

HPAI Situation and Poultry Disease Control in Lao PDR



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Networking for HPAI control and Prevention in Asia
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I. Poultry production

- Three main poultry production systems co-exist:
 - (A) traditional, small-scale, extensive backyard poultry production, accounting for around 84% of the national poultry flock.
 - (B) semi-intensive, small- to medium-scale, market-oriented, commercial poultry production.
 - (C) intensive, large scale, industrially-integrated poultry production.
- Exact record data for the poultry production sector in accordance with FAO criteria is not available. However, More than 84% of poultry producers are small scale farms (Sector 3, 4) with low bio security. The standard farm clarification is not yet developed.
- More than 70 % of the total poultry population is held by small scale farms and backyard poultry (sector 3, 4).

Poultry type	Farm house holds with (,000)		No. of Livestock (,000)	
	1999	2011	1999	2011
Local Chickens	487	488	9,376	8,665
Com. Chickens	4	4	290	649
Duck	191	213	1,351	1,791



I. Poultry production

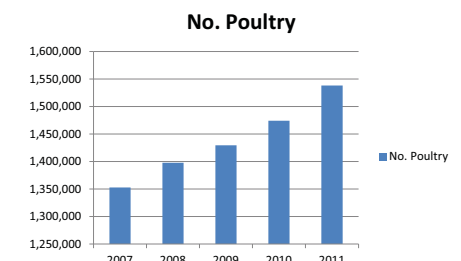
- In 2011, 62% of household farms kept local chickens, compared with 73% in 1999
- Local Chicken numbers fell by over 700,000 between 1999 and 2011. however, the number of commercial chickens rose by 359,000 over that period.
- More then two-thirds of the commercial chickens are in Vientiane Capital. Of adult local chickens, 37% are layers.
- In 2011, 27% of household farms kept ducks, a similar rate to 1999. Duck numbers rose by a third to 1.8 million. Nearly 60% of ducks are boilers



I. Poultry production

- Chickens and ducks are the major species raised, while geese, turkey, pigeon and quail inventories are marginal.
- Four-fifths of all birds are kept in central and northern regions, with the highest poultry and human densities in Vientiane Capital province.
- The current level of poultry production equates to 3.1 kilograms of poultry meat available annually per person.

Number of Poultry by Region					
Province	2007	2008	2009	2010	2011
Northern Region	303,531	312,084	323,405	336,407	356,989
Central Region	780,342	801,457	810,639	834,076	867,669
Southern Region	269,140	284,182	295,503	304,073	313,616
Total	1,353,013	1,397,726	1,429,547	1,474,196	1,538,274



Issues and challenges for H5N1 control at the farmer's level

- In small scale farms, low bio-security level
- Free range/roaming duck system may help H5N1 virus maintain its circulation in the environment.
- Small scale farmers usually do not report sick birds to the local VS.
- Ducks can be found with other species while they do not tend to show clinical signs even if they are infected with the virus.

Good practices to improve H5N1 situation

- Under the FAO and World bank support, projects provide biosecurity training for backyard and semi-intensive farms to the farmer
- Develop guidelines for biosecurity practices for poultry farms
- Develop standard farm guidelines

II. Live poultry markets

- Live poultry markets are common throughout the country .
- Over 90% of live birds sold at these markets are from the backyard poultry and small scale farms.
- Poultry at the markets comes from many sources and some infected poultry may not show symptoms.
- Many animal species are in close contact at the markets.
- Most of the Live bird markets are very poor and have low biosecurity. A poor market with low biosecurity may result in disease spread.
- Poultry are slaughtered at the market. Slaughtering sick or infected poultry at the market is also likely to lead to disease spread as well.
- During the slaughter, blood , feathers, intestine and faeces may contaminate the environment.
- There are very few interventions from veterinary authorities to control and regulate live poultry markets. However, 10 safety markets have been established which are a model for other poultry markets. They present better market management and greater biosecurity through the introduction of increased control and preventive measures including disinfectants and the use of cages to segregate birds from humans.

Live poultry markets



Key Points regarding AI Intervention Measures at Live bird market

Live Poultry market

- increasing public awareness on safety handling poultry and hygiene for the vendor in the LBM
- the increasing of bio-security system for duck production is crucial

Key Points regarding AI Intervention Measures at Live bird market

Fresh Poultry Meat Market

- Zoning of market (stalls selling different foods eg Cooked food, raw meat and vegetables not to be in same area)
- The poultry should not be slaughtered at the market
- Table surfaces should be made of material that is easily cleaned.
- Wash hands after touching poultry meat or eggs.
- Only eviscerated poultry for sale in the market
- Vendors should practice good personal hygiene.
- Improve public awareness on biosafety and biosecurity

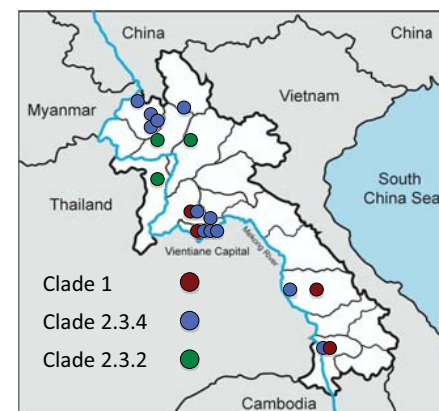


Zoning in market selling live poultry and poultry meat and eggs

Overview of HPAI status in Lao

- Laos has experienced eight HPAI H5N1 outbreaks between Jan 2004 to May 2010.
- Two HPAI-associated human deaths occurred in Feb-Mar 2007.
- Outbreaks between 2004-2007 occurred largely in 4 central and southern provinces: Vientiane Capital, Savannakhet, Champasak, and Vientiane Province, with one outbreak in the north-eastern province of Xiengkhouang in Feb-Mar 2007.
- After Mar 2007 there was a shift in the geographic focus of HPAI outbreaks to the northern provinces of Laos where infection occurred predominantly in duck farms and backyard poultry populations: Luang Namtha (2008), Luang Prabang (2008), Oudomxay (2008), Sayabouly (2008), and Phongsaly (2009).
- The last outbreak occurred in May 2010 at Saythani District, Vientiane Capital.

Background: H5N1 outbreaks in Lao PDR



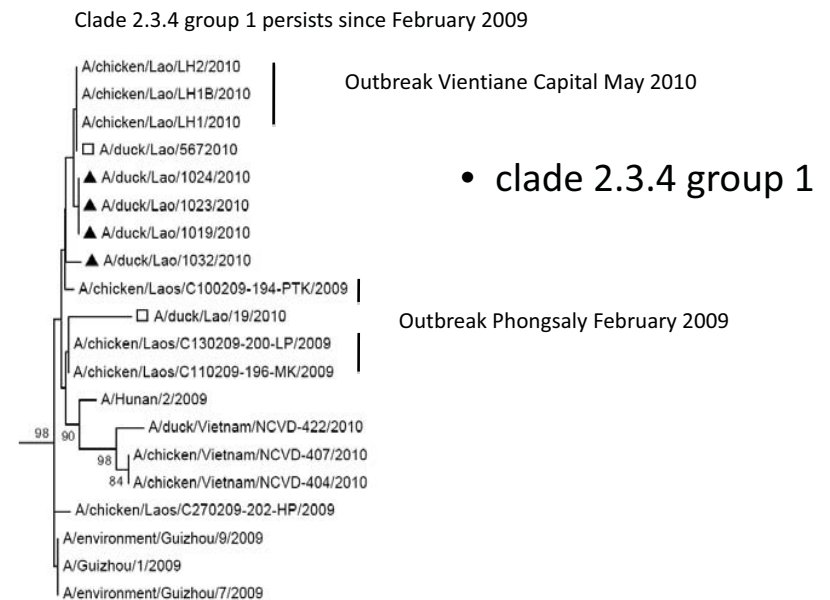
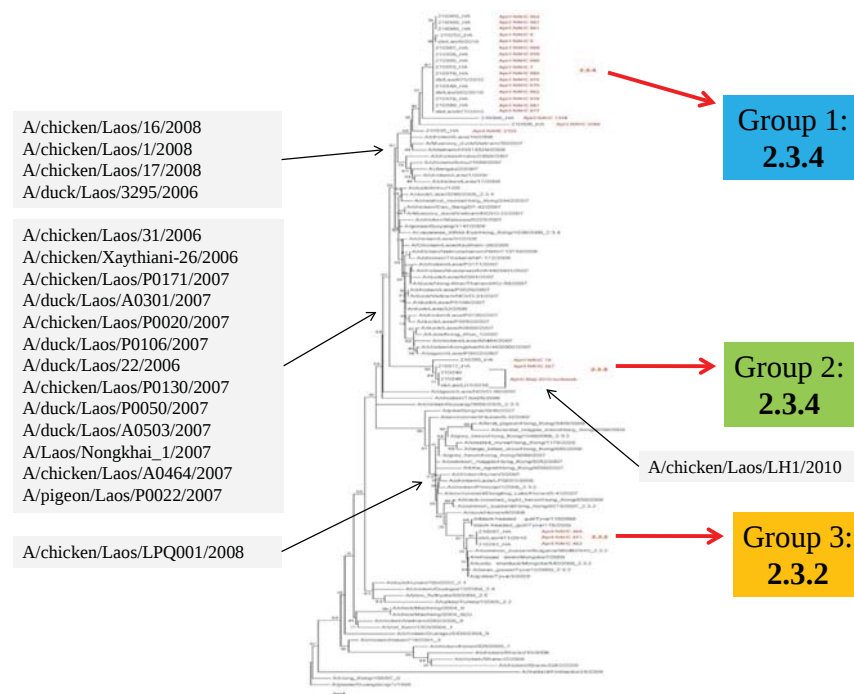
- Eight outbreaks from January 2004 to April 2010
- Clade 1 (early 2004)
- Clade 2.3.4 (2006, 2007, 2008, 2009, 2010)
- Clade 2.3.2 (2008)

Recent H5N1 outbreaks

- All the cases were detected in small scale farms where they raise chicken and ducks in the same place.
- No case of H5N1 has been reported at live bird markets.
- The predominate Clade in 2008, 2009 and 2010 are Clade1.1. and Clade 2.3.2.1. as shown on the next slide.

	2008	2009	2010
Total Number of Outbreak Case	6	7	1
Poultry	12000	2266	1049

Phylogenetic Analysis of HA gene of H5N1 virus



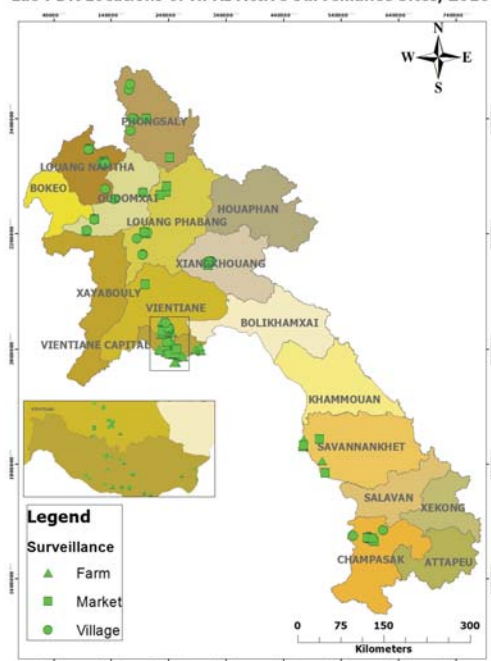
Preliminary analysis

- Geographical diversity suggests the positive sample locations of H5N1 in Lao occurred repeatedly with very closely related strains
- One introduction each of the 2.3.4 viruses (representing first and second Vietnam-subfamilies)
- Based on geographical similarity, samples from Luang Namtha suggest a South Chinese origin
- Current evidence does not suggest that these viruses persist in Lao for longer periods of time, but ongoing serum analysis will hopefully provide some insights

The active surveillance programme

- Target [ducks](#) as they may be carriers of the H5N1 virus without showing symptoms
- Covering all 10 provinces where [HPAI outbreaks](#) had previously been detected
- Repeated sampling of ducks at the same locations (2-4 times per year) to identify the [temporal patterns](#) of infection given the seasonal pattern of HPAI outbreaks

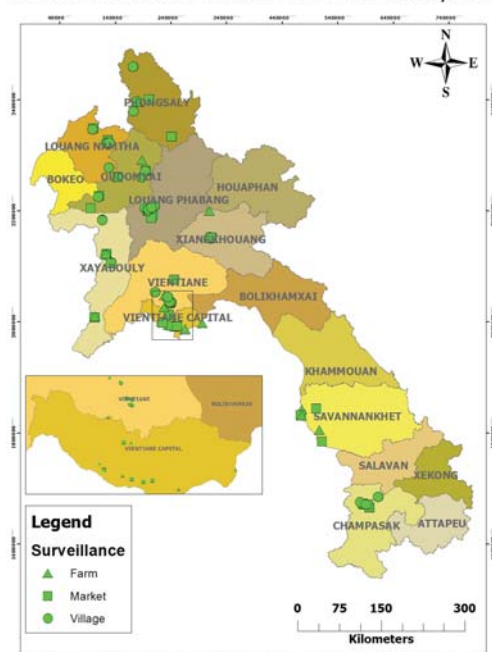
Lao PDR Locations of HPAI Active Surveillance Sites, 2010



