

Avian Influenza

Prevention and Preparedness:

Global and Regional Strategies and Actions



8 February, 2006
Thammasat University and Asian Disaster Preparedness Center
Bangkok, Thailand

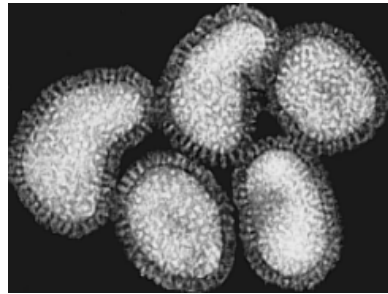


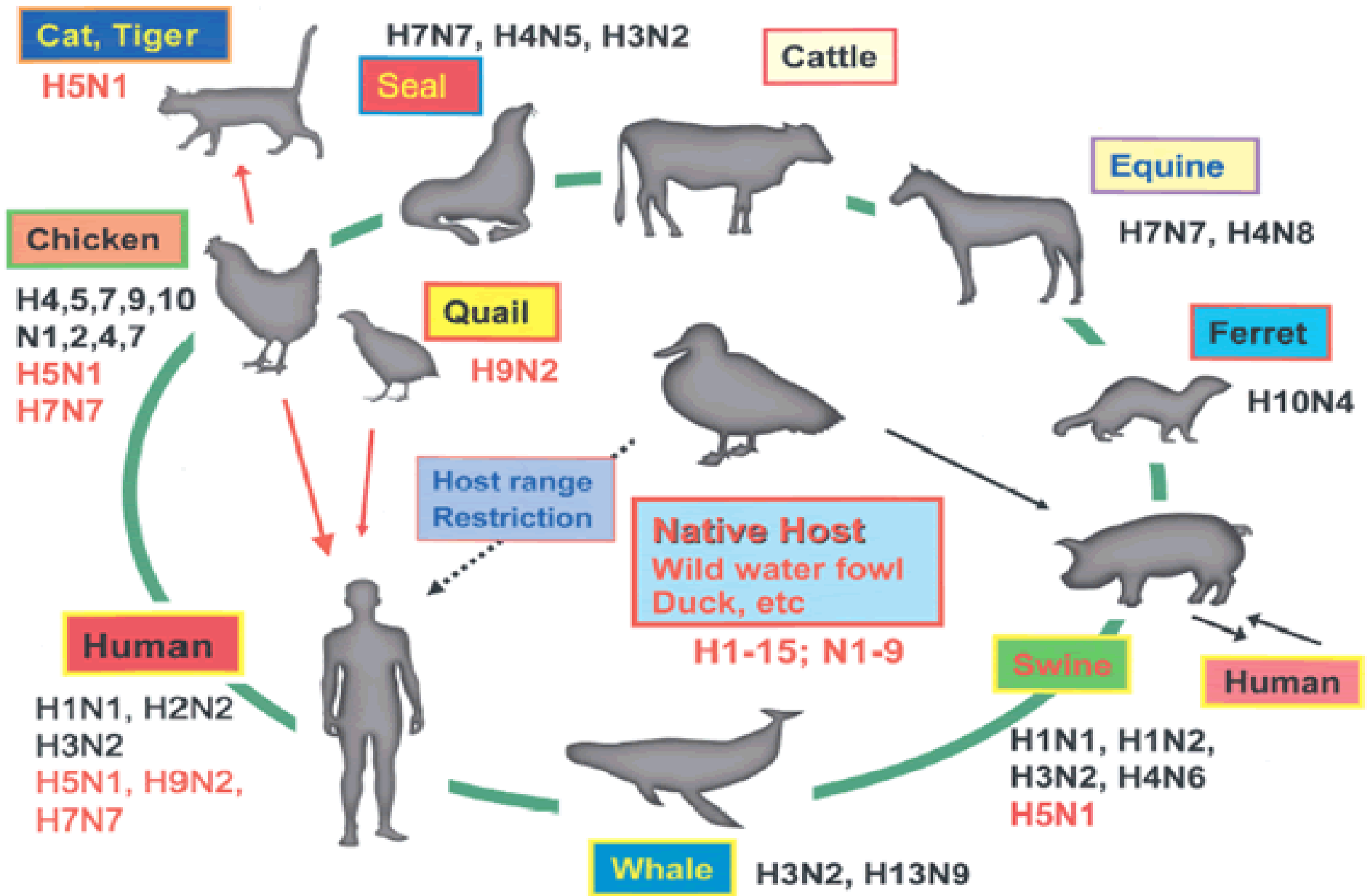
What will be presented

- The problem (brief review)
- Preparedness:
 - what is needed
 - current status
- Research and policy issues



