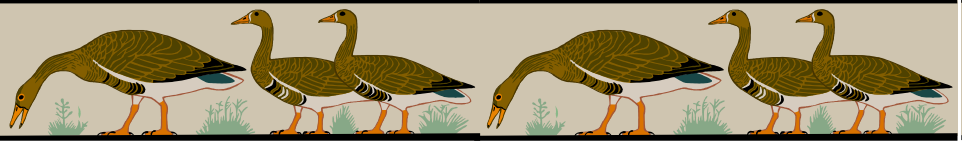
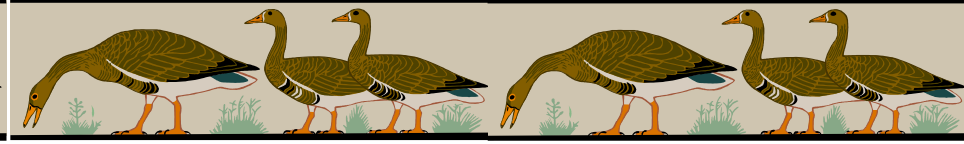
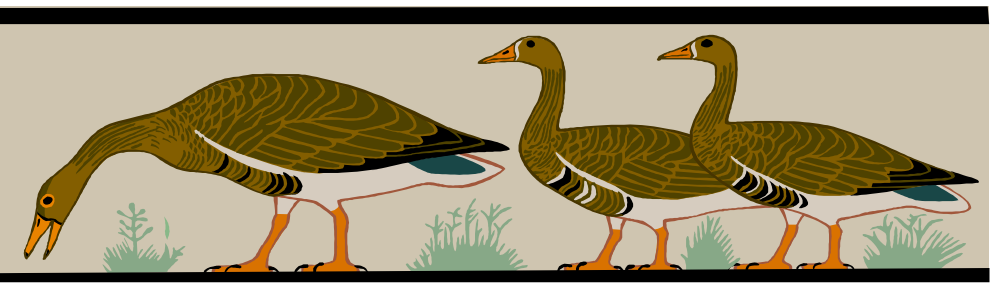
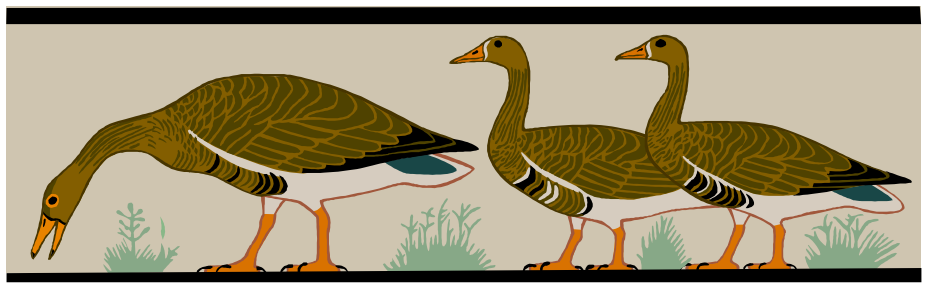
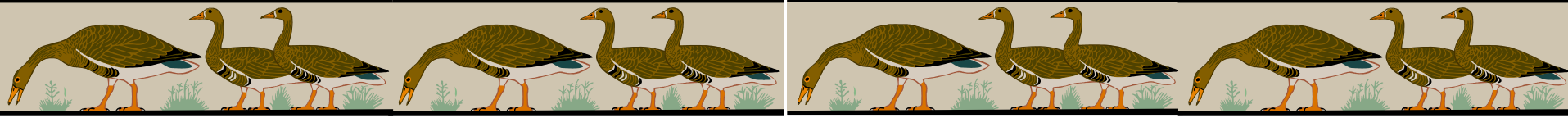
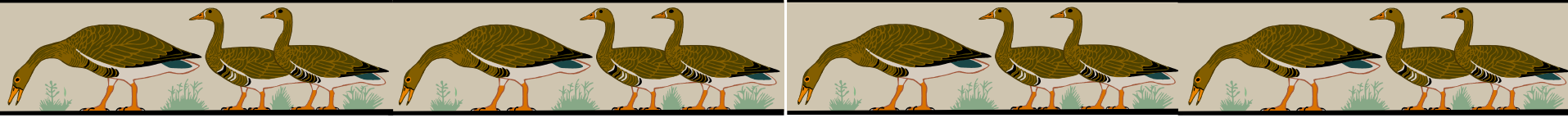



The AVIAN INFLUENZA Crisis, Response, and The Unknowns

J. Lubroth, V. Martin, and J Slingenbergh
FAO Animal Health Service





Highly Pathogenic Avian Influenza

The crisis

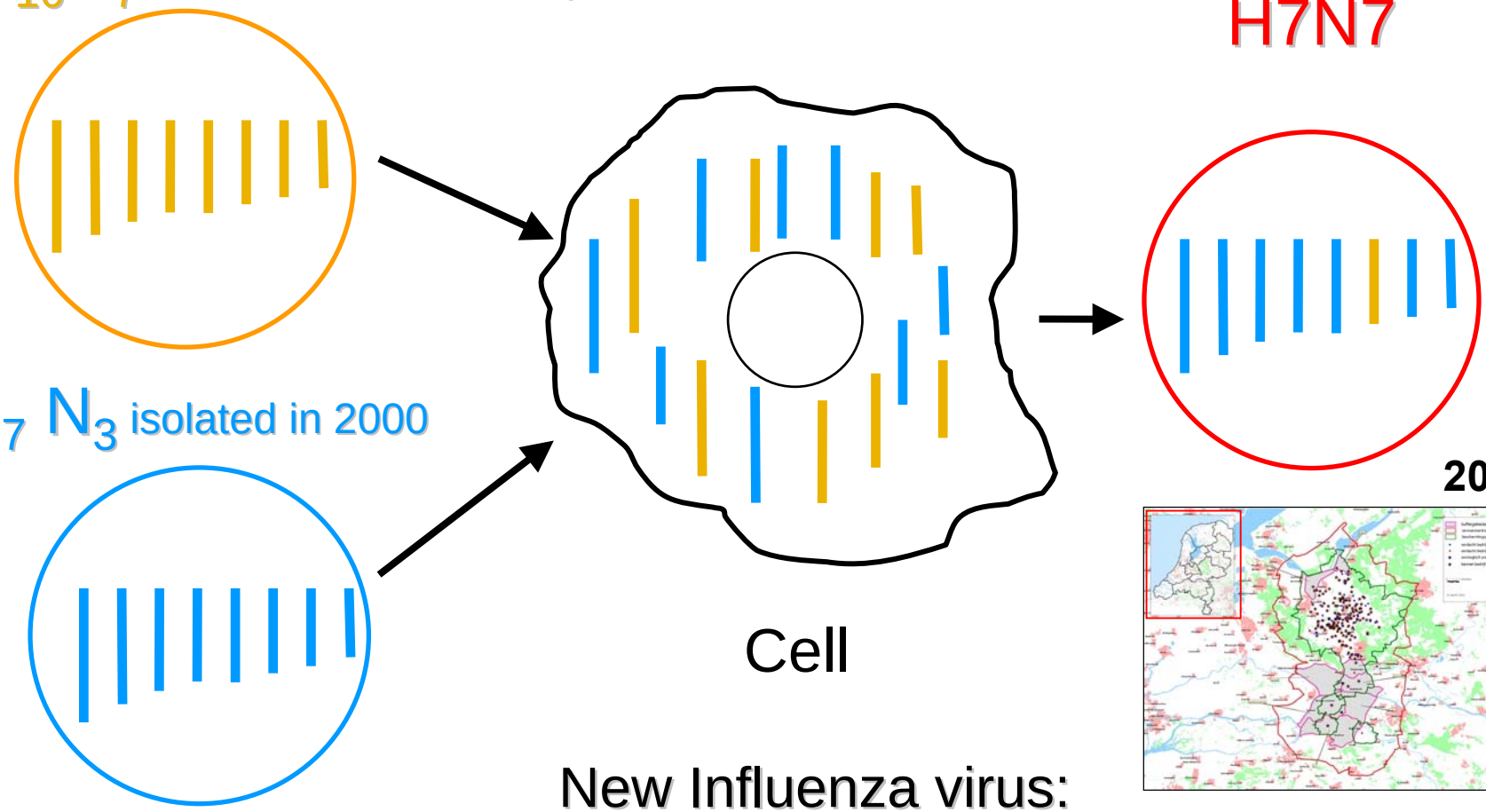
Why ?

- Evolution of virus
- Insufficient overall capacity (Veterinary Services, Information Systems, Diagnostic Tools, Human resources)
- Lack of legislation and **countries not meeting their international obligations to report**
- Lack of biosecurity at the farm, market, international borders … level.

GENETIC REASSORTMENT

$H_{10}N_7$ isolated from mallard (*Anas platyrhynchos*) in 1999

H_7 N_3 isolated in 2000



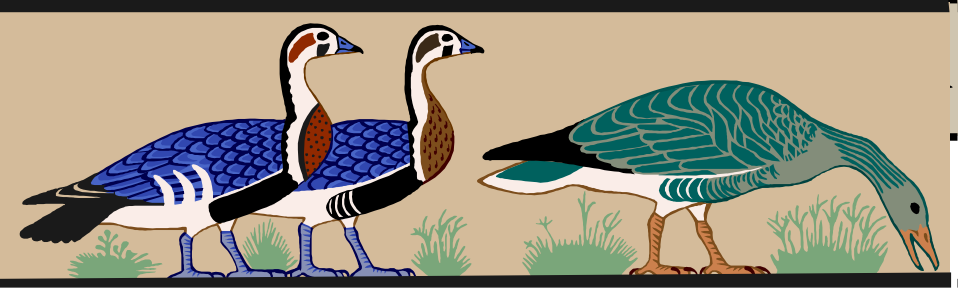
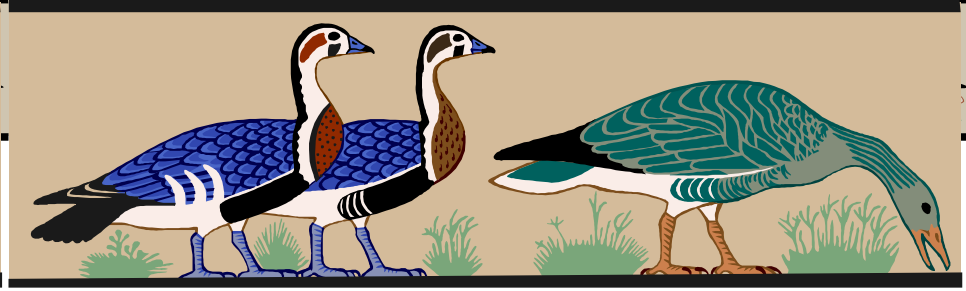
Cell

H7N7

2003

New Influenza virus:
256 possible combinations

Adapted from G Koch, Central Institute Animal Disease Control (CIDC – Lelystad)

In perspective

- **Highly Pathogenic Avian Influenza vs. Low Pathogenic Influenza**
- Influenza in Humans

Type A H1N1, H3N2 or Type B, and now … H5N1

Since 1996 H7N7, H5N1, H9N2 from birds to humans

What is the danger?