Active Surveillance in 2010

- Nine provinces
- Surveillance sites:
 - 30 live bird market
 - 37 high duck concentrated villages
 - 26 duck farms
- Four samplings:
 - Mar, Jun, Sep, Dec

Lao PDR Locations of HPAI Active Surveillance Sites, 2011



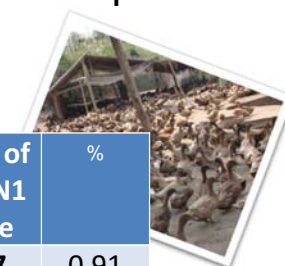
Active surveillance in 2011

- Ten provinces
- Surveillance sites:
 - 33 live bird market
 - 40 high duck concentrated villages
 - 19 duck farms
- Two samplings:
 - March and June

Decription		Description	
1. Frequency	2-4	7. Target Premise	-33 live bird market - 40 high duck concentrated villages - 19 duck farms
2. timing	March, June	8. Target serotype	H5N1
3. Target species	duck	9. Testing method	ELISA, HA test and Real time RT-PCR
4. Surveyed provinces	10 provinces	10. In case of Positive	Control measures are to be applied.
5. Sample category	Swab (cloacal & tracheal), Serum		
6. Sample scale	100 birds/province		

Number of ducks with H5N1 virus positive

Time of sampling	No. of ducks tested	No. of M-PCR +ve	%	No. of H5N1 +ve	%
Mar-10	1863	317	17.02	17	0.91
Jun-10	2076	227	10.93	0	0.00
Sep-10	1933	21	1.09	0	0.00
Dec-10	1711	11	0.64	9	0.53
Mar-11	2027	4	0.20	2	0.10
Jun-11	1915	0	0.00	0	0



Ducks with H5N1 positive antibodies

Time of sampling	No. of ducks tested	No. of ELISA +ve	%	No. of HI H5 +ve	%
Mar-10	1928	145	7.52	17	0.88
Jun-10	2029	15	0.74	0	0.00
Sep-10	1946	145	7.45	9	0.46
Dec-10	1804	247	13.69	0	0.00
Mar-11	2005	221	11.02	12	0.60
Jun-11	1873	157	8.38	20	1.07



Control measures

- Culling of infected and potentially infected poultry
- Disinfecting the pen and surroundings of after culling
- Road blocks for controlling the movement of poultry and its products, and disinfecting the vehicles that pass through the red zone
- Safe and hygienic disposal of poultry carcasses and other disposable supplies used in the culling
- Disinfection of all the material and equipment in the household or on the farm
- Disinfection of the transportation that goes in and out of the outbreak zone
- Raising Public awareness and public education
- Reasonable compensation policy (60%)



- Prohibit all movement of poultry within, into and out of the control zone
- Control movement of poultry along all possible throughfares around the outbreak area
- Educate the poultry owners on how to destroy and properly bury carcasses and how to improve bio-security in the raising place to protect their poultry from diseases



Actions to be undertaken in the next 5 years

- the 3 main reasons that allow H5N1 virus to continue existing in temporary are:
 - Illegal poultry movement from infected area to un-infected area.
 - Lack of veterinary officer at the central, provincial level and the field level for reporting and respond
 - More than 90% of poultry production in Lao is Back yard poultry and small scale of poultry farm with bio security that can allow virus to continuous existing in the country

Actions to be undertaken in the next 5 years

- the control of illegal movement of poultry and poultry product will play great role
- the public awareness and education on the significance of HPAI need to be brought down to the farmer and trader levels.
- establish the zoning and compartmentalization system for the poultry production in the country
- promote the bio-security for backyard poultry production will be useful
- the increasing surveillance and rapid response along with the improvement of the laboratory diagnostic techniques and sharing information among countries will help to achieve the goal in 2020.

- Investment in veterinary education
- Increase human resources especially DVM to enhance disease control capacity in the long term
- Strengthen the epi-surveillance services
- Improve laboratory capacity and quality management for both BSL2 and BSL3 labs
- Develop and improve molecular diagnostic techniques
- Complete the whole legislation framework to support the implementation of the 2008 Law on Livestock Production and Veterinary Matters
- Enhance inter-sectoral coordination and partnership using a "ONE HEALTH" approach at the national and provincial level (under coordination of NEIDCO)

- Continue conducting active surveillance
- Continue to raise public awareness and education
- Strengthening disease recognition and reporting at the village level
- Continue the collaboration with both national and international institutions involved in the HPAI control program
- Strengthening the veterinary service



Data source:
National Animal Health Centre, Department of Livestock and Fisheries,
Ministry of Agriculture and Forestry, Vientiane, Lao PDR supported by
Food and Agriculture Organization of the United Nations

Country Poster Presentation

MALAYSIA

Dr. Azri Bin Adzhar

Department of Veterinary Services Malaysia

For the

5th OIE Regional Meeting

Strengthening Animal Health Information Networking for HPAI

Control and Prevention in Asia

Hanoi, Vietnam 2-3 Oct 2012

A. Poultry Production

Sector	No. of Farms		No. of Poultry (X1000)			
	No.	%	Total	chicken	duck	others
1	794	18.41	78,340	75,000	3,000	340
2	1,208	28.00	32,200	30,000	2,000	200
3	808	18.73	11,400	11,000	300	100
4	1,504	34.86	3,370	3,000	170	200
Total	4,314	100	125,310	119,000	5,470	840

- >50% poultry producers are sector 3&4, with low biosecurity
- >46% are sector 1&2
- Sector 3&4 ; predominantly chickens
- Sector 4 free-range roaming chickens, sector 3 open house system
- Small scale farms purchase chicks and ducklings from commercial hatcheries. Local small scale day-old-chick supplier for local supply.

Category	2009 (million)		2010 (million)		2011 (million)	
	No.	%	No.	%	No.	%
Chicken	118	93.5	121	93.1	119	95.0
Duck	6.1	4.8	6.4	4.9	5.47	4.4
Others	2.1	1.9	2.5	1.9	0.84	0.7
Total	126.2		129.9		125.31	

- Poultry population has been stable in chicken and ducks in the last 3 yrs
- The growth rate in 2011 was 3.53%
- The demand for poultry has also grown in the last 5 yrs . The trend is increasing.

- Small scale farms acquire chicks and ducklings from big commercial breeders, although there were some small scale suppliers but the numbers are very small
- Free roaming ducks and chickens are mainly a backyard ‘hobyist’, and for own consumption or to supplement household income.

Issues/Challenges in mitigating the risk of H5N1 at farmers' level

- Farmers usually do not report sick birds to local DVS. "The disease is over" syndrome.
- Subsistence management: Low bio-security, less investment, is thought to be good.
- Many small scale farmers are part time owners of the farms. The workers tended the birds. Communication break down between the service and the players.

Good Practices to prevent H5N1 at farmers' level

- Consider chickens and ducks as though as pets or hobby. So they take good care better.
- We include HPAI in any other veterinary and public health extension programs
- Duck populations are small
- Regulation: All breeder suppliers are required to reveal its chickens/ducklings health status for each production sale.

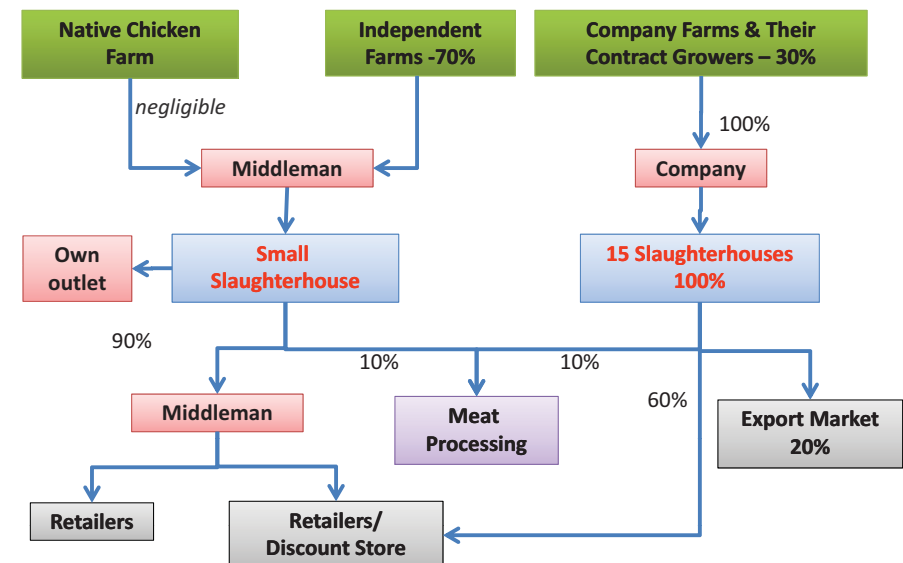
B.1: Live poultry market Malaysia

- Estimated 70% poultry production are for live poultry market. The market preference is for live and fresh poultry.
- Live birds are slaughtered, sold as whole or cuts. Slaughtering and carcasse processing at slaughtering points, or in the same space market and cut according to customer preference.
- Slaughtering process is a visual value added to the customer confidence according to halal procedure. Chicken bloods are not consumed.
- Most live bird markets are commercial chickens with village chickens. More than 90% of birds are from commercial scales (sector 1 and 2). The operation time is from 5AM to 2PM.
- The unsold poultry are kept in the premise. By the second day all are slaughtered. No control against overnight stay.
- The wet markets are regulated and controlled by the Local Council. The veterinary department is promoting and encouraging of adoption for **Veterinary Health Management** in production related to animal products.

B.2: Overview of supply/distribution of live poultry to markets

- 241 wet markets with 1,083 veterinary registered poultry seller (for slaughter and meat)

Flow of Products in the Broiler Marketing Chain



B.2: Action to be taken to prevent H5N1 at live bird market

- Discourage live bird market and centralizing slaughtering, but is not easy.
- Restricted and designated areas of selling poultry
- There is appropriate procedure in disposal of poultry intestines, furs etc
- Improve biosecurity:
 - Segregation of birds from human
 - Segregation of different species of birds
 - Use disinfection
- Encourage proprietor to adopt VHM (veterinary health mark) and GVHP (good veterinary health practice)



LIVE POULTRY MARKET BY THE LOCAL COUNCIL MARKET



**AVERAGE PRODUCTION
ABOUT 600-800/DAY/STALL**

**The number of stalls depends
on the location and size of the
wet markets**



INDEPENDENT LIVE POULTRY PROCESSING POINT, 150-200/DAY



This operator keep some ducks and chickens!



INDEPENDENT LIVE POULTRY PROCESSING POINT, 1000 /DAY



HISTORY OF HPAI OUTBREAK IN MALAYSIA 2004- 2007

2006 outbreaks----124 days

4. 20 Mac 2006
Permatang Bogak, Penang
Mort: 6/20 vil.chic.

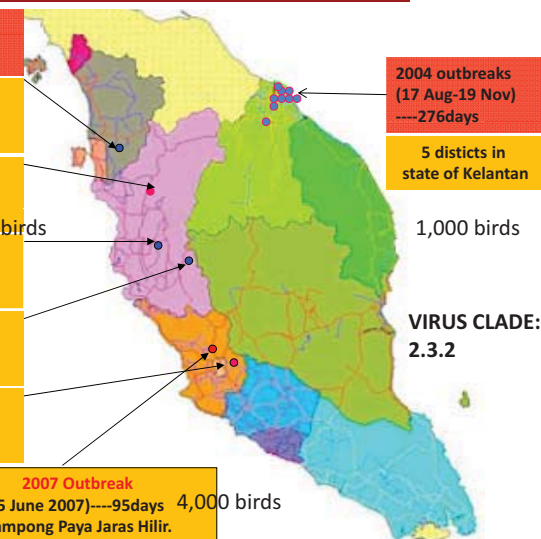
3. 16 Mac 2006
Bukit Merah, Perak

5. 21 Mac 2006
Titi Gantong, Perak

2. 16 Mac 2006
Changkat Tualang, Perak
Mort: 9/20 vil.chic.

1. 19 Feb 2006
Pasir Wardieburn, WP
Mort: 40/150 vil.chic.

2007 Outbreak
(5 June 2007)----95days 4,000 birds
Kampong Paya Jaras Hilir.



Freedom declaration complying OIE code: 10 September 2007

SABAH and SARAWAK are free from HPAI

KAMPONG PAYA JARAS HILIR, SELANGOR, 2007



Chicken coop in backyard of a village home. Involving 67 village chickens. 100% mortality

SURVEILLANCE FOR HPAI

- National HPAI Surveillance Programs
 - Annually, implement in all 14 states,
 - poultry and wild birds
 - Clinical
 - virology
- Data is collated and analysed by **Animal Disease Information Centre - ADIC**
- 'Early Warning System' for animal diseases using sms
- E-Permit**; a central monitoring of animal and its products movement between the states



Surveillance, Epidemiology & Information System



Active surveillance

- HPAI is one of the Annual National Important Animal Disease Surveillance Program
- Chickens, duck, poultry and wild birds
- All poultry premises
- Tracheal /cloacal swabs only
- Pre-determine sample scale
- Target H5, H7 and H9
- PCR and virus isolation
- H5N1 positive validation by VRI

Surveillance HPAI, 2011

States	Cecair Allantoic	Goose	Chickens	Birds	Ducks	Grand Total
Johor	0	0	6322	3	782	7107
Kedah	0	0	330	0	31	361
Kelantan	3	21	2087	3	1097	3208
Melaka	0	0	443	0	83	525
N.Sembilan	0	0	992	0	138	1130
Pahang	0	0	1509	6	50	1565
Perak	0	0	2816	119	13747	16682
Perlis	0	0	13	0	0	13
Pulau Pinang	0	0	863	62	25	950
Sabah	0	0	11	0	0	11
Sarawak	0	0	0	0	0	0
Selangor	0	0	1584	155	359	2098
Terengganu	3	0	1319	0	335	1654
W.Persekutuan	0	0	255	347	0	602
Grand Total	6	21	18544	695	16646	35906

* Surveillance continued until August 2012 with total samples about 19000 and results are all negative for HPAI.



