Pacific Animal Health Information". The "Diseases" section features a red circle around "Highly pathogenic avian influenza", which includes a rooster icon and a brief description: "The information here includes reports of outbreaks, outbreak maps, time against the disease in OIE Members and on the diagnostic laboratories".

Right Screenshot (Foot and mouth disease Section): The header reads "OIE Regional Representation for Asia and the Pacific Animal Health Information". The "Foot and mouth disease" section includes "Reports" (Outbreak Data, Disease Time Series Analysis), "Outbreak maps", "Distribution maps", and "Other Information" (Foot and mouth disease Control Measures, General information on Foot and mouth disease).

New Version of OIE Regional Website for Asia and the Pacific

Oie World Organisation for Animal Health
Regional Representation for Asia and the Pacific

HOME ABOUT US STRATEGIES ACTIVITIES DISEASE INFO DOCUMENTATION GALLERY + ADVANCED SEARCH

+ Home

Activities of Tokyo office

Regional Representation's Activities

- First Coordination Committee Meeting of the OIE/JTF Project for FMD Control in Asia
- Second Regional Short-term Training on Risk Assessment for Veterinary Vaccines Tokyo, 12-16 November 2012
- Workshop for OIE National Focal Point for Animal Production Food Safety Tokyo, 31 Oct- 2nd Nov 2012

Sub-Regional Representation for South East Asia

- History and Mandate
Helping members to prevent, control and eradicate animal diseases
- Key Programmes and Project
STANDZ Initiative, HPED Programme and IDENTIFY Project
- Recent Activities
Capacity building and other activities recently conducted by SRR SEA

News & Highlights

- 11/16/12 **Vacancy Announcement**
Regional Project Coordinator for OIE Regional Representation for Asia and the Pacific
- 10/19/12 **OIE donates 50,000 rabies vaccines to Lao PDR on World Rabies Day**
28 September 2012
- 08/27/12 **OIE launched the second version of its World Animal Health Information System.**
Paris, 27 August 2012
- 05/21/12 **The former Regional Representative received the Gold Medal.**
Paris, May 2012

Activities of Bangkok office

Worldwide Alerts
+ LATEST NEWS ON ANIMAL DISEASES

WAHID

RAHIS

Forthcoming Regional Events

- 03/27/13 **Regional Seminar for OIE National Focal Points on Communication**
Beijing, 25-27 March 2013
- 12/13/12 **5th OIE Regional Expert Group Meeting for Implementation of the Programme on Surveillance of Wild and Domestic Birds along Migratory Flyways**
Tokyo, 13-14 December 2012
- 10/22/12 **Third Regional Workshop on Multi-Sectoral Collaboration on Zoonoses Prevention and Control**
Bali, 26-28 November 2012

+ View All Forthcoming Events

Contact & Address

Regional Representation for Asia and the Pacific
Food Science Building 5F The University of Tokyo

Sub-Regional Representation for South East Asia
c/o Department of Livestock Development

OIE World Conference

Going to be launched in 2013

Programme F

: Strengthen National Laboratory

- Training on surveillance and diagnostic techniques in collaborated with OIE Reference Center
- Short term hands-on training course in collaboration with OIE Reference Centers

Strengthen the capacity for HPAI diagnosis in the national Laboratory by Collaboration with Reference centres

- Individual Training of the Lab staff from Mongolia in collaboration with OIE Reference Lab (Hokkaido Univ.) in June 2011
- On the Job training for DNA analysis of HPAI by the expert from Reference Lab in August 2011 and August 2012

- **New Programme (in place of H) are under consideration for FY 2013 by GOJ.**
- **The follow up activities for HPAI control (including the surveillance) in Asia might be continued in a New Programme.**

**Thank you for
your attention!!**

AI surveillance of domestic birds in Vietnam

Under the OIE/Japan Trust Fund Project (JTF) for Strengthening HPAI Control
in Asia, 2008 -2012



Kenji Sakurai, OIE Asia-Pacific
Tokyo, 13-14 December 2012

Contents

1. Background information
 - H5N1 HPAI situation in Asia
 - Poultry production and marketing systems in Asia
2. AI virus prevalence studies on backyard farms and Live bird markets in Vietnam

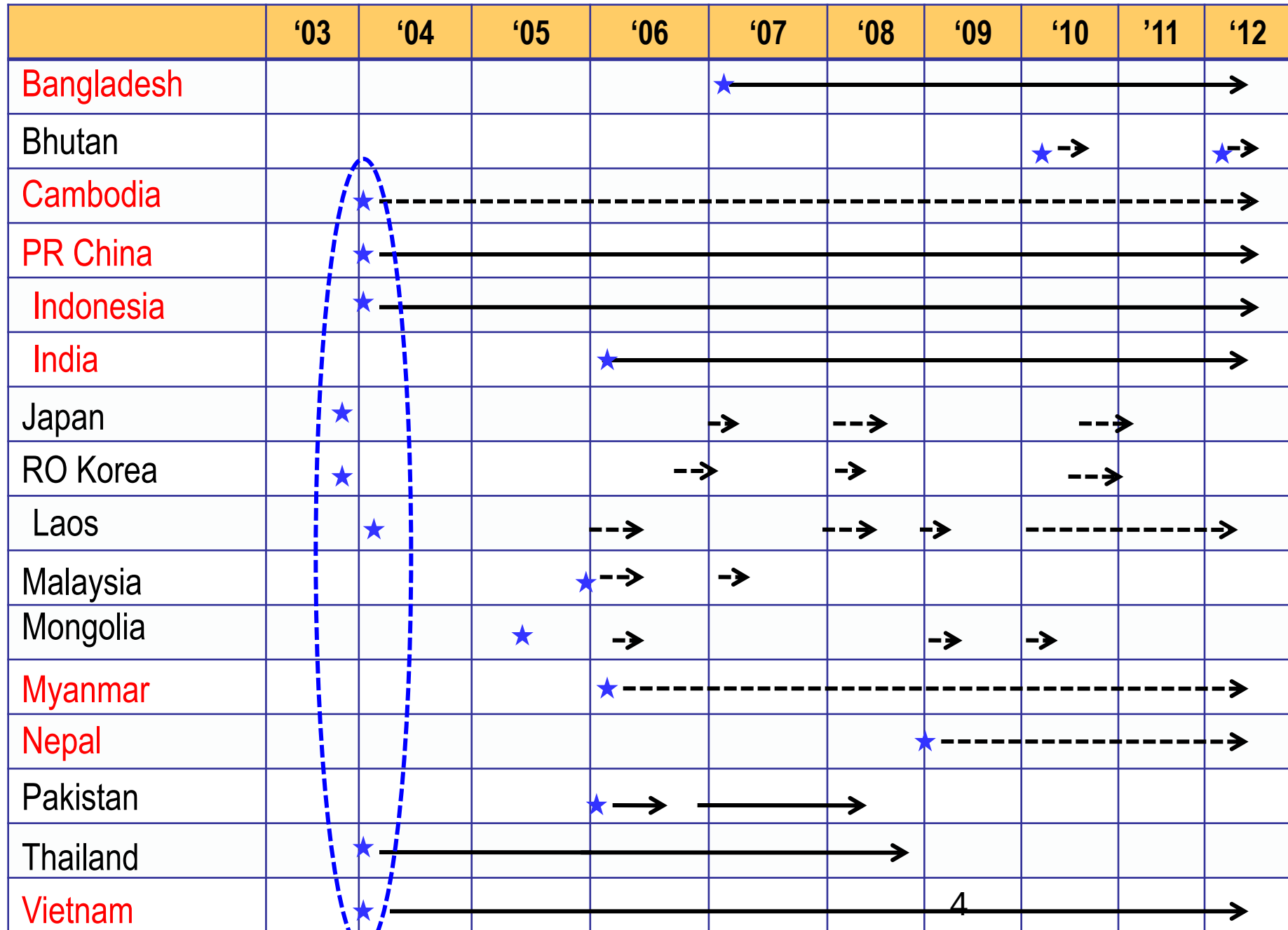
Contents

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Occurrences of H5N1 HPAI outbreaks in Asia



H5N1 HPAI status in Asia

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

Figure in parenthesis: year of the last H5N1 case

Critical factors for the H5N1 control in Asia

- Performance of Veterinary Services
- **Poultry production and marketing systems**
- Movement of poultry and poultry products
- Migratory birds
- Vaccination

Characteristics of poultry production and marketing systems in Asia

1. Large duck population
2. Small scale/household production systems
3. Poultry production systems integrated with rice production systems
(Free ranging ducks)
4. live bird (poultry) marketing systems

