OFFLU avian influenza virus characterisation meeting
29 – 30 March 2017
FAO Headquarters, Rome, Italy

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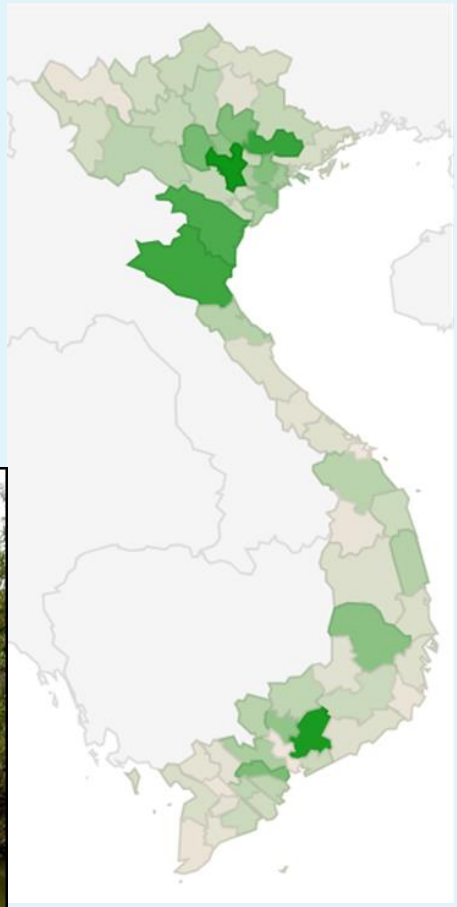
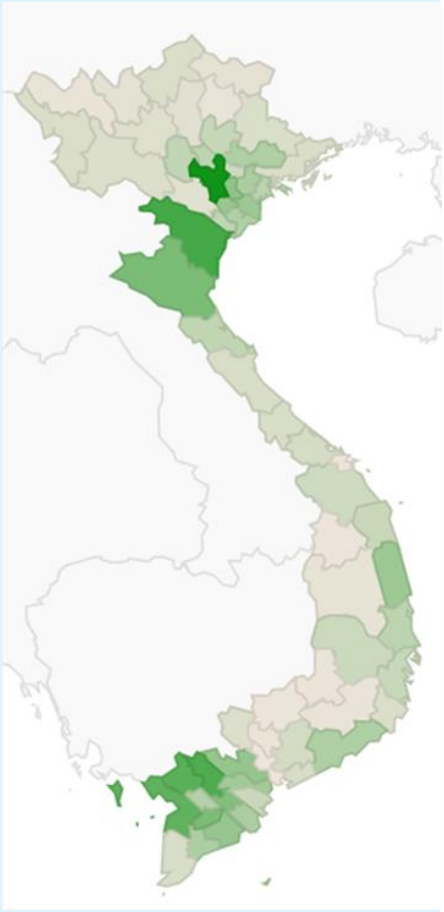
Vietnam

Poultry production in Viet Nam

- Population (<342 million)
- Chicken (<260 million)
- Duck (>82 million)
- Backyard production (70%)
- Free-range ducks