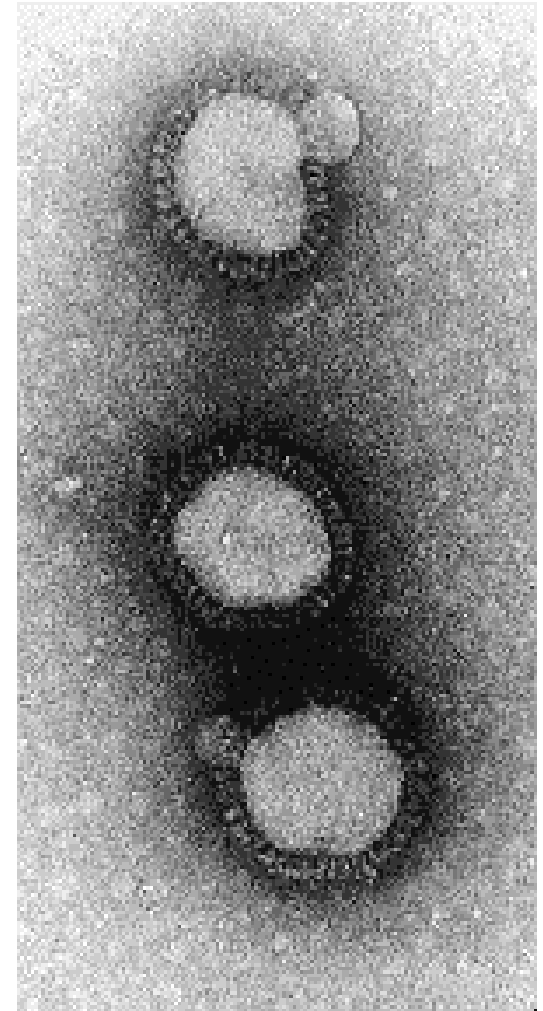
The current outbreak of H5N1

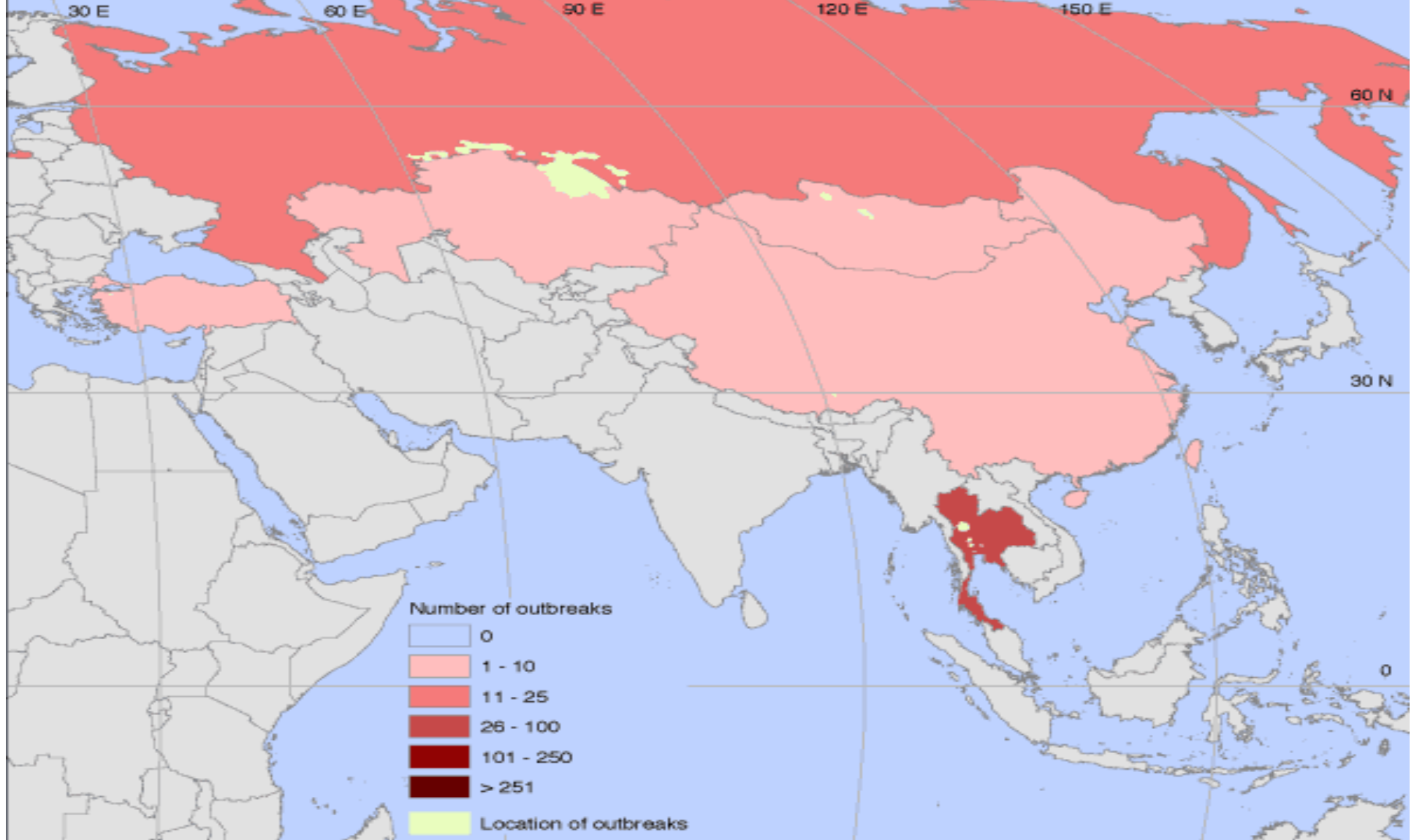




What is an influenza pandemic?