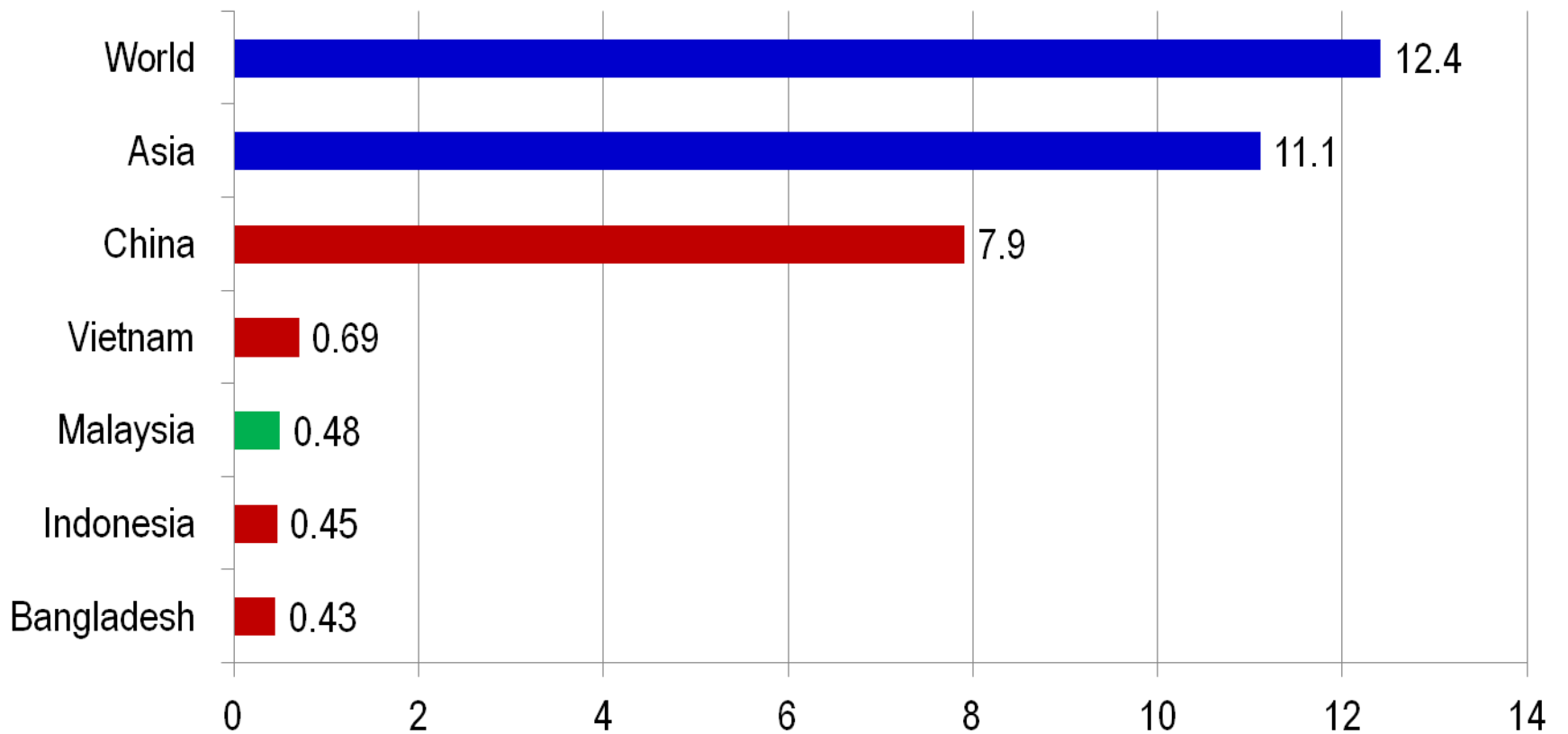


Poultry production and marketing systems in Asia can provide a suitable and comfortable condition for H5N1 virus to circulate in ecosystems.



Duck population

- Asia is home to 90% of world duck population.
- China and Vietnam are home to 80% of duck population in Asia.
- Ducks do not always manifest clinical signs when they get infected with H5N1 virus.



Source : FAO (2010)

Unit : hundred million

Small scale farms

- Poultry production in Asia relies on small scale production systems including household backyard farms.



- 60-70% of total number of poultry in Asia is raised in small scale farms.



- Low bio-security
- Different species

Small scale farms

- Duck production systems are embedded in rice production systems in Asia.
- Free ranging ducks



Live poultry marketing systems (LBMs)

- Live bird markets (LBMs) are ubiquitous and integral part of poultry marketing systems in most of developing countries in Asia.
- LBMs are a preferred place for the locals to purchase poultry or freshly killed poultry for consumption.
- LBMs are situated close proximity to residential areas in a city, village or community.



Main issues of live bird/poultry markets

1. Poultry from multiple producers (mainly small scale farms)
2. Different species of poultry
3. Selling live poultry and slaughtering/cutting process in the same area
4. Lack of appropriate hygiene practice (no clean and disinfection)
5. No sanitation systems (wastewater treatment/disposal)
6. People take poultry live.
7. Overnight poultry (leftover poultry)

Some features of live bird/poultry markets



Key roles of LBMs in AIV infection

- Retail LBMs are a dead-end for poultry, **but not a dead-end for the virus!**

1. LBMs can maintain, amplify and disseminate AIVs and may allow the viruses to persist there for a long period of time.
2. LBMs can serve as a source of infection for farms, because the virus transmission from LBMs to farms may occur through movement of humans, live poultry, contaminated poultry meat and materials/equipment.
3. LBMs possibly help maintain infection in poultry flocks and provide a potential site for intervening to control virus transmission.

Contents

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Areas studied in Vietnam



Time	South	North
2009		1 st (March)
	1 st (April)	
2010	2 nd (March)	2 nd (January)
	3 rd (October)	
2011	4 th (February)	
	5 th (October)	3 rd (September)
2012	6 th (February)	
		4 th (April)
	7 th (October)	5 th (August)

AI virus studies and analyses

- **Target AIV:** Influenza A virus (H1-H16)

- **Testing flow:**

1. Real time PCR (5 birds in 1 pool) → Vietnam
 2. LAMP (5 birds in 1 pool)
(Loop-mediated Isothermal Amplification)
 3. Virus isolation
 4. Genetic analysis (DNA Sequencing)
 5. Serological studies
 6. Others
-
- Japan

- **Public Database:** (1) GenBank/EMBL/DDBJ
(2) Hokkaido Univ. Influenza Database System

Methodology :Sample collection

Sample scale	• 600 head
Main target species	• Duck, Muscovy
Sample category	• 2 swabs (Cloacal & tracheal)
Surveyed site	• 15 Backyards (20 head/premise) • 15 LBMs (20 head/premise)
Others	• Apparently healthy poultry • Without history of vaccine against H5N1

● Total number of poultry surveyed in the South and the North

Species	South	North
Duck	2,957 (95.4%)	2,233 (88.4%)
Chicken	137 (4.4%)	290 (11.5%)
Others	6 (0.2%)	2 (0.1%)
Total	3,100	2,525

Prevalence of AI virus from 4 different angles

- I. Number of LPAI and HPAI virus isolate
- II. Number of AIV isolates in backyard and LBM
- III. Subtype of AIV isolates
- IV. AIV positive rate of backyard and LBM (at a premise level)

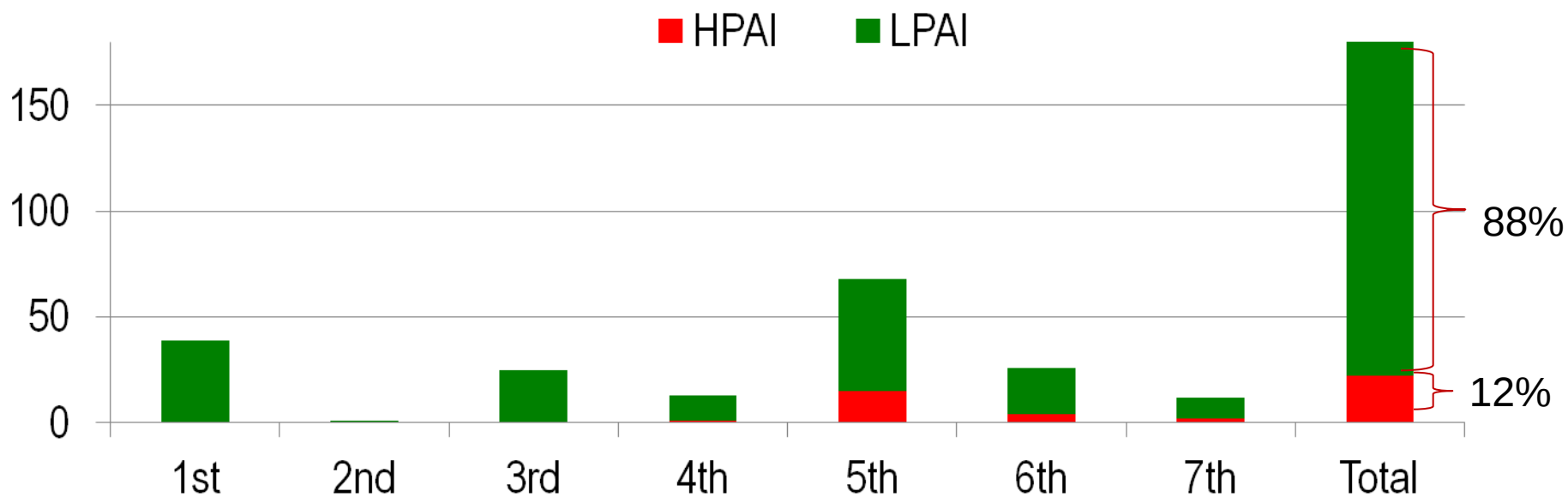


Backyard poultry



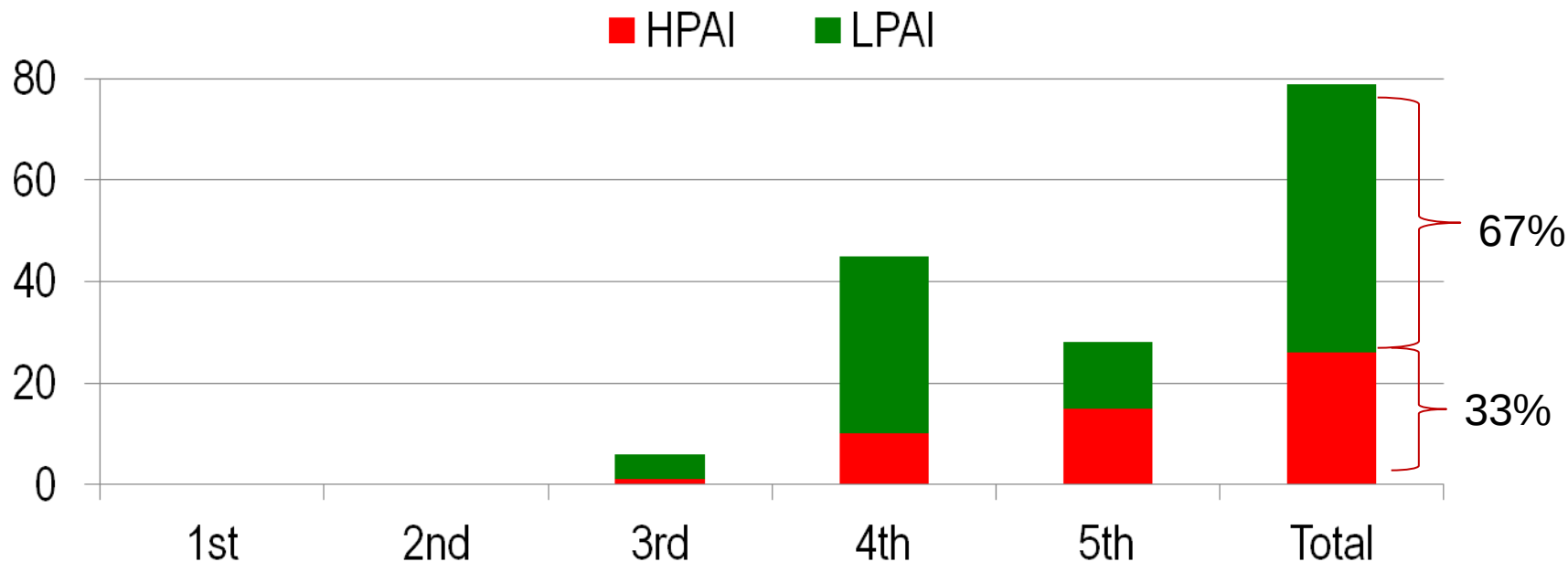
LBM poultry

(I) LPAI and HPAI virus isolate in the South



	Apr.' 09	Mar. '10	Oct. '10	Feb. '11	Oct. '11	Feb. '12	Oct. '12	Total
LPAI	39 (13.0%)	1 (0.3%)	25 (8.3%)	12 (3.0%)	53 (8.8%)	22 (3.7%)	10 (1.7%)	162 (6.1%)
HPAI	0	0	0	1 (0.3%)	15 (2.5%)	4 (0.7%)	2 (0.3%)	22 (0.8%)
No. of bird	300	300	300	400	600	600	600	3,100

