

# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD AND DOMESTIC BIRDS IN TAIWAN

*Wen-Chen, Li*

Animal Health Research Institute, Council of Agriculture,  
Executive Yuan (AHRI)

*Shu-Fen, Chang*

Bureau of Animal and Plant Health Inspection  
and Quarantine (BAPHIQ), Council of Agriculture

*Russia, Vladimir, 18 June 2014*





# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN

- Since 1998
- To monitor the highly pathogenic avian influenza virus in wild birds.
- Collaborate with wild bird society
- 1998 to 2013: 61,352 samples

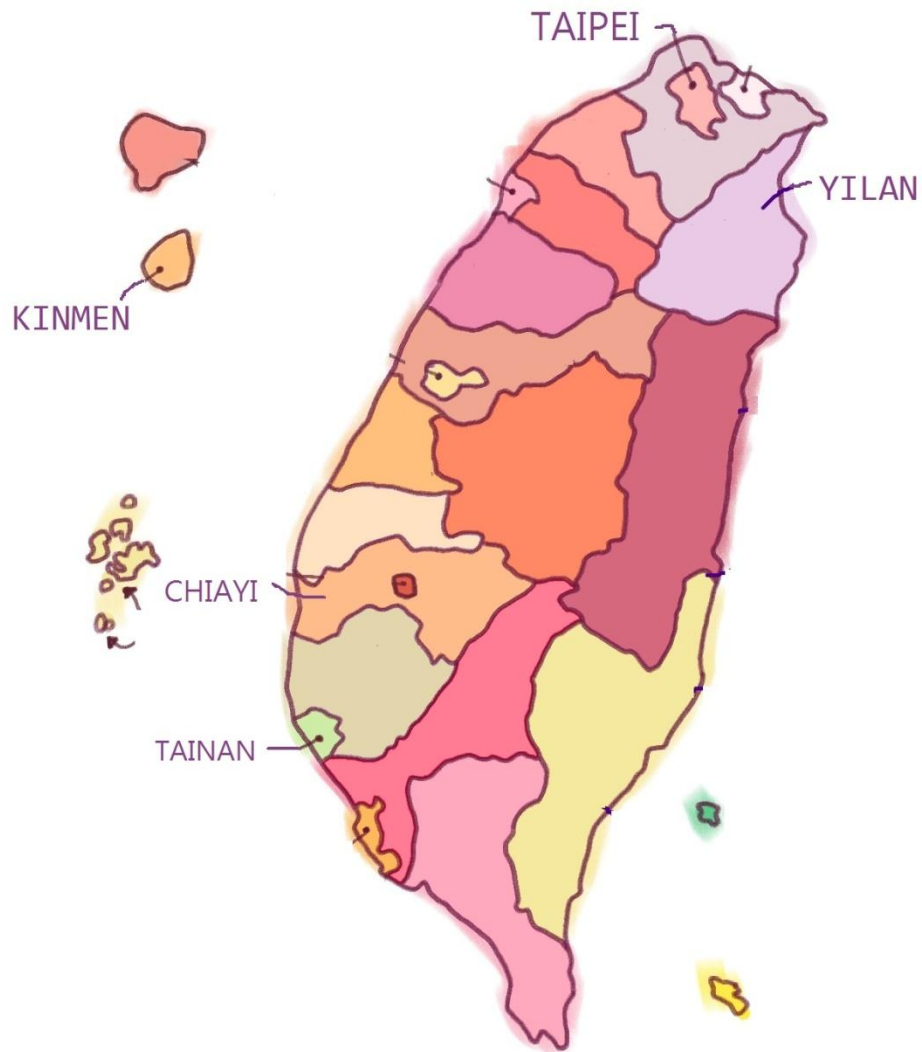
# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN

## SAMPLE

- Sample time: flybird traveling season (Spring, Autumn)
- Object
  - Anatidae vigors,
  - Scolopacidae vigors,
  - Charadriidae vigors,
- Cloacal swab
- Feces



# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN





# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN

## Isolation List

Time	No. samples	No. Isolates(%)	No. subtypes	Subtypes
1998/2-1998/4	906	13 (1.4)	1	H1N3
1998/9-1999/4	2,134	163 (7.6)	10	H1N1, H1N3, H2N3, H3N8, H4N2, H4N6, H4N7, H4N8, <u>H7N1</u> , H10N7
1999/8-2000/7	1,831	36 (2.0)	8	<u>H1N1</u> , H4N6, H6N1, <u>H7N1</u> , H8N4, H10N4, H11N9, H14N7
2000/8-2001/3	1,427	3 (0.2)	1	<u>H7N1</u>
2001/10-2002/5	2,781	9 (0.3)	3	H4N6, H4N8, H10N4
2002/9-2003/6	2,888	8 (0.3)	5	H4N6, H3N8, H6N2, H3N6, H6N1
2003/7-2004/7	3,488	7 (0.2)	2	H11N9, H10N3

# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN

Time	No. samples	No. Isolates(%)	No. subtypes	Subtypes
2004/8-2005/5	3,611	28 (0.8)	11	H1N1, H2N7, H4N2, H4N6, H4N8, <u>H5N2</u> , <u>H5N6</u> , H6N5, <u>H7N3</u> , H10N8, H11N9
2005/8-2006/7	5,201	44 (0.8)	14	H1N3, H3N8, H3N6, H3N9, H4N3, H4N6, H4N2, <u>H5N2</u> , <u>H6N1</u> , <u>H7N3</u> , H10N4, H10N6, H11N9, H12N2
2006/8-2007/7	4,027	38 (0.9)	9	H1N3, H3N8, H4N6, H4N7, <u>H7N6</u> , H9N6, H9N9, H10N3, H10N7
2007/8-2007/12	1,889	18 (0.9)	6	H1N1, H1N2, H3N8, H4N6, <u>H7N7</u> , H8N4
2008/1-2008/12	4,265	25 (0.6)	11	H2N9, H3N6, H3N8, H4N2, H4N6, H7N3, H7N7, H10N1, H10N7, H10N9, H11N3



# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN

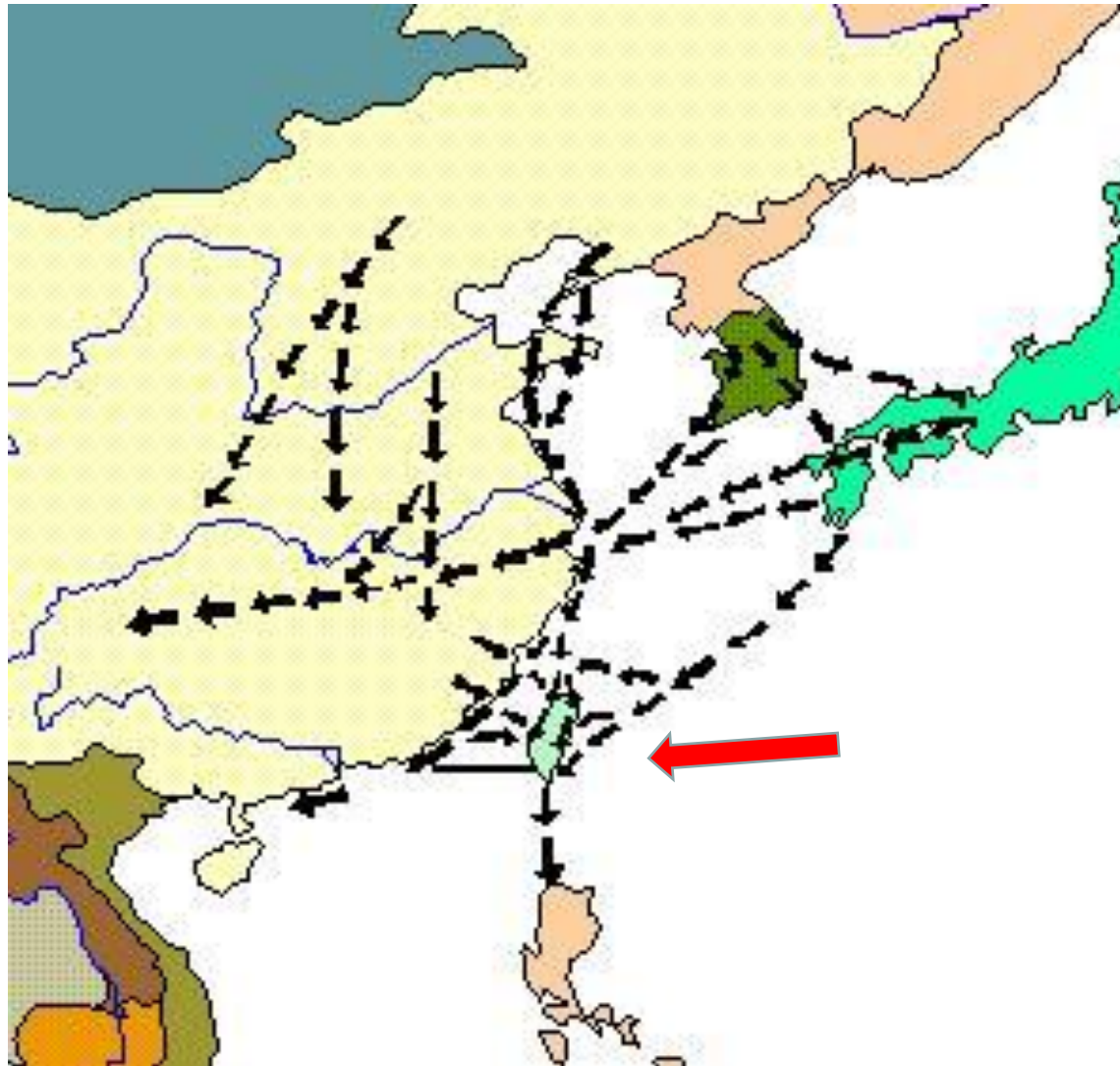
Time	No. samples	No. Isolates(%)	No. subtypes	Subtypes
2009/1-2009/12	5,834	35 (0.6)	15	H1N1, H3N2, H3N8, H4N5, H4N6, H4N8, H6N2, H6N9, H7N3, H7N5, H7N7, H7N9, H10N3, H10N7, H11N3
2010/1-2010/12	4,849	38 (0.8)	7	H1N1, H2N3, H4N6, H7N2, H10N3, H10N7, H10N9
2011/1-2011/12	3,935	27 (0.7)	8	H3N6, H3N8, H4N6, H5N2, H7N3, H7N6, H7N9, H10N7.
2012/1-2012/12	4,428	18 (0.4)	5	H1N1, H1N3, H4N6, H7N1, H10N7.
2013/1-2013/12	7,858	21 (0.3)	15	H1N1, H1N3, H3N6, H3N8, H4N6, H5N2, H5N3, H6N1, H7N1, H7N3, H7N6, H7N7, H7N9, H10N7, H12N5
Total	61352	531 (0.87)	48	H1N1, H1N2, H1N3, H2N3, H2N7, H2N9, H3N2, H3N6, H3N7, H3N8, H3N9, H4N2, H4N3, H4N5, H4N6, H4N7, H4N8, H5N2, H5N3, H5N6, H6N1, H6N2, H6N5, H6N9, H7N1, H7N2, H7N3, H7N5, H7N6, H7N7, H7N9, H8N3, H8N4, H9N6, H9N9, H10N1, H10N2, H10N3, H10N4, H10N6, H10N7, H10N8, H10N9, H11N3, H11N9, H12N2, H12N5, H14N7