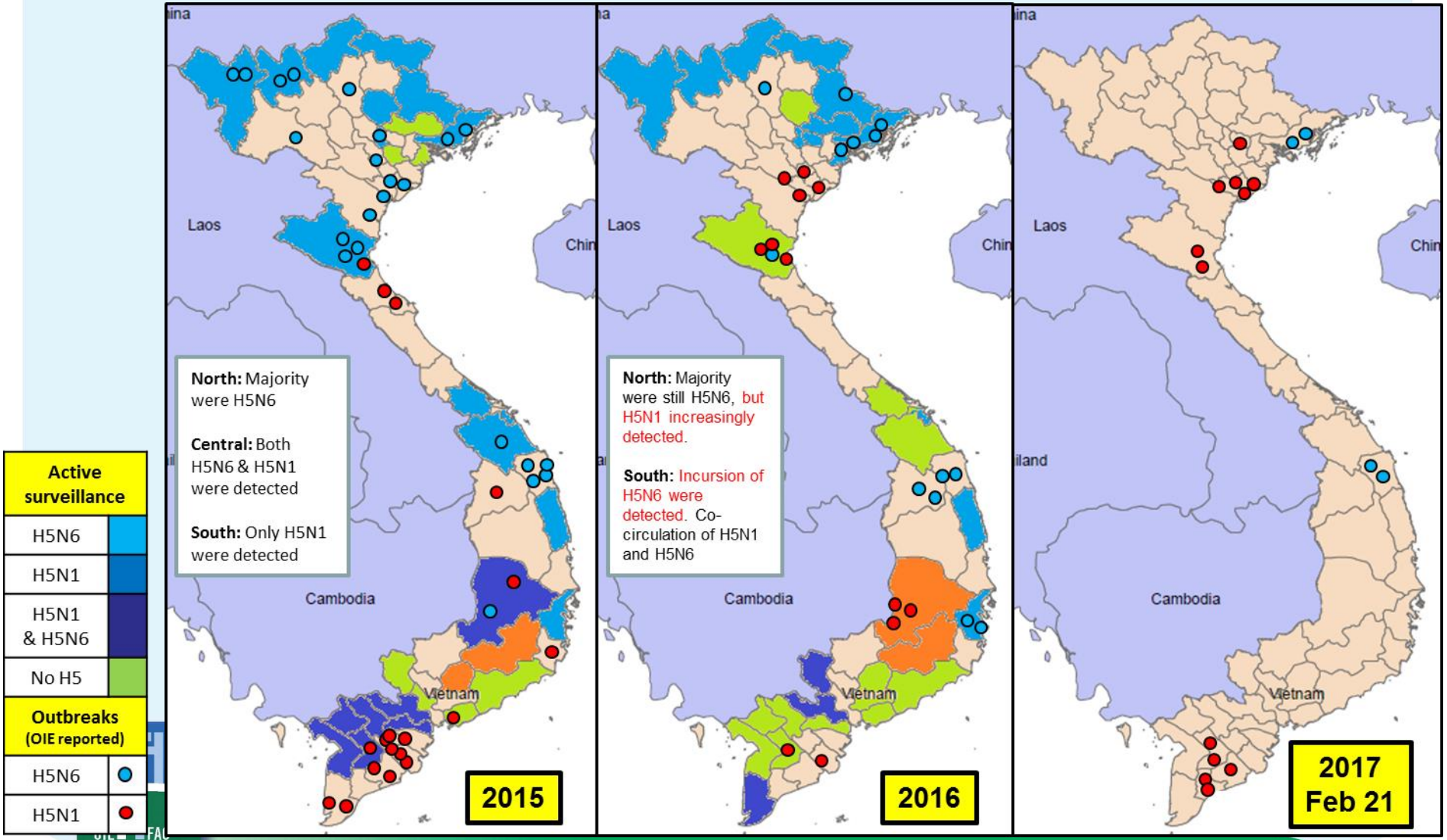


CHICKEN



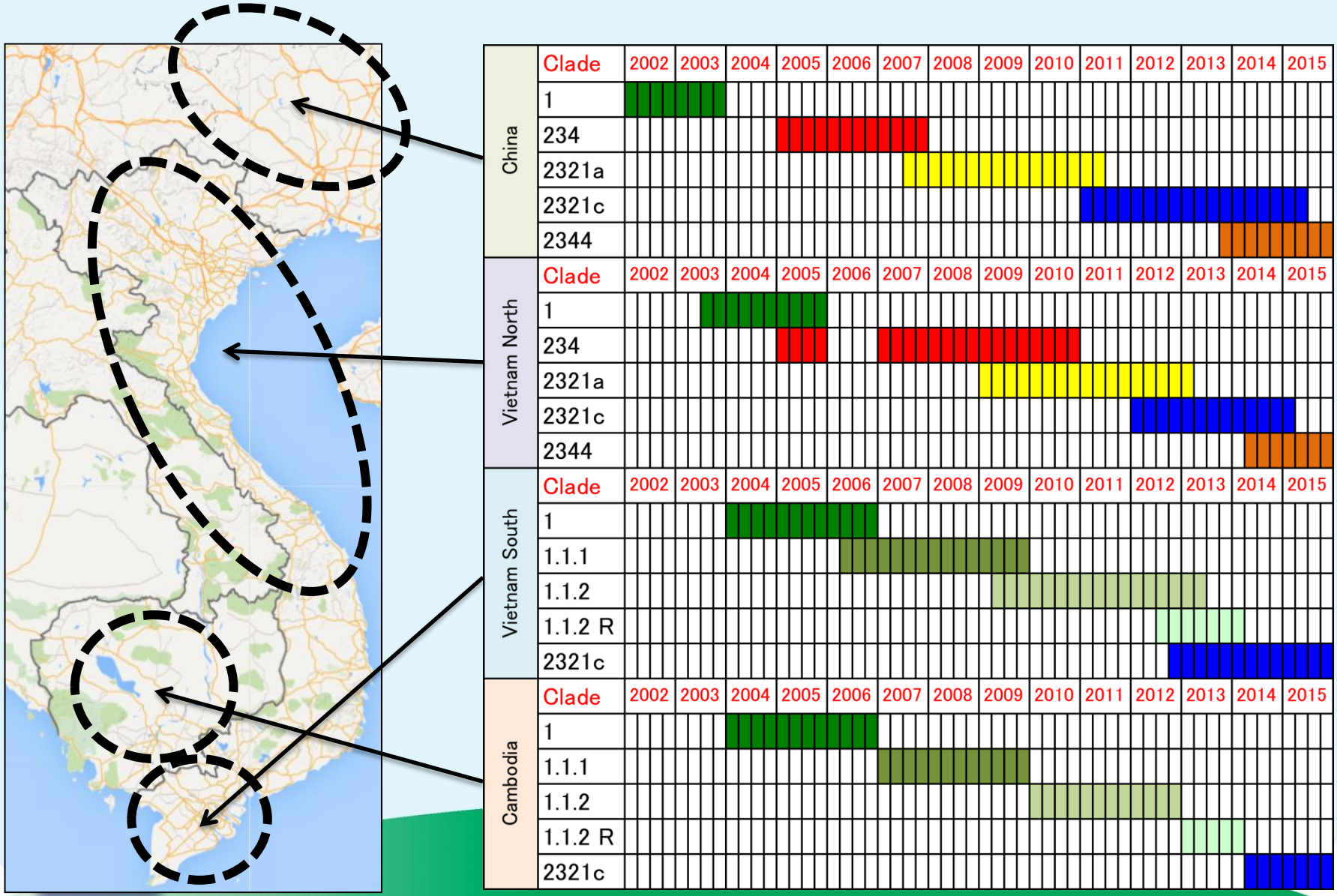
DUCK

HPAI H5 Disease Situation 2015 - 2017



Transition of H5 HA Clade in 4 areas 2002-2015

China, North Vietnam, South Vietnam, Cambodia



H5 Vaccines used/in use in Viet Nam

Vaccine	H5N2	BioFlu H5N9	Trovac	Re-1	Re-5	Re-6	Vifluvac	Re-6 &8	Virus in circulation (clade)	
By	Intervet	Merial	Merial	Harbin	Harbin	Harbin	Navetco	Harbin		
Country	Holland	France	France	China	China	China	Vietnam	China		
Strain (clade)				0	234	2321b	1	2321c 2344	North	South
2005	X	X	X	X					1, 234	1
2006	X	X	X	X					234	1, 111
2007	X	X	X	X					234	111
2008				X					234	111
2009				X					234, 2321ab	111,112
2010				X	X				234, 2321ab	112
2011				X	X	X			2321a	112
2012				X		X			2321a, 2321c	112
2013						X	X		2321c	112, 2321c
2014						X	X		2321c, 2344	2321c
2015						X	X		2321c, 2344	2321c
2016						X	X		2321c, 2344	2321c, 2344
2017						X	X	Testing	?	?