(I) LPAI and HPAI virus isolate in the North



	Mar.' 09	Jan. '10	Sep. '11	Apr. '12	Aug. '12	Total
LPAI	0	0	5 (0.8%)	35 (5.8%)	13 (2.2%)	53 (2.1%)
HPAI	0	0	1 (0.2%)	10 (1.7%)	15 (2.5%)	26 (1.0%)
No. of bird	350	375	600	600	600	2,525

Summary-I

(I) LPAI and HPAI virus isolate

- LPAI viruses were more frequently isolated from poultry in the South than in the North.
- However, the number of HPAI virus isolate in the North was slightly larger than that in the South.

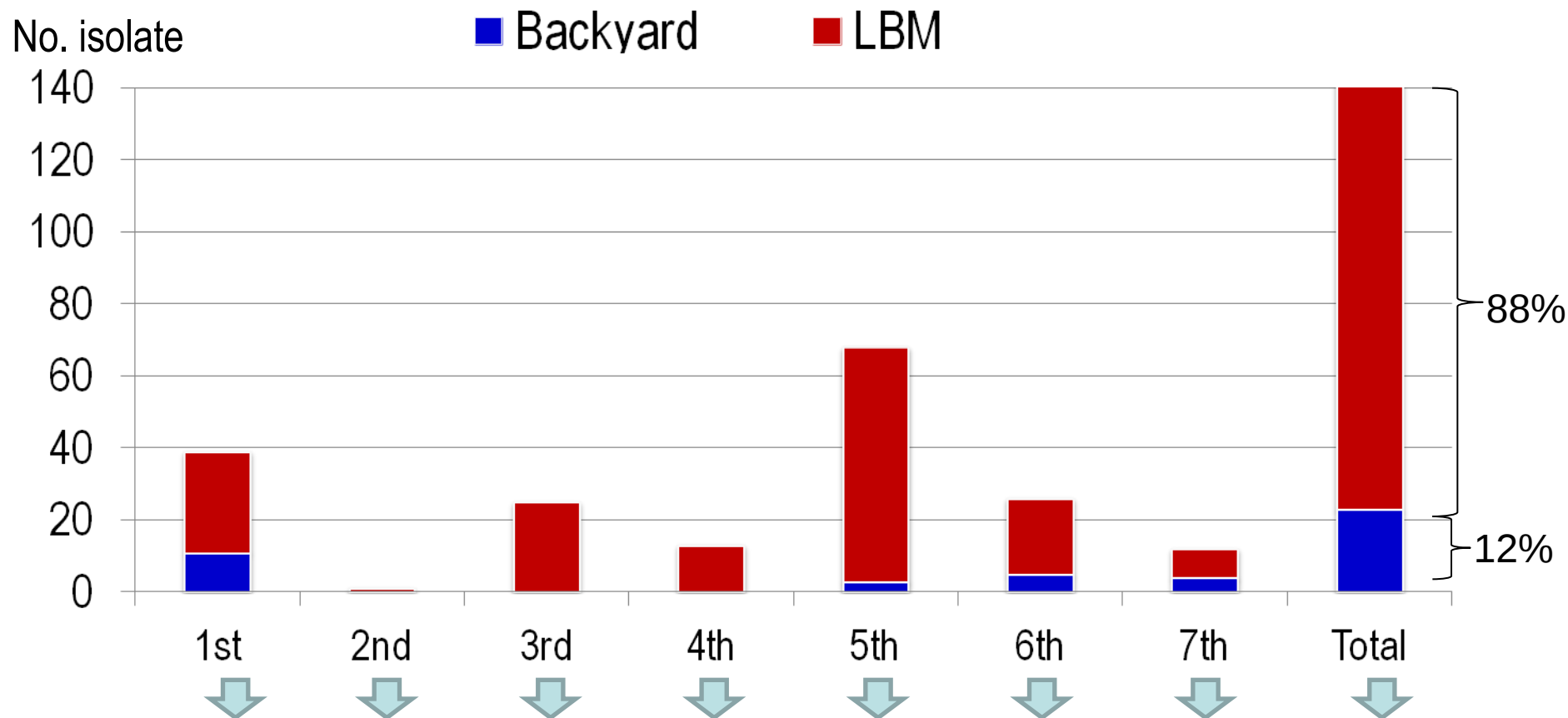
	No of bird	LPAI	HPAI	Total
South	3,100	162 (5.2%)	22 (0.7%)	184 (5.9%)
North	2,525	53 (2.1%)	26 (1.0%)	79 (3.1%)

(II) AI virus isolate in backyard and LBM in the South

		Backyard	LBM
No. of bird		1,700	1,400
No. of isolate	LPAI	23 (1.4%)	139 (9.9%)
	HPAI	0	22 (1.6%)



(II) AI virus isolate in backyard and LBM in the South



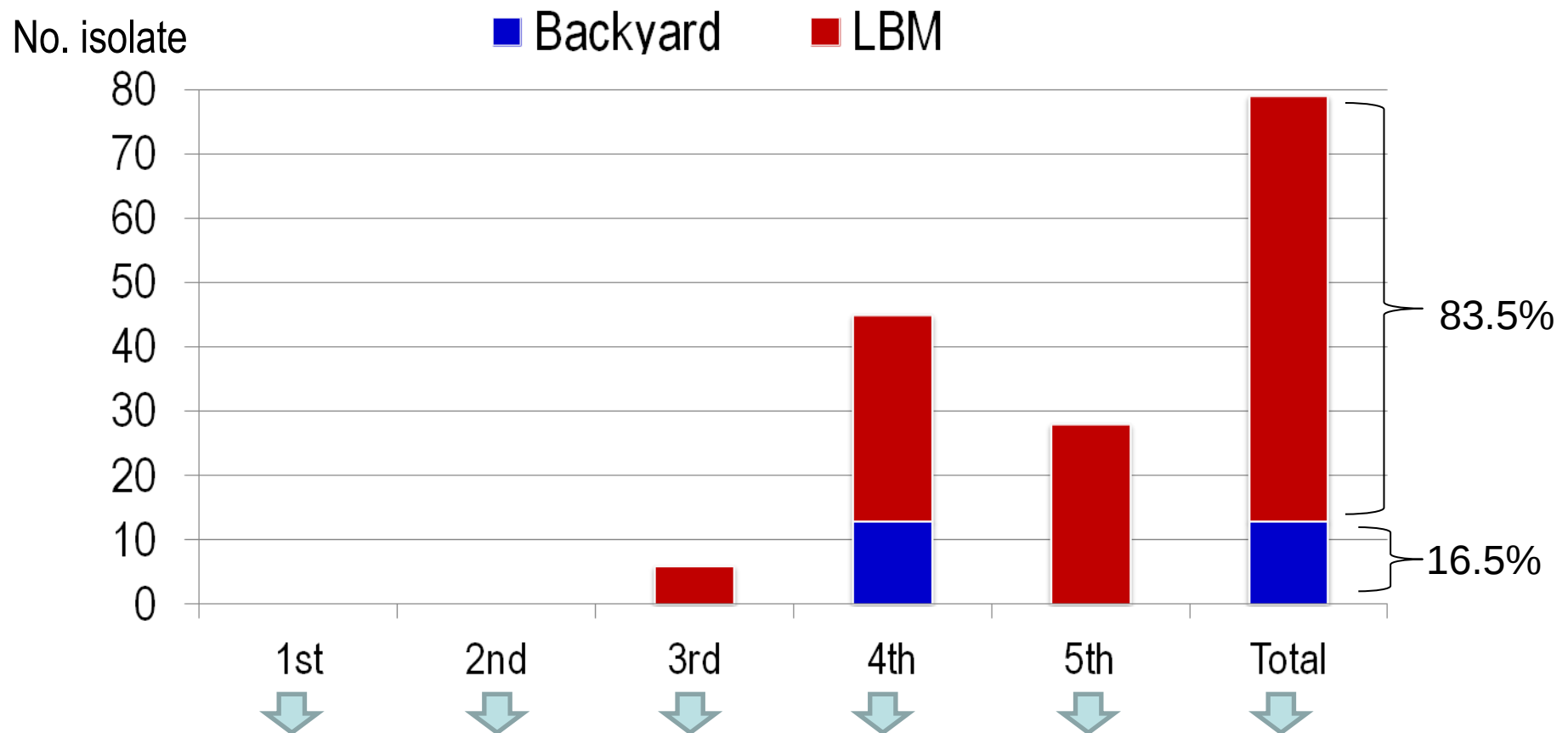
	Apr. 09	Mar. 10	Oct 11	Feb 11	Oct 11	Feb 12	Oct 12	Total
Backyard	11	0	0	0	3	5	4	23
LBM	28	1	25	13 (1)	65 (15)	21 (4)	8 (2)	161 (22)

(II) AI virus isolate in backyard and LBM in the North

		Backyard	LBM
No. of bird		1,475	1,050
No. of isolate	LPAI	13 (0.9%)	40 (3.8%)
	HPAI	0	26 (2.5%)



(II) AI virus isolate in backyard and LBM in the North



	Mar. 09	Jan. 10	Sep 11	Apr. 12	Aug. 12	Total
Backyard	0	0	0	13	0	13
LBM	0	0	6 (1)	32 (10)	28 (15)	66 (26)

Summary-II

(II) AI virus isolate in backyard and LBM

In both the South and the North:

- More than 80 % of AIV were isolated from LBM poultry.
- HPAI viruses were exclusively isolated from LBM poultry.