National HPAI Surveillance Programme for Wild Birds

LOCATION OF SAMPLING SITE



EAST-ASIAN AUSTRALASIAN FLYWAY-
SHOREBIRDS SITES



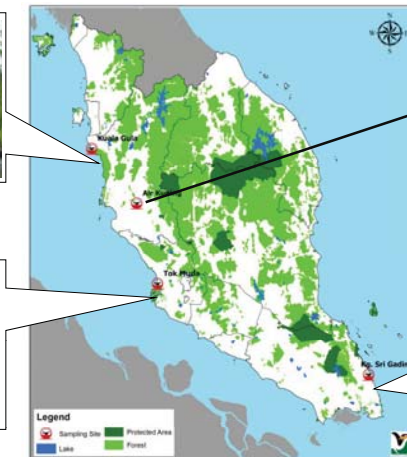
Kuala Gula, Kerian



Air Kuning, Perak Tengah



Kapar, Kelang



Kampung Sri Gading, Kota Tinggi



Surveillance, Epidemiology &
Information System

F: Control Measures

- Policy of no vaccination against H5N1 until 30% of the poultry industry is affected
- Control of H5N1 by stamping out, upon confirmation by the reference lab, with compensation

HPAI control and eradication policies

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

Principal control measures

- Disease investigation, diagnosis and confirmation of the disease, reporting system, gazetting by laws and emergency declaration.
- Disease control includes stamping out in infected zone, disinfections, restrictions of animal movements in/out control zone
- Public awareness
- Surveillance for new outbreak and determining the status of the disease
- Recovery of the normal livelihood of the affected zone

G.1: Action to be taken in Asia

Lessons learned:

- Prompt action taken in containing the disease
- Good cooperation from the farmers and multi-sectoral agency in disease control at source

G.2: suggestions for Asia

- Improving early detection of the infection at stakeholder level as well in the veterinary services
- Action for program in managing the outbreak and surveillance staff as in contingency and preparedness plan
- Again, strengthening laboratory capacity and good surveillance systems for early detection of infection
- Adversory and strengthening communication among country members, sharing information

The End

Avian Influenza Situation in Mongolia

Raadan ODBILEG

Institute of Veterinary Medicine

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

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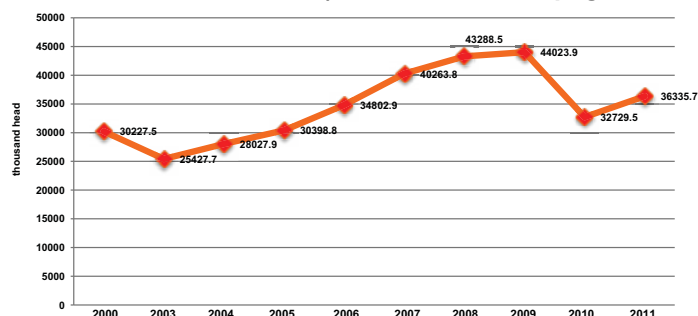
MONGOLIA



Area - 1.56 mln.sq.km:

Population – 2.8 mil

Number of livestock (cattle, horse, sheep, goat, camel)



INSTITUTE OF VETERINARY MEDICINE

- Veterinary research organization in Mongolia (since 1961)
- The institutes research works focus on various infectious, parasitic and non-infectious diseases in animals and measures of diagnosing, curing and preventing the animal diseases, and development of novel veterinary drugs and advanced technologies.

Laboratories:

- Molecular genetics
- Infections diseases & immunology
- Virology
- Laboratory of sanitation & hygiene
- Pathmorphology & histology
- Reproduction pathology & endocrinology
- Metabolism & biochemistry
- Helminthology
- Arachno-entomology & protozoology
- Physiology & pathology of young animal
- Pharmacology & toxicology



Year	Poultry
2005	140,000
2006	210,000
2007	250,000
2008	360,000
2009	480,000
2010	500,000
2011	630,000



- In Mongolia the poultry farm is developed weakly.
- Total 501.0 thousand head of domestic birds for egg production.
- No HPAI disease is registered in domestic fowl.
- Limited import to product of birds

- Commercial poultry farm
 - Only egg production
 - Located near capital
 - 18 farms-320,000 layers
 - 6,000-100,000 per farm
 - Indoor management



- 3 big farms;
"Tumen shuvuut" company
"Bokhog" company
"NVTs" company

Golden egg award winner;
(International egg commission)
/ London/ (2012-09-24)
Excellent marketing strategy



<https://www.internationalegg.com/corporate/eggindustry/details.asp?id=57>

HARBIN WEIKA BIOTECHNOLOGY DEVELOPMENT CO.
All the vaccination has been stopped in 2010

“Avian Influenza Control & Human Influenza Pandemic Preparedness and Response”
project (Sept. 2008 – Nov. 2011)

- State Central Veterinary Laboratory
- Institute of Biology, Mongolian Academy of Sciences

Migratory birds

- observed bird species 181, in Mongolia
- 170 species waterfowl

A map of Mongolia showing its administrative regions. The regions are color-coded: bayandagi (dark grey), vrs (medium grey), hovd (light grey), arhangai (pink), bulgan (orange), bayanhongio (light pink), khovsgol (red), Dornod (dark green), Hentii (light green), and Sukhbaatar (medium green). Red dots represent observation points. A legend at the bottom left identifies the regions and observation points. A legend at the bottom right identifies the MGL lake (blue) and the state border (black line). A scale bar at the bottom right shows distances from 0 to 8 miles. A compass rose at the bottom right indicates North (N), South (S), East (E), and West (W).

Table 1: Surveillance period, lakes, points and team members (2009-2011)

№	Aimag	Surveillance period			Number of observation lake	Number of observation points	Numbers of team members
		2009	2010	2011			
1	Arkhangai	10-17, Aug	13-16, July	14-18, July	3	27	9
2	Bulgan	16-21, July		10-15, Sep	6	28	12
3	Bayan-Ulgii	19-23, Aug	29 Aug-4 Sep	21-26, Aug	5	55	14
4	Gobi-Altai	24-29, Aug	26 Aug-8 Sep	21 July-3 Sep	8	33	17
5	Dornod	15 Aug-4 Sep	12 Aug-15 Sep	12-31, Aug	25	85	17
6	Sukhbaatar	5-10, Aug	22-24, July	16-20, Aug	10	15	6
7	Khentii	22-28, Aug	26-29, Aug	12-18, Aug	12	25	9
8	Khuvsgul	12-18, Aug	22-25, July	13-16, July	3	23	8
9	Zavkhan	21 July-15 Aug		11-20, Aug	10	89	18
10	Bayanhongor	12-16, Aug	19-23, July	10-16, Aug	2	16	8
11	Khovd	17-29, Aug	23 Aug-2 Sep	11-26, Aug	3	132	15
12	Uvs	14-27, Aug	24 July-17 Aug	16-31, Aug	9	124	26

Table 2: 2009-2011 observation result

Year	2009	2010	2011	Total
Observed bird species	146	141	156	181
Sensitive species for AI	48	58	56	62
Observed bird population	491380	377444	517497	1484583
Sensitive birds for AI	394598	329325	402208	1232642
Percentage of sensitive species AI	32%	41.1	36.4	34.254
Percentage of sensitive birds AI	80.30%	87.3	77.7	83.029

Table 3: Total samples collected between 2009 and 2011 (Poultry farmers)

No	Aimag	Number of poultry farms			Collected samples	
		2009	2010	2011	Blood	Swabs
1	Uvs	3	10	5	250	280
2	Bulgan	5	10	6	250	280
3	Orkhon	5	11	11	250	280
4	Darkhan - Uul	5	11	7	250	280
5	Ulaanbaatar	10	19	7	250	280
6	Dornod	5	10	6	250	280
Total		33	71	42	1500	1680

- Samples were collected from poultry farmers of Ulaanbaatar, Uvs, Bulgan, Orkhon, Darkhan-Uul and Dornod aimags.

- Laboratory testing: HI, RT-PCR, ELISA

- This study proved an absence of LPAI and HPAI among poultry

Avian influenza in Mongolia

Migratory bird:

- Since 2005 to 2010 reported 7 cases of H5N1 (HPAI) in migratory birds, but never reported cases in human and poultry birds.

- Through the territory of Mongolia passed major trajectories of migratory birds, for this reason it is probable to occur bird flu in Mongolia.

State Central Veterinary Laboratory, Mongolia

Capacities of diagnostic laboratory

BSL-III and Mobile laboratory



Methods	Kit and reagents
Virus isolation	9-11 old days chicken embryonated eggs
	MDCK cells
Rapid test	-Symbiotics, USA
	-Anigen, Korea
Antigen and antiserum for HI, NI test	-HVR1, China
	-IZP, Italy
	-NVSL, USA
RT-PCR	-A, H5, H7, H9 kits, Anigen, Korea
	-H1-H15 primers, Invitrogen, USA
	-One-Step PCR kit, Bionote, Korea
Real-Time PCR	-Real-Time PCR kit, Takara, Japan
	- A, H5 real-Time PCR kit, Bionote, Korea
ELISA	-AIV Ab ELISA kit, Anigen, Koea
	-AIV Ab IDEXX
Gene sequencing	ABI, USA

**HOKKAIDO UNIVERSITY IN JAPAN: OIE
REFERENCE LABORATORY**
Dr Kida, Dr Takada, Dr. Okamatsu ...etc



Samples collected from suspect cases were forwarded to the OIE Ref.laboratory at Hokkaido University for confirmation.



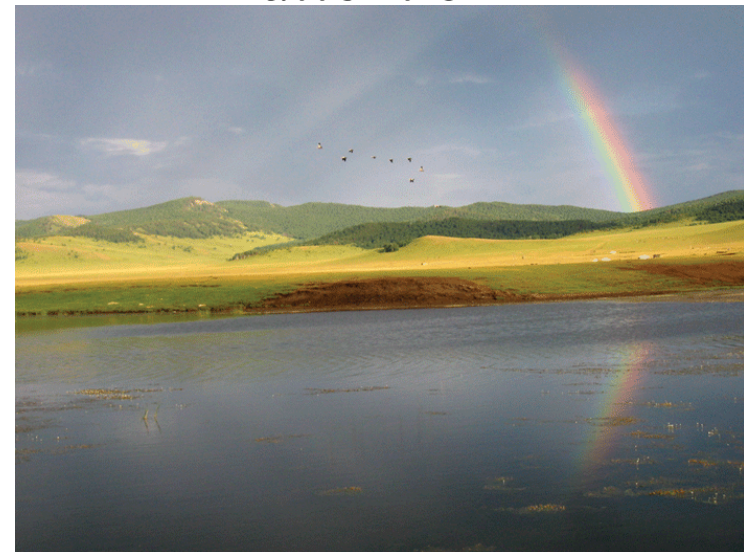
AT THE FINAL END...

- Location of lakes, river and points for surveillance of bird flu were determined and network was established in Mongolia.
- In association with that major trajectories of migratory birds are across the territory of on country, it is probable to occur bird flu in Mongolia.
- In Mongolia the poultry farm is developed weakly.
- Risk of avian influenza in Mongolia
(Domestic birds, Migratory birds, Import to product of birds)
- Each HPAI H5N1 suspected samples send to the OIE Reference laboratory (Hokkaido University, Japan) for confirmation and phylogenetic analyses.