# SURVEY OF AVIAN INFLUENZA VIRUS FROM WILD BIRDS IN TAIWAN

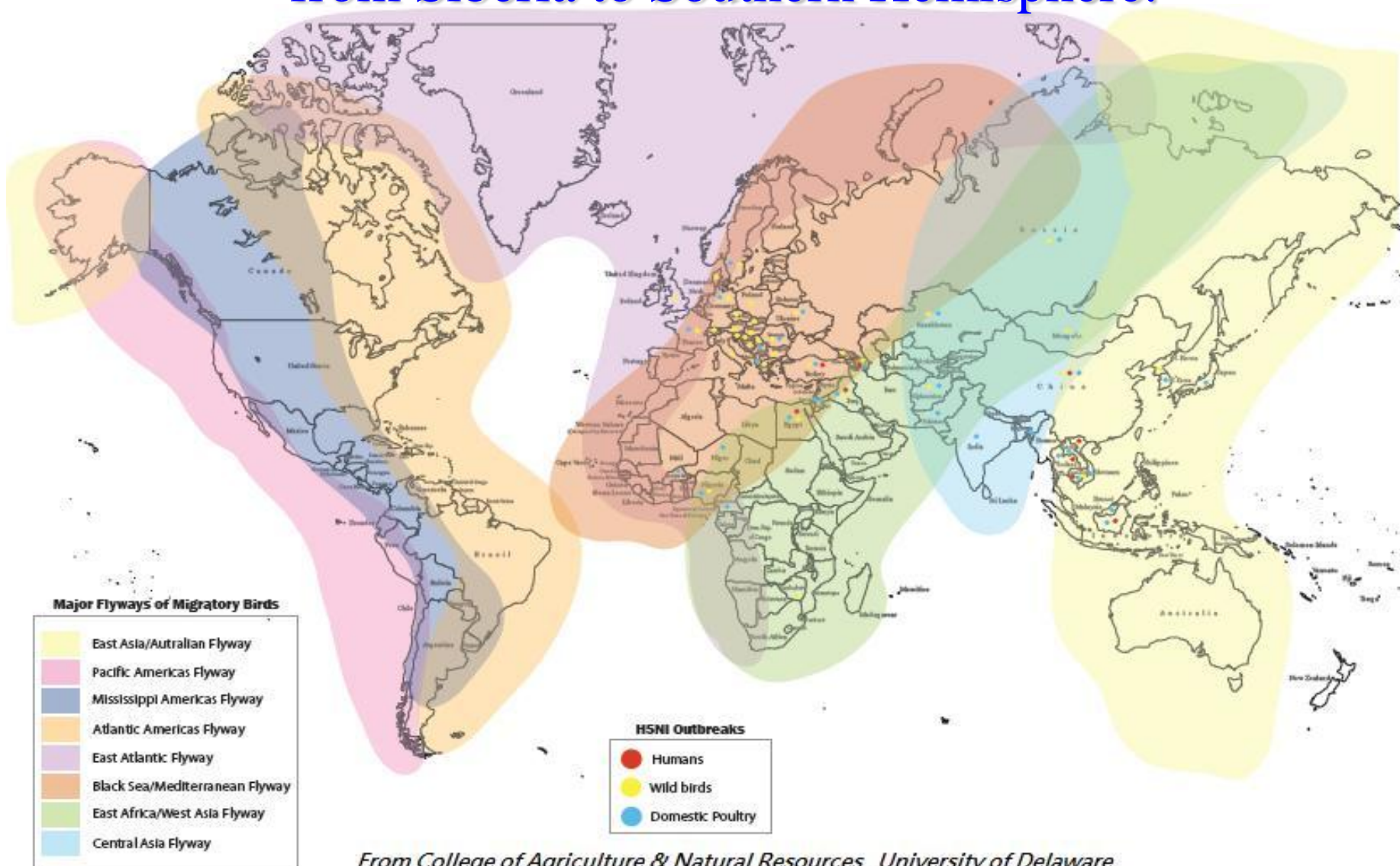
- Isolation: 531 virus, 48 subtypes
- The H5 and H7 subtype virus are all LPAI pathogenic
- High Isolation rate:
  1. Season: SEP. – DEC.
  2. Host: *Anatidae spp.*



# East Asia Migration Pathways



Taiwan, site in the middle of the Western Pacific and located at one of the migration way of the wild bird from Siberia to Southern Hemisphere.