(III) Subtype of AIV isolates in the South

	1st	2nd	3rd	4th	5th	6th	7 th
No. of isolate	39	1	25	13	68	26	12
HPAI	0	0	0	H5N1 (1)	H5N1 (15)	H5N1 (4)	H5N1 (2)
	6 sub.	1 sub.	2 sub.	4 sub.	5 sub.	8 sub.	4 sub.
LPAI	H3N2 (1)	H9N6 (1)	H6N2 (24)	H6N2 (7)	H3N6 (1)	H4N6 (1)	H3N8 (4)
	H3N8 (1)		H6N6 (1)	H11N5 (3)	H3N8 (7)	H6N2 (1)	H6N2 (3)
	H4N6 (7)			H11N9 (2)	H4N6 (4)	H7N1 (2)	H11N6 (1)
	H9N2 (26)				H6N2 (39)	H9N2 (12)	H11N9 (2)
	H11N3 (3)				H6N9 (2)	H9N8 (2)	
	H11N9 (1)					H10N7 (1)	
						H10N8 (1)	
						H11N3 (2)	

Note: Figure in parenthesis shows the number of isolate.

Subtype of AIV isolates in Backyard and LBM in the South

	1st	2nd	3rd	4th	5th	6th	7th
Backyard	2 sub.	0	0	0	1 sub.	5 sub.	2 sub.
	H4N6 H9N2	-	-	-	H4N6	H7N1 H9N2 H9N8 H10N7 H10N8	H3N8 H11N9
LBM	5 sub.	1 sub.	2 sub.	4 sub.	6 sub.	9 sub.	4 sub.
	H3N2 H3N8 H9N2 H11N3 H11N9	H9N6	H6N2 H6N6	H5N1 H6N2 H11N5 H11N9	H3N6 H3N8 H4N6 H5N1 H6N2 H6N9	H4N6 H5N1 H6N2 H7N1 H9N2 H9N8 H10N7 H10N8 H11N3	H3N8 H5N1 H6N2 H11N6

(III) Subtype of AIV isolates in the North

	1st	2nd	3rd	4th	5th
No. of isolate	0	0	6	45	28
HPAI	0	0	H5N1 (1)	H5N1 (10)	H5N1 (14) H5N2 (1)
LPAI	0	0	3 subtypes	6 subtypes	3 subtypes
	-	-	H3N8 (1) H4N2 (1) H6N6 (3)	H3N2 (11) H3N6 (9) H4N6 (4) H6N6 (6) H9N2 (4) H11N9 (1)	H3N8 (7) H9N2 (5) H9N8 (1)

Note: Figure in parenthesis shows the number of isolate.

(III) Subtype of AIV isolates in Backyard and LBM in the North

	1st	2nd	3rd	4th	5th
Backyard	0	0	5 subtypes	0	1 subtype
	-	-	H3N2 H3N6 H4N6 H6N6 H11N9	-	H4N6
LBM	0	0	4 subtypes	5 subtypes	5 subtypes
	-	-	H3N8 H4N2 H5N1 H6N6	H3N2 H3N6 H5N1 H6N6 H9N2	H5N1 H5N2 H9N2 H3N8 H9N8

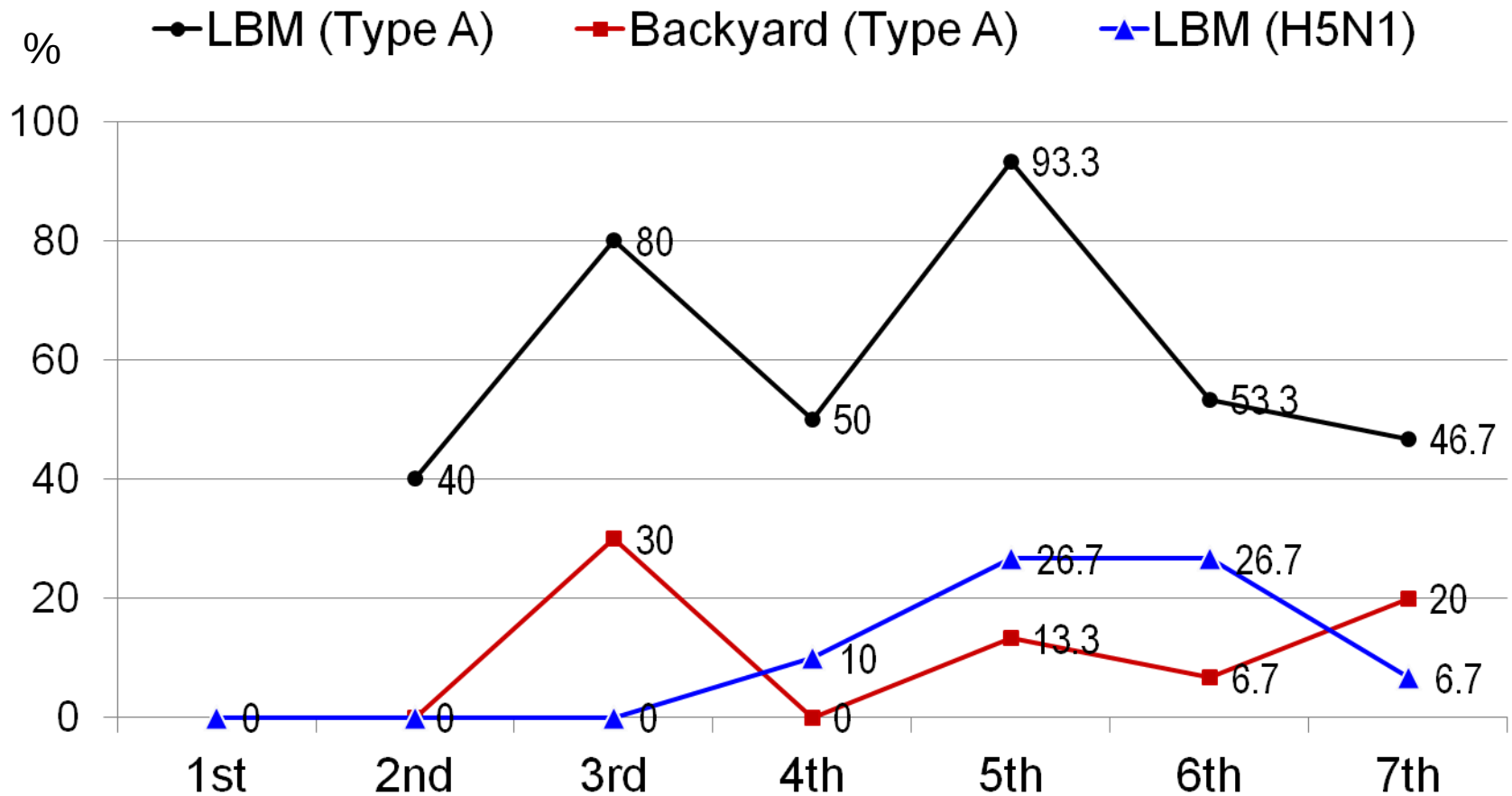
Summary-III

(III) Number of AI virus isolate in backyard and LBM

- Different subtypes of AIV were detected from LBM poultry.
- H9N2 and H6N2 viruses were more frequently isolated in the South.

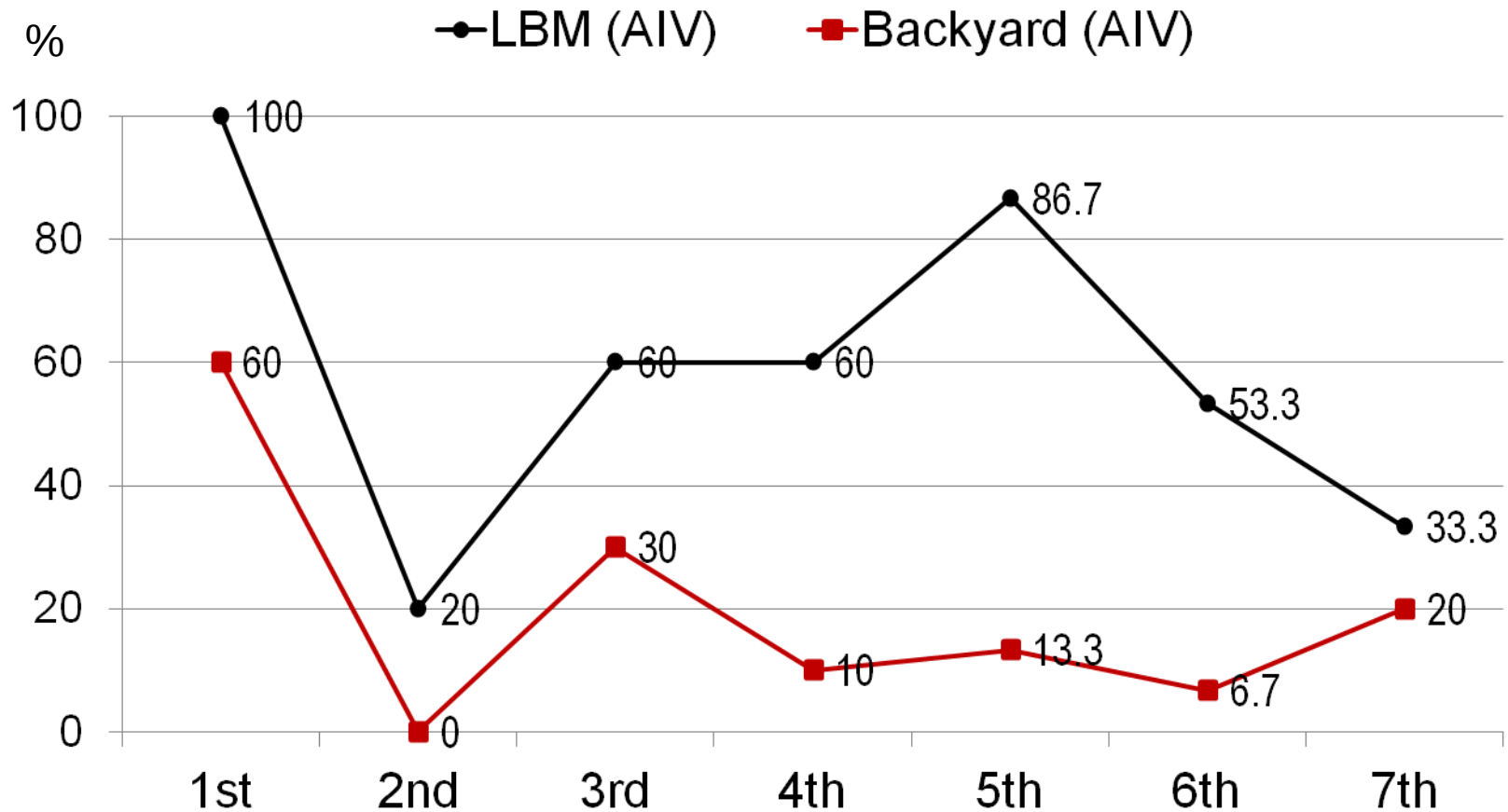
(IV) AIV positive rate of backyard and LBM in the South

