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HPAI Control and surveillance in China

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2008. 11



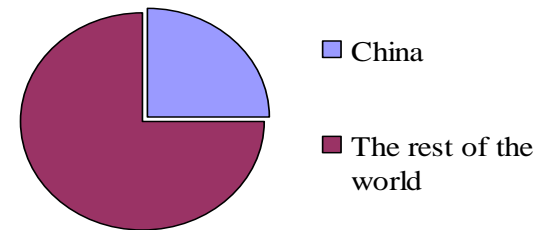
I. General Information

1. Poultry annually increases by 3-8% for nearly 3 decades in China

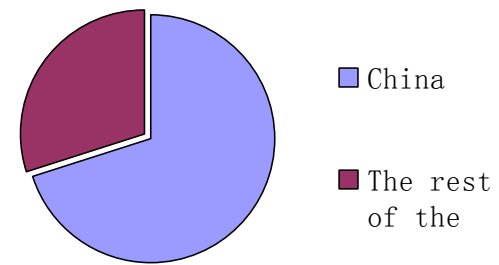
In 2007, China poultry:

- **15.5 billion fowls raised**
- **5.4 billion fowls in stock**

Chickens (1/4)



Waterfowls (70%)



2. Poultry transportation and live market

- Also increase rapidly in China



3. Inadequate biosecurity

Therefore, China poultry

- Vulnerable to exotic infectious diseases
- Difficult to control and eliminate these infectious diseases