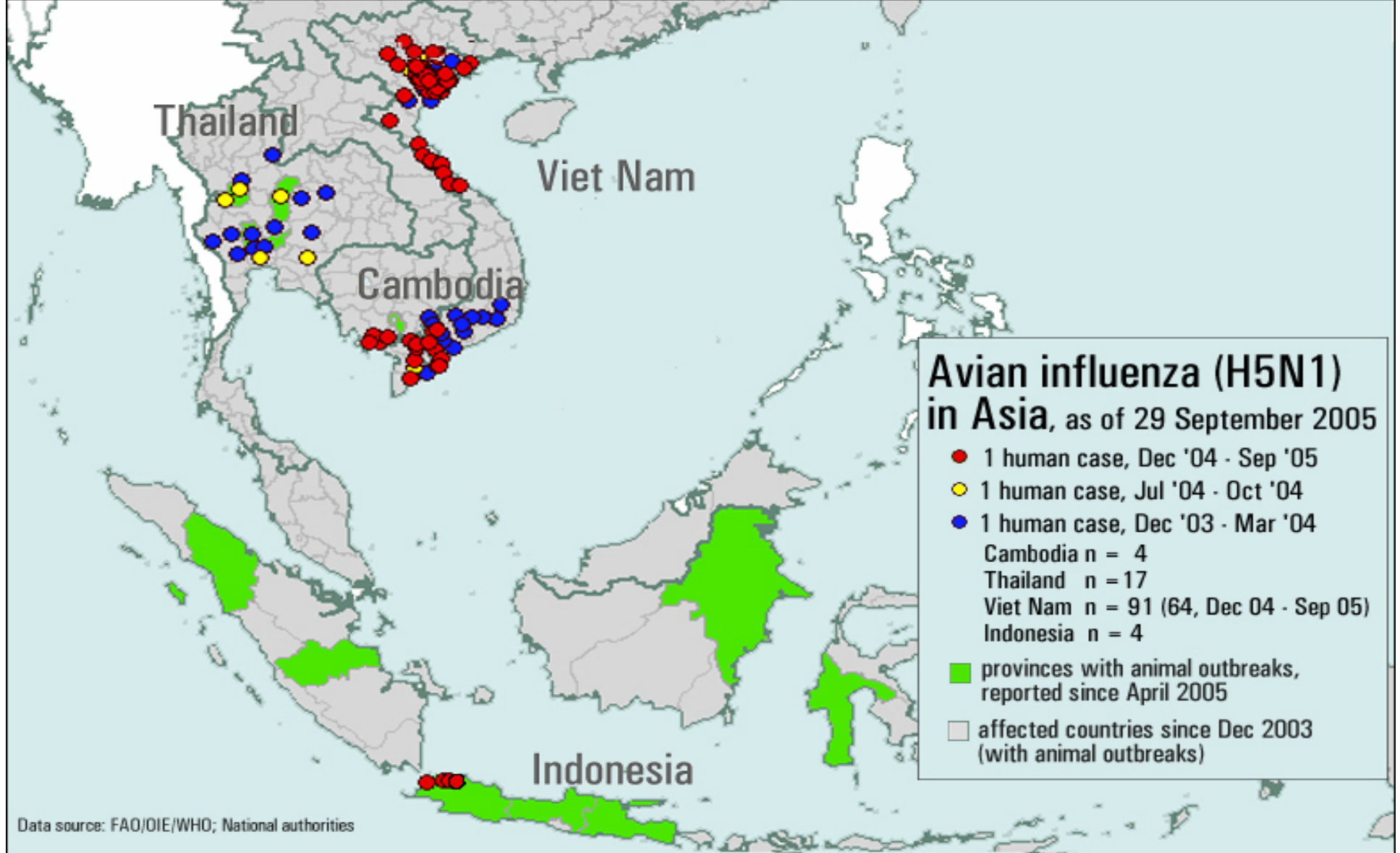
- A global epidemic of influenza resulting from a combination of
 - the emergence of an influenza A virus with a sub-type different from strains circulating among humans in recent years
 - a high proportion of susceptible people in the community
 - high person-to-person transmissibility of the new virus, with accompanying human disease





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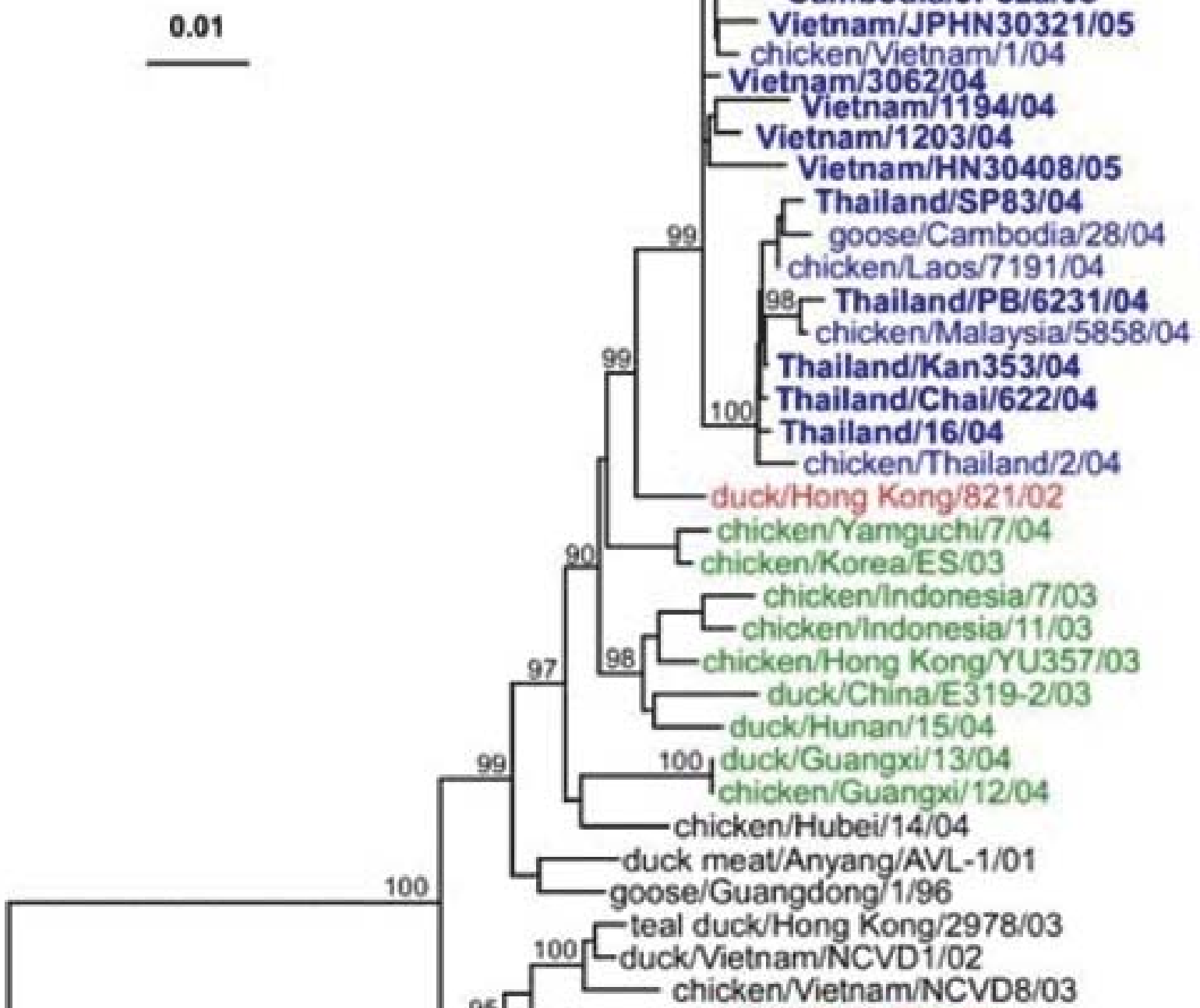




Disclaimer: The presentation of material on the maps contained herein does not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or areas or its authorities of its frontiers or boundaries.