Real time RT-PCR in Vietnam



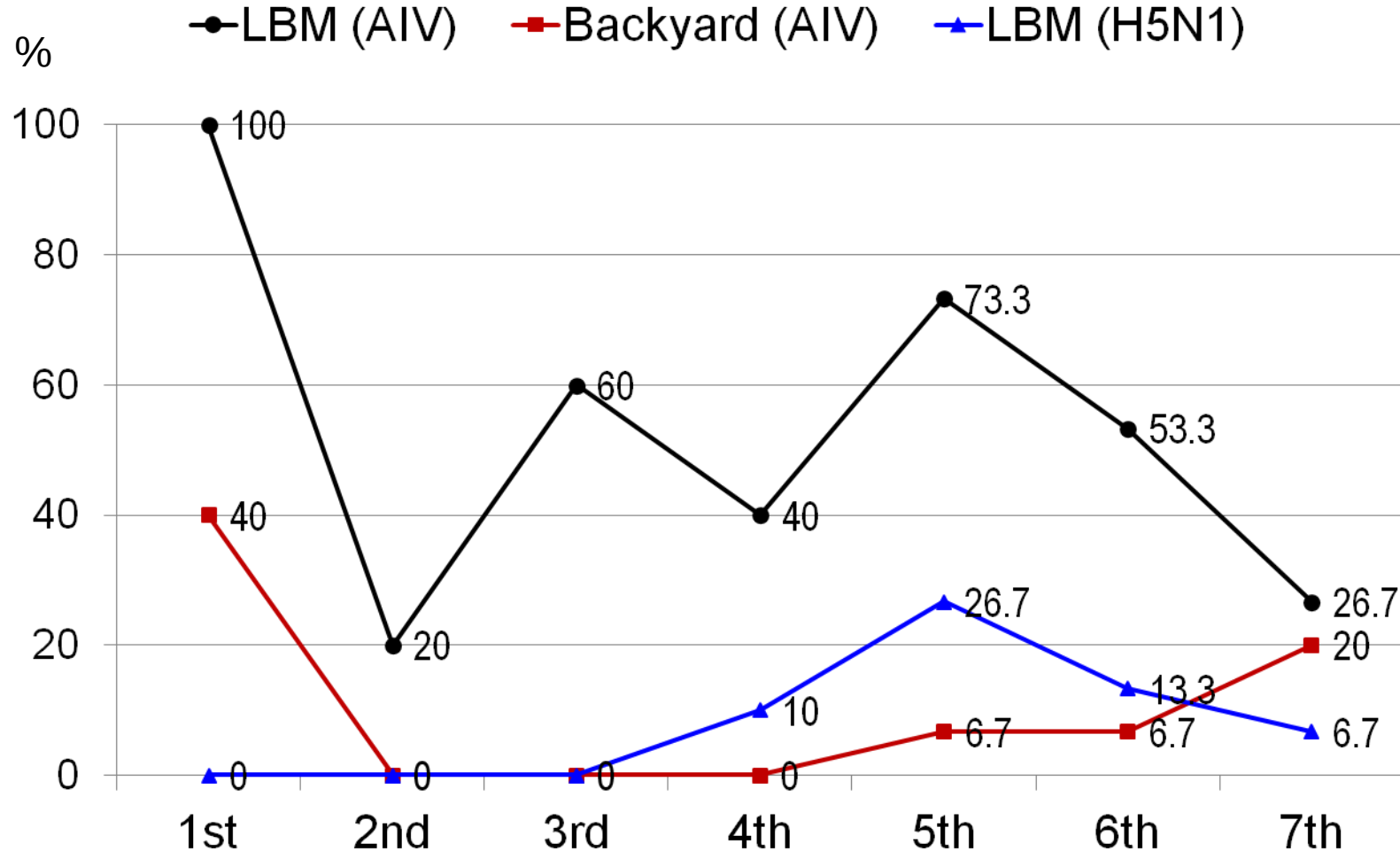
(IV) AIV positive rate of backyard and LBM in the South

LAMP in Japan



(IV) AIV positive rate of backyard and LBM in the South

Virus isolation in Japan



Summary-IV

(IV) AIV positive rate of backyard and LBM

- AIV positive rate of LBM was higher than that of backyard farm in every round of the surveillance.

Overall summaries of the results

- Percentage of LBM infected with AIV was higher than that of backyard farm. Thus, LBM is more likely to be infected with AIVs than backyard farms.
- AIVs were more frequently isolated from LBM poultry than backyard poultry. Thus, LBM poultry is more likely to be infected with AIVs than backyard poultry.
- Different subtypes of AIV were isolated from LBMs than backyard farms. Thus, LBM poultry are more likely to be infected with different subtypes than backyard poultry.
- No H5N1 virus was isolated from backyard farms, while 48 HPAI viruses were isolated from LBMs in the past 2 years. Thus, LBM is more likely to be infected with HPAI virus than backyard farms.

Observations

- LBM can act as the key amplifier of AI virus including H5N1 and maintain the virus in the environment.
- LBM can promote, *more than backyard farms*, the amplification, circulation and dissemination of AI virus in the environment.



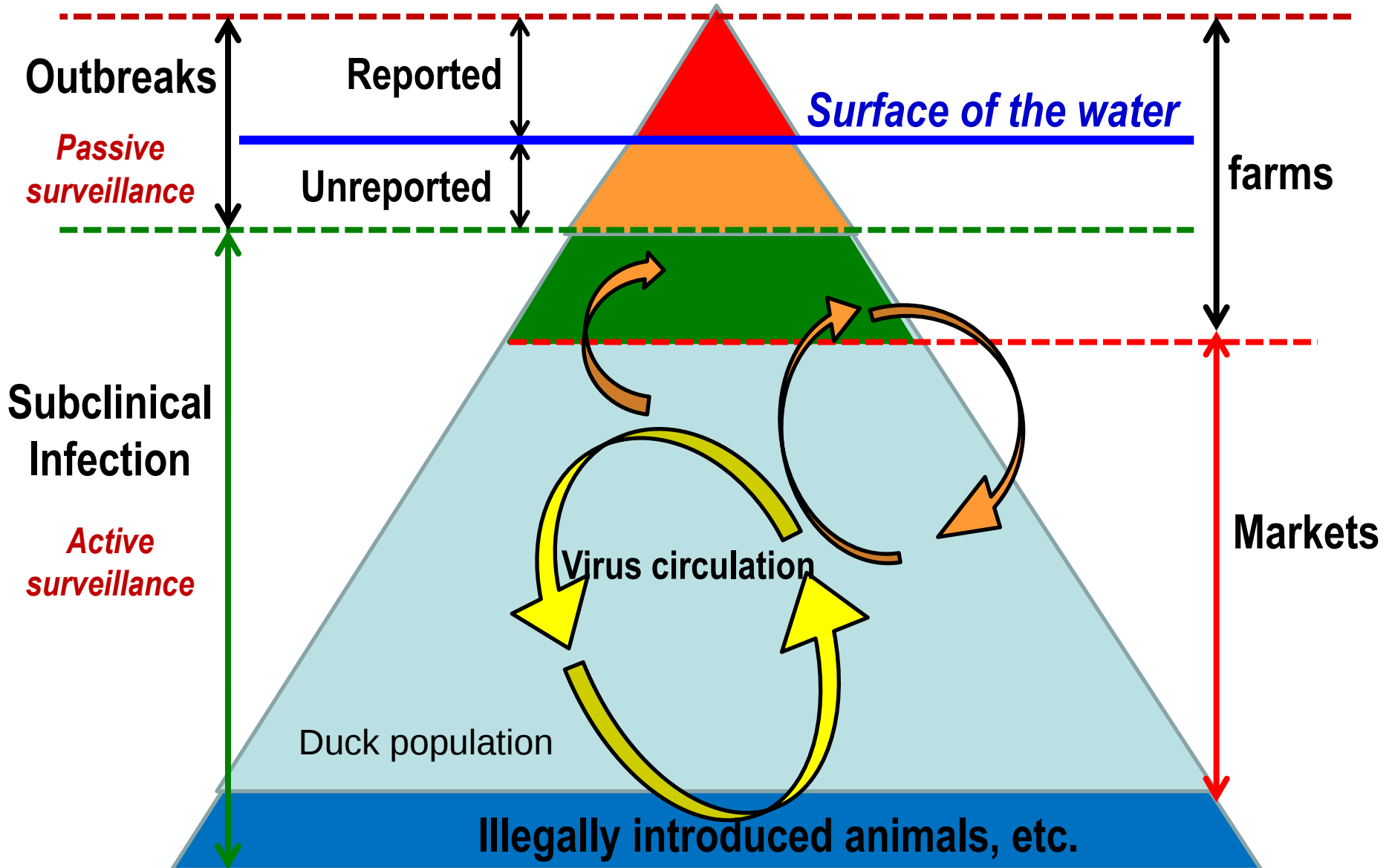
- If we reduce the level of amplification of H5N1 virus in LBM, we can decrease the amount of the virus in the environment.
- If we can decrease the virus load in the environment, the chance of virus transmission from LBMs to farms will also be reduced.