CONTROL MEASURES AGAINST HPAI

- Surveillance for HPAI (Government Implementation Agency Department of Veterinary and animal Breeding Ministry of Agriculture and Industry);
- Strengthen national systems for influenza surveillance in both humans and animals, based on WHO, FAO AND OIE guidance
- No vaccination
- To organize work committee of implementing (National Avian influenza control strategies) plan
- To expand research on the epidemiology of influenza in wild birds, in order to understand & prevent the spread of this disease among birds & humans.
Information sharing system (animal health, human health & emergency)
- Every year have a budget ~ 21.000.000 (MNT) for surveillance (including 6 diagnostic kit)
- Animal infectious diseases control law (ongoing)

Thank you for your
attention



Country Presentation- Nepal

Dr Nar Bahadur Rajwar
Director General, Department of Livestock Services
OIE Delegate, Nepal

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



THE PHYSIOGRAPHY OF NEPAL

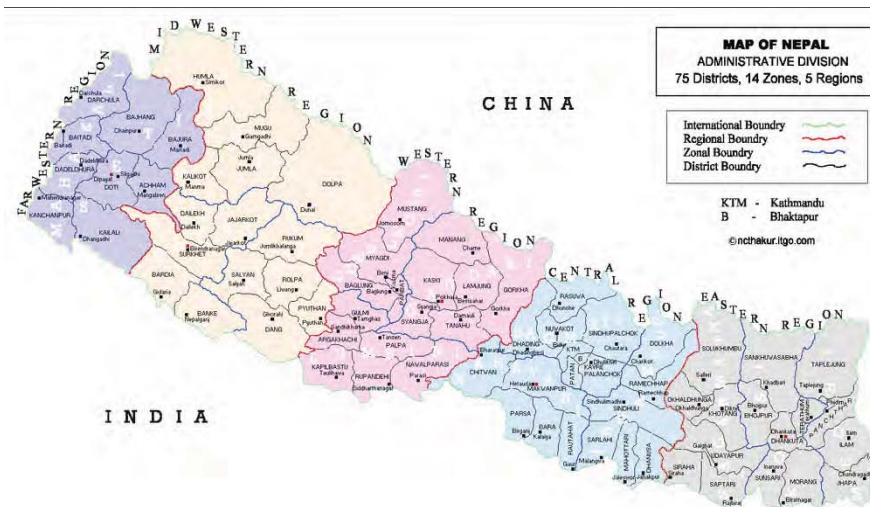
AND

THE LIVESTOCK SECTOR

Nepal: General Information

- ❑ Nepal is a landlocked country with an area of 147480 Sq. Km. with 26.62 million Human population (CBS, 2011).
- ❑ Altitude of the country ranges from 70 m (Kechana) to 8848 m Sagarmatha (the highest point on earth).
- ❑ Ecologically, Nepal has three geographical regions;
 - Mountains (35%)
 - Hills (42%)
 - Terai (23%)

Country Map



Importance of Livestock

- ❑ Backbone of rural economy
 - ✓ Around 65% of the population is engaged in agriculture.
 - ✓ Almost all household engaged in agriculture rear certain species of livestock
 - ✓ Important sector contributing for employment and poverty reduction
- ❑ Livestock contributes to-
 - GDP – 11%
 - AGDP – 27 %
 - Dairy – 62.6%
 - Meat – 32.4%
 - Eggs – 5.0%

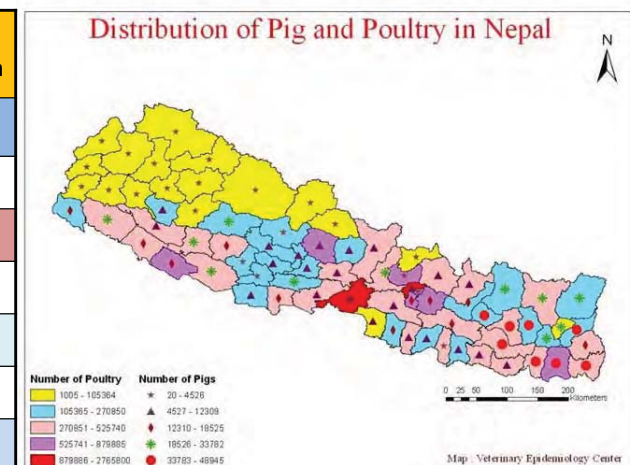
Importance of Poultry

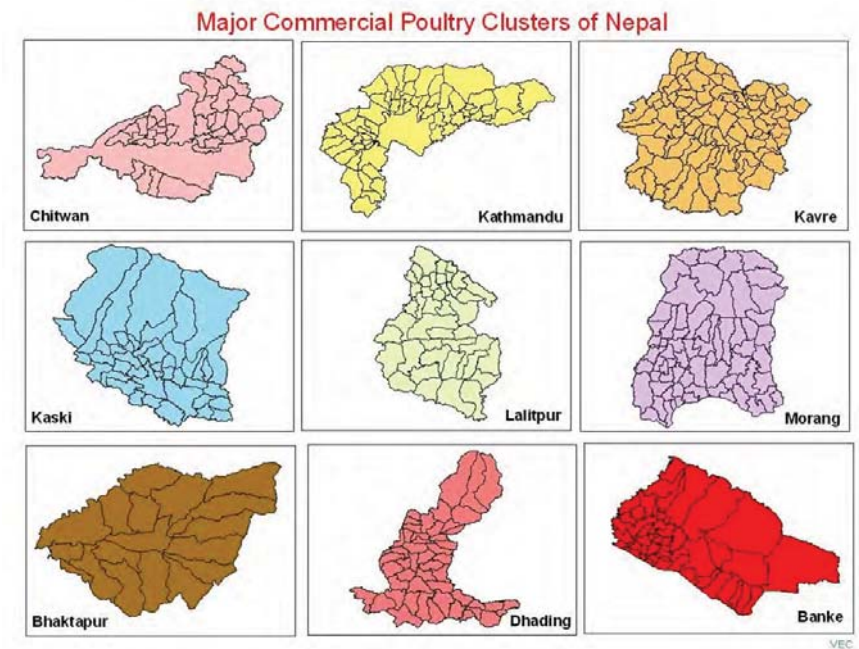
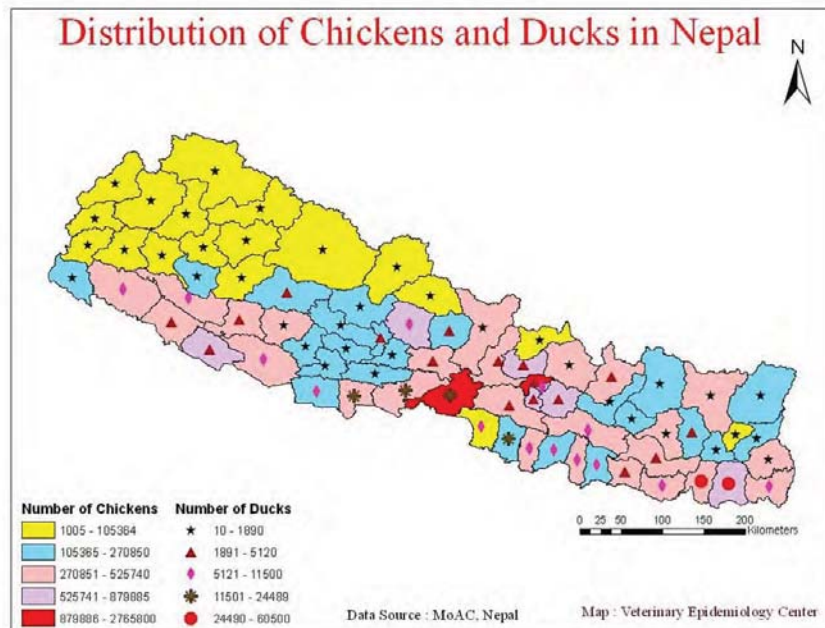
- Poultry sub-sector alone contributes about 3 – 4 % in AGDP.
- Commercial Poultry sub-sector is providing employment opportunities to more than 0.1 Million
- Cheap source of protein



Poultry Population of Nepal

Year	Poultry Population
05/06	23.2
06/07	23.9
07/08	24.6
08/09	24.4
09/10	25.7
10/11	27.0
Growth %	5.2





Poultry Production Statistics



Around 55%
(Backyard)



Around 45%
(Commercial)

• Total Production



Meat

40,346 Mt



Eggs

77.4 mil

(Source : DLS, 2011/12)

Commercial Poultry Production



Broiler parent: 0.42 mil
Com. Broiler: 39.7 mil
Feed (Mt): 5,00,535



Layer parent: 90,239
Com. layer: 6.6 mil
Eggs: 1125 mil

Total: 46.3 mil

Meat (Mt): 68,681

Source: Dr. T. Bhattarai

Import/Export Permit to Facilitate Poultry and Allied Industries

Parent Stock Import/Year

Broilers	Layers	Hatching Eggs
Approx 0.1 Million	Approx 30,000	Less than 0.2 Million

Breeds Imported : Cobb-500, Hubbard, Ross, Lohmann Indian River, Cobb-100, Marshall R, Anak 2000, Indbro Fast, B.V 300, Lohmann Brown, Tetra SL, H&N Nick Brown, Hyline, Dominant CZ

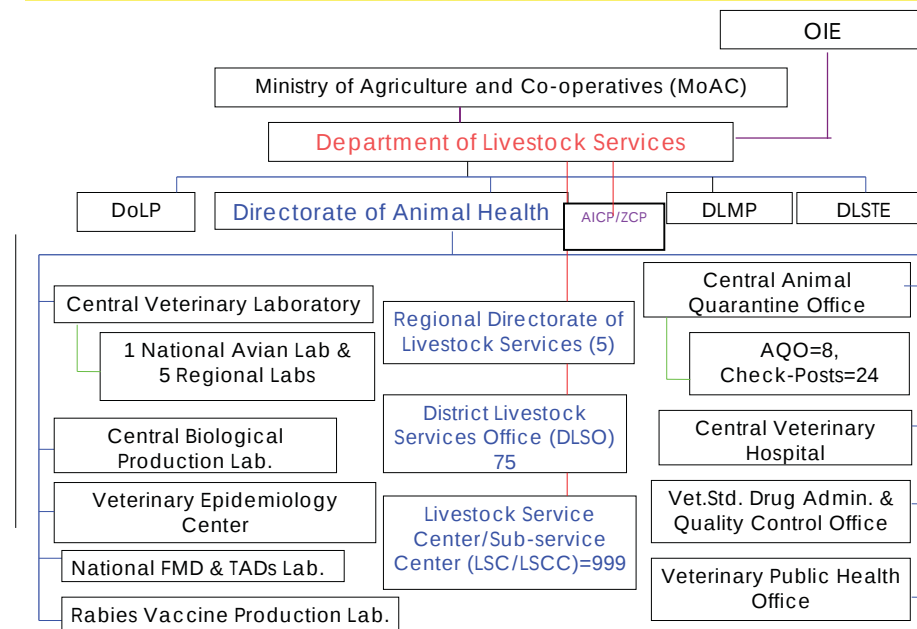
Imported from: New Zealand, The Philippines, Malaysia, Australia, Czech Rep., France, Germany, India, Italy, The Netherlands, Russia, Sri Lanka, Thailand, USA, UK. **(During HPAI Free Status)**

Poultry Export

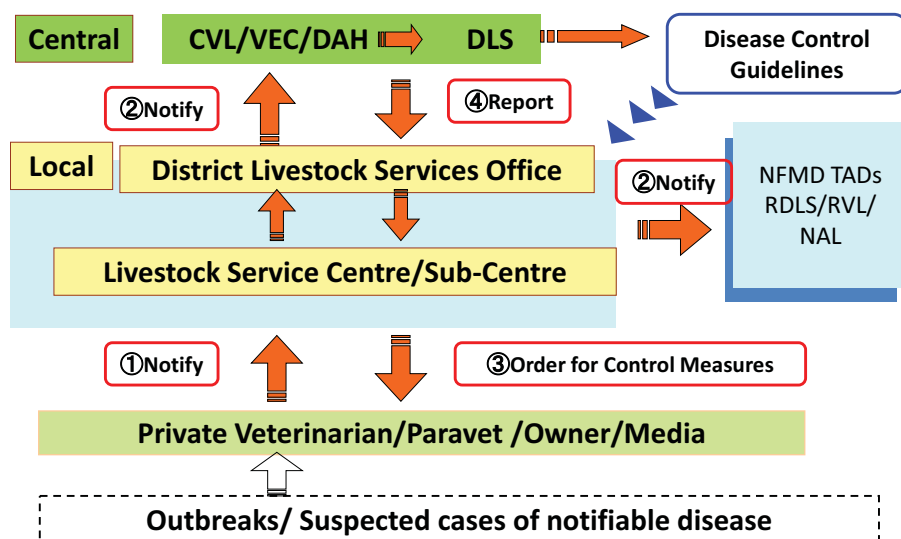
(CAQO).

Nominal amount exported to Bhutan

Institutional Framework



National Disease Notification System



Legal and Operational Documents Related to HPAI in NEPAL

Animal Health and Livestock Services Act and Regulation

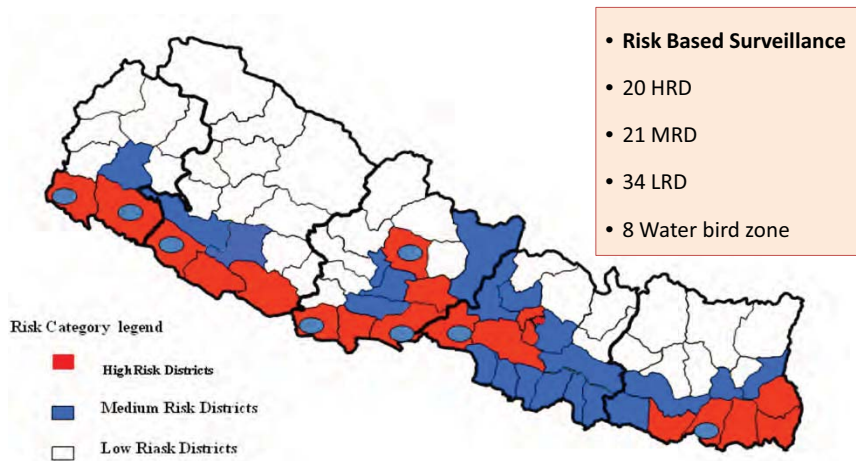
Bird Flu Disease Control Order

National Bird flu surveillance Plan

Guideline for Emergency Disease Investigation (EDIT)

SOP for Control and Containment of HPAI

HPAI Surveillance in Nepal



Method of surveillance

• Passive

- Poultry producers
- Associations,
- Community organizations,
- Wildlife,
- NGO participatory groups,
- Private Practitioners/ Village animal health workers
- ❖ advised to report "trigger" points.