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Licensing of H5 Vaccines

- Registration and licensing of poultry H5 vaccines are under management of the Department of Animal Health (DAH).
- National Centre for Veterinary Medicine Control No.1 first checks for vaccine quality and then carries out field trials (immune response), which are then evaluated by the DAH's scientific committee.
- Licenses and marketing authorisation are granted based on these assessments.
- DAH also requests the National Centre for Veterinary Diagnostics to carry out laboratory challenge studies for licenced vaccines using newly detected field viruses.

Vaccination Strategy

2005-2012

- National mass vaccination program funded by central government
- Coverage: high risk province (density, number of outbreaks)
- Species: chicken, duck, muscovy duck

2013-2017

- Vaccination depends on province and commercial sector
- Vaccination done at most high risk province by the fund of province
- Compensation for culling at outbreak is only for flocks with vaccination
- Central government supports the cost of ring vaccination in response to outbreaks and advice on vaccine selection

Selection and monitoring efficacy of H5 vaccines

- This is a challenge as the strain changes every 2-3 years.
- Vaccines are selected based on the information collected especially from China
- Monitoring of antigenic matching of vaccines with the circulating virus is done by
  - Routine genetic characterization of H5 gene to find any new strain?
  - HI test of vaccine antisera with field viruses
  - Challenge experiment (annually or upon the emergence of a new strain)

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Efficacy Tests of Chinese H5N1 Re-1 Vaccine 2008-09

Birds		Chicken			Duck	
Challenge virus (HA clade)		1	2.3	7	1	2.3
Vaccinated	HI Ab titer	7.0	6.2	6.5	7.2	6.3
	Virus excretion (Mean Ct)	+ (35.8)	+ (32.0)	+- (37.2)	+ (33.4)	+ (31.6)
	Mortality (%)	0%	0%	0%	0%	0%
Control	HI Ab titer (GMT)	Neg	Neg	Neg	Neg	Neg
	Virus excretion (Mean Ct)	+++ (23.8)	+++ (24.2)	++ (27.3)	++ (25.8)	+++ (24.0)
	Mortality (%)	100%	100%	40%	60%	70%

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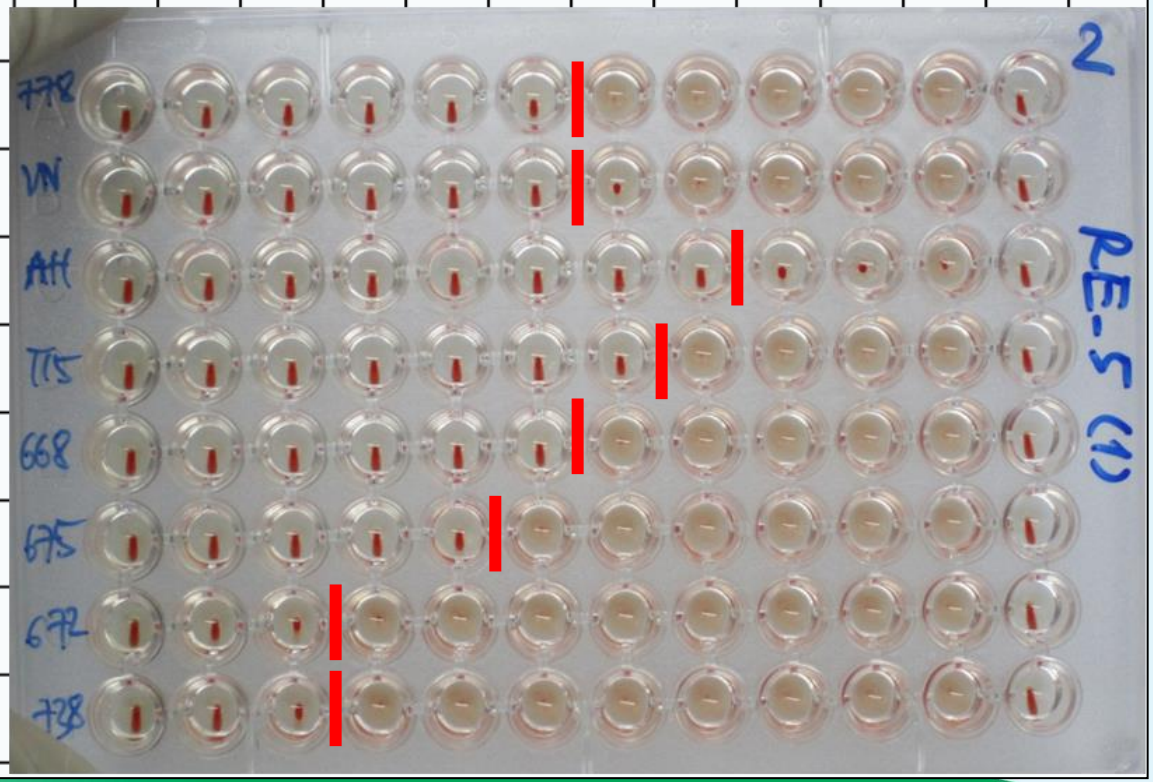
Difference in antigenicity among different clade of H5 viruses