0.01



Δ20 stalk



Other Recent Developments

- Resistance to oseltamivir...? (Chui, Hayden, Purdue)
- Family clustering of H5N1 (Olsen, Ungchusak, Aldis et al; Emerging Infectious Diseases Nov 05)
- Review of human H5N1 infection (Hayden et al; NEJM 01 Sept 05)
- Spread of H5N1 eastward (Kazakhstan, Russia, Turkey, Iraq- WHO teams now investigating human suspect cases in Armenia, Azerbaijan, Egypt, Georgia, Iran, Lebanon, Moldova, Syria, and Ukraine)
- “Resurrection” in the laboratory of 1918 pandemic virus!! (Tannenburg et al, Nature 5 Oct 05, Church et al, Trumpey et al, Science vol 310, 05)



RECREATING THE VIRUS



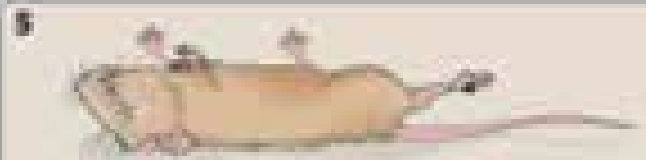
1
Flu victim frozen in Alaskan permafrost since 1918.



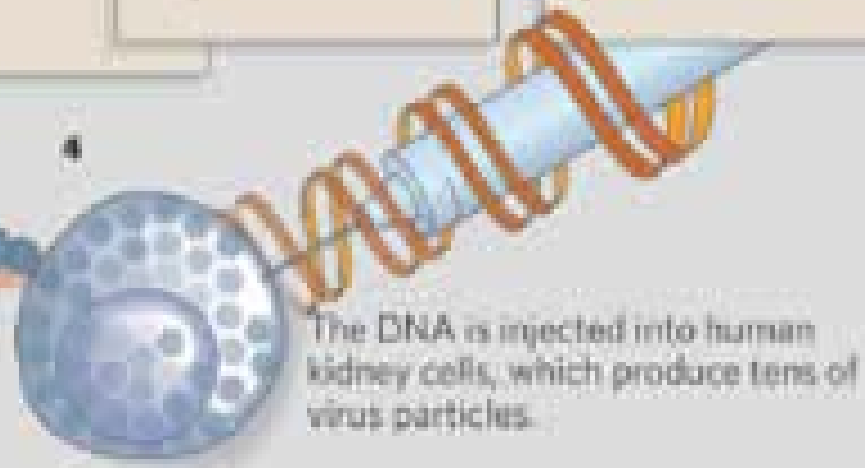
2
Fragments of RNA are retrieved from samples of lung tissue, converted into DNA and sequenced.



3
The overlapping sequences are pieced together to give the full genome sequence. A DNA version is synthesized in the lab.



5
The virus is isolated from the cells and used to infect mice. They all die within 6 days.



4
The DNA is injected into human kidney cells, which produce tens of virus particles.



Confirmed human cases of influenza A (H5N1)

As of January 2005

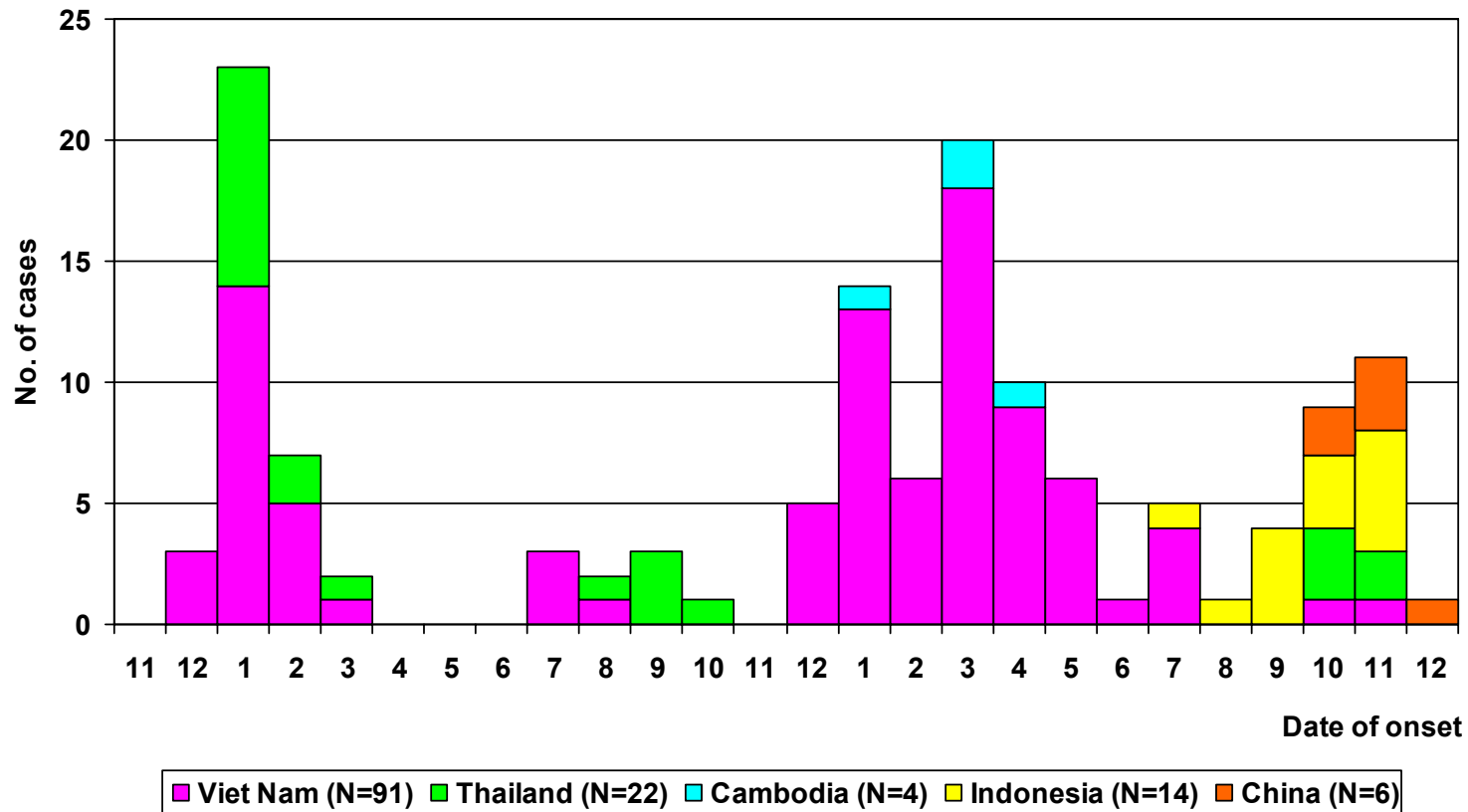
	Cases	Deaths
Cambodia	4	4
Thailand	22	14
Viet Nam	93	42
Indonesia	23	16
China	10	7
Turkey	14	4
Iraq	1	1
Total	177	88