Conclusion

- LBMs should be the primarily target for the H5N1 control in endemically/sporadically infected countries through the combination of various measures including;
 - (1) Regulating the introduction of poultry into LBMs,
 - (2) Improving the hygiene practice (cleaning and disinfection),
 - (3) Regulating the overnight poultry practice
 - (4) Not allowing people to take poultry live, etc.
- Surveillance systems should be incorporated into these control measures to monitor and check the virus level in the environment, which enable us to confirm the progress of the H5N1 control.
- Involvement of local communities and people is of paramount importance to lead the efforts to be successful ones.

H5N1 HPAI situation in Asia

“Tip of the iceberg”



Acknowledgements

- Department of Animal Health of Vietnam (DAH)
- National Centre for Veterinary Diagnostics of Vietnam (NCVD)
- Regional Animal Health Office No. 7 of Vietnam (RAHO-7)
- Hokkaido University (OIE Reference Lab for HPAI in Japan)
- Yamashina Institute for Ornithology in Japan
- National Diagnostic Centre of Animal Quarantine Service of Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF)
- MAFF-Japan (Donor of the Project)



Thank you for your attention.

AI surveillance on wild bird in Mongolia from 2009 to 2012

OIE/Japan Trust Fund Project (JTF) for Strengthening HPAI Control
in Asia, 2008 -2012



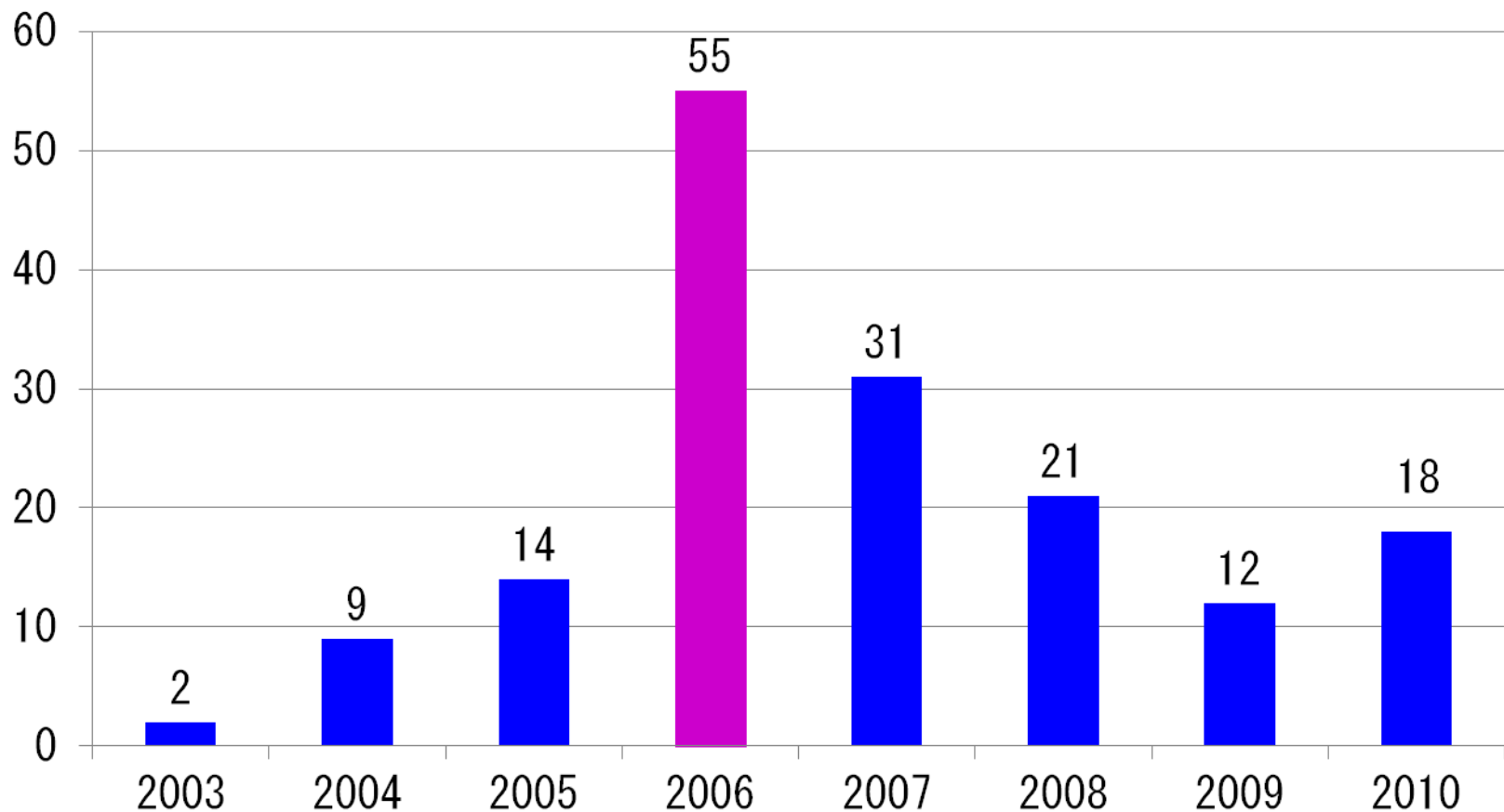
Kenji Sakurai, OIE Asia-Pacific
Tokyo, 13-14 December 2012

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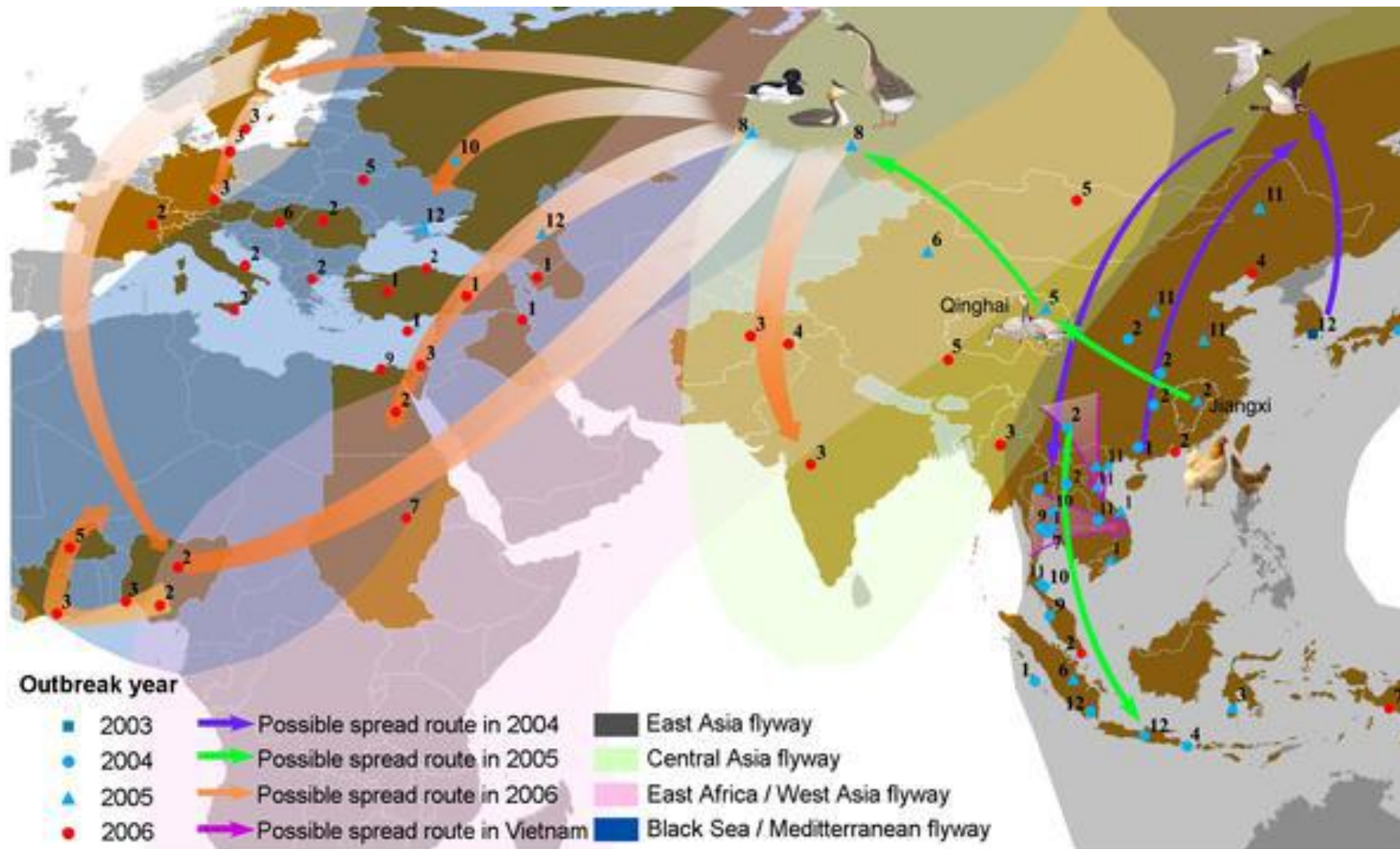
- 1. Some key facts concerning involvement of wild birds in H5N1 spread**
2. Outline of AI surveillance of wild birds in Mongolia

H5N1 HPAI affected countries

- 63 countries has been affected by H5N1 HPAI since late 2003.
- 2005-2006: Long distance transmission from Asia to Europe to Africa to the Middle East



Long distance transmission: Involvement of wild birds



Source: Liang et al –*PLoS ONE* (Oct 22 2010)

Involvement of wild birds

Case-1: spread of **clade 2.2 virus** in Asia

- **In 2005:**

- Over 6,000 wild birds died at **Qinghai Lake in China**. Afterward, number of report on dead wild birds due to H5N1 HPAI virus (clade 2.2) has increased.
- Subsequently H5N1 HPAI outbreaks in wild birds were reported more than **75 wild birds species from 38 countries** in Asia, Europe, Africa and the Middle East.

- **In 2005 and 2006:**

- Clade 2.2 viruses were isolated from wild birds in **Mongolia**.

- **During the winter 2006/07:**

- Clade 2.2 viruses was detected in **Korea and Japan**.

- **In 2006 and 2007:**

- Clade 2.2 viruses were introduced in **India and Pakistan** (2006), and in **Bangladesh** (2007).