HI test of antiserum to Re-5 vaccine with different clade of viruses

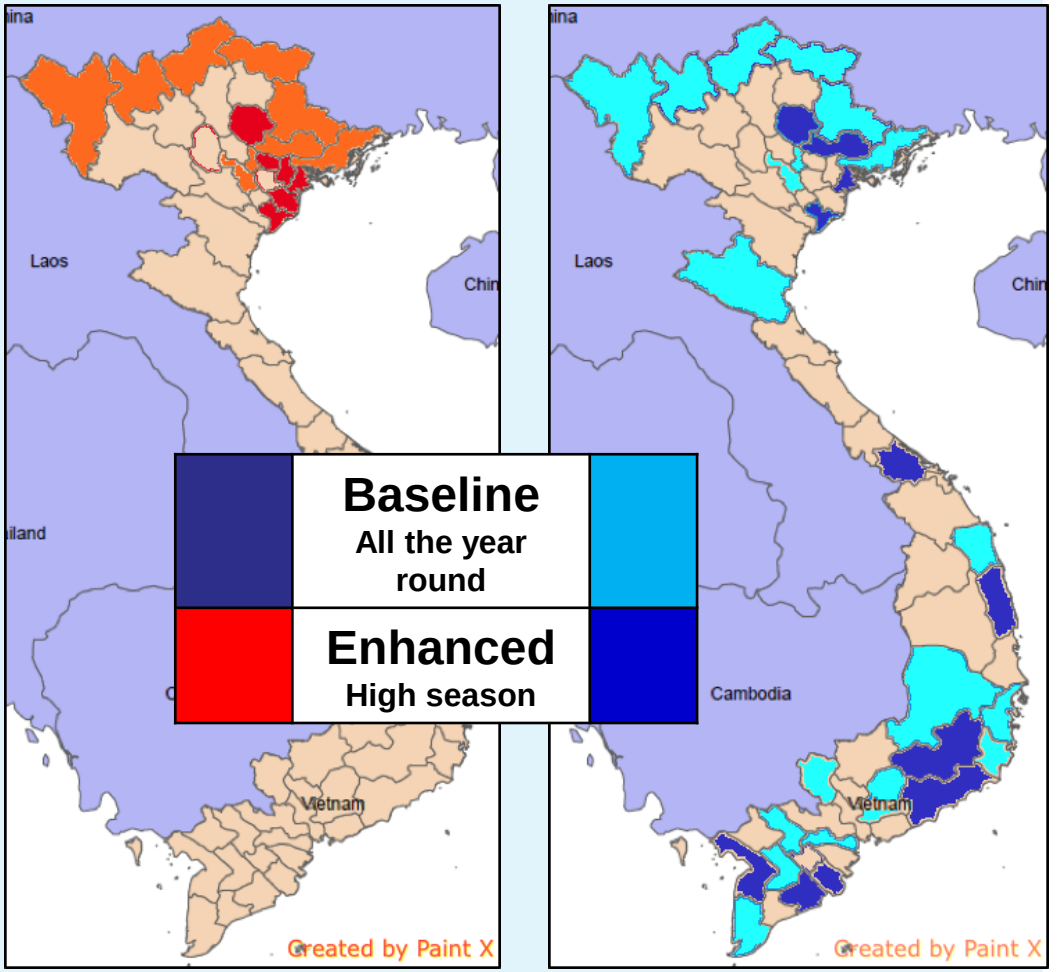
HI antigen		Serum dilution (log2)										
Clade	Virus	1	2	3	4	5	6	7	8	9	10	11
1	A778											
	VN1203											
2-3-4	Anhui/1/05											
	T15											
2-3-2A	A668											
	A675											
2-3-2B	A672											
	A738											