• Active

- ☐ Visiting ,
 - ✓ commercial farms,
 - ✓ backyard poultry premises and
 - ✓ live markets
 - for clinical Examinations
- ☐ Swab sampling from sick and dead birds
- ☐ Collecting blood samples from healthy Ducks,
- ☐ Fresh Fecal Sample from wild birds (waterfowl)

Sampling Plan

Tracheal swab : Chickens (Sick or Dead)

Cloacal swabs : Ducks (Healthy, Sick, Dead)

Fresh, wet fecal swabs: Wild birds and live markets

Blood (serological) sample: Ducks and other wild water birds (whether healthy or showing any signs of disease)

Collection of dead birds: Whole carcass is extremely valuable (any species of bird)

Technical Modality

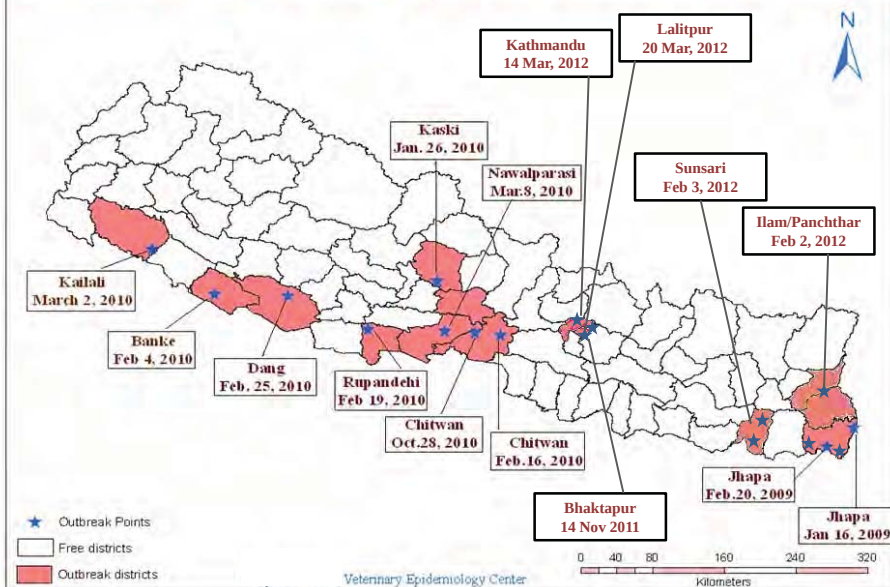
Active Surveillance

- Clinical Examination
 - Interview to owner
 - Public awareness Message Delivering
 - Distribution of pamphlets etc
- Sampling
 - Collection , packing & dispatch
 - Communication

Rumor Verification

- Rumor register
- News Papers
- Phone calls etc.

Outbreaks of Highly Pathogenic Avian Influenza (HPAI) in Nepal



Control Strategy for HPAI

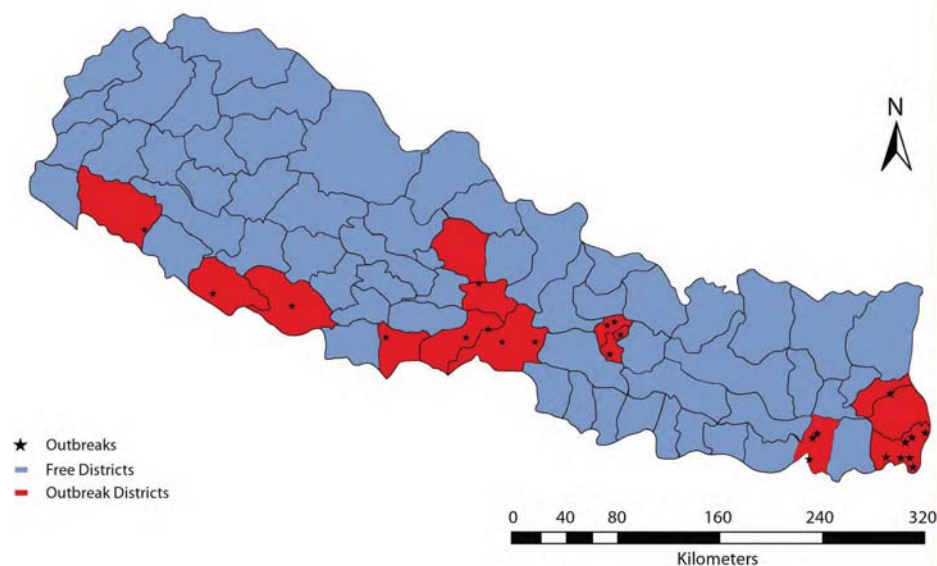
- Stamping out of birds up to 3 km radius (infected zone) from the epicenter
- Intensification of active surveillance in 7 Km radius out side the infected zone and through out the country
- Cleaning and disinfection
- Movement control
- Quarantine inspection inside the country and across the border
- Import ban on poultry and products from infected countries
- Compensation
- No Vaccination
- No treatment of affected birds



HPAI Outbreaks in Nepal

S.N	District	Date	Cases	Destroyed	Total	Type of Birds
1	Jhapa	16-Jan-2009	14	24689	24703	Backyard
2	Jhapa	20-Feb-2009	150	2871	3021	Backyard
3	Kaski	26-Jan-2010	153	11128	11281	Backyard /Commercial
4	Banke	4-Feb-2010	351	286	637	Backyard
5	Chitwan	16-Feb-2010	30	194	224	Backyard
6	Rupandehi	19-Feb-2010	256	358	614	Backyard
7	Dang	25-Feb-2010	2	0	2	Backyard
8	Kailali	2-Mar-2010	40	83	123	Backyard
9	Nawalparasi	8-Mar-2010	216	4551	4767	Backyard
10	Chitwan	28-Oct-2010	66	11437	11503	Commercial Layers
11	Bhaktapur	14-Nov-2011	88	308	396	Backyard
12	Kathmandu	27-Jan-2012	4		4	Crow (Corvus spp)
13	Ilam/Panchthar	2-Feb-2012	500	241	741	Backyard
14	Sunsari (3)	3-Feb-2012	7370	7282	14652	Commercial /Backyard
15	Jhapa (5)	9-Feb-2012	1665	1365	3030	Backyard and Commercial
16	Kathmandu	14-Mar-2012	15160	60	55220	Commercial
17	Lalitpur	20-Mar-2012	6646	2954	9600	Commercial
Total			32711	67807	140518	23 Outbreaks

HPAI Outbreaks in Nepal



HPAI Control- 2012



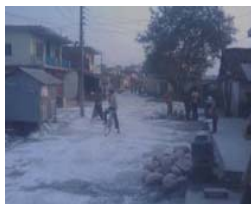
Clades of H5N1 Viruses Identified



- Clade 2.2 (2009)
- Clade 2.3.2 and 2.2 (2010)
- Clade 2.3.2.1 (2011-2012)



No Human cases so far



Disease Information Data Management

- Data managed at Veterinary Epidemiology Center/DAH
- Data managed using
 - o Excel (HPAI)
 - o Access (Monthly epidemiological reporting)- NEPCEU
 - o TAD info (Initiated for HPAI surveillance data)
- Data Analysis
 - Analyzed reports published by VEC (Annually/Six Monthly) and distributed to all stakeholders
 - Reporting to OIE (Six Monthly/Annually)

Trade of Poultry in Nepal



Live Market

Bird Transportation

Most of the Commercial Birds are marketed/transported from leading producing districts following the standards set by DLS

Lesson Learned from HPAI Control in Nepal

- Determination
- Good Coordination between stakeholders
- Management of Logistics
- Communication
- Monitoring
- Compensation
- Cross border collaboration

Issues and Challenges

- Movement of the poultry and products
- Unauthorized Live/Wet markets
- Financial, Logistics and human resources management during multiple outbreaks
- Cross border cooperation

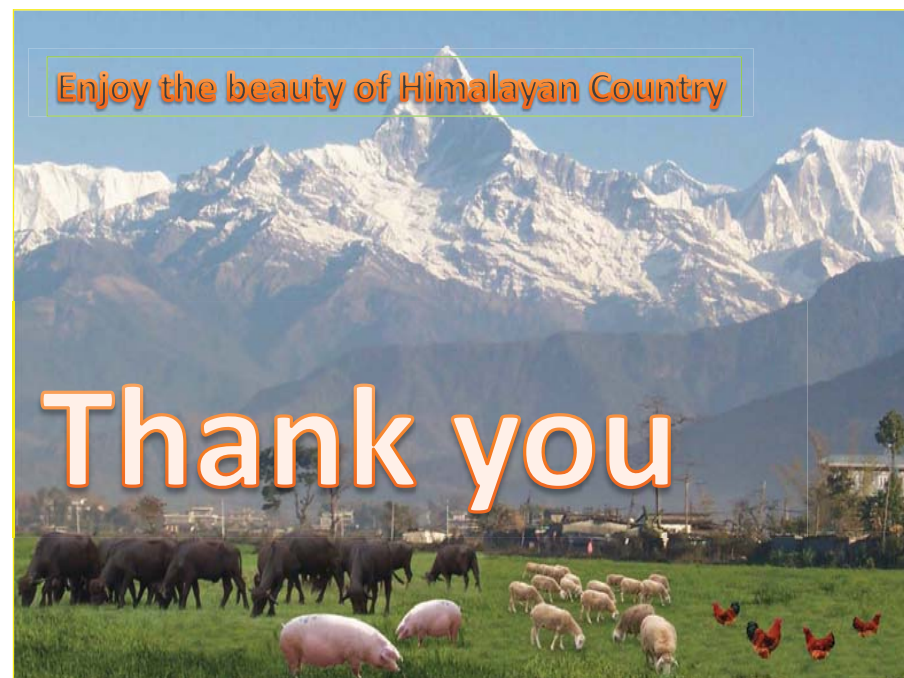


Lets Work Together to Make Our Planet Safe



Enjoy the beauty of Himalayan Country

Thank you



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



HPAI Prevention and Control in the Philippines

Emelinda L. Lopez, DVM, MSc

Animal Health Division
Bureau of Animal Industry
Department of Agriculture

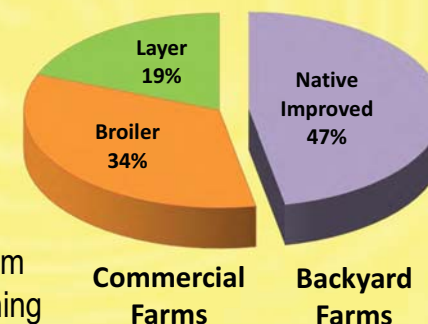
Poultry Production System



- **Total chicken population** (as of 1 January 2012)
164.19 million birds

- Native or village chickens - 47%
raised in backyard farms (Sector 4)
with minimal biosecurity
- Broilers - 34% / Layers - 19%
raised in commercial farms
(Sectors 1-3)
- Broiler and layer stocks sourced from
imported Day-Old Chicks and hatching
egg breeders

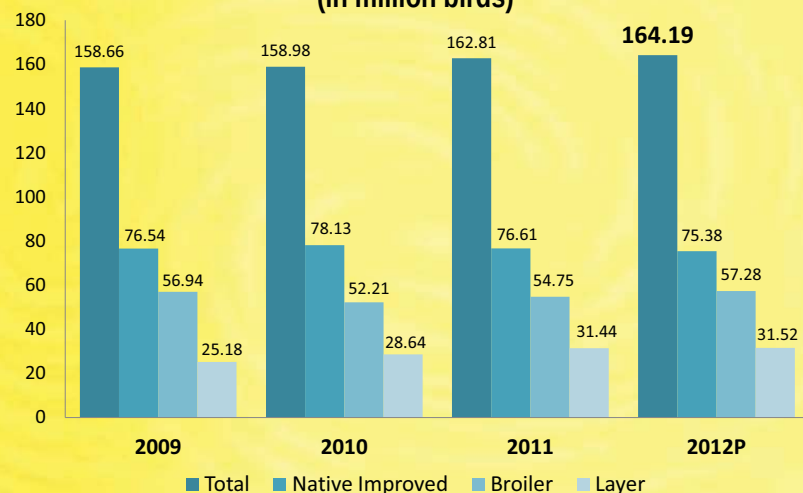
Chicken Population by Farm Type, 2012



Source: Bureau of Agricultural Statistics (June 2012). Chicken Industry Performance Report January-December 2011

2

Chicken Population by Classification, Philippines
as of January 1, 2009-2012P
(in million birds)



P-Preliminary

Source: Bureau of Agricultural Statistics (June 2012). Chicken Industry Performance Report January-December 2011

3

- **Total duck population** (as of 1 January 2012)
9.984 million birds

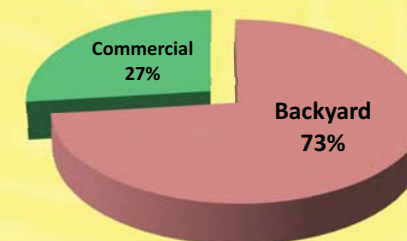
- 73% - backyard farms
27% - commercial farms

- Age Classification:
Laying flock - 50%
Growing flock - 35%
Day-old chicks - 15%