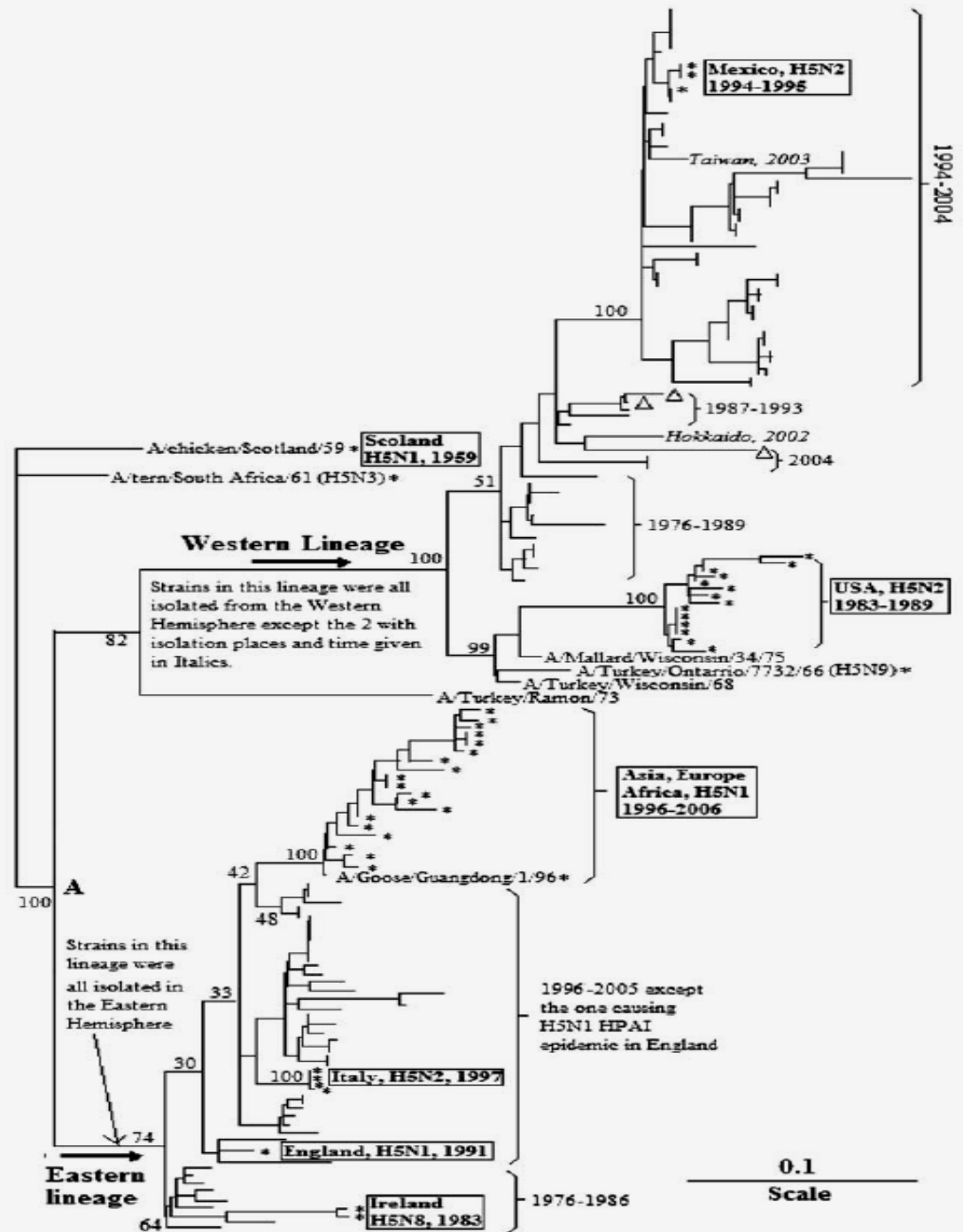
1996: first H5 HPAI virus isolated

- From Guangdong province, backyard geese
- A/goose/guangdong/1/96 (H5N1)

Before this, the H5 HPAI viruses have...

- circulated in the Europe and Asia at least for decades
- Caused a dozen of outbreaks in poultry in multiple countries including England, South Africa, Italy, Australia, etc.