Avian Influenza Surveillance 2017

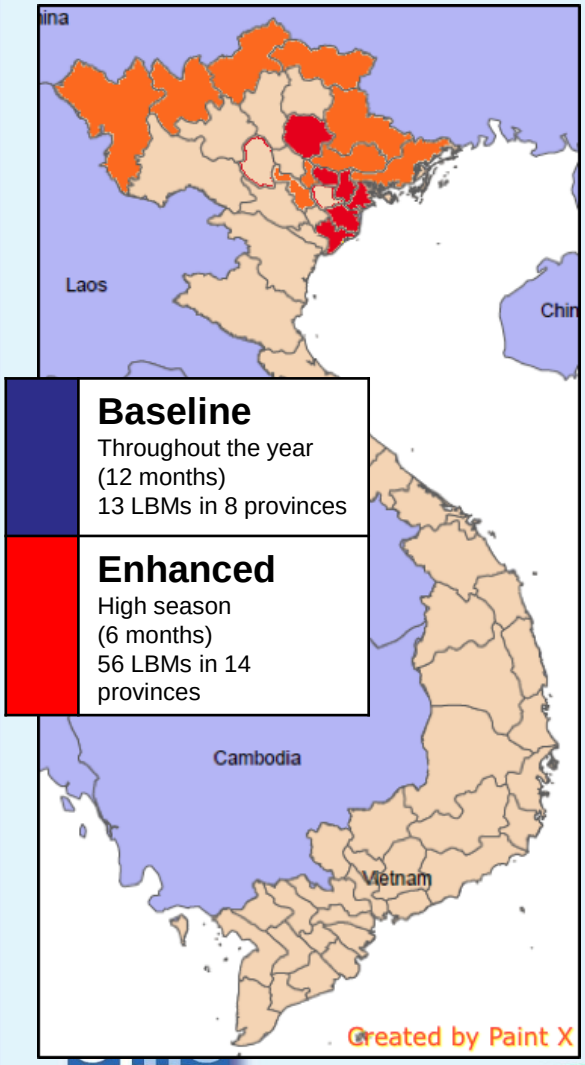
Objectives

1. **Early detection of H7N9** viruses in poultry and LBMs in high-risk areas for rapid response;
2. **To understand the epidemiology and the evolution of HPAI H5** viruses in poultry to inform prevention and control strategies, including vaccine selection; and to evaluate the performance of H5Nx control programme
3. **To understand the gene pool and the evolution of influenza A** viruses in poultry and pigs for early warning of emergence of pandemic influenza A