# Current Situation of Poultry Production in Taiwan

- **Value of Livestock Products in 2013**

- **Value of Livestock Production: NTD 150 billion (USD 5 billion); the top 3 of Livestock Production are:**

- **Hog : NTD 66.8 billion, 45% of Livestock Production**
- **Chicken : NTD 38.1 billion, 25% of Livestock Production**
- **Egg : NTD 19.0 billion, 13% of Livestock Production**

- **Poultry Production in 2013**

Species	Farms	Head on Farms	Slaughtered
Chicken	5,618	91,070,017	307,487,000
Waterfowl	2,795	8,511,418	39,114,000
Total	8,413	99,581,435	346,601,000

# **The outbreaks of Avian Influenza in Taiwan from 2012 till now**

- No H5N1 case was noticed or detected in domestic and wild birds since the ancient times.
- 7 H5N2 HPAI and 9 H5N2 LPAI were detected in 2012
- 5 H5N2 LPAI and 2 H5N3 LPAI were detected in 2013
- 1 H5N2 HPAI and 1 LPAI were detected in 2014

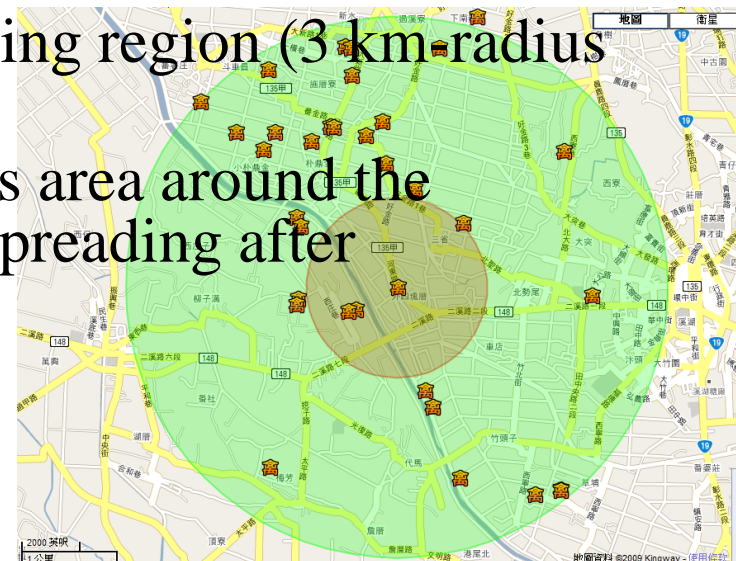
# Active surveillance programme of domestic birds

- Active surveillance programme had been initiated since 1998.
- The aim is to detect clinical/subclinical NAI cases and as the measure for precaution for early case response and control.

Item	Description
Frequency	Four times a year
Timing	Each season
Target species	Chicken, Duck, Geese
Survey province	22 provinces
Sample category	Serum and Cloacal Swab
Sample scale	20 /per farm
Target premise	Farms (about 1,000 farms/per year) , Live poultry trade markets ( about 145 )
Target serotype	H5, H7
Testing method	ELISA, HI, RT-PCR, VI, Genetic analysis