1959 Scotland
1961 South Africa
1983 Ireland
1991 England
1997 Italy

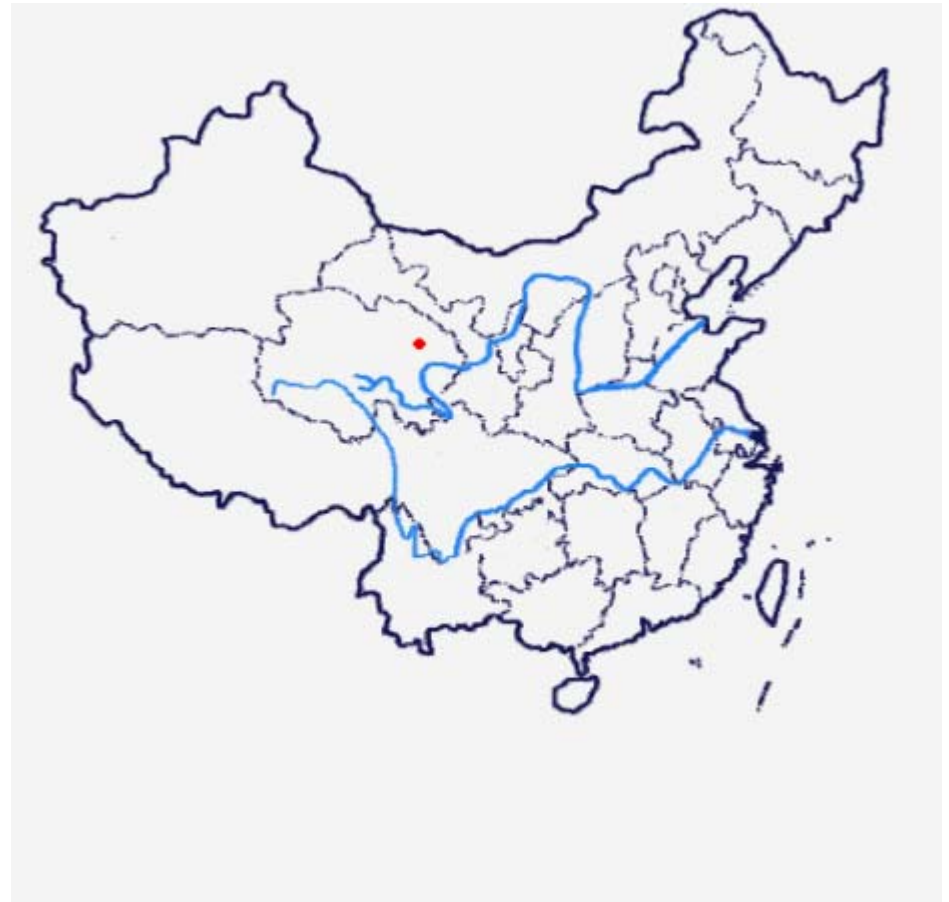


Dec. 2003 –Feb. 2004

- Pandemic in fowls began in East and Southeast Asia
- Outbreaks reported in Korea, Thailand, Vietnam, Japan, Hong Kong, Cambodia, Laos
- China reported the H5N1 HPAI outbreaks in 16 provinces