Involvement of wild birds

Case-2: spread of **clade 2.3.2 virus** in Asia

- **In 2007:**
 - Clade 2.3.2 virus was detected in Qinghai, **China**.
- **In 2008:**
 - Clade 2.3.2 virus was found in **Japan, Korea, Laos and Russia**.
 - Clade 2.3.2 viruses were isolated from swans in Japan and poultry in RO Korea
- **In May 2009 and May 2010:**
 - Dead migratory birds were found in Qinghai and Tibet, **China**. All the isolated H5N1 viruses classified into clade 2.3.2.
- **In July 2009 and May 2010:**
 - Clade 2.3.2 viruses were isolated from wild birds in **Mongolia**.
- **During the winter 2010/11:**
 - Clade 2.3.2 viruses were isolated from wild birds in **Japan and Korea**.
- **In 2010 and 2011:**
 - **In South Asia**, clade 2.3.2 viruses were first detected in **Nepal** (2010), **India and Bangladesh** (early 2011).

Correlation of H5N1 HPAI outbreaks between “Japan-Korea” and “China-Mongolia”

During the winter 2006/07 and 2010/11, H5N1 HPAI viruses were introduced into both Japan and Korea. At the same time, in spring 2006 and 2010, H5N1 HPAI outbreaks in migratory birds had been reported in both China and Mongolia.

	'03	'04	'05	'06	'07	'08	'09	'10	'11
Japan		★			★	★		★	
Korea		★			★	★		★	
Mongolia			★	★			★	★	
China			★	★			★	★	

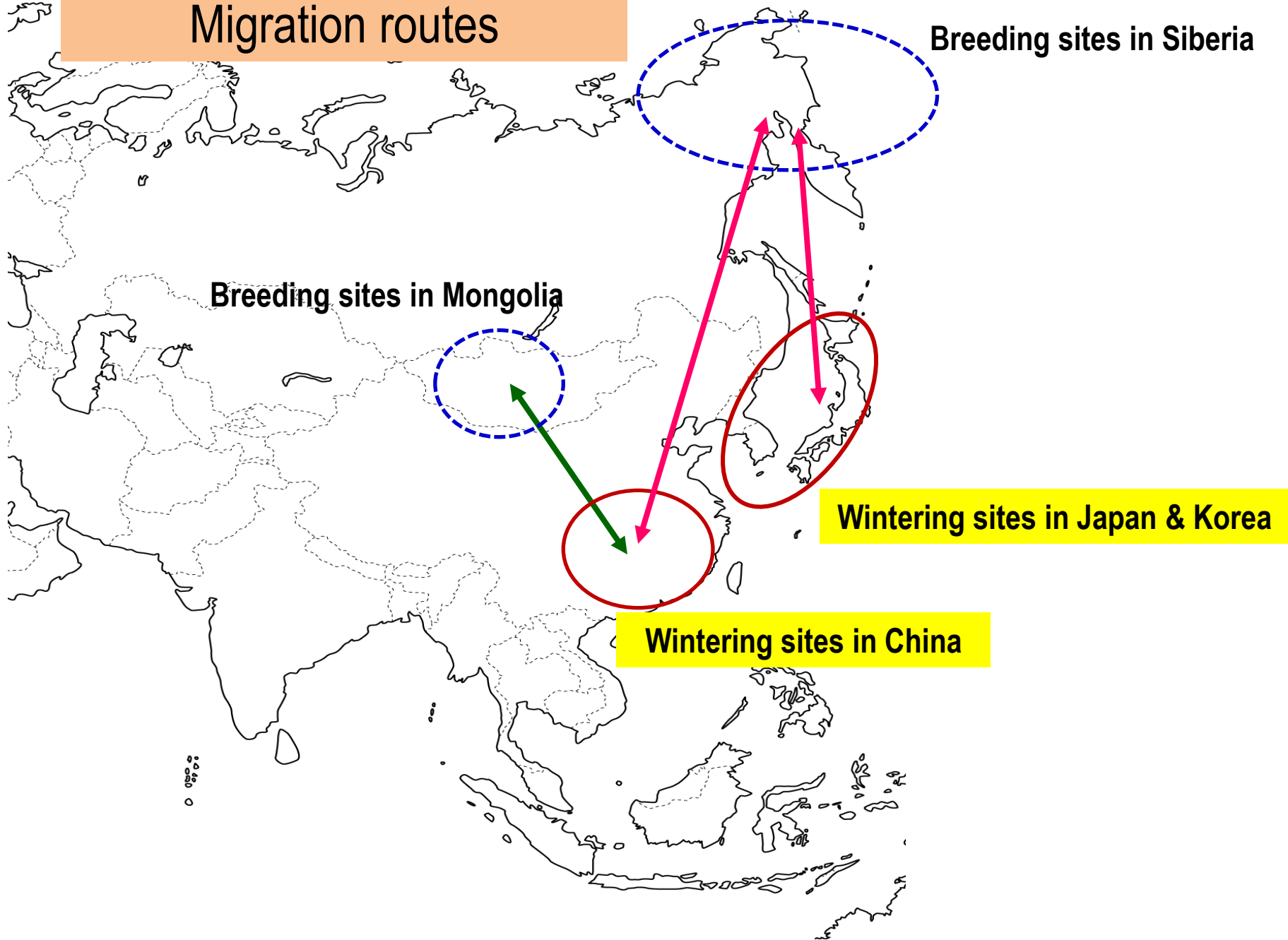
★ Outbreaks in Poultry

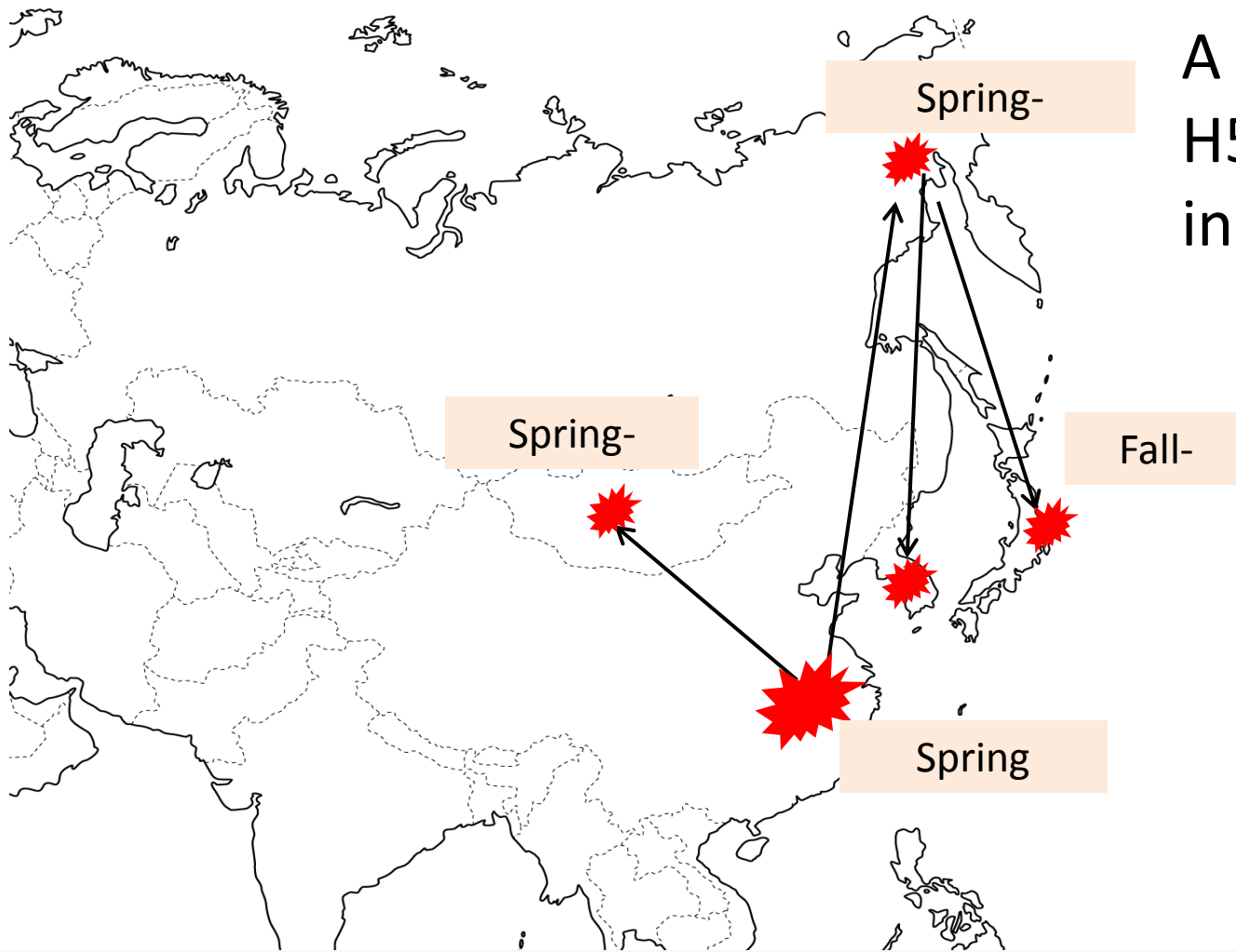
★ Outbreaks in both Poultry and migratory birds

★ Outbreaks in migratory birds

Outbreaks were reported to OIE.

Migration routes





A hypothesis of H5N1 outbreak in East Asia

If a H5N1 outbreak is detected in wild birds in China and Mongolia in this Spring onward, there is a possibility that the disease may be introduced in Japan or RO Korea in the next fall several months after the outbreak in China and Mongolia.

Involvement of wild birds

1. Migratory birds may act as temporary reservoirs for H5N1 HPAI virus and may be responsible for primary introduction of the virus in a previously free area.
2. However, the role of wild birds in the spread and transmission of HPAI viruses has not been clearly understood yet.
3. Furthermore, it is not clear whether or not H5N1 HPAI viruses are maintained in wild bird populations for a certain period of time.
4. Since the first H5N1 outbreak in Indonesia in 2003, the clade 2.1 virus continues circulating only in Indonesia. This fact suggests that wild bird transmission of H5N1 viruses from Indonesia back to mainland Asia have not occurred.
5. The role/involvement of wild birds in introduction/transmission of H5N1 viruses may be different from country to country and is dependent on various factors in each country/region.