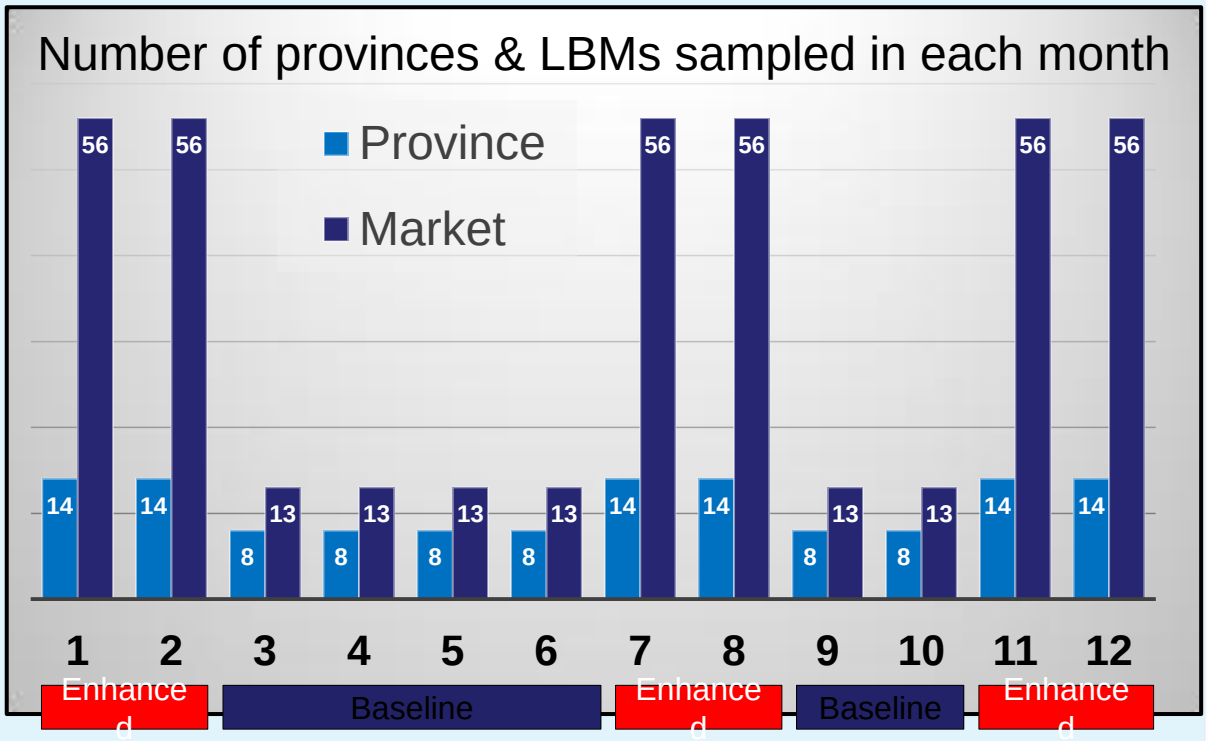
Detection (H7N9) **Monitoring (H5)**

1. Early detection of H7N9



Baseline
Throughout the year
(12 months)
13 LBMs in 8 provinces

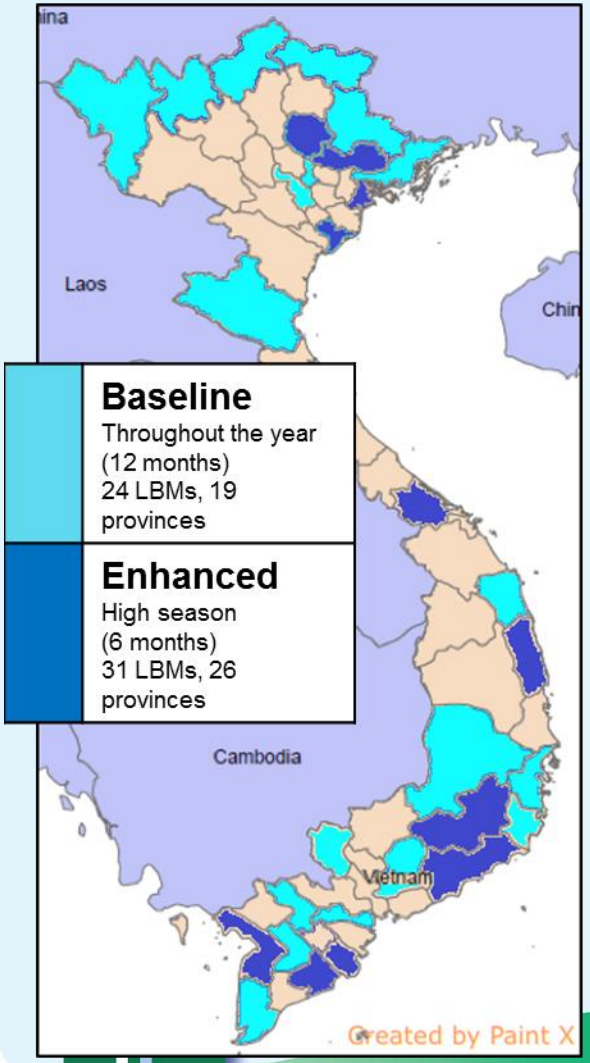
Enhanced
High season
(6 months)
56 LBMs in 14 provinces