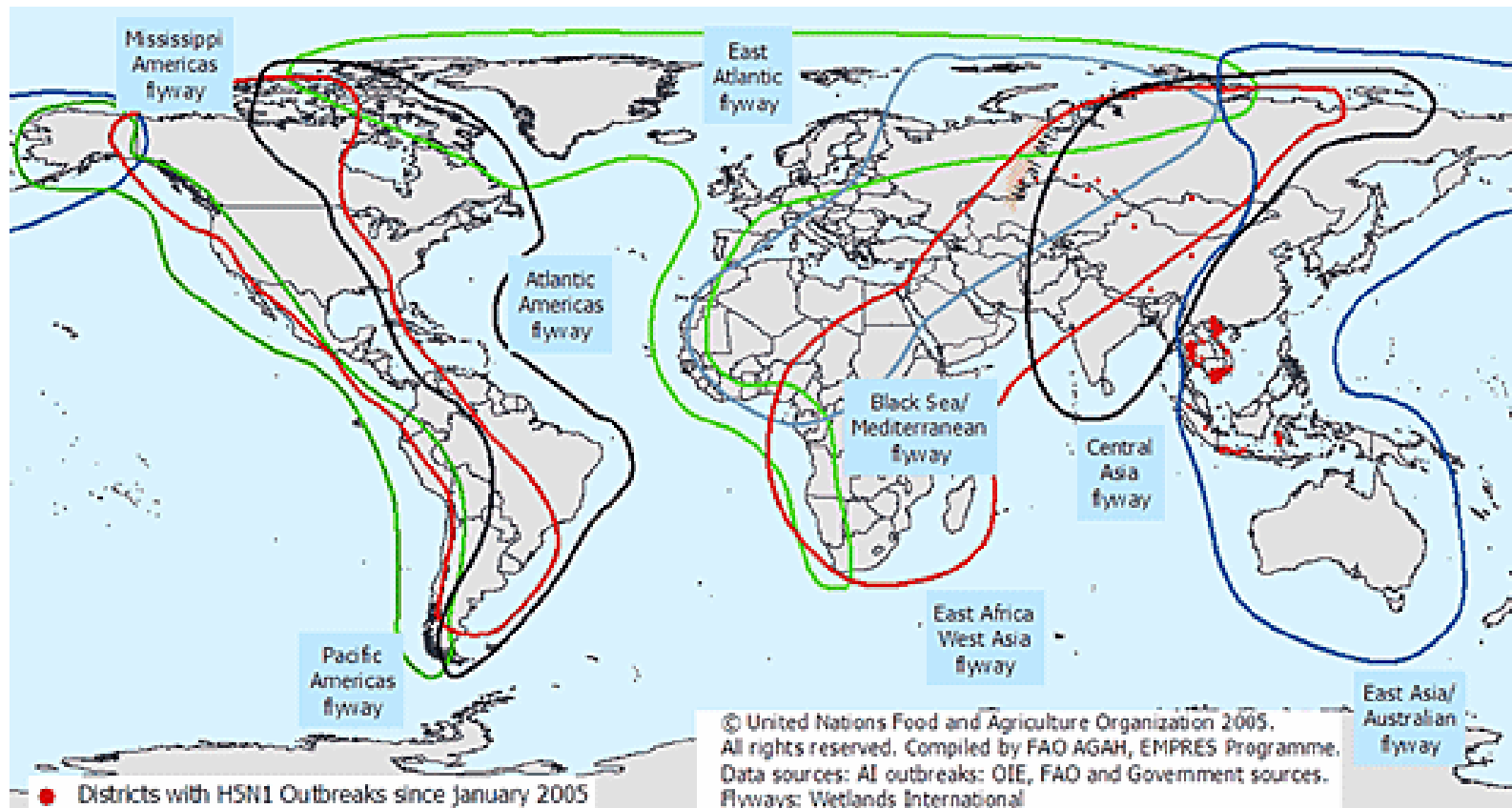
April. 2005

- Many wild birds died in Qinghai Lake in the western province of China
- Later, this variant (clade 2.2) caused many outbreaks in Mid and West Asia, Africa, Europe



Where did the variant come from?

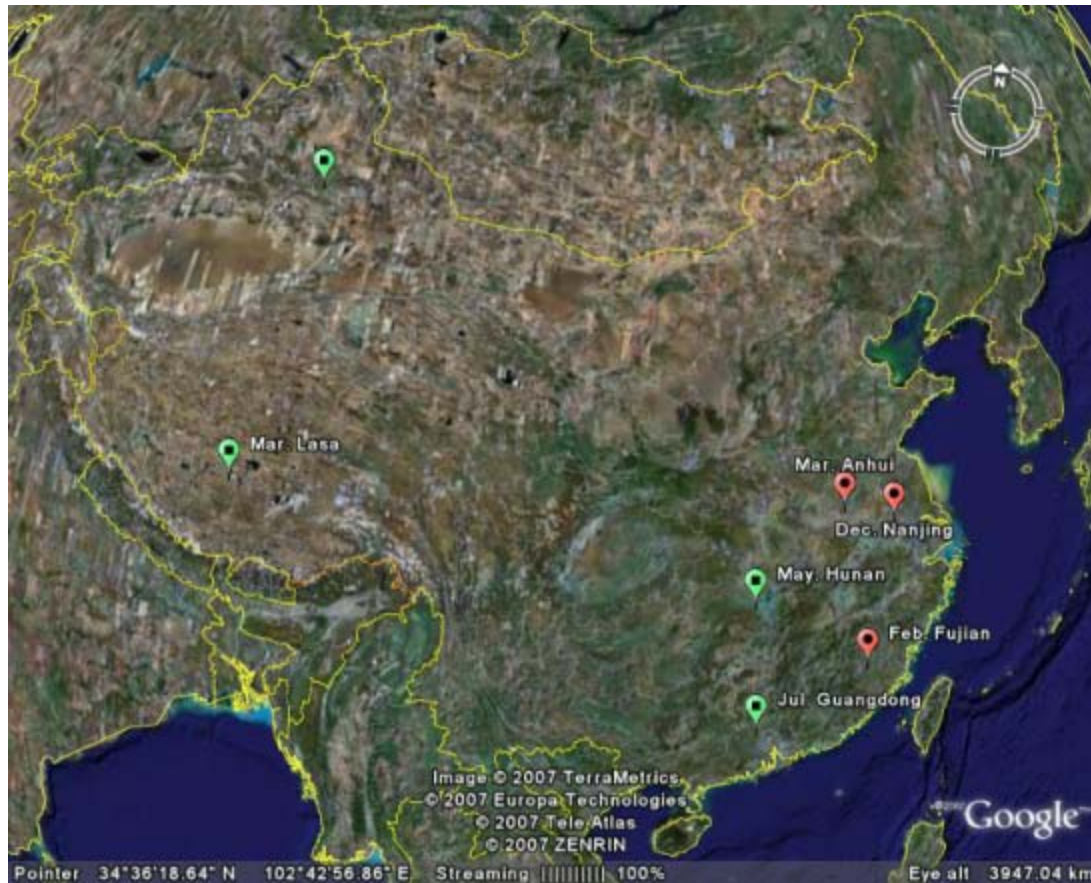
- Some suspected: South China
- Actually: unknown
- Iceberg phenomenon: little surveillance prior the outbreak
- Probability
- The variant was always very rare in South China
- Few birds migrated to the lake from South China