- Chicks and ducklings sourced
from hatcheries and franchised dealers

- Free range/roaming ducks

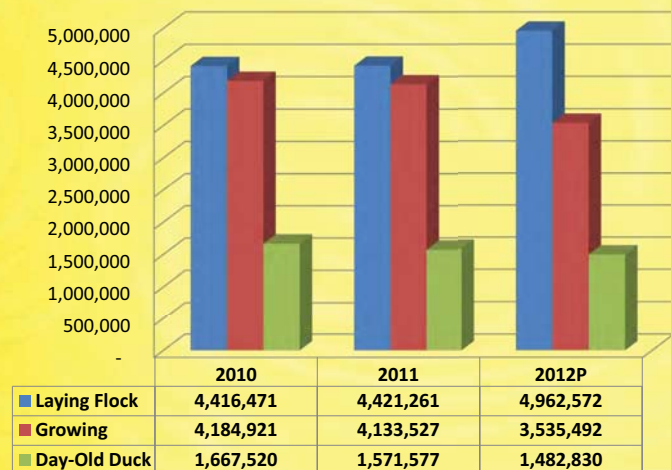
Duck Population by Farm Type, 2012



Source: Bureau of Agricultural Statistics (June 2012). Chicken Industry Performance Report January-December 2011

4

Duck Inventory by Classification, Philippines as of January 1, 2010-2012P (number of birds)



P-Preliminary

Source: Bureau of Agricultural Statistics (June 2012). Chicken Industry Performance Report January-December 2011

5

Good practices and lessons learned to prevent the introduction of H5N1 virus



Main problems/challenges to reinforce preventive measures against H5N1 at farmer's level

1. Enforcement of biosecurity measures in smallhold or backyard farms
2. Updating preparedness and making contingency plans
3. Sustaining public awareness

1. Strong partnership with the poultry industry stakeholders and Local Government Units
2. Good intersectoral collaboration ("One Health" approach)
3. Technical support and cooperation through regional mechanisms (e.g. ASEAN)
4. Learn from the lessons of earlier affected countries

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Live Poultry Markets



Practices in the Live Poultry Markets

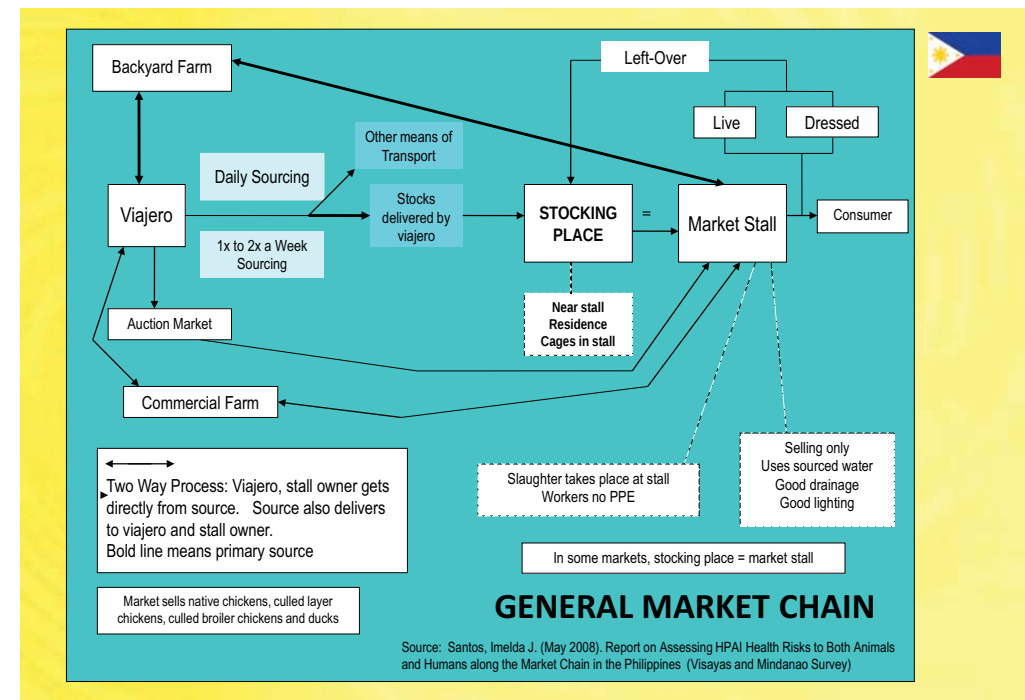
1. Sourcing of poultry from different sources
2. Biosecurity measures not instituted at the source of poultry
3. Different poultry and species of birds kept together in one place
4. Unsold live chickens returned and kept to the holding facility where the newly sourced stocks are located
5. Workers involved in slaughter not wearing any protective clothing
6. Cleaning and dressing of chickens done on the floor
7. Home slaughter of chickens not regulated
8. Unsold dressed chickens stocked in a cooler and sold the next day
9. No proper waste disposal facilities
10. No proper cleaning and disinfection done after slaughter and after the market day activity

References:

1. Benigno, Carolyn Anne C. And Santos Imelda J. (2006) Assessing Health Risks to Both Animals and Humans along the Market Chain Given an HPAI Scenario in the Philippines.
2. Santos, Imelda J. (2008). Report on Assessing HPAI Health Risks to Both Animals and Humans along the Market Chain in the Philippines (Visayas and Mindanao Survey)



Photos c/o Dr. Imelda J. Santos



Recommendations for preventive measures in the live poultry market

Preparedness in reducing risks of spread of HPAI in live poultry markets

1. Regulation of the operations of live poultry markets and activities of viajeros/traders of poultry
2. Institution of controls on slaughter and inspection of chickens passing through the wet markets
3. Market surveillance
4. Public awareness of HPAI of market vendors and viajeros
5. IEC on the importance of practicing biosecurity in farms

Active Surveillance Program

Objective	To demonstrate freedom from HPAI
Frequency	Twice a year
Timing	Bird migration season (October to February)
Target Species	Ducks, chickens and other bird species (e.g. pigeons and captive bred pet birds for import/export)
Target Premises	Poultry farms
Sample Category	Serum / cloacal and tracheal swabs Choanal swabs (wildbirds)
Sample Scale	Thirty (30) samples each from six (6) barangays in the twenty priority areas for surveillance



- Target serotype**
- All serotypes
 - Screening first for H5 and H7 (OIE notifiable subtypes) by serology (HI Test)
 - Ducks to be transported to other provinces - required to be tested for H5 and H7 AIV antibodies
- Testing method**
- Serology (HI Test, ELISA, AGPT)
 - Real-Time PCR (for detection of Influenza A and H5 viral RNA)
 - Virus isolation in embryonated chicken eggs (for confirmation of positive PCR and/or HI Test results)
 - Subtyping of isolate

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Surveillance



YEAR	No. of Samples Collected & Tested
2005	5,976
2006	14,046
2007	10,148
2008	18,253
2009	5,423
2010	3,318
2011	6,326
2012	1,698*
Total	65,188

* As of 14 September 2012



All tests yielded **NEGATIVE** results for the HPAI agent

For issuance of local shipping and export permits

Number of Samples Tested (January to August 2012)

2,835

14



If sample tests positive for H5N1 at the 1st stage of testing:

1st stage of testing

HI Test / PCR

Egg Inoculation

Subtyping of Isolate

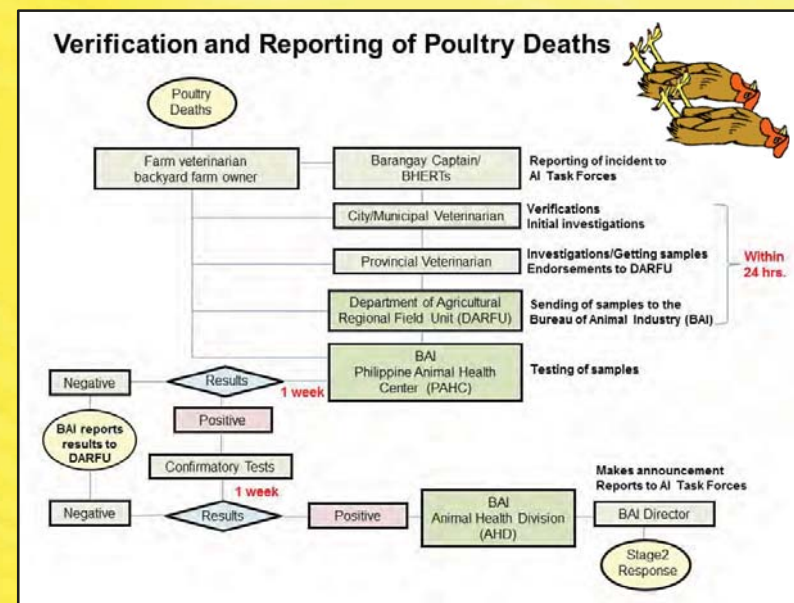


If H5 or H7 is isolated

Samples Sent to the Australian Animal Health Laboratory (AAHL) in Geelong for Confirmation

15

When an outbreak is detected,



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Control Measures



Avian Influenza Protection Program (AIPP)

- **Quarantine** – 3km radius Quarantine Zone Level 1 if Suspect Premises; if becomes Infected Premises, reclassified to a Quarantine Zone Level 2 with an additional 7km radius Control Zone
- **Movement Control and Restrictions**
 - Respiratory cases reported and evaluated
 - No movement of poultry and poultry products for the first 15 days
 - Live bird markets, cockfights and other gatherings with poultry and other birds will be **PROHIBITED**
 - No re-stocking of poultry farms within the Control Zone
- **Stamping out** – All birds in the Infected Premises and Quarantine Zone Level 2 killed by cervical dislocation, carbon dioxide or electrical single application

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Avian Influenza Protection Program (AIPP)

- **Disposal** – Dead/killed birds including their feeds, manure, eggs, and rice hulls buried in an onsite pit
- **Vaccination** – **To vaccinate only in case of related outbreaks** (successive outbreaks occurring within the immediate vicinity) of a Control Zone; to recommend either to:
 - Vaccination of the existing poultry population within a 50km radius from the Infected Premises
 - Stamping out, if more economical than vaccination
- **Recovery Process** – Clean up and disinfection and 21-day rest period; restocking with sentinel chickens; repopulation at farm capacity; declaration of the farm as disease-free

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Key Factors for the Country Still Being HPAI Free

1. **Unique Geographic Location** – Away from the South East Asia mainland; the country is made up of many islands => lesser cross country animal movements, with natural physical barriers (e.g. large bodies of water)
2. **Preparedness Plans** – Came up with early preparedness and response plans based on the lessons learned and experiences of countries previously affected by HPAI
3. **One Health Approach** – Good intersectoral collaboration between the human health, wildlife & poultry industry sectors to support the AIPP
4. **Socio-Cultural Factors** in Poultry Rearing and Production Systems

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Actions to be Undertaken in the Next 5 Years

- Review and updating of the AIPP
- for further improvement of preparedness and response protocols
- Completion of the four components of preparedness and response by all regions and local government units, namely:
 - (1) creation of functional AI Task Forces; (2) enactment of local ordinances; (3) presence of preparedness and response plans; and (4) checklist/resource inventory of supplies for rapid action
- Widening of coverage of areas for disease surveillance for early detection of HPAI
- Conduct of more simulation exercises
- Intensification of IEC campaign

20

Sri Lanka



Dr A.M.U.W.Adikarinarayake
Department of Animal Production
and Health
Veterinary Research Institute,
Gannoruwa, Peradeniya, Sri Lanka.

5th OIE Regional Meeting AHI Networking/
Hanoi,
Vietnam, 2-3 October 2012

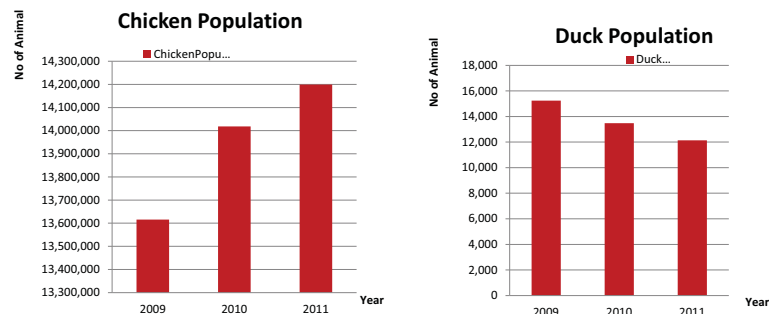
No of Chicken farms in Sri Lanka

Category	No. of farms
Sector-1	2,874
Sector-2&3	51,281
Sector-4	134,707
Total	188,862

No. of Chicken & Duck Population in Sri Lanka

Chicken	Duck	Total
14,199,200	12,135	14,211,335

Chicken and duct population growth in past 3 years



Category	2009	2010	2011
Chicken	13,615,290	14,018,320	14,199,200
Duck	15,244	13,485	12,135

Farmers level problems

- ❖ Most of section 4 farmers are not educated
- ❖ Low bio security level
- ❖ Small scale farms are located near water reservoirs or near jungles where migratory birds stay.(restrictions to move farms)
- ❖ Poor farmer organizations.

Current Live Poultry market situation

- Live poultry market is not popular due to religious taboo (74% population Buddhist)
- Established only in the Muslim dominated and Christian dominated communities
- Commonly seen only in cities but very rare in country side where symbiotic relationship seen with human
- Cultural and religious background discourages killing animals in public

Current market situation Contd..

- Organized live bird markets in main cities exists along less traffic roads
- Consumer chooses and pay for live weight before slaughter
- Opening hours from 8.00am-8.00pm
- Common market for country chicken but not for ducks or broiler type franchise chicken
- Live birds transported to cities from rural areas
- Unsold birds remain in the battery type cages inside the shop

Current market situation Contd..