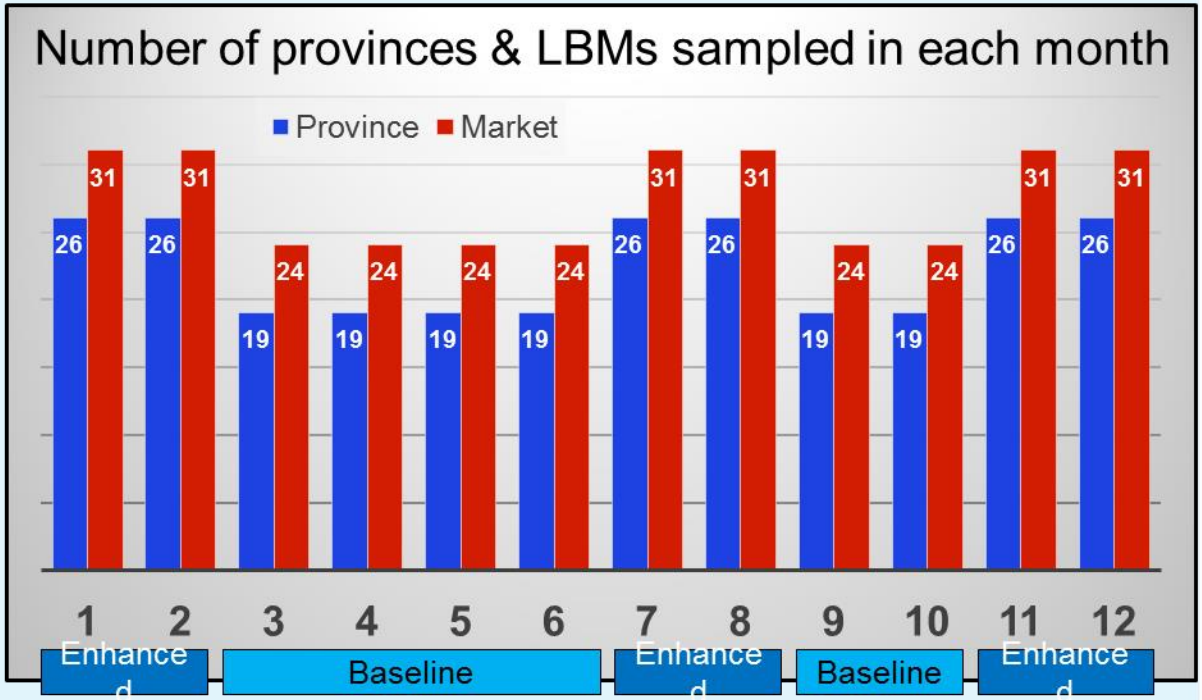


Sampling

- Once a month
- 40 environment samples / LBM, pooled to 8 samples
- Total number/year: 16,560 (3,312 pools of 5)
  - Baseline: 6,240
  - Enhanced: additional 10,320

2. Monitoring of H5 virus evolution and epidemiology





Sampling

- Once a month for baseline, once more a month for enhanced
- Environment samples, 40/LBM for baseline
- Oropharyngeal swabs, 30 chicken, 30 ducks/LBM for enhanced
- Total number/year: 16,560 (3,312 pools of 5)
  - Baseline: 11,520 (pooled to 2,304)
  - Enhanced: additional 11,160 (individually collected, not pooled)

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Lab Testing Algorhythm