HPAI: 01/2004 - 06/2008

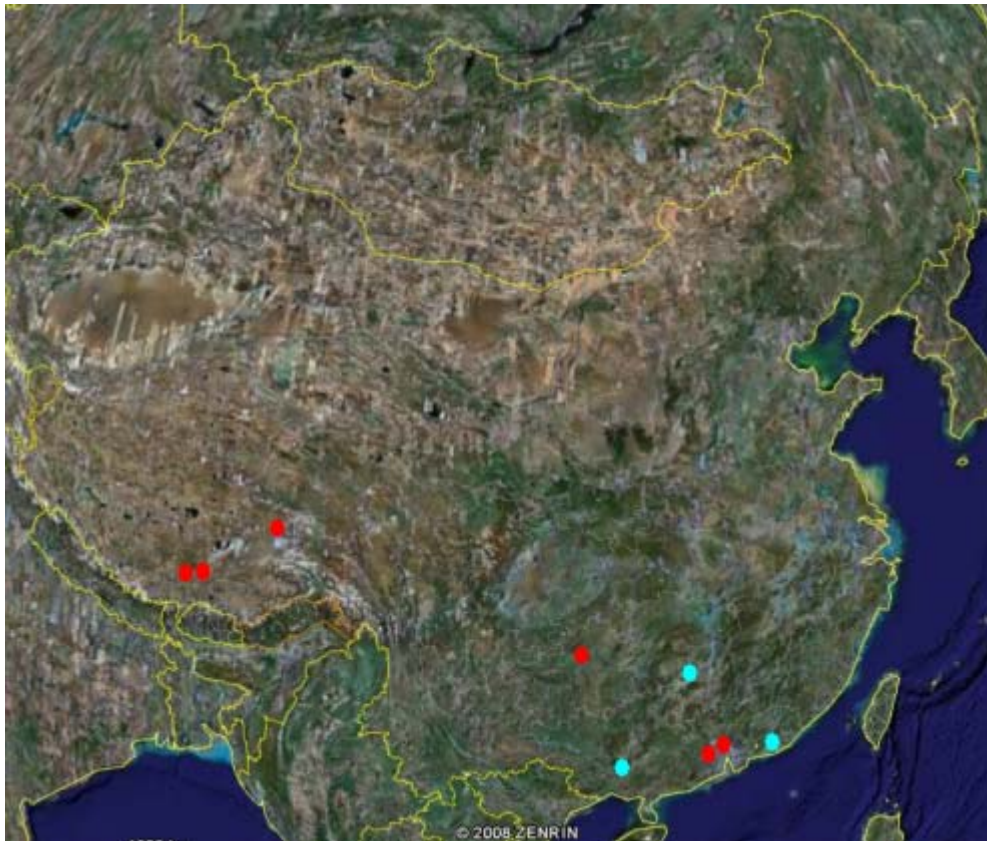
Year	Outbreaks	Deaths (1,000)	Slaughtered (1,000,000)
2004	50	129	8
2005	32	155	23
2006	10	47	3
2007	4	22	0.09
2008	6	NA	0.59

HPAI Situation in China in 2007



- 4 poultry outbreaks
- 5 human cases, 3 fatal

HPAI Situation in China in 2008



- 6 poultry outbreaks
- 3 fatal human cases



II . HPAI Control Policy in China

Principles: Early, Quick, Strict

- **Early:** Discover, report, diagnose, ASAP
- **Quick:** Response, ASAP
- **Strict:** Strict measures

Contain the outbreak

Minimize the spread

Comprehensive measures

- **Compulsory vaccination:** all domestic birds are compulsory for vaccination, including backyard flocks.
- **Stamping-out:** all the infected and suspect animals within the epidemic spot should be slaughtered, well buried and disinfected with proper compensation and biosecurity
- **Others:** surveillance, education, biosecurity enhancement in poultry production, transportation and markets, international cooperation, etc.