- **75-100% mortality in chickens, turkeys slightly less**

  Low in waterfowl, sometimes none

  Other shorebirds and wildlife – varies

- **Livelihoods**
- **Commercial Industries and Export**
- **Genetic diversity and Conservation**

FAO's RESPONSE

Under implementation
Six National TCPs

- **WHERE?**

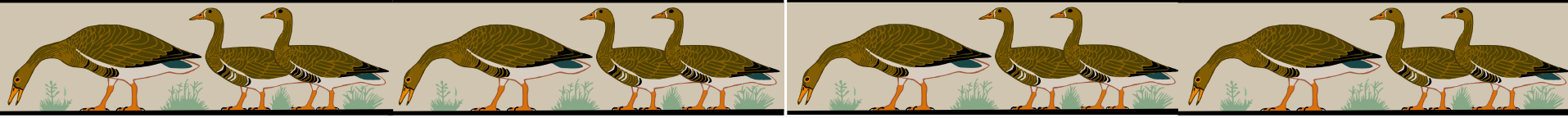
  Vietnam, Cambodia, Laos DPR, Pakistan, China, Indonesia

- **TO DO WHAT?**

  Control the Avian Flu by technical advice, training,

→ US$ 2.3 million + 20 million (WB, Japan)

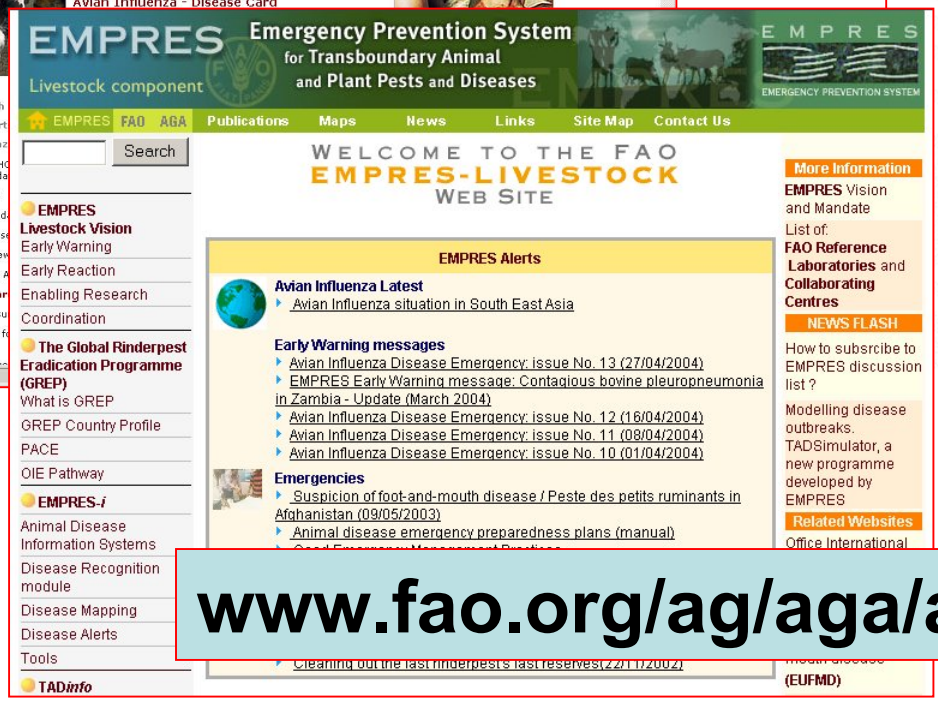
Under implementation
Five sub-Regional TCPs



- **WHERE?**
  - East Asia, Southeast Asia, South Asia
- **HOW?**
  - Network of surveillance teams
  - Network of diagnostic laboratories
  - Policy and rehabilitation
- **TO DO WHAT?**
  - Surveillance, early detection, early reaction
  - Identification of risk factors
  - International coordination
  - Training and education

Inform and communicate

AGA and EMPRES Web sites



www.fao.org/ag/aga/agah

Consolidate available data EMPRES-i information system

Data storage, validation, analysis in EMPRES-*i*

Home

Disease Tracking
- Add New
- View & Update
- Analysis
- Configuration

Country Profiles
- Add New
- View & Update
- Configuration

Information Library
- Publications
- Photos

Contacts
- Add New
- View & Update
- Configuration

Institutes
- Add New
- View & Update
- Configuration

Logout vincent

Latest Disease Tracking Observations

Highly pathogenic avian influenza in Viet Nam (Confirmed)
Observed: 06/05/04 Director of the Agriculture Ministry's Animal Health Department
Entered: 11/05/04 Larfaoui, Fairouz (Animal Health Officer)
AI case in Dong Thap, Viet Nam

Highly pathogenic avian influenza in Japan (Confirmed)
Observed: 05/03/04
Entered: 10/05/04 Larfaoui, Fairouz (Animal Health Officer)
Confirmed AI crow case in Sonobe town, Kyoto province

Highly pathogenic avian influenza in Japan (Confirmed)
Observed: 02/04/04 Government
Entered: 10/05/04 Larfaoui, Fairouz (Animal Health Officer)
Confirmed AI crow case in Kameoka city, Kyoto province

Highly pathogenic avian influenza in Japan (Confirmed)
Observed: 14/03/04 Government
Entered: 10/05/04 Larfaoui, Fairouz (Animal Health Officer)
Confirmed AI crow case in Kameoka city, Kyoto Province

African swine fever in Tanzania, United Rep of (Suspicion)
Observed: 18/08/03 Veterinary Service, Ministry of Water and Livestock Development
Entered: 06/05/04 Kamata, Akiko (Animal Health Officer)
Location(outbreaks/susceptible/cases/deaths/destroyed): Ngarenaro, Arusha district(1/254/53/10/...); Olerian, Arusha district (1/250/25/25/...); Sombetini, Arusha district (1/200/2/2/...). Neighbouring countries are notified//Affected pig producers are asked to depopulate & disinfect their premises//Intensive active surveillance//The quarantine notice proclaimed on 12 September 2001, all swine and swine products' movement into or out of the affected area was banned//Public awareness campaigns were started//Veterinary staff and Government administrators throughout the country are on the alert to look out for clinical signs.

African swine fever in Tanzania, United Rep of (Suspicion)
Observed: 09/02/04 Veterinary Service, Ministry of Water and Livestock Development
Entered: 06/05/04 Kamata, Akiko (Animal Health Officer)

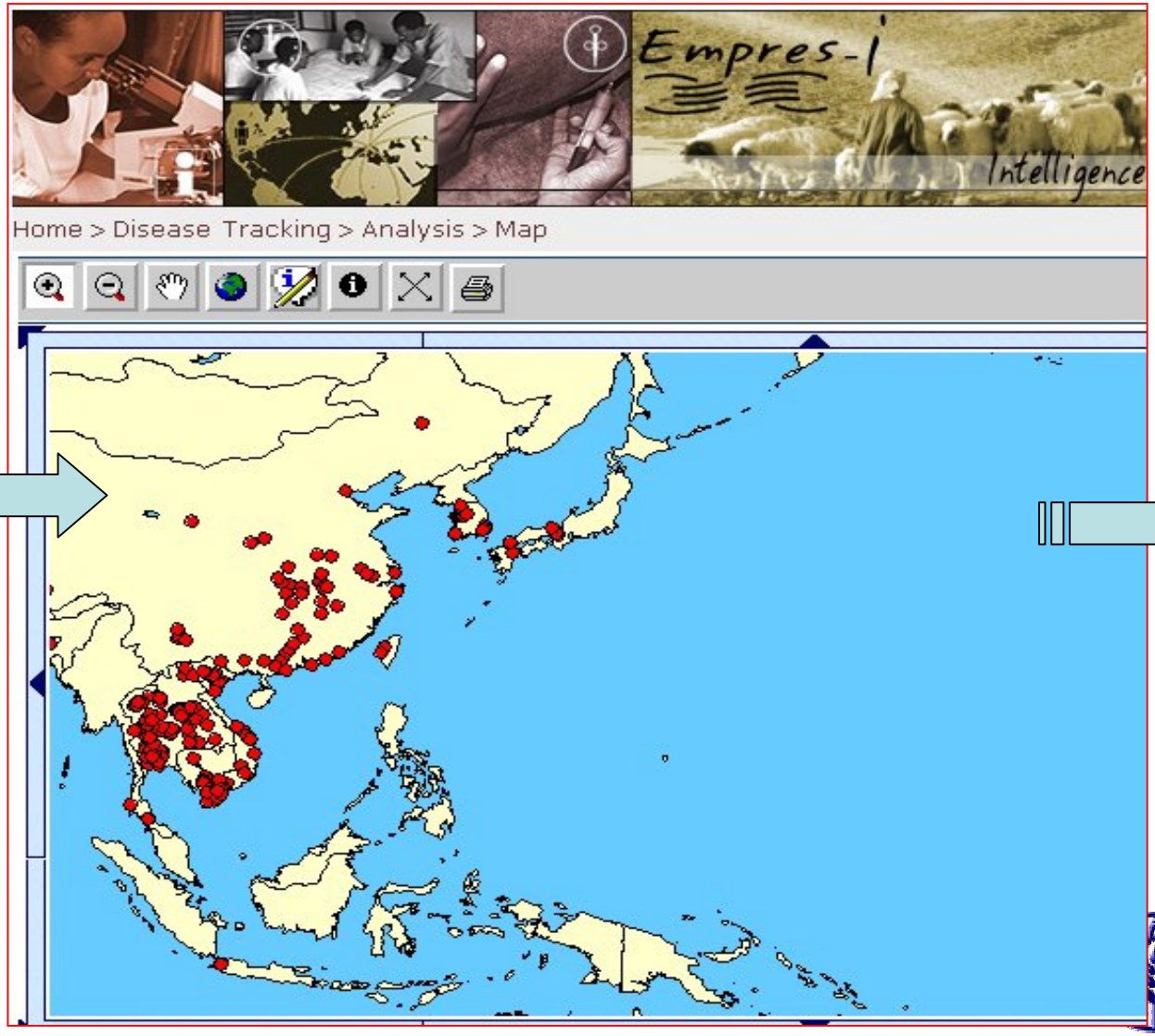
African swine fever in Tanzania, United Rep of (Suspicion)
Observed: 09/02/04 Veterinary Service, Ministry of Water and Livestock Development
Entered: 06/05/04 Kamata, Akiko (Animal Health Officer)