Over-all CFR: 49.7 %

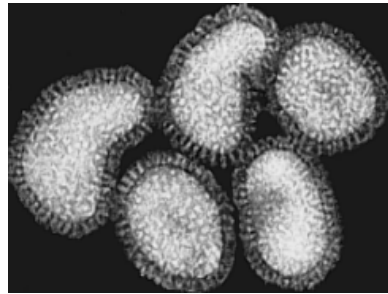


Human Avian Influenza A/H5N1 Cases by Onset Date and Country

(16 December 2005)



The current outbreak of H5N1



Approximate beginning of the epidemic, 1918



before
sept. 14

between
sept. 14 - 21

between
sept. 21 - 28

between
sept. 28 - oct. 5

after
oct. 5

Source: *America's Forgotten Pandemic - The Influenza of 1918 - 1989*



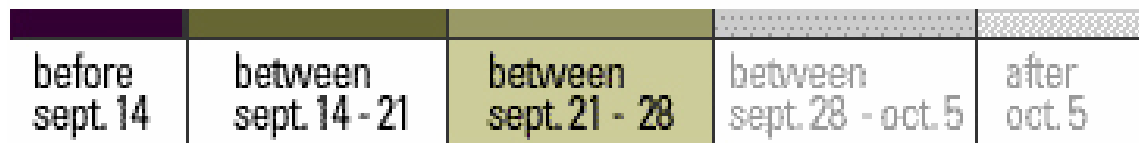
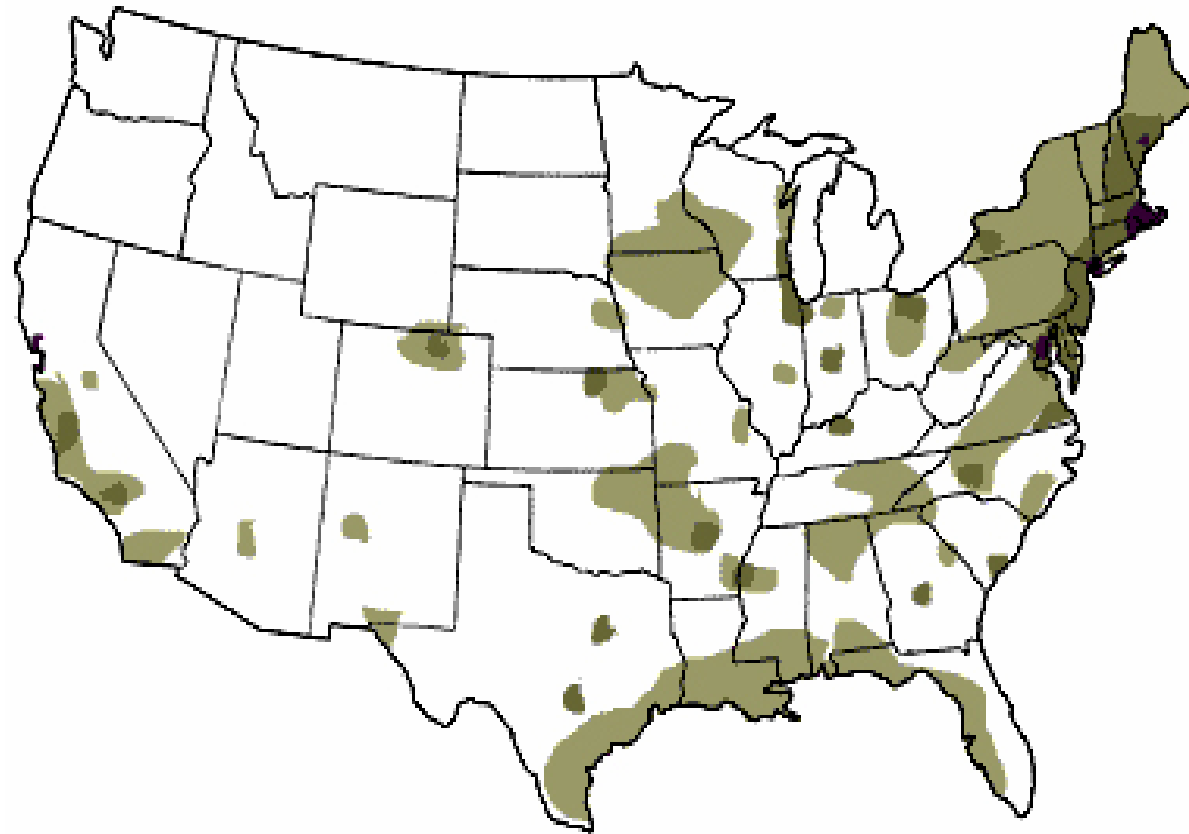
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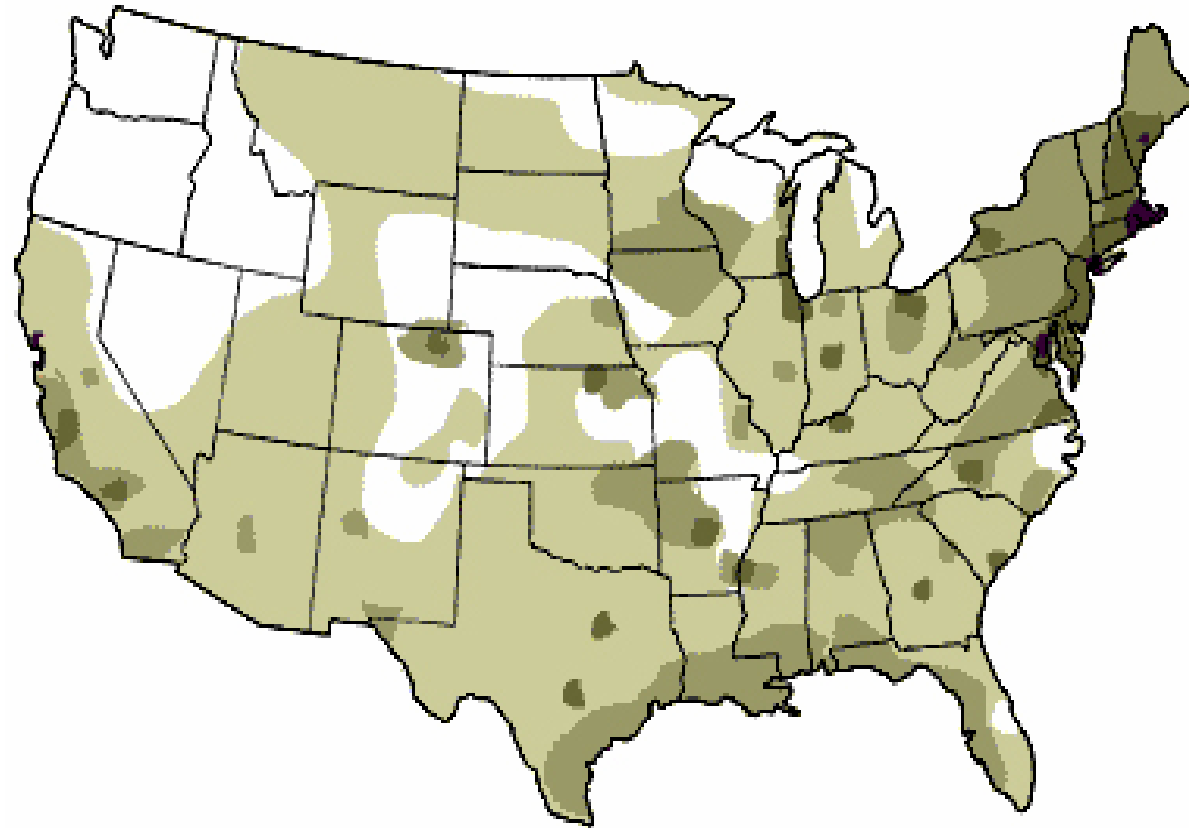
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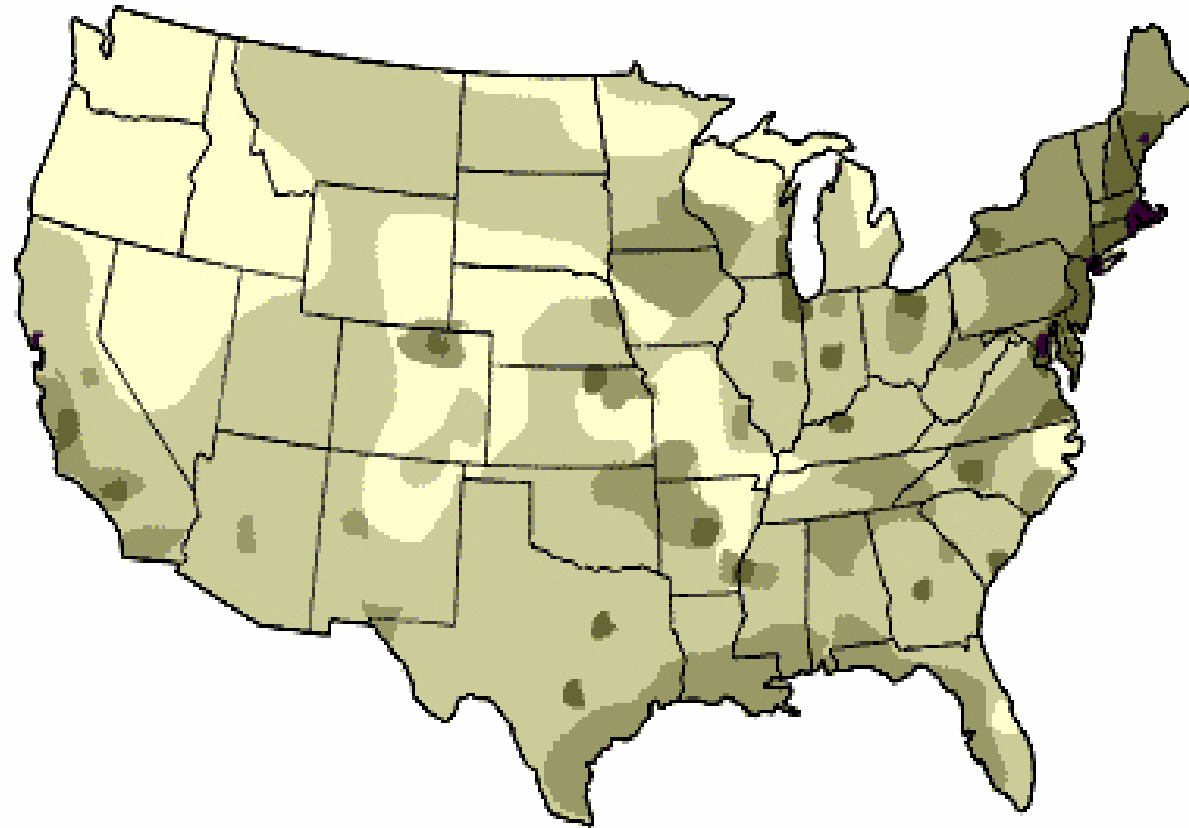
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*World Health Organization
Communicable Disease Surveillance and Response*