Maintain high-level political commitment

- The National Instruction Headquarter for the HPAI control established in the early 2004
- MoA, MoH, MoF and others: co-ordination
- The Commander-in-chief: a Vice-premier.
- The local governments also established similar co-ordination organizations for HPAI.

Strengthen the legislative system on animal diseases

- ***The National Contingency Plan for HPAI*** stipulated by the State Council in 2004
- ***The Regulations on Emergency Response to Major Animal Epidemics*** stipulated by the State Council in 2005
- **State plan for rapid response to animal health emergencies** stipulated by the State Council in 2006
- **State plan for rapid response to HPAI** stipulated by the State Council in 2006
- ***The Law of the People's Republic of China on Animal Epidemic Prevention*** (adopted 1997-07-03, revised 2007-08-30)



The Law of the People's Republic of China on Animal Epidemic Prevention





III. Twelve key points of emergency responses

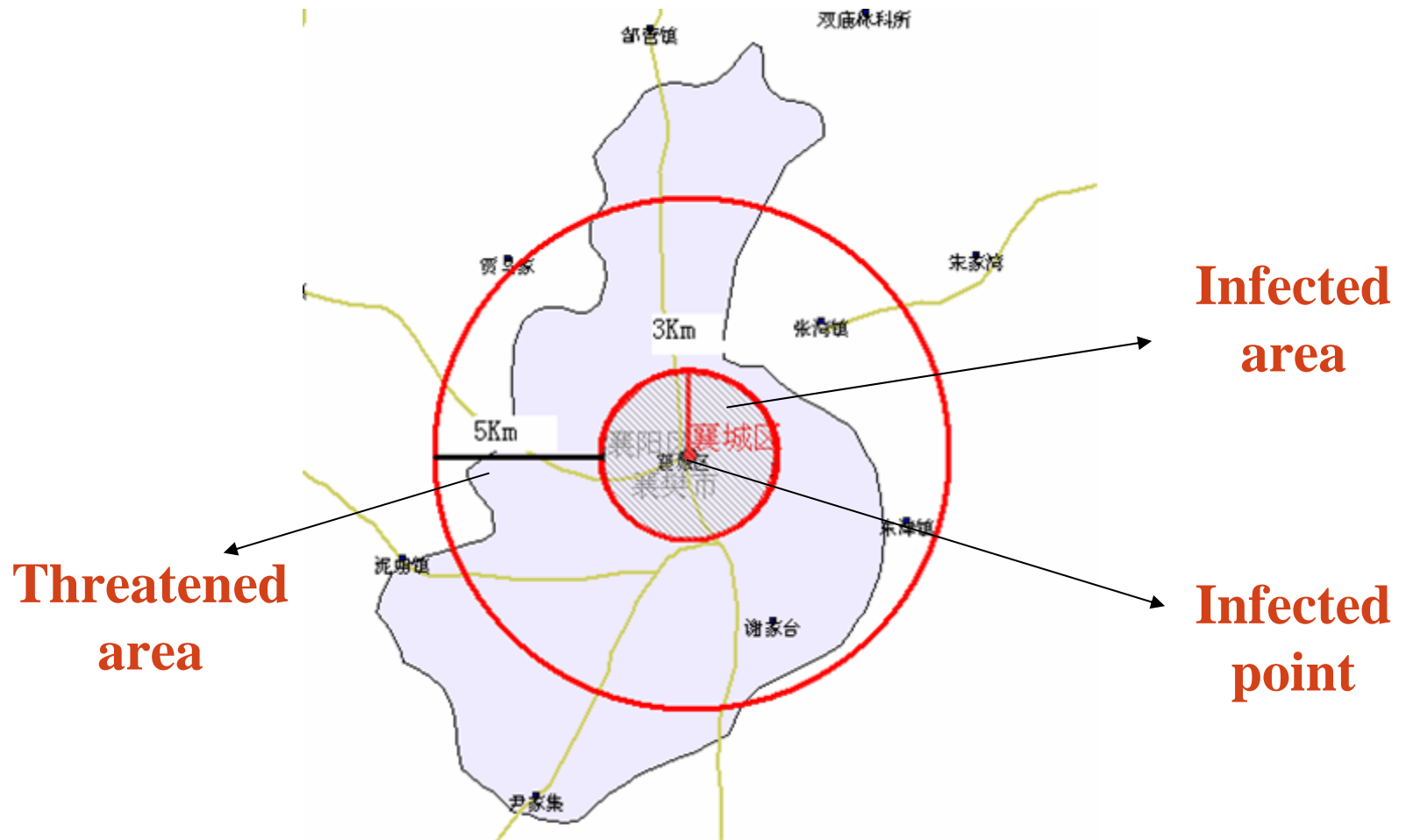
1: Investigation/report

- Where/when/what/whether
- Report
- Sampling for detection
- Cleaning and disinfection should be applied, if needed

2: Confirmation/decision

- Confirmation: seriously, correctly, quickly
- Decision making

3: Classification of infected point/zone and threatened area




- Infected point (epidemic spot): Premises with infected poultry or relevant slaughterhouses and other establishments
- Infected areas: within the 3km radius.
- Threatened areas: within 5 km around the infected areas.

Sometimes geographical and vaccination barriers should be considered

4: Stamping-out in the infected zone



- 
- To cull and destroy all infected and susceptible fowls and the cohort ones
 - If there are too many fowls in the infected area and most have been vaccinated, antibody surveillance could be applied in advance to identify the unsusceptible fowls

Disposal with Bio-safety



5: Emergency vaccination in the threatened area



6: Cleaning and disinfection



7: Movement control



8: Closing the market



9: Tracing in and out

- Where did it come from?
- Where could it spread to?

10: Human protection

- Occupational staff of poultry rearing, trade and transportation and process
- People in the infected areas should be under observation