Contents

1. Some key facts concerning involvement of wild birds in H5N1 spread
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AI surveillance in Mongolia

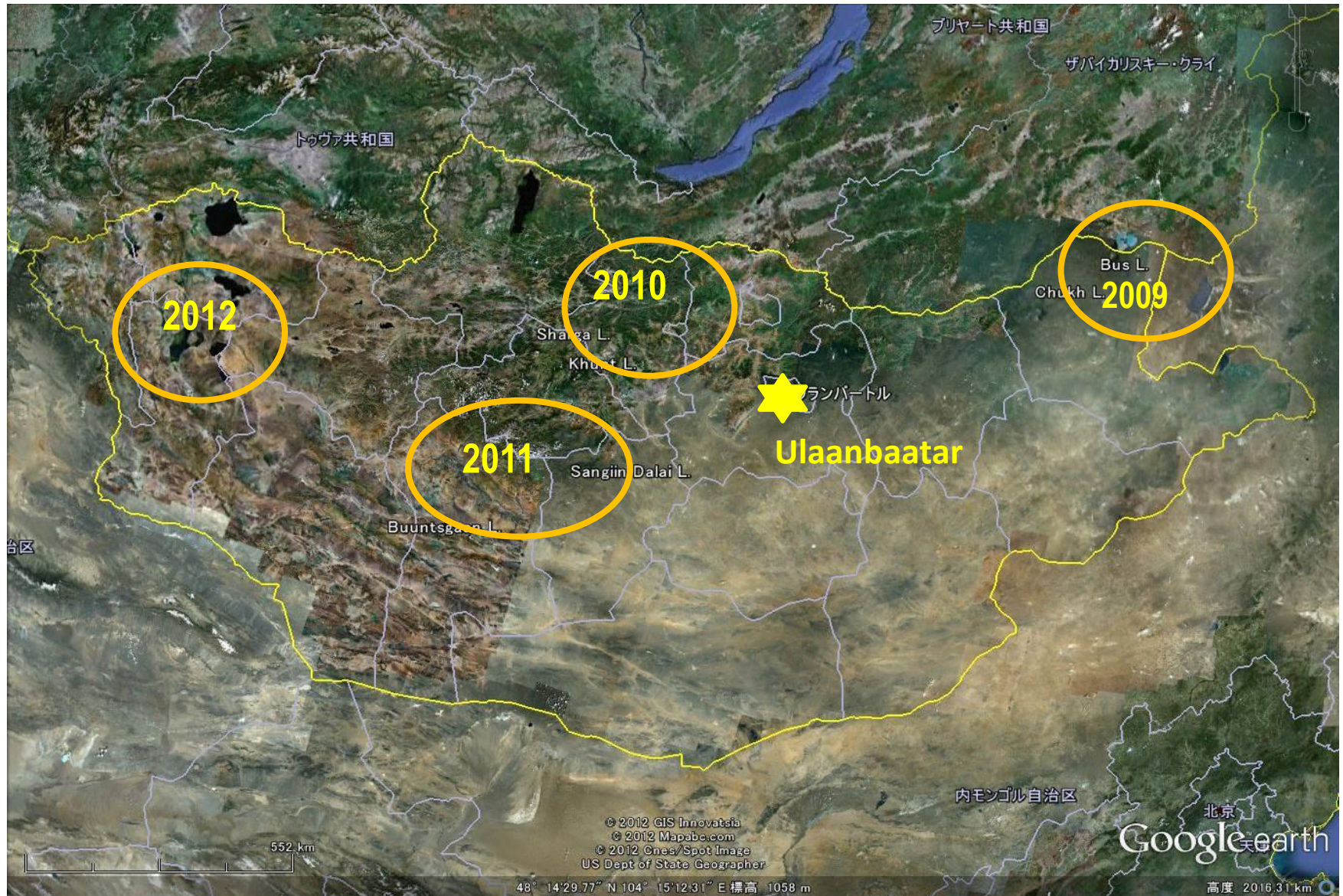
1. AI virus studies:

- Sample collections from wild birds and the environment
- Influenza A virus (H1-H16)
- More focused on the environmental sample (feces)

2. Telemetry studies of Migratory flyways:

- Yamashina Institute for Ornithology in Japan

Four areas surveyed in Mongolia



AI Surveillance in Mongolia

- AI surveillance has been conducted 8 times since July 2009.
- In the 3rd, 5th, 6th and 8th rounds, we focused on the environmental samples to collect in 3 regions (eastern, central and western).
- Number of bird surveyed or samples taken:

	1 st July 2009	2 nd July 2010	3 rd May 2011	4 th July 2011	5 th Aug. 2011	6 th May 2012	7 th July 2012	8 th Sep. 2012	Total
Poultry	300	0	0	0	0	0	0	0	300
Wild bird	108	100	0	55	0	0	56	0	319
Env.	60	54	3,000	311	3,000	838	300	900	8,463

Note: “Env.” means the environmental samples including fresh dropping, lake water.

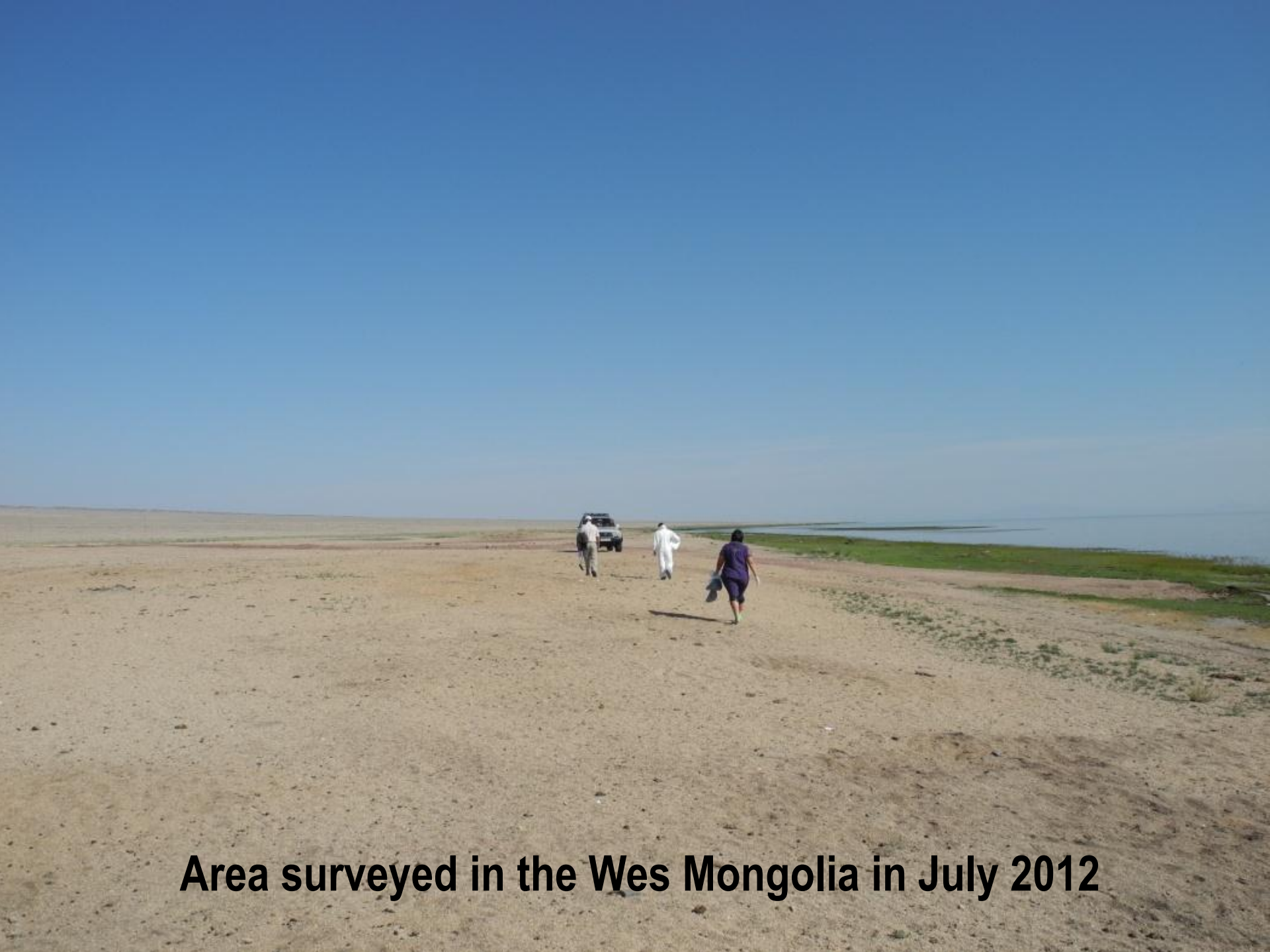
Results of AI virus isolation in Mongolia

- No AI virus was isolated from all the wild birds surveyed.
- In total 6 LPAI viruses were isolated from wild bird feces.

Round	Time	Total No. of Env. Smples	No. of isolate	Subtype	Bird species of feces	Area
5 th	Aug. 2011	3,000	3	H4N6 H3N5 H3N2	Ruddy shelduck Ruddy shelduck Mallard	Eastern Eastern Eastern
6 th	May 2012	838	2	H2N9 H3N8	Gadwall Gadwall	Central Central
8 th	Sep 2012	900	1	TBD	Ruddy shelduck	Central

Taking a swab sample from whooper swan





Area surveyed in the Wes Mongolia in July 2012



Telemetry Study of Wild Bird Flyways

- **Objective:** To track wild birds to trace their flyways
- **Materials:** Argos GPS solar-powered platform terminal transmitter
- **Target species:** Whooper swan and other Anseriformes
- **Data collection & analysis:** Yamashina Institute for Ornithology



*Transmitter and wild birds, in
Central Mongolia, July 2010
(Yamashina Team)*



Telemetry study of wild bird flyways in Mongolia

- Number of wild birds surveyed

Round	Month/Year	location	No. of transmitter	Species
1 st	July 2009	East	5	Whooper swan (5)
2 nd	July 2010	Center	15	Whooper swan (10) Other Aseriformes (5)
3 rd	July 2011	Center	12	Whooper swan (12)
4 th	July 2012	West	10	Whooper swan (9) Tundra swan (1)



Thank you for your attention.