- Intervention by veterinary authorities is very marginal
- Identified as a threat of disease spread
- Information on the operation available collected through sample survey
- Specially reared chicken for cock-fighting sold high prices although unauthorized
- However, live chicken market is in increasing with expansion of city limits

good practices in live poultry markets

- Registering of live birds suppliers
- Conducting awareness programs
- Advice to implement good hygienic practices

Epidemiological surveillance

A. Migratory Water-Birds- Anseriformes: Water birds such as ducks, swans, geese etc. and, Charadriiformes : Sea birds such as gulls, turns etc.

Locations	30 locations suggested by the Dept. of Wildlife Conservation and Ceylon Bird Club
Type of sample	Wet droppings/cloacal swabs/tracheal swabs/environmental sampling (water etc)
Collection by	Wildlife staff, VIOs, VSs
Period of collection & frequency	Sept – November and February to April; monthly
Sample size	5 sites, 15 samples from a site pooled into 2 samples each with 7-8 individual samples from a site. ie 10 pooled samples from a site/location ie 300 pooled samples
Laboratory testing	Screening and virus isolation at VRI

B. Backyard poultry in the vicinity of migratory bird locations

Locations	Areas in the vicinity of Migratory Bird locations, within a radius of 3 km
Type of birds	All poultry such as chicken, duck, turkey, quail, guinea fowl, geese etc. reared under extensive management
Type of sample	Wet droppings/cloacal swabs/tracheal swabs/environmental sampling (water etc)
Collection by	Field VSs coordinated by staff, VIOs
Period of collection & frequency	Sept – May monthly I
Sample size	5 sites, 15 samples from a farm or a group of adjoining farms (1-5) from a site pooled into 2 samples .each with 7-8 individual samples from a site. ie 10 pooled samples from a site/location and 300 pooled samples
Laboratory testing	Screening and virus isolation at VRI

C. Commercial poultry

Locations	All districts
Type of birds	Commercial layers and broilers
Type of sample	Wet droppings/cloacal swabs/tracheal swabs
Collection by	Field VSs coordinated by staff, VIOs
Period of collection & frequency	Throughout the year
Sample size	Sample sizes for the different areas are calculated by the Animal Health Division of the DAPH based on poultry numbers in different districts and informed to relevant staff
Laboratory testing	Screening and virus isolation at VRI

D. Sero-surveillance in ducks

Locations	Western Province, North-Western Province, North & East Province and North-Central province
Type of sample	Serum/blood
Collection by	Field VSs coordinated by staff, VIOs
Period of collection & frequency	Once a year
Sample size	750 Samples (15 samples at 50 sites/farms)
Laboratory testing	ELISA Screening and virus isolation at VRI

E. Live –bird Markets

Locations	Western Province. Outlets belonging to six municipal councils and other Local Government institutions such as urban councils (e.g. Ja-ela) and Pradeshiya Sabhas
Type of sample	Cage swabs (swabs of fresh faecal material from cages used to hold birds in markets) . Dirty cages or cages housing mixed species of poultry, cloacal swabs
Collection by	Municipal Council VSs and selected field VSs
Period of collection & frequency	Twice a year
Sample size	50 sites. From each site 15 samples pooled into 2 samples of 1-5 markets depending on the number of birds. ie 100 pooled samples in all.
Laboratory testing	Screening and virus isolation at VRI

F. Poultry Processing Establishments

Locations	Fifteen processing establishments
Type of birds	Broilers
Type of sample	Cloacal swab/wet droppings
Collection by	Municipal Council VSs and selected field VSs
Period of collection & frequency	Monthly
Sample size	30 Samples/Processor/Month; 10 samples to be pooled. ie 45 pooled samples
Laboratory testing	Screening and virus isolation at VRI

G. Poultry Breeder Farms

Category 1	Day old parent/grand parent chicks on arrival from abroad
Type of sample	Wet droppings
Collection by	Animal quarantine staff
Period of collection & frequency	2 consignments/importing hatchery/year
Sample size	30 samples per consignment pooled into 3 pooled samples for a consignment. 20 consignments to be sampled per year
Laboratory testing	ELISA Screening and virus isolation at VRI

G. Poultry Breeder Farms cont....

Category 2	Day old birds imported from non-infected countries where vaccination against AI is practiced to be screened before they reach 4 weeks
Type of sample	Serum/blood
Collection by	Animal quarantine staff
Period of collection & frequency	2 consignments per month
Sample size	30 samples per consignment pooled into 3 pooled samples for a consignment. 24 consignments to be sampled per year
Laboratory testing	ELISA Screening at Animal Quarantine Laboratory

H. Pet-Birds Breeding Establishments

Locations	10 identified locations
Type of birds	All types of pet birds
Type of sample	Cloacal swab/wet droppings
Collection by	VIO and field Vss
Period of collection & frequency	Once a year
Sample size	20 pooled samples from 10 locations
Laboratory testing	Screening and virus isolation at VRI

Sri Lanka never experienced H5N1 outbreaks Due to

- Being an island in the Asian Continent
- Strict Quarantine Measures
- Awareness programs under Sri Lanka Exotic Disease Emergency Plan
- Administrative Structure
- low Poultry population

Regional Approach to control HPAI in next 5 years

- ✓ Sri Lanka we have prepared and implementing Exotic Disease Emergency Plan. I think preparation of Regional HPAI Emergency plan is useful in future
- ✓ Implementing awareness program to the decision makers of the regional Counties (political aspects of disease control and prevention).
- ✓ Development of better communication through proper networking among regional countries for H5N1 HPAI control and elimination.

The 5th OIE Regional Meeting on Strengthening Animal Health Information Networking for HPAI Control and Prevention in Asia

- in collaboration with Department of Animal Health of Vietnam -

Hanoi, Vietnam, 2-3 October 2012



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 Veterinary Expert
 Bureau of Disease Control and Veterinary Service
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 Ministry of Agriculture and Cooperatives
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I) Poultry production (layer and broiler)

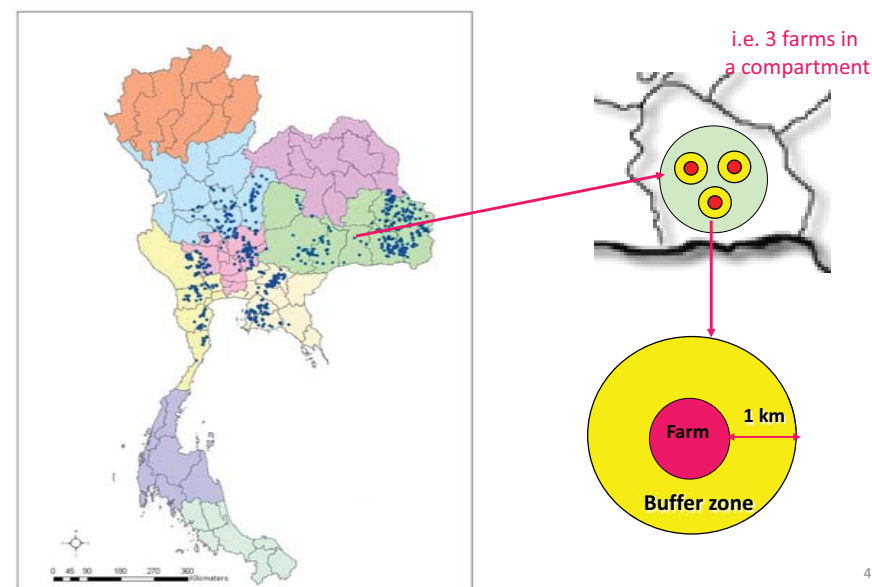
Types of Poultry	2009		2010		2011	
	No. of Farms	No. of Poultry	No. of Farms	No. of Poultry	No. of Farms	No. of Poultry
Breeder chicken	169	16,223,716	164	15,860,317	182	17,654,807
Broilers	7,310	213,8116,285	7,253	214,156,768	6,841	226,885,322
Layers	2,275	58,703,514	2,246	57,752,964	2,091	54,967,352
Native chicken	-	61,613,536	-	71,207,090	-	76,155,430
Breeder ducks	26	697,484	26	697,484	25	546,035
Meat-typed ducks	1,291	11,387,242	1,263	10,446,634	557	7,751,063
Layer ducks			77	397,400	36	257,580
Free grazing ducks (flocks)	3,943 (2012)	9,838,811 (2012)	4,355	7,990,780	4,173	8,963,097

Poultry compartmentalisation



- Location & Structure
- Biosecurity management
- NAI surveillance
- Traceability
- HACCP
- Risk assessment
- Disease control measures
- Contingency plan
- Reporting procedures

Poultry Compartmentalisation



Poultry Compartments in Thailand

	2009	2010	2011
Number of Companies	15	16	17
Number of Compartments	43	47	53
Number of Farms	273	297	294
Number of birds/crop (5-6 crops/year)	72, 406,178	73,259,354	75,972,086

Types and Number of GAP certified Poultry Farms: 2012



Type	Farms	Poultry
- Meat-typed duck farms	499	7,796,837
- Duck layer farms	11	237,880
- Duck breeding farms	24	445,877
- Chicken broiler farms	6,735	226,885,322
- Chicken layer farms	1,948	55,065,773
- Chicken breeding farms	193	19,204,321
Total	9,410	309,636,010



Passport for Free Grazing Duck



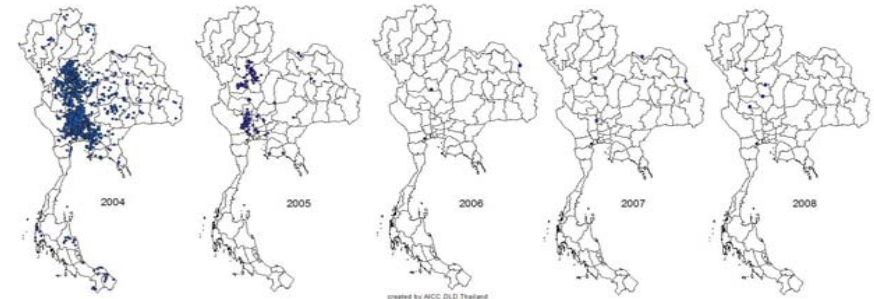
Registration of Free Grazing Duck Flocks



II) Live poultry markets

- There are not many live bird markets in Thailand. (<100)
- Both permanent and temporary LBM (during Chinese New Year) are under the :-
 - MOPH Regulation on Market Sanitation (B.E. 2551)
 - Law of Public Health (B.E. 2535) and the Revision (B.E. 2550)
 - Local Administrative Body Ordinance on Market
 - Law of Cleanliness and Tidiness Maintenance of the Neighbourhood
- Poultry sellers/vendors need the “Licence for Trade in Animal & Animal Products (R. 10)” and renew every year.
- Any movement of poultry requires a “Movement Permit”
- The cloacal swab testing for HPAI Virus, with negative result, prior to movement has been employed for issuance of the Permit.
- AQSS & Checkpoints to examine animal movement
- HPAI Awareness Campaign in markets during festive seasons

iii) HPAI Outbreaks in Thailand during 2004-2008



Outbreaks and affected Areas	2004	2005	2006	2007	2008
Numbers of Outbreak	1740	194	2	4	4
Sub-district	797	110	2	4	4
District	298	58	2	4	4
Province	60	21	2	4	4

Types of Birds Affected with H5N1

Type of Poultry	2004	2005	2006	2007	2008	Total	%
Backyard Chicken	1000	153	1	2	3	1159	59.61
Duck	477	20		1		498	25.61
Broiler	109	5			1	115	5.91
Layer	90	8	1	1		100	5.14
Quail	40	7				47	2.41
Geese	15	1				16	0.82
Others	9					9	0.46
Total outbreaks	1740	194	2	4	4	1944	100

IV) Active surveillance programme on domestic birds

Groups of Poultry & Sampling:-

1. Poultry Compartmentalisation
2. DLD certified farms for Good Agricultural Practice (GAP)
3. Non GAP certified farms
4. Native poultry or fighting cocks with basic biosecurity
5. Backyard poultry
6. Free grazing ducks
7. Natural & Migratory birds



Avian Influenza Surveillance Programme in Thailand: 2011

Group of poultry	Farm status	Clinical Surveillance	Laboratory surveillance		
			Cloacal swab sampling		Serum Sampling
			During rearing Period	Before Movement	
1. Poultry in Compartments (Poultry commercial farms)	To be certified as NAI free status	✓	✓ (763)	-	✓ (3,014)
	To be maintained for NAI free	-	-	-	✓ (39,545)
	Buffer zone	✓	✓ (1,655)	-	✓ (4,140)
2. DLD certified GAP farms (Poultry commercial farms)	Broiler farms	✓	✓ (71,416)	-	-
	Breeder/Layer farms	✓	✓ (16,150)	-	-
3. Non GAP certified farms	Broiler farms	✓	-	✓ (5,685)	-
	Breeder/Layer farms	✓	✓ (1,778)	✓ (4,258)	-