- Stringent protective measures must be implemented for staff participating in the destroying infected birds

11: Surveillance

- Emergency surveillance for area classification
- Surveillance after the emergency vaccination for validation of the effect of vaccination
- Surveillance of mammals including humans and pigs

12: Quarantine lift

- At least 21 days after infected point and infected area have been strictly treated and no new cases occur.
- At least 14 days after all the susceptible birds in the threatened area have been emergently vaccinated and no new cases occur.
- The lift should be issued by some relevant authorities.
- The infected points could be re-stocked 6 months after the lift.




Question 1: Who is responsible for emergency responses?

- The main responsibility entity: the local government at the county level
- The provincial government and the central government are responsible to supply with technical and financial support and inspection

Question 2: What should we do before confirmation?

- Sampling and doing confirmation ASAP
- Report
- Suspected infected spot: isolation and strict movement control, stamp out, disinfect, Strict prevent from the moving out of animal and animal production and related materials, Strict disinfection, Monitor the local live market.
- Surveillance on local poultry and swine flocks for early diagnosis and tracing in and tracing out.



IV. HPAI Surveillance in China

Surveillance functions

- Outbreak surveillance: diagnosis, time and space distribution, loss estimation, trace in and trace out, early warning, susceptible flock identification, emergency vaccination effect, quarantine lift
- Routine surveillance: early warning, time and space distribution, susceptible flock identification, vaccination effect, policy making and policy evaluation


Surveillance entities

- 146 border animal diseases surveillance stations
- 300 animal disease surveillance stations at the areas with high animal density
- 2,800 Surveillance Labs and stations at county level with serological test capability
- 31 Surveillance Centers (Labs) at Provincial level with RT-PCR detection capability
- 3 National surveillance Centers such ACDC, CAHEC, NAIRL with BSL-3 Labs

China has established the animal diseases surveillance system at Central, provincial, municipal and county levels.