Consolidate available data

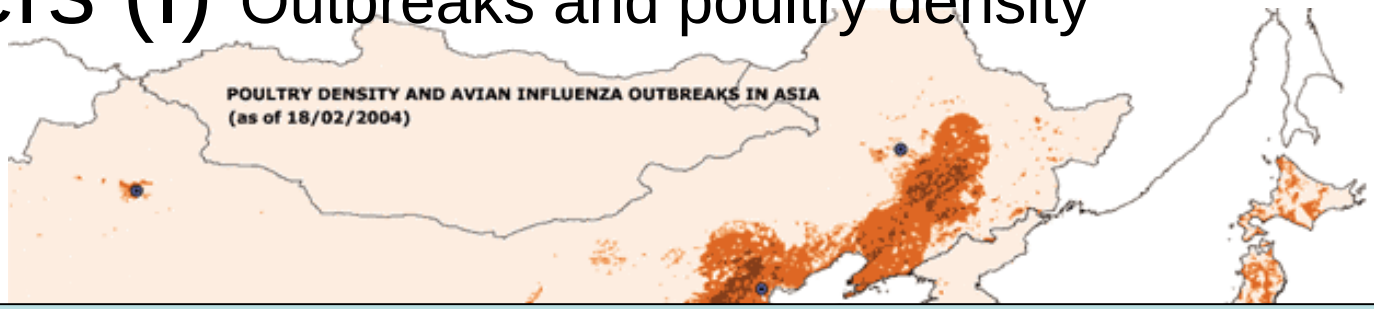
EMPRES-i information system

Data storage, validation, analysis in EMPRES-*i*

HPAI in South-East Asia

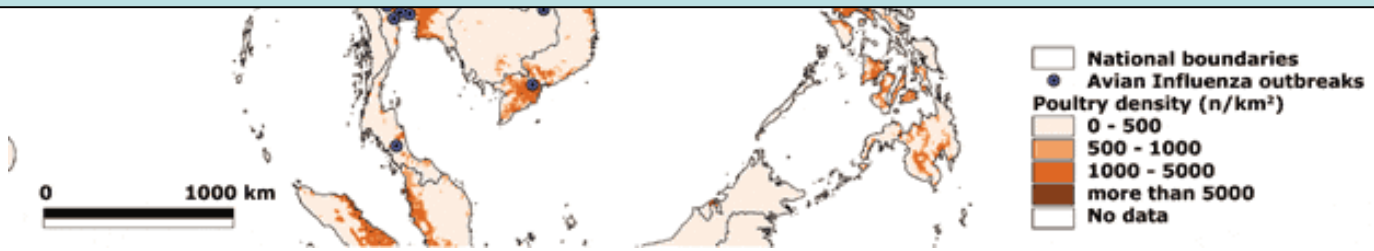


Layers (I) Outbreaks and poultry density

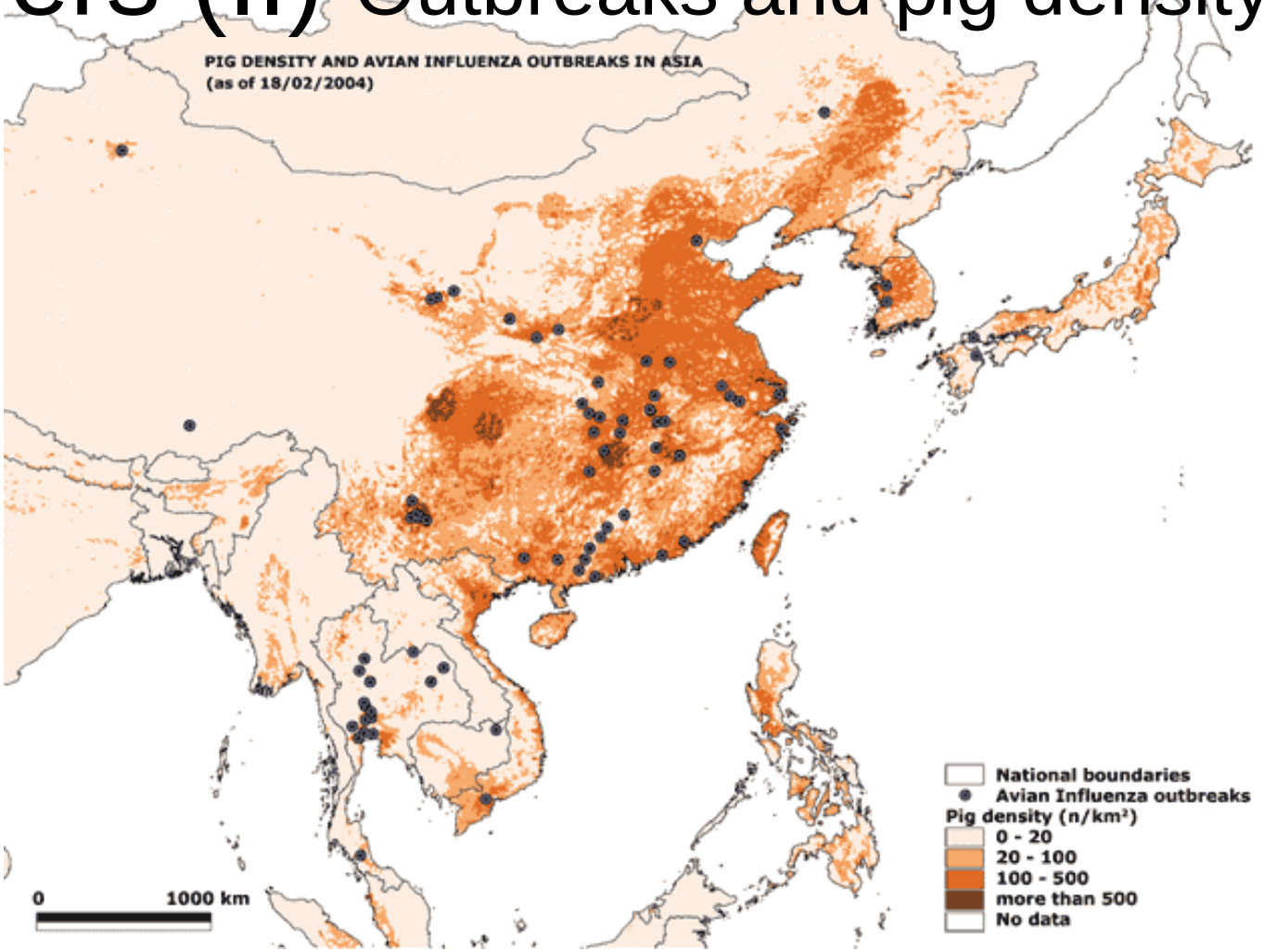


Asian region is affected by the spread of the avian flu [1] is estimated to house approximately **7 billion chickens**[2], approximately **40 percent of global totals**..
China and **Thailand account for ~ 82 %**, of the region's estimated production of 20 million tonnes**.**