Pandemic Phases

Inter-pandemic

Phase 1: No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals.

Phase 2: No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.



Pandemic Phases

Pandemic Alert

Phase 3: Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.

Phase 4: Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.

Phase 5. Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).



Pandemic Phases

Pandemic period

Phase 6: Pandemic: increased and sustained transmission in general population.



How severe would a pandemic be?

(What are we planning for?)

- Best case scenario
 - Significant amount of illness, but mostly not severe and no deaths
 - Hospitals still function
 - Medical insurance provides cover
 - Sufficient tamiflu to provide treatment
 - Food and basic supplies continue to be available at reasonable cost
 - Airlines keep flying, staff can move freely
 - Communications not disrupted
 - No security issues



How severe would a pandemic be?

- Worst case scenario
 - Severe illness in staff with some deaths?
 - Hospitals overwhelmed despite applying strict triage (WHO needs to operate clinic and provide direct care)?
 - Medical insurance not available except at prohibitive levels?
 - Severe pressure on use of tamiflu for treatment of cases and contacts and for prophylaxis of staff?
 - Severe disruption to food and water supplies?
 - Airlines not operational – essential travel only possible
 - Communications disrupted (telephones / internet)?
 - Security issues



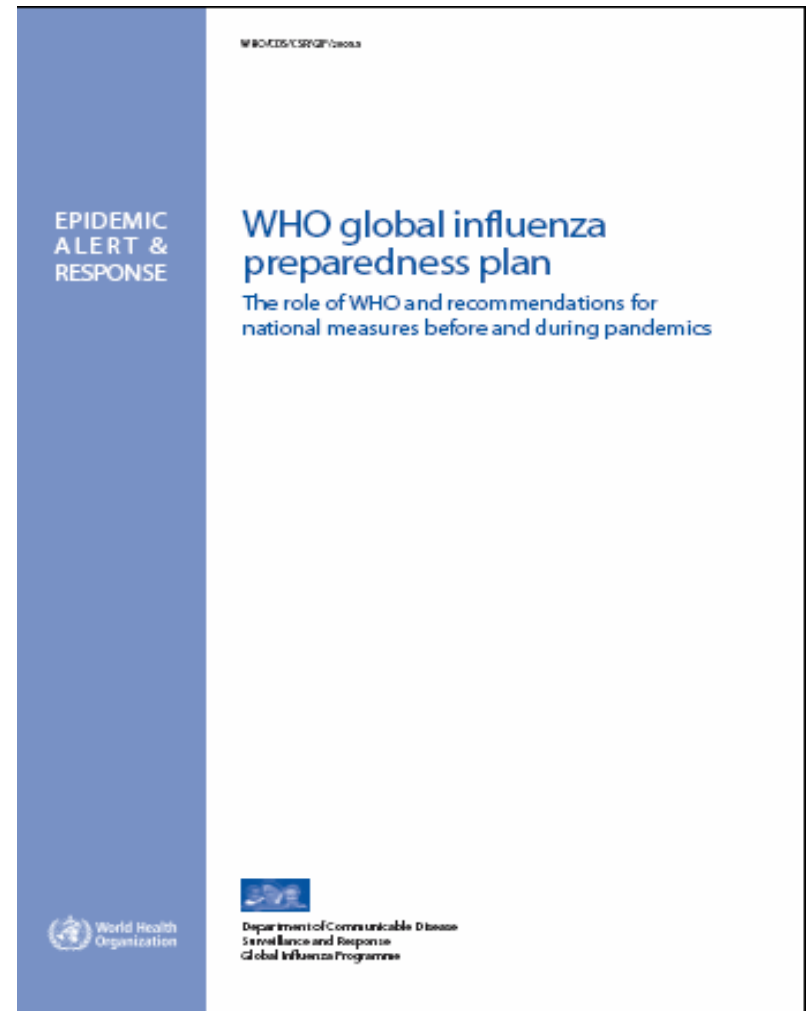
Available Public Health Interventions for a Pandemic When It Starts

- **Vaccines**
 - 6 months until vaccine production, little surge capacity, stockpiling not possible
- **Antiviral drugs**
 - Uses
 - Treatment use (individual protection, expensive)
 - Prophylactic use
 - Pandemic ‘pre-emption’ through mass treatment ...?
- **Others**
 - Personal measures: ‘respiratory etiquette’, avoid crowds and public places, food preparation
 - Case isolation, contact confinement, border screening, travel restrictions... it is likely to be impossible to completely halt transmission



Pandemic Preparedness

- **WHO Guidelines**
 - First version published in 1999
 - Revised version 2005
- **Consultation on Recommended Measures Before and During Influenza Pandemics**
 - Revision on phases
 - Geneva, 13-15 December, 2004
- **Pandemic vaccine development**
- **Global stockpiles of antivirals**
 - Any role in preventing or mitigating pandemic?