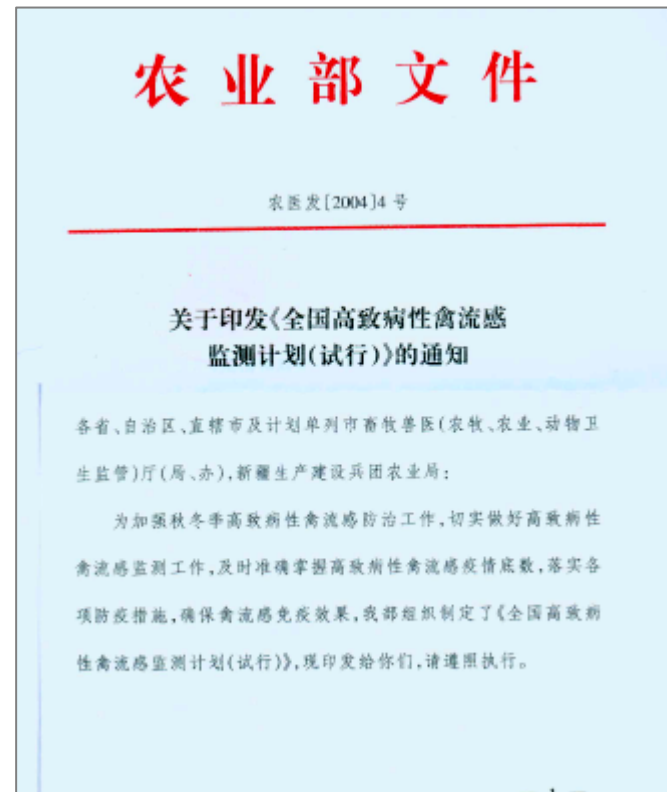
全国边境动物疫病监测站、疫情测报站分布图



- 
- In 2008, China National Avian Influenza Reference Laboratory in Harbin was selected as one of the OIE AI reference laboratories.
 - Providing diagnosis service for neighboring countries.

Surveillance guidelines

Annually, The National Surveillance Program for HPAI and other animal diseases issued by MOA since 2004



Surveillance methods

- Passive surveillance
- Active surveillance

- Serological surveillance
- Pathogenic surveillance

- Scanning surveillance
- Targeted surveillance

Surveillance targets

- Domestic and wild birds, Pigs
- Different types of poultry farmers, live markets

Surveillance results

- Published in OFFICIAL VETERINARY BULLETIN
- <http://www.agri.gov.cn/ztzl/sygb/>

Surveillance in 2006 (1)

From Jan-Oct, on domestic fowls:

- 4.8 million vaccinated sera samples: 86.86% with protective antibody titer
- 452,400 unvaccinated sera samples: none antibody-positive
- 318,900 pathogenic samples: 24 positive

Surveillance in 2006 (2)

From Jan-Oct, on wild birds:

- 680 sera samples: 2 positive
- 18,300 pathogenic samples: 16 positive from 3 provinces of Liaoning, Tibet and Qinghai

Surveillance in 2006 (3)

From Jan-Oct, on other birds (ostriches and quails, etc):

- 11,542 vaccinated sera samples: 60.55% with protective antibody titer
- 203 unvaccinated sera samples: none positive
- 10,740 pathogenic samples: 1 positive from Guizhou

Surveillance in 2006 (4)

From Jan-Oct, on pigs:

- 8,400 sera samples: 10 positive
- 21,000 pathogenic samples: 0 positive

Pathogenic surveillance results from 2004 to 2007

Year	Pathogen samples (unit: 1,000)	Pathogenic Positives
2004	93	16
2005	209	21
2006	465	50
2007	306	40
2008 #	293	46
Total	1366	173

#: As of Jan-July 2008

Risk assessment based on surveillance results

- South China
- Live market
- Duck
- Backyard fowls
- Sporadic outbreaks and human cases will exist for years to come in China



Thank you for your attention!