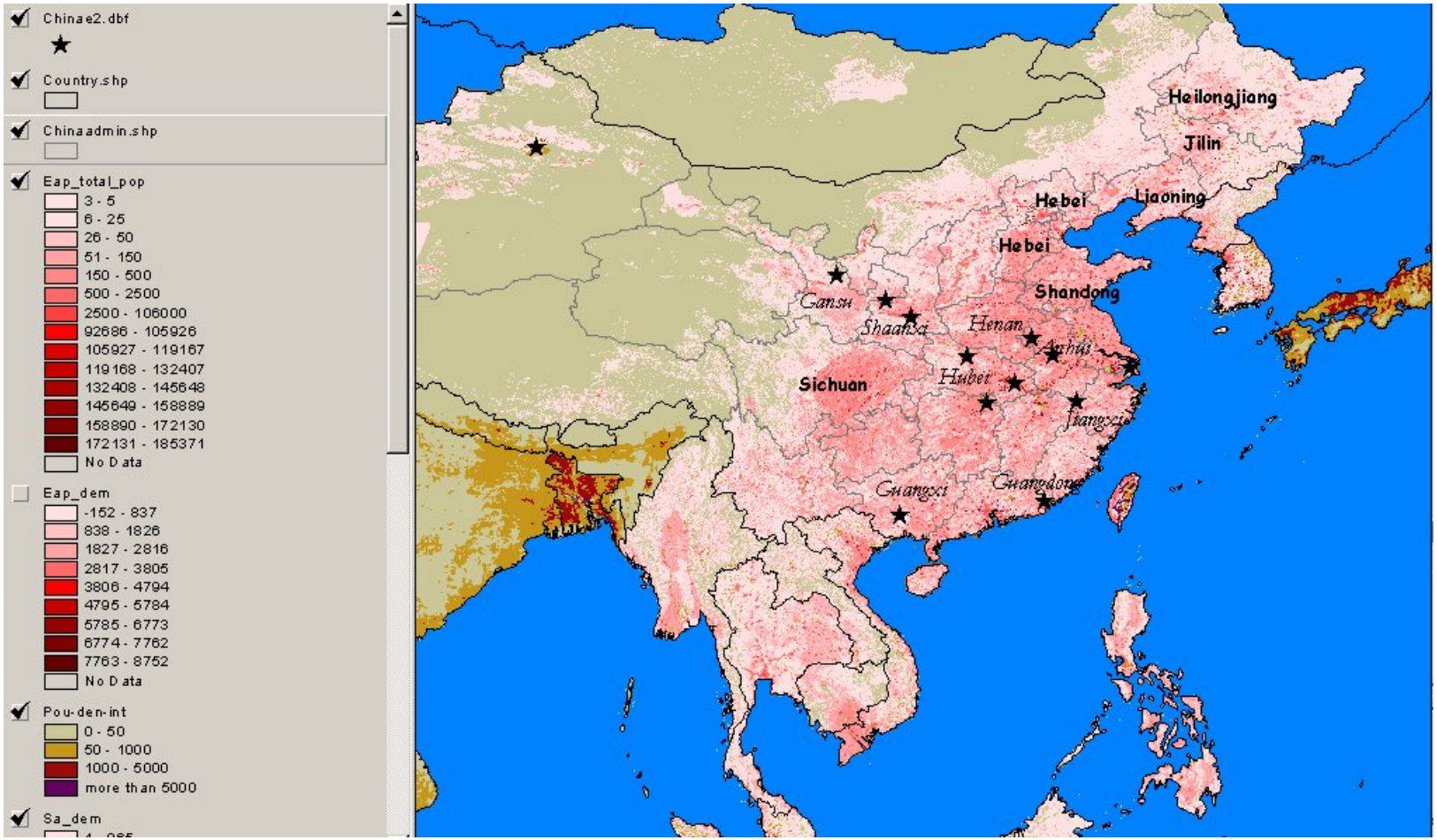
[1] South East Asia and Pakistan
[2] Excluding mainland China, this number totals only 2 billion.



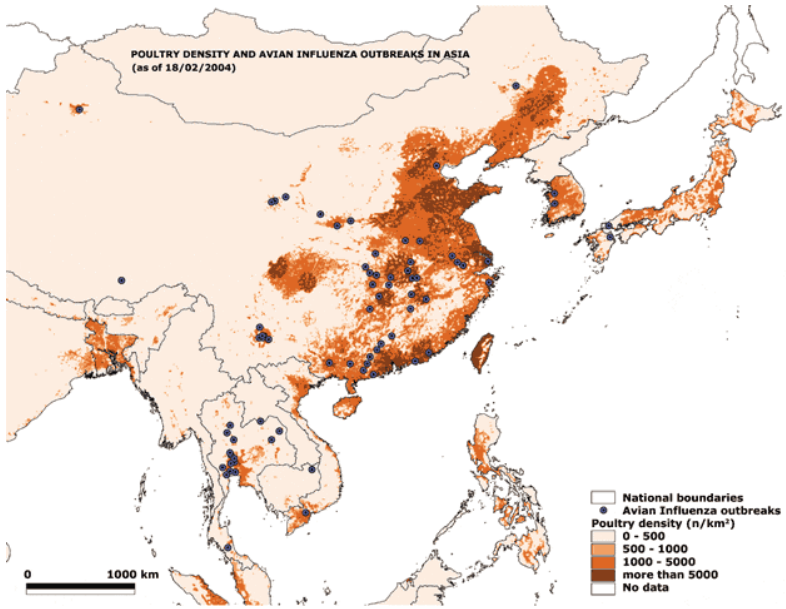
Layers (II) Outbreaks and pig density

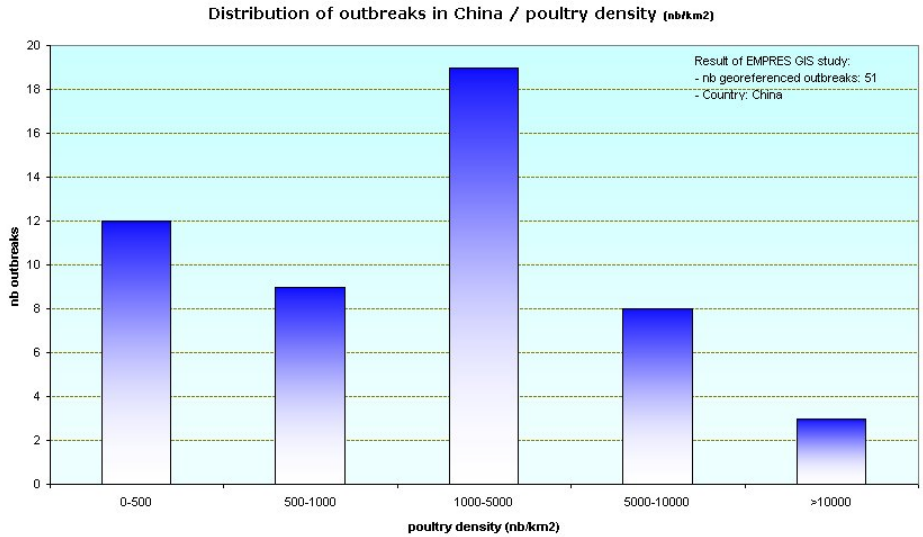


Layers (III) - Outbreaks and human density



Results (I): Outbreaks and poultry density

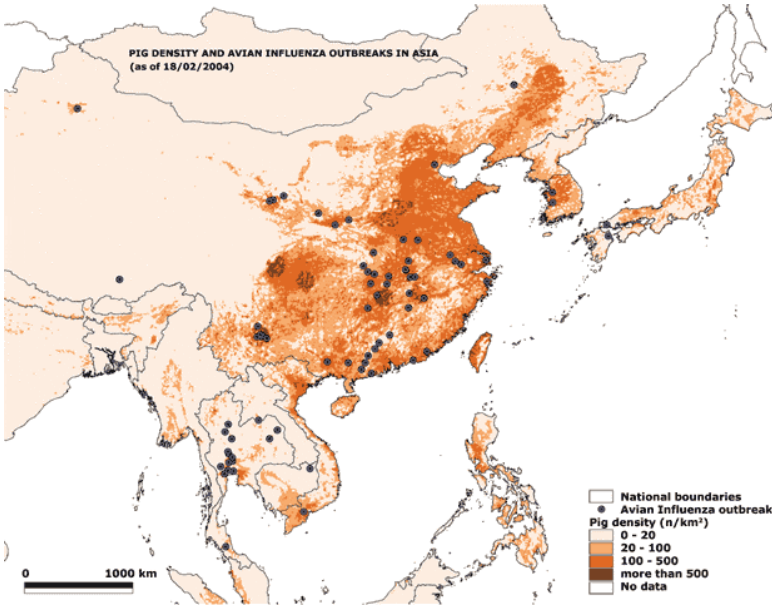


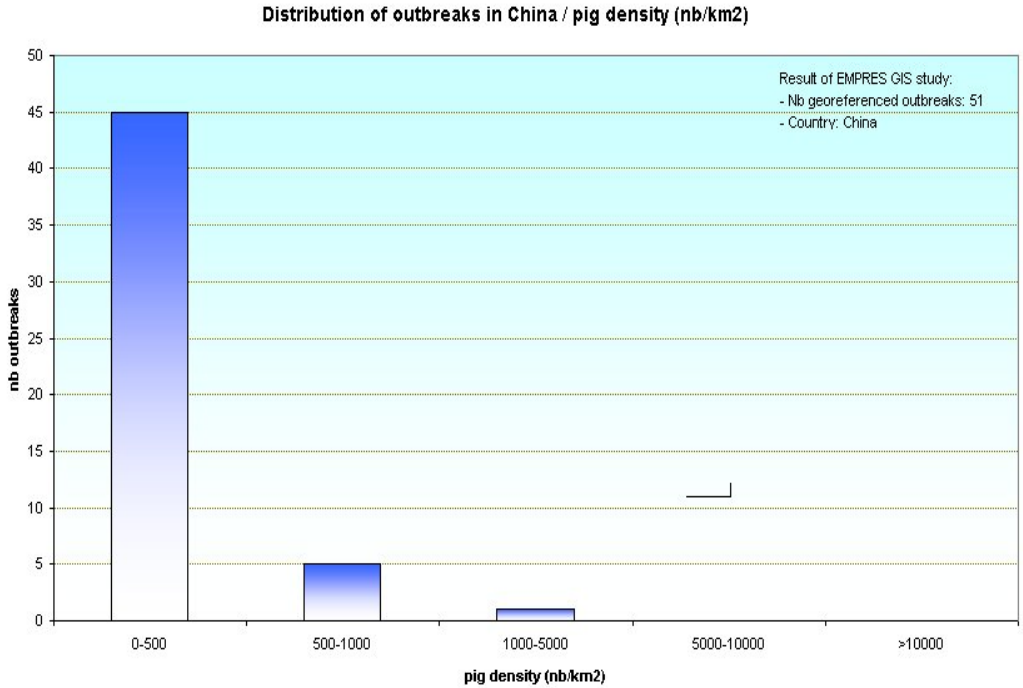


- **80 % outbreaks in areas where density <5000**
- **23 % <500**
- **54 % between 500-5000**
- **Average density : 3288**