Thailand Strategies for Influenza Pandemic Preparedness (2005-2007)



- 1. Strengthen Influenza Surveillance System**
- 2. Preparedness of essential medical supplies and equipment**
- 3. Knowledge generation and management**
- 4. Public Relations and Education**
- 5. Development of Sustainable and Integrated Management Systems**



Prevention and Preparedness: Where Are We Now?

- Global Issues:
 - chaotic mix of regional political groupings, bilateral agreements / funding, multilateral organizations, UN HQ AI coordination
 - funding (chaos?... Beijing meeting)
 - pandemic early response (stockpiling, pandemic preemption?)
 - national plans as basis for support to countries



Prevention and Preparedness: Where Are We Now?

- National Issues:
 - status of national plans (complete? inter-sectoral? simulation exercises??)
 - pandemic early response... preemption??
 - preparedness reaching communities?
 - contingency plans for social disruption?



Prevention and Preparedness: Beijing Conference 17-18 January 2006

- US\$ 1.9 billion pledged (against est. US\$ 1.2 billion 'gap')
- “to assist countries with national preparedness plans”
- Mechanisms for release
- ...connection with reality



Prevention and Preparedness: Where Are We Now?

- Policy questions:
 - is global coordination sufficient?
 - is there agreement on pandemic early response (?? preemption)
 - we are still operating under the old out-of-date International Health Regulations
 - what are we doing about *community readiness*?

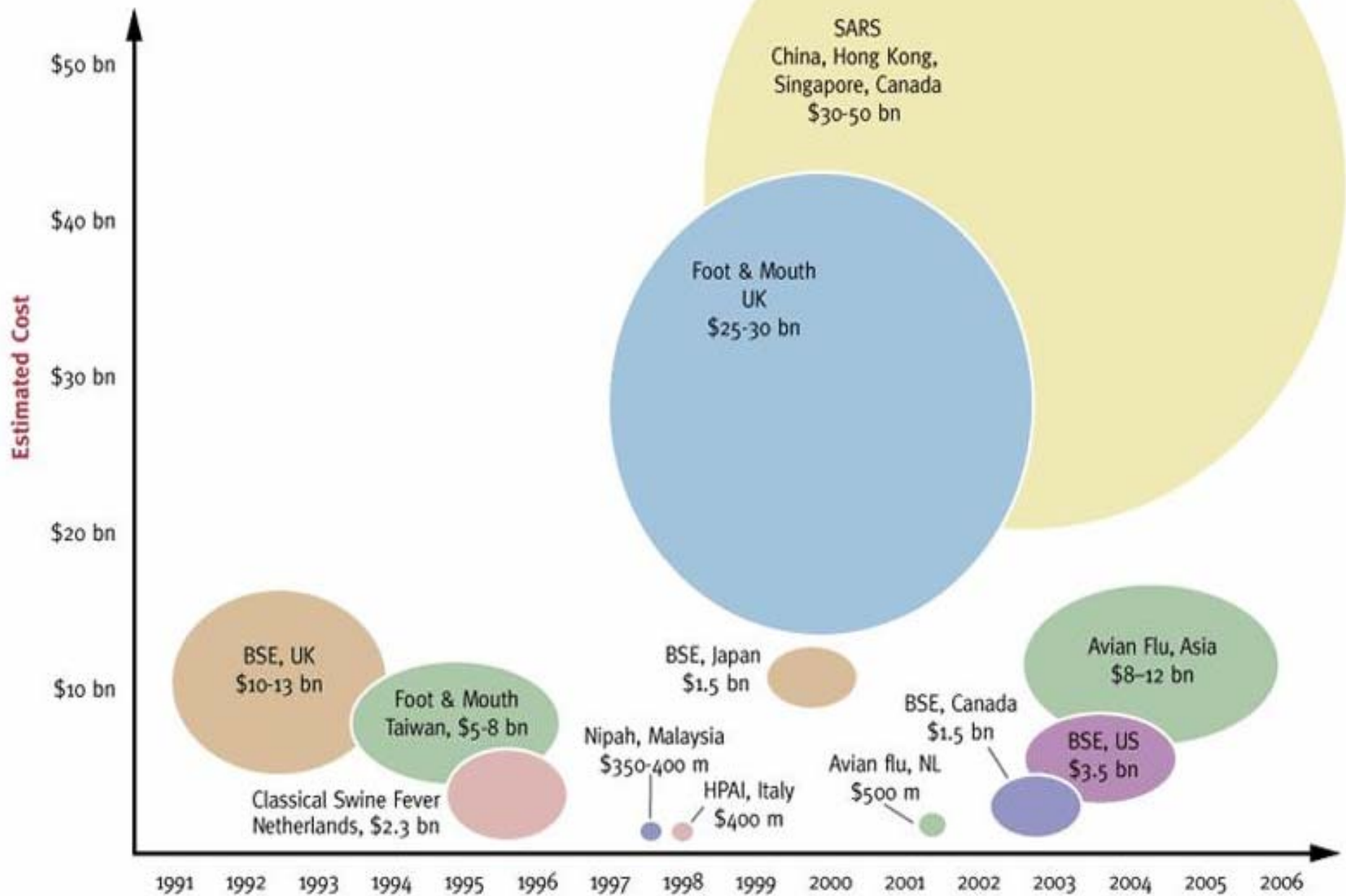


Prevention and Preparedness: Where Are We Now?

- Research questions:
 - behavior change communications: what works?
 - farming practices: what minimal changes in backyard poultry production would be sufficient to prevent or reduce human infection?
 - are national and sub-national plans realistic (we need operational research during simulation drills)
 - clinical case management: correct oseltamivir dose, optimal respiratory critical care protocols
 - modeling effects of human influenza pandemic: social, political and economic consequences



Economic Impact of Selected Infectious Diseases