# Active surveillance programme of domestic birds

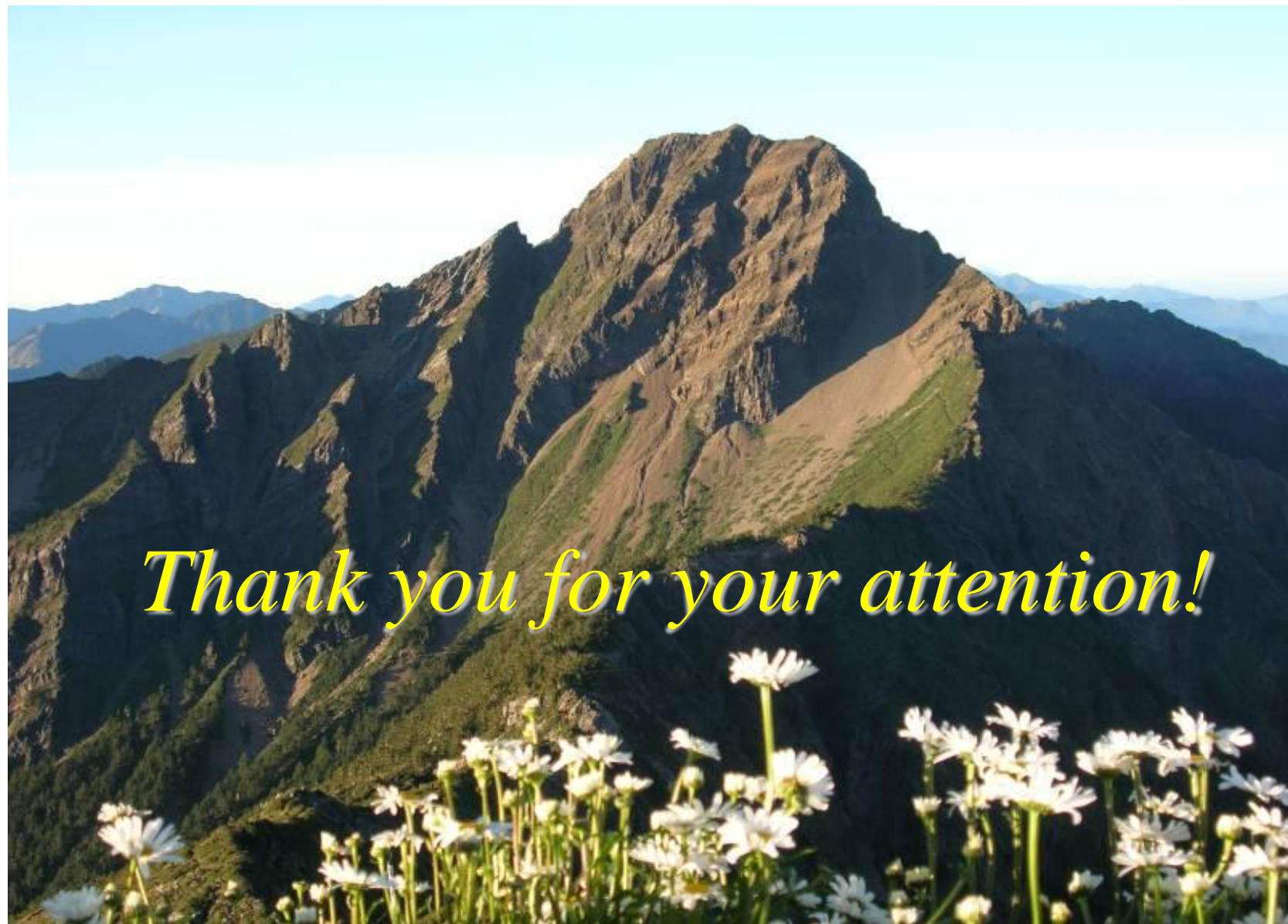
- Control measures to be undertaken if HPAI case/LPAI case is detected:
  - Movement restriction.
  - Stamping-out of infected farm. (the regular rule for HPAI)
  - Cleaning and disinfection.
  - Empty for at least 21 days.
  - Sentinel chicken testing.
  - Intensified surveillance of surrounding region (3 km radius of infected farm) for 3 months.
  - Ring vaccination within 1 km radius area around the infected farm (if the outbreak was spreading after evaluation).





# Interesting Issue

- What's have you done during the 2005 to 2010 for prevention Avian Influenza (AI) virus infect poultry?
- Have any routine surveillance program of AI in domestic bird and wild bird in Russia?
- How to treat the waste from AI affected farm? (Including dead bird, litter and feces.)
- What kind of method do you use to make the poultry lost consciousness before stamping out?



*Thank you for your attention!*