Sample: 51 outbreaks

Results (II): : Outbreaks and pig density

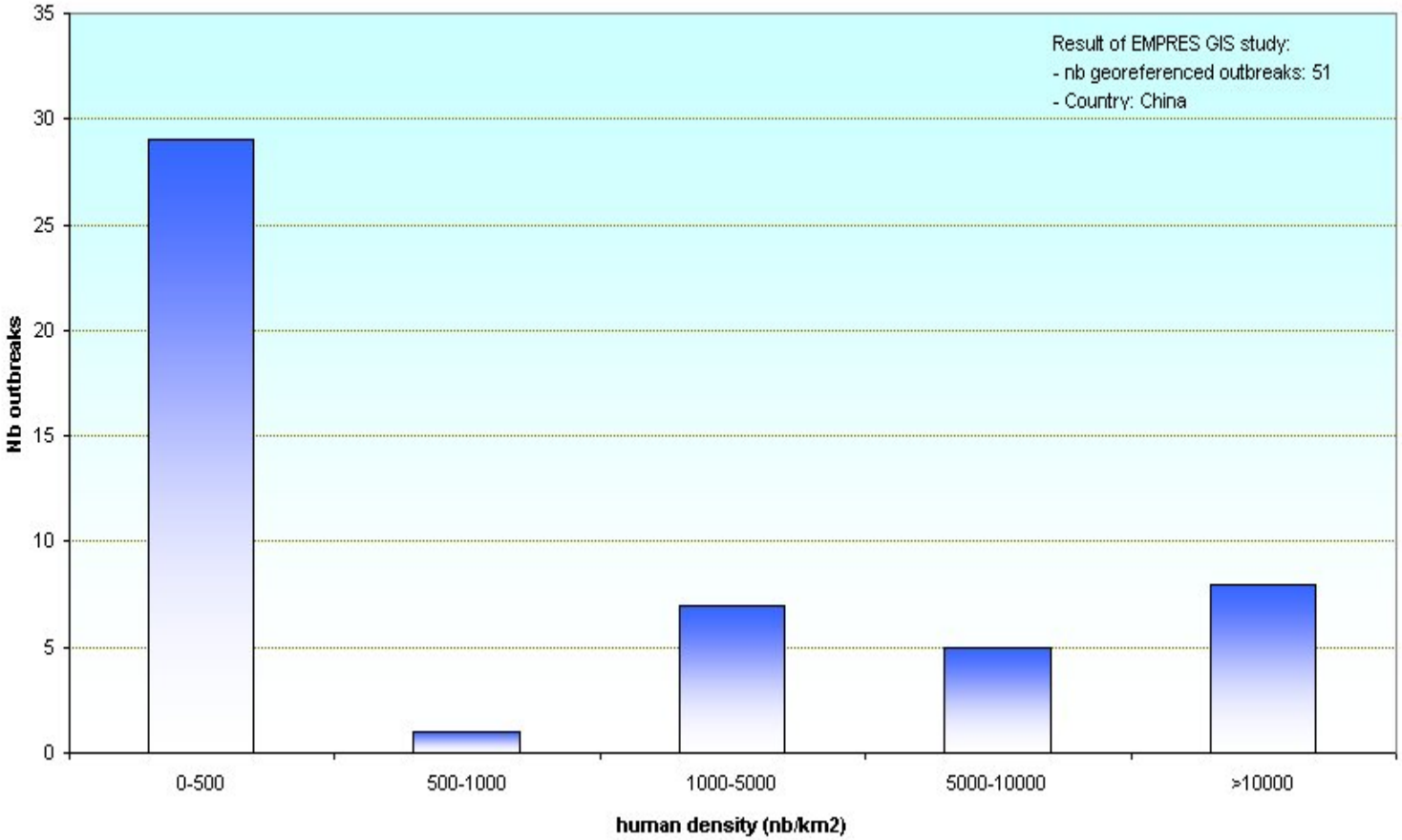




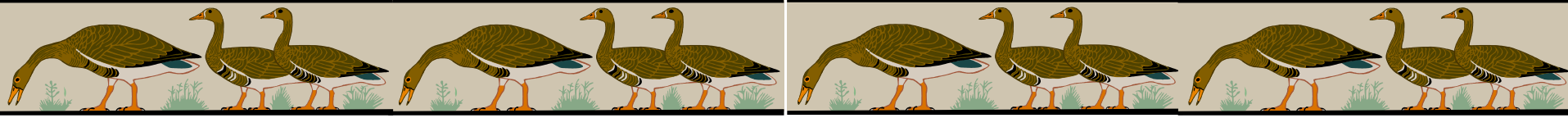
Sample: 51 outbreaks

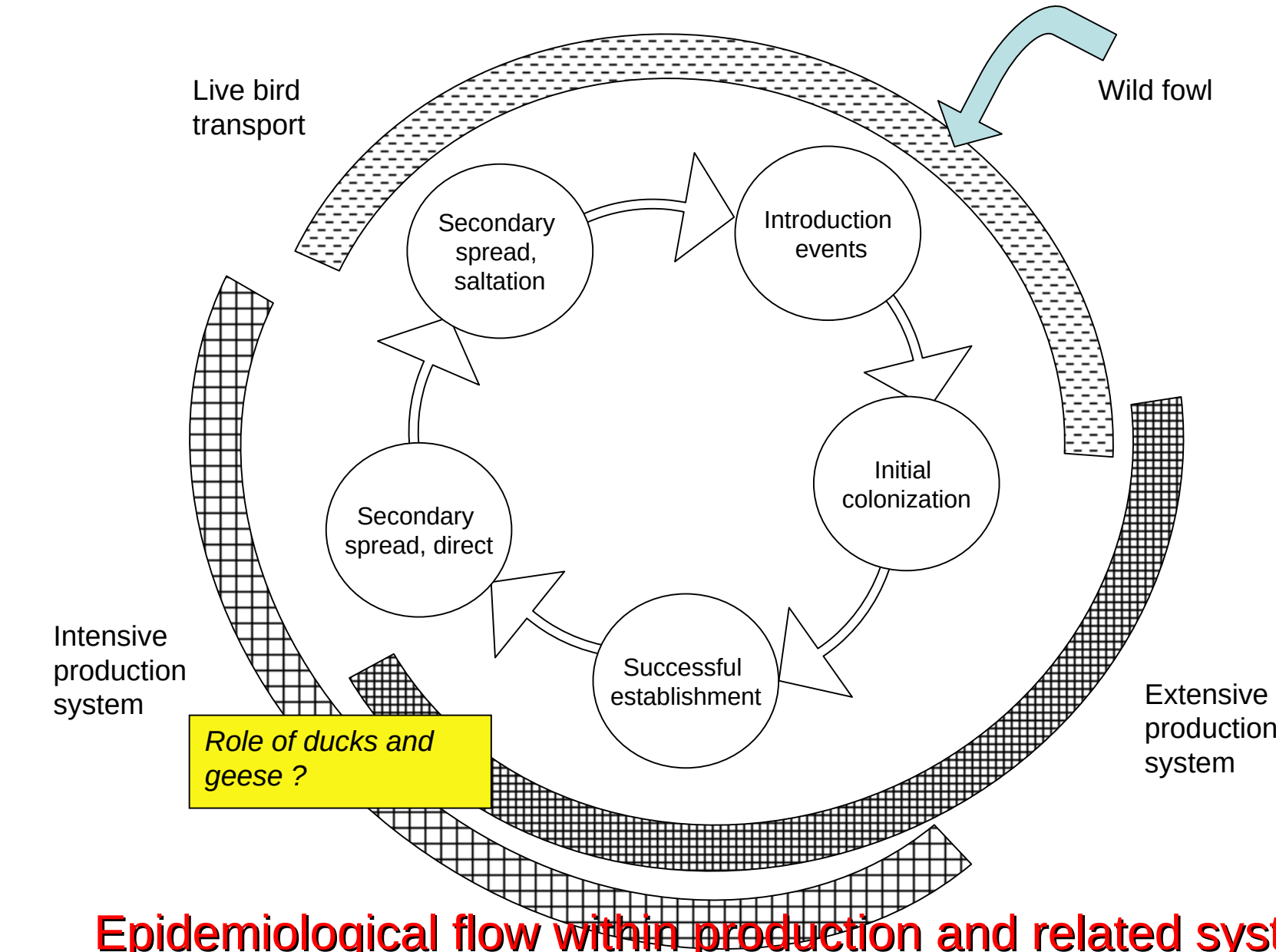
- **90 % outbreaks in areas where density <500**
- **98 % <1000**
- **Average density : 223**

Results (III): Outbreaks and human density



- **58 % outbreaks in areas where density <500**
- **60% outbreaks in areas where density <1000**
- **Average density** (popdens/km2) **: 4389**

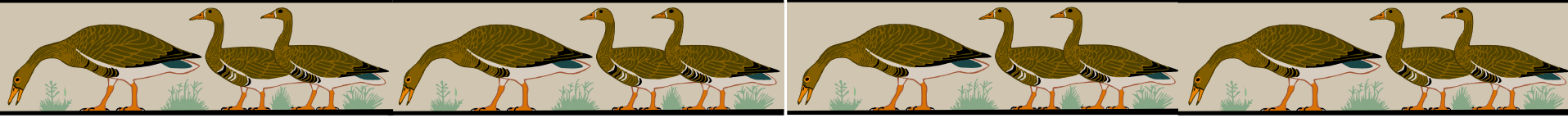




Epidemiological flow within production and related systems

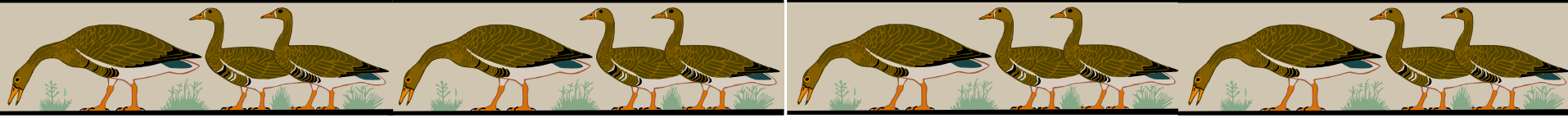
GIS preliminary analysis - *potential bias*

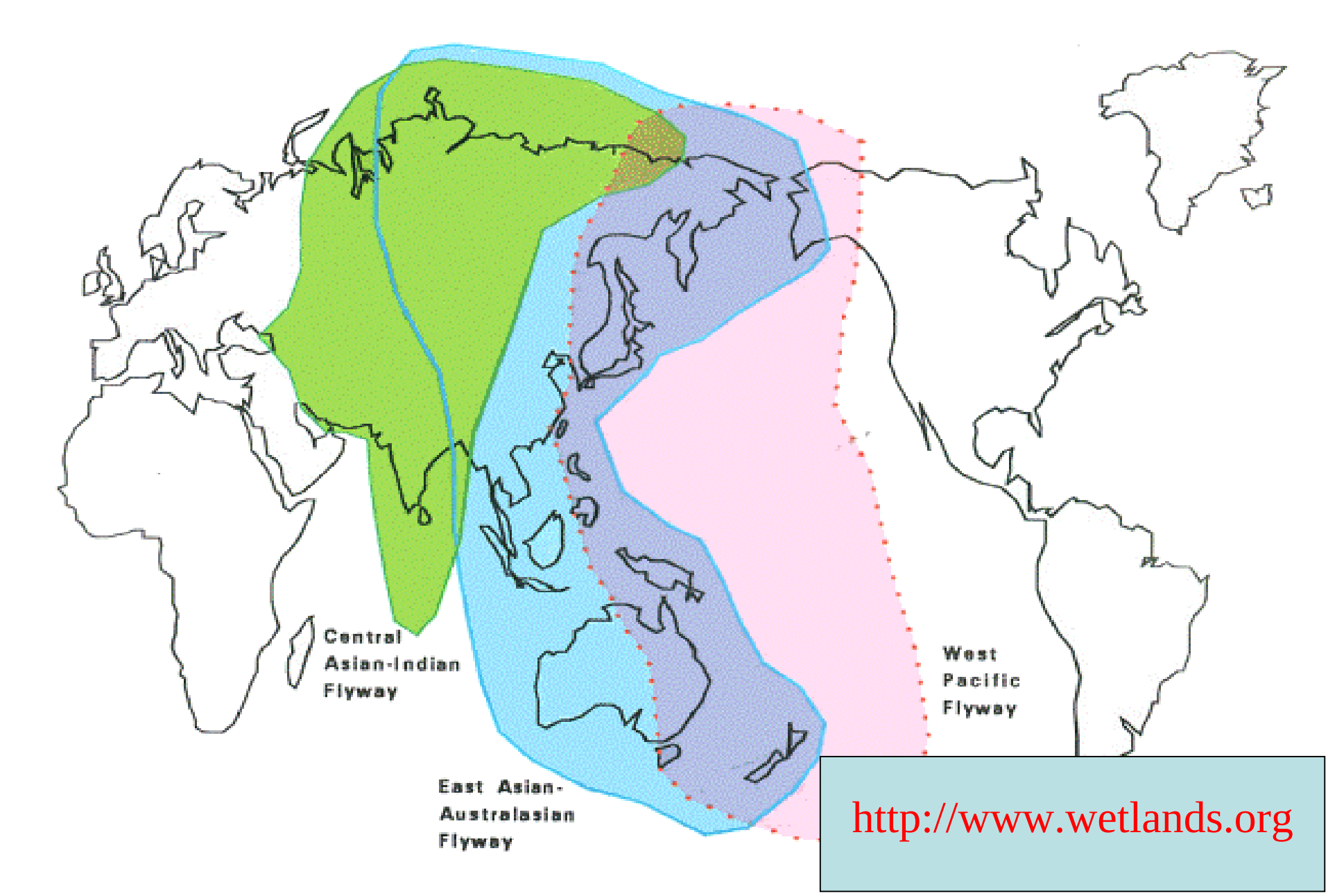
- Preliminary description of the whole population sample should be done before drawing any conclusion (pig, human and poultry density in China)
- GIS study based on extrapolated data (population density for pigs, poultry and human)
- Analysis on data reported (problem of under reporting)
- Statistics derived from geographical estimates obtained through EMPRES-*i* (source of geographical coordinates NIMA database)
- The precision of the statistics depends on the quality and the accuracy of the geographical coordinates used (further validation required)



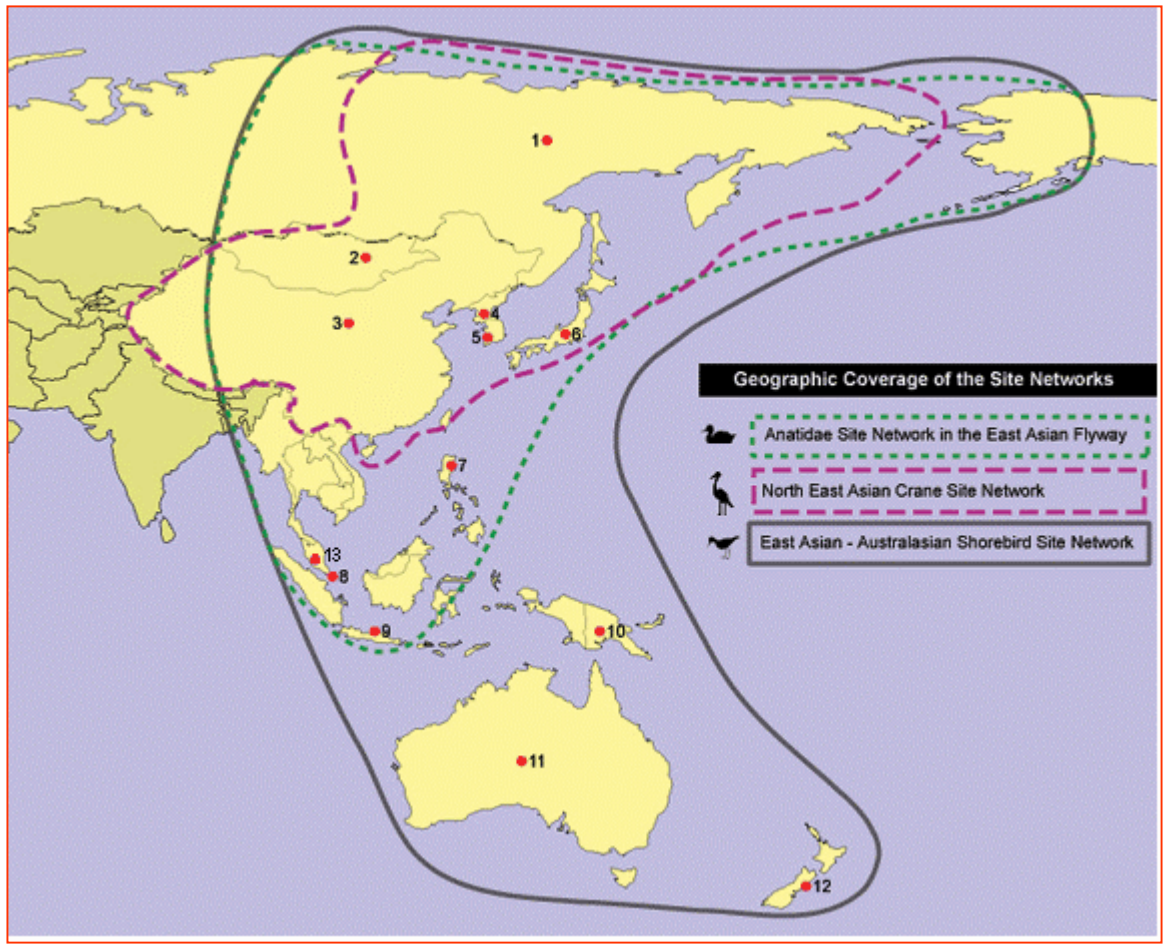
What next

- Cluster analysis (spatial relationship between outbreaks)
- Analysis of additional potential risk factors (distance to roads, water bodies and rivers/migration, farming systems)
- Intervention and rehabilitation. Restructuring of the poultry sector. Participation of the private sector.
- Significance of swine in H5N1 epidemiology
- Coordination of active AIV surveillance among migratory bird and aquatic fowl sanctuaries and habitats.
- Studies on virulence genes and AIV and “rules” of re-assortment events.
- Vaccination efficacy studies in farmed water fowl.



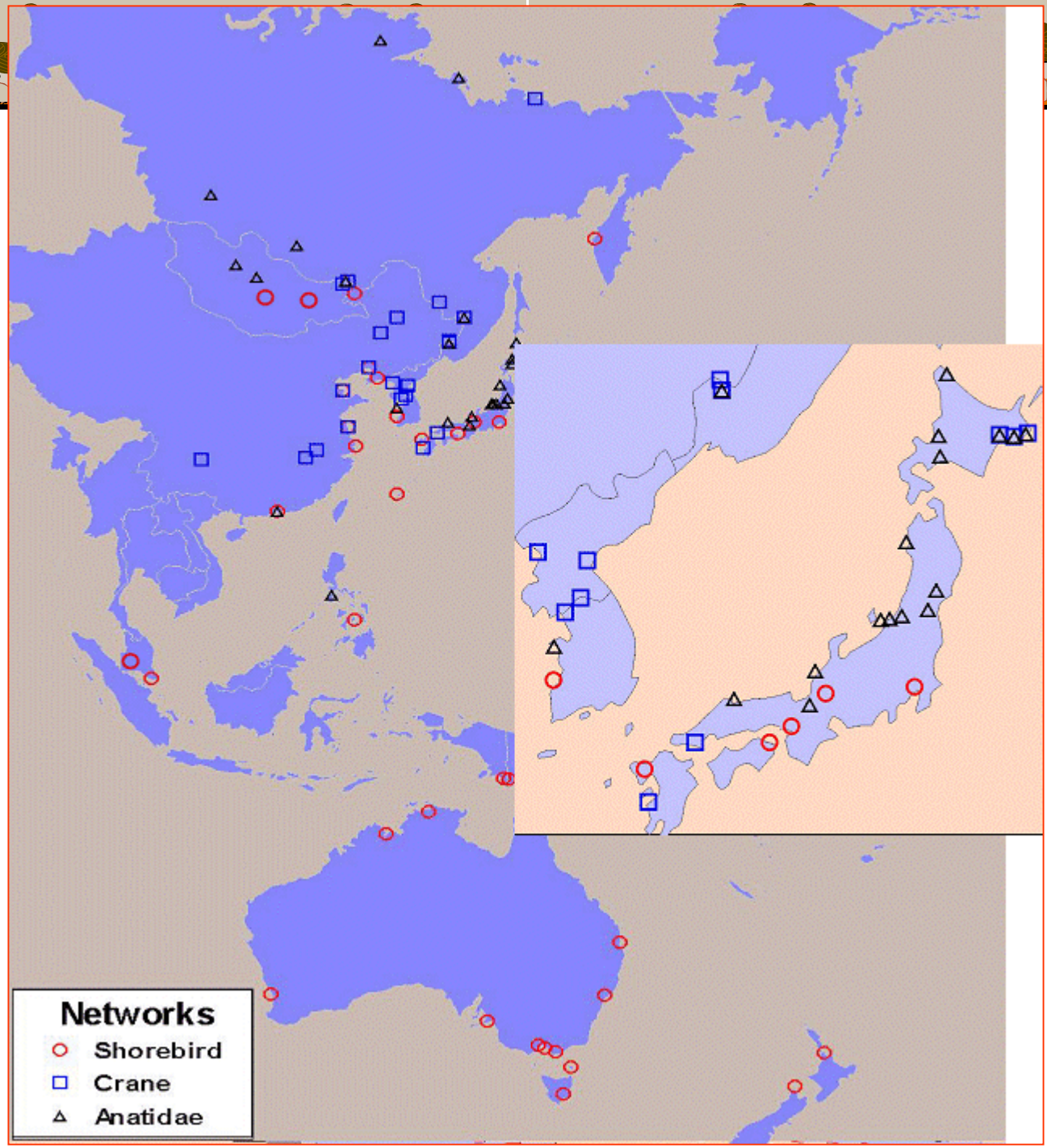


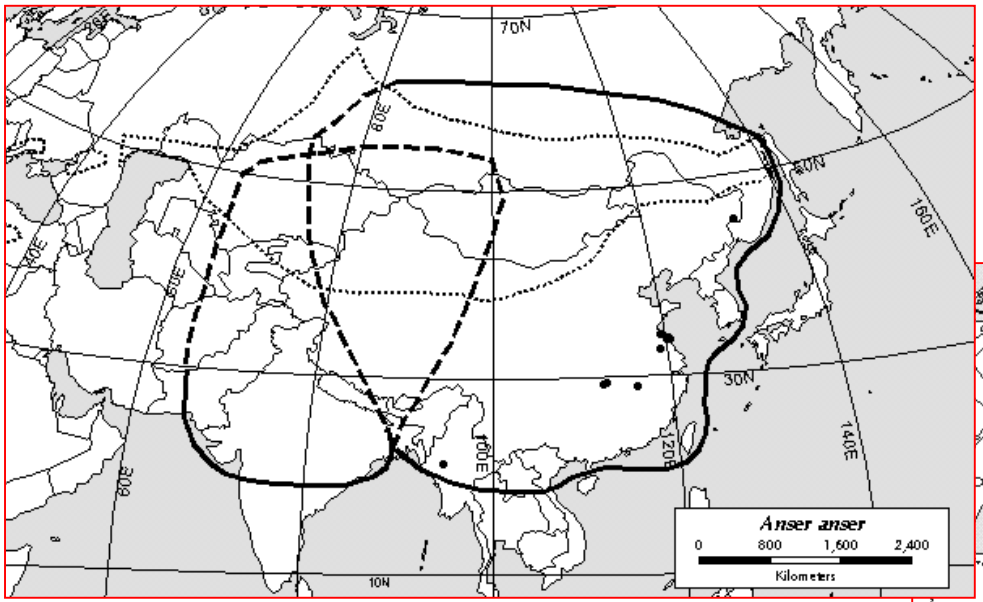
http://www.wetlands.org



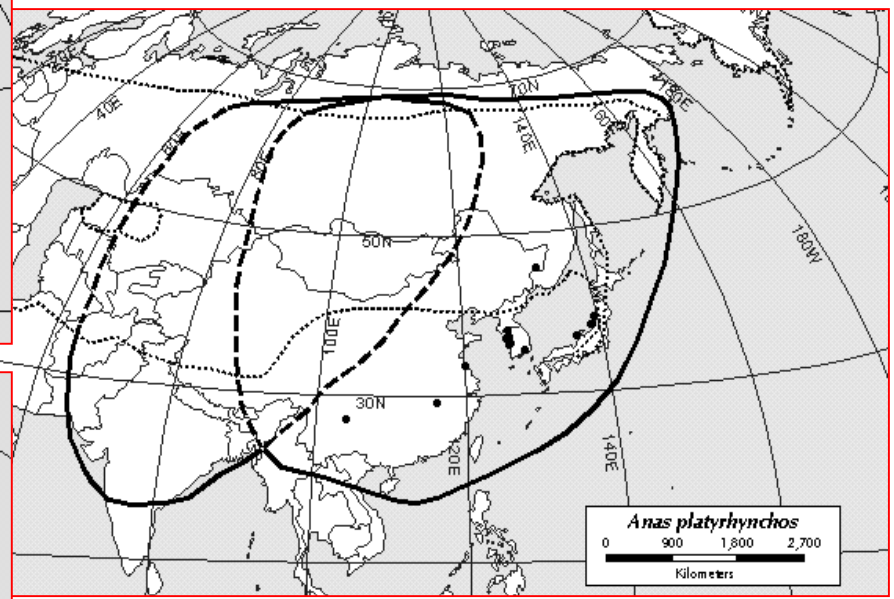
International Site Networks for migratory waterbirds in the East Asian-Australasian region

~ Asia-Pacific Migratory Waterbird Conservation Strategy ~

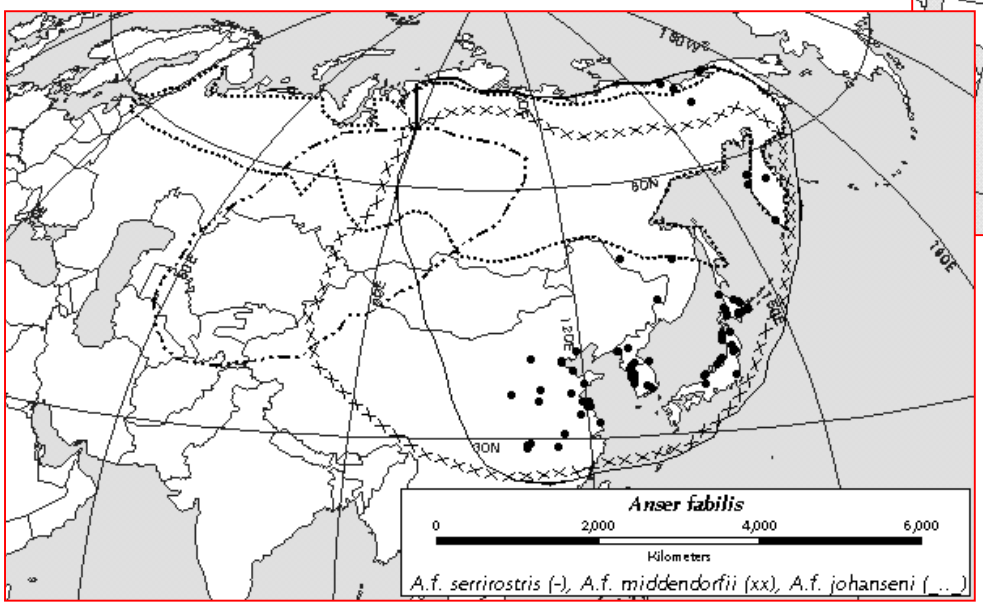

Networks
Shorebird
Crane
Anatidae



Greylag goose

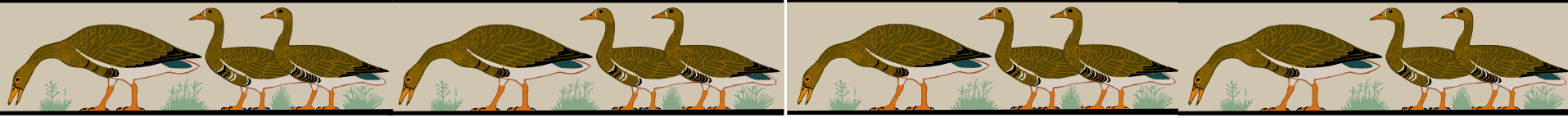


Mallard Duck

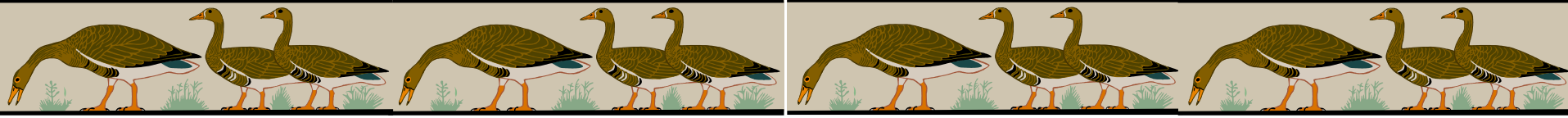


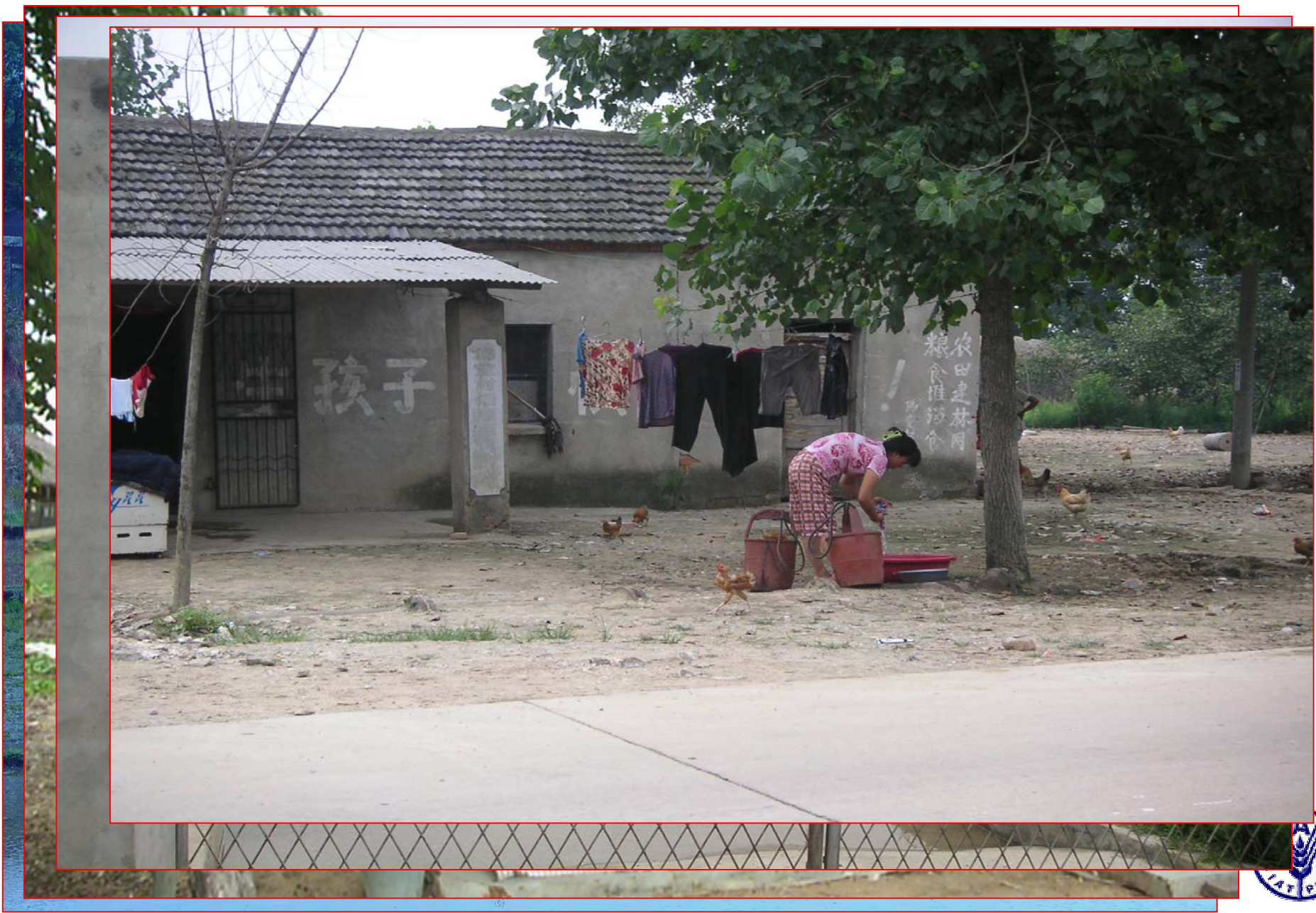
Bean Goose

Dhanin Chearavanont TIME 2004



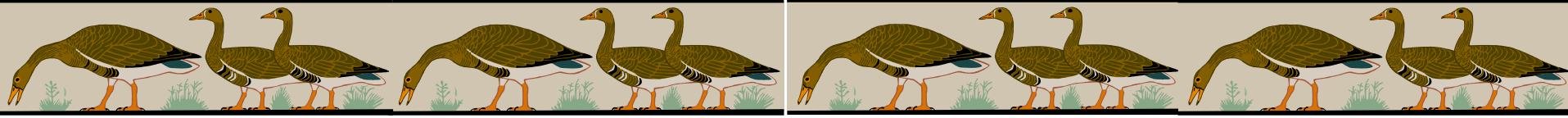
- To date we do not have indications that swine play a role in maintenance or spread of HPAI
- To date we don not have indications that wildlife (free flying aquatic birds) are mayor players in constant introductions of HPAI, although new genetic material is always a possibility.
- Separation of species in village livelihoods or commercial operations




孩子

Rehabilitation and Recovery

- This is the **end goal**
- *Cannot be done until everything is done*
- Prior to commencing, it must be based on disease/infection search in areas of high risk, disease occurrence, and identification for viral persistence in areas cleaned and disinfected (sentinelisation)
- Biosecurity – simplistic to complex
- Restructure of Poultry Sector – mid/long range planning
- Compartmentalisation

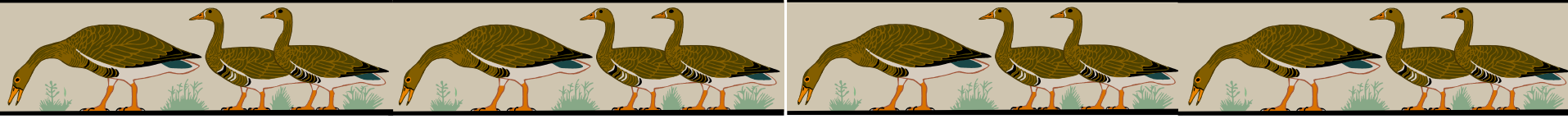


Highly Pathogenic Avian Influenza

Ending the crisis

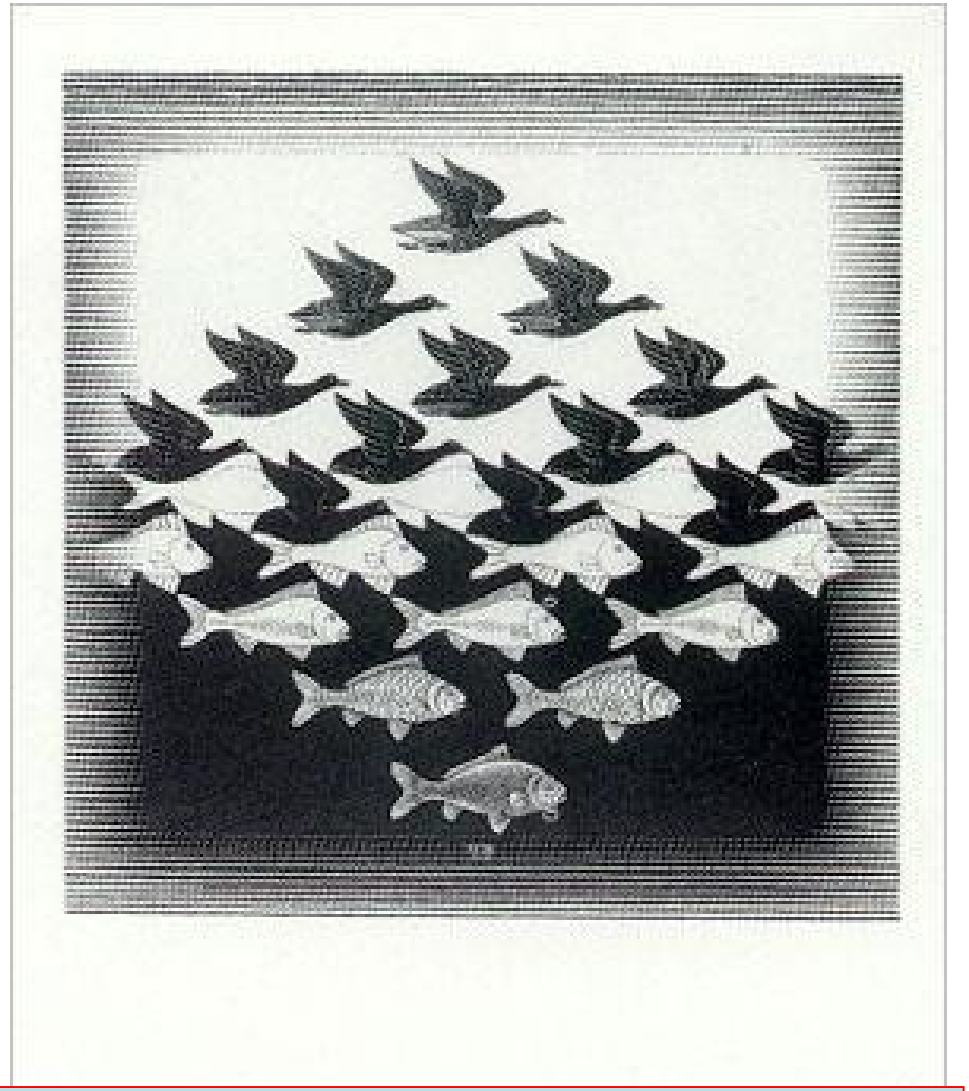
What to do in **immediately and prepare for the next uncertainty**

- Capacity at the **veterinary laboratories** to conduct differential diagnostic testing
- Establish **contingency and emergency plans** for HP Avian Influenza
- Establish **links with other Ministerial forces** to apply the necessary counter-epizootic measures
- Establish cooperation and participation of the **private sector**
- Periodic reviews of **national legislation** to enable official services to intervene in the event of animal health emergencies
- Establish systems to penalise countries that do not meet their international reporting obligations [how?]
- Institute **basic biosecurity** concepts at the farm, market, and official service levels.
- Establish **laboratory networks** that collaborate with national and **regional epidemiology units**



Opportunities for Active Surveillance

- Natural reserves- Collection/Analysis
- Reservoirs, Lakes vicinity to Poultry Production Areas - Collection/Analysis
- Abattoir Routine Sample - Collection/Analysis
- Network of Laboratories
- Collaboration with WHO diagnostic systems and OIE/FAO Laboratories



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