Avian Influenza Surveillance Programme in Thailand : 2011

Group of Poultry	Farm Status	Clinical surveillance	Laboratory surveillance		
			Cloacal swab		Serum
			During rearing Period	before Movement	
4. Native poultry, fighting cocks with basic biosecurity	Rearing places with basic biosecurity management	✓	✓ (3,621)	-	✓ (11,020)
5. Backyard poultry	Rearing places for backyard poultry or fighting cocks with no biosecurity	✓	✓ (31,340)	✓ (8,095)	-
6. Free grazing ducks	-	✓	✓ (46,462)	✓ (2,587)	✓ (12,326)
7. Natural & Migratory birds	-	-	✓ (3,489)	-	-
Total	-	(4,461,302)	(176,674)	(20,625)	(64,486)

V) Active/passive surveillance programme on wild birds



Materials on AI Surveillance in
Natural Birds

- DLD cooperates with Dept of Wildlife, Min of Nat. Resources & Environment
- Sampling cloacal swabs from habitats of natural and wild migratory birds throughout the country
- Bird e.g. pigeons, open-billed storks, turtle doves, *Sturnidae spp.* etc

VI) Control measures

- **Thailand prohibits AI vaccination in poultry**
- **Depopulation** the affected premises,
- **Compensation 75 % of the local market price**
- **Disinfection** of premises & infected materials
- **Disposal** of carcasses, products & infected materials
- **Quarantine** the suspected premises & surroundings
- **Movement control** in the radius of 10 km , 30 days
- **Active surveillance** timely in all groups in risk areas
- **Public awareness & special Campaigns**
- **Coordination** with all authorities concerned – MOPH Environment & Natural Resources, Prov. Governor

HPAI Case Definition

1. Broad signs to cover all AI potential cases
2. AI Case Definition (since January 2004) and further Revisions :-
 - a) Almost 100% mortality
 - Poultry death $\geq 10\%$ within a day (July 2004 Revision)
 - Poultry death $\geq 5\%$ within 2 days (Revised since July 2005)
 - Farmed poultry death $\geq 1\%$ within 2 days OR 20 % reduction in feed & water intake during a day
 - b) Severe respiratory signs with excessively watery eyes & sinusitis, cyanosis of the combs, wattle and shanks, edema of the head, ruffled feathers (Eye opacity in some ducks)
 - c) Diarrhoea and nervous signs (torticollis, seizure)
 - d) Sudden death OR cumulative death up to 40% in 3 days, depress, off feeding, egg drop, abnormal eggs OR no clinicals
3. If any one criterion is observed, disease control measures will be executed

VII) Actions to be undertaken in the next 5 years

- Daily active clinical surveillance & reporting
- Periodical intensive & active laboratory surveillance, at least twice a year (OIE)
- Encouraging poultry farmers for compartmentalisation
- Biosecurity improvement for all poultry rearing places
- Restructuring of free grazing ducks & backyard poultry
- Registration & ID
 - Fighting cocks /owners / farms / rings & arenas
 - Free grazing duck flocks
- Sampling & testing those Sector 4-Poultry, prior to movement
- Development of **community networks** for disease surveillance and control (*Sub-district Administrative Body*)
- Special campaigns e.g. HPAI Public Awareness and Disinfection Campaign, Poultry Products Safety Consumption during Chinese New Year etc.
- Simulation exercise (or Table-top exercise)

The 5th OIE Regional Meeting on Strengthening Animal Health Information Networking for HPAI Control and Prevention in Asia

Hanoi, 2-3 October 2021

Controlling and Prevention of HPAI in Vietnam

Vietnam Department of Animal Health

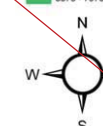
Poultry production system

• Poultry population in 2011:

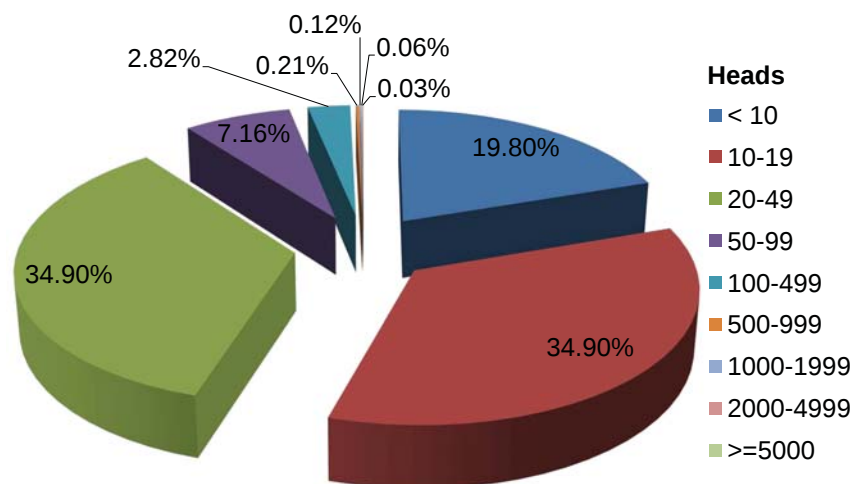
- Chicken: 232.7 mil.
- Duck: 74.9 mil.
- Muscovy: 14.3 mil.

- Two important areas of poultry production in Vietnam are Red River (in the North) and Mekong River Basins (in the South) where HPAI outbreaks occurred more frequently.

Legend: Density of poultry households
Spatial distribution at commune level
Number of poultry households



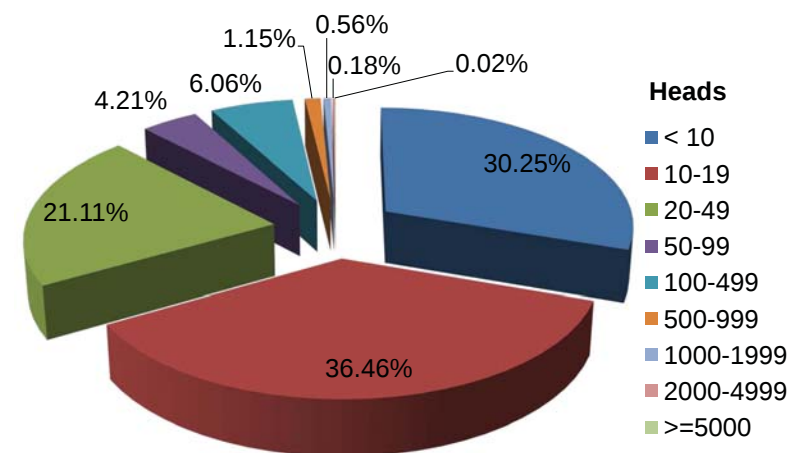
Proportion of households keeping chickens in Vietnam in 2011



Total: 7,864,738 chicken households

Data source: GSO, 2012

Proportion of households keeping ducks in Vietnam in 2011



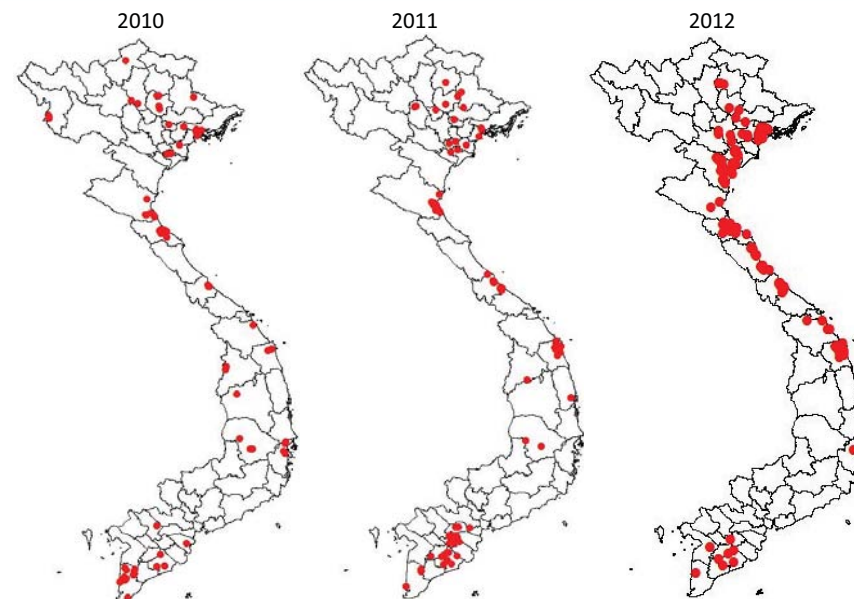
Total: 1,757,012 duck households

Data source: GSO, 2012

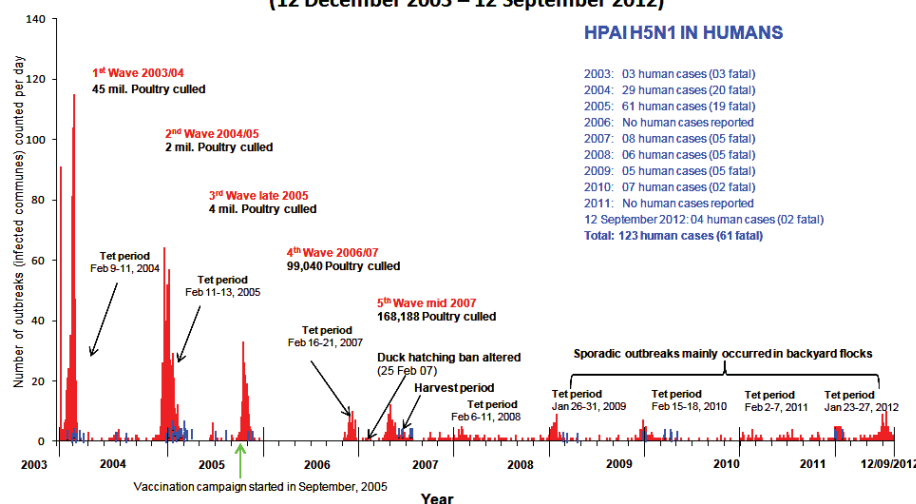
Recent HPAI H5N1 outbreaks in domestic birds

- **2010:** HPAI H5N1 outbreaks recorded in 56 communes, 33 districts of 19 provinces; 75,970 birds culled; chickens (38,2%), ducks (57,90 %); Muscovy ducks (3,9 %).
- **2011:** HPAI H5N1 outbreaks recorded in 76 communes, 40 districts of 21 provinces; 103,452 birds culled; chickens (41,70 %), ducks (57,29 %); 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; chickens (14,60 %), ducks (82,60 %); Muscovy ducks (2,80%).

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



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



Data sources (up to 12 September 2012): DAH & WHO, 2012
Prepared by Nguyen Van Long, Epi.Div, DAH

HPAI H5N1 IN HUMANS

2003: 03 human cases (03 fatal)
2004: 29 human cases (20 fatal)
2005: 61 human cases (19 fatal)
2006: No human cases reported
2007: 08 human cases (05 fatal)
2008: 06 human cases (05 fatal)
2009: 05 human cases (05 fatal)
2010: 07 human cases (02 fatal)
2011: No human cases reported
12 September 2012: 04 human cases (02 fatal)
Total: 123 human cases (61 fatal)

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	

Source: NCVD, 2012

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.

Disease control and prevention

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

National vaccination plan

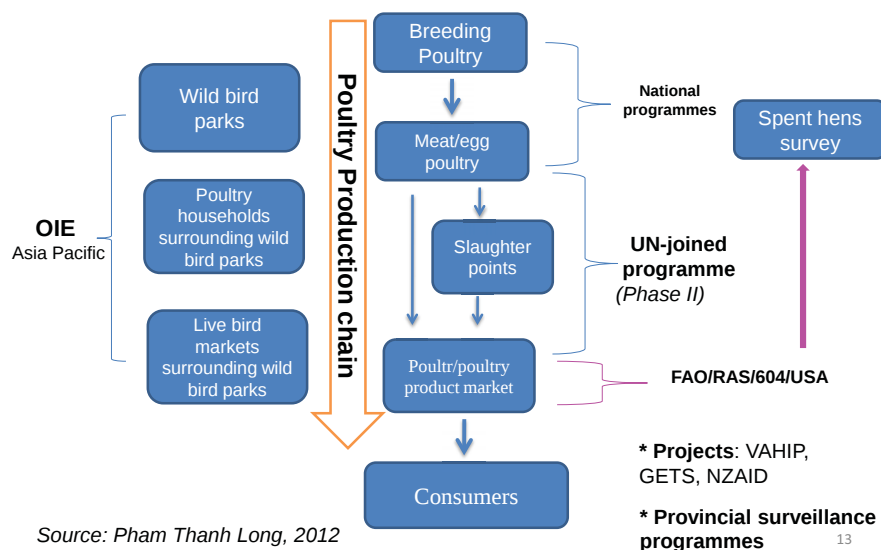
- The National vaccination plan for HPAI control
 - Phase I (2005 – 2006),
 - Phase II (2007 – 2008);
 - Phase III (2009 – 2010)
 - Phase III (2011 – 2012).
- Mass vaccination by two main campaigns per year.
- Central Government provides vaccines free of charge for small scale farms; local governments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

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

AI active surveillance in Vietnam from 2007 to 2012



Market surveillance in 2011/2012

Legend

VN_Communes

H5N1

- Not detected
- 1 month detected
- 2 months detected
- 3 months detected
- 4 months detected
- Surveyed district
- Surveyed province
- vn_province
- VN_Communes

Source: Pham Thanh Long, 2012

Lessons learned

- Single measures cannot lead to successful control and elimination of HPAI H5N1 virus
- An integrated control programme using the combination of measures best suited to its existing situation.
 - culling of affected flocks,
 - movement control,
 - disinfection,
 - vaccination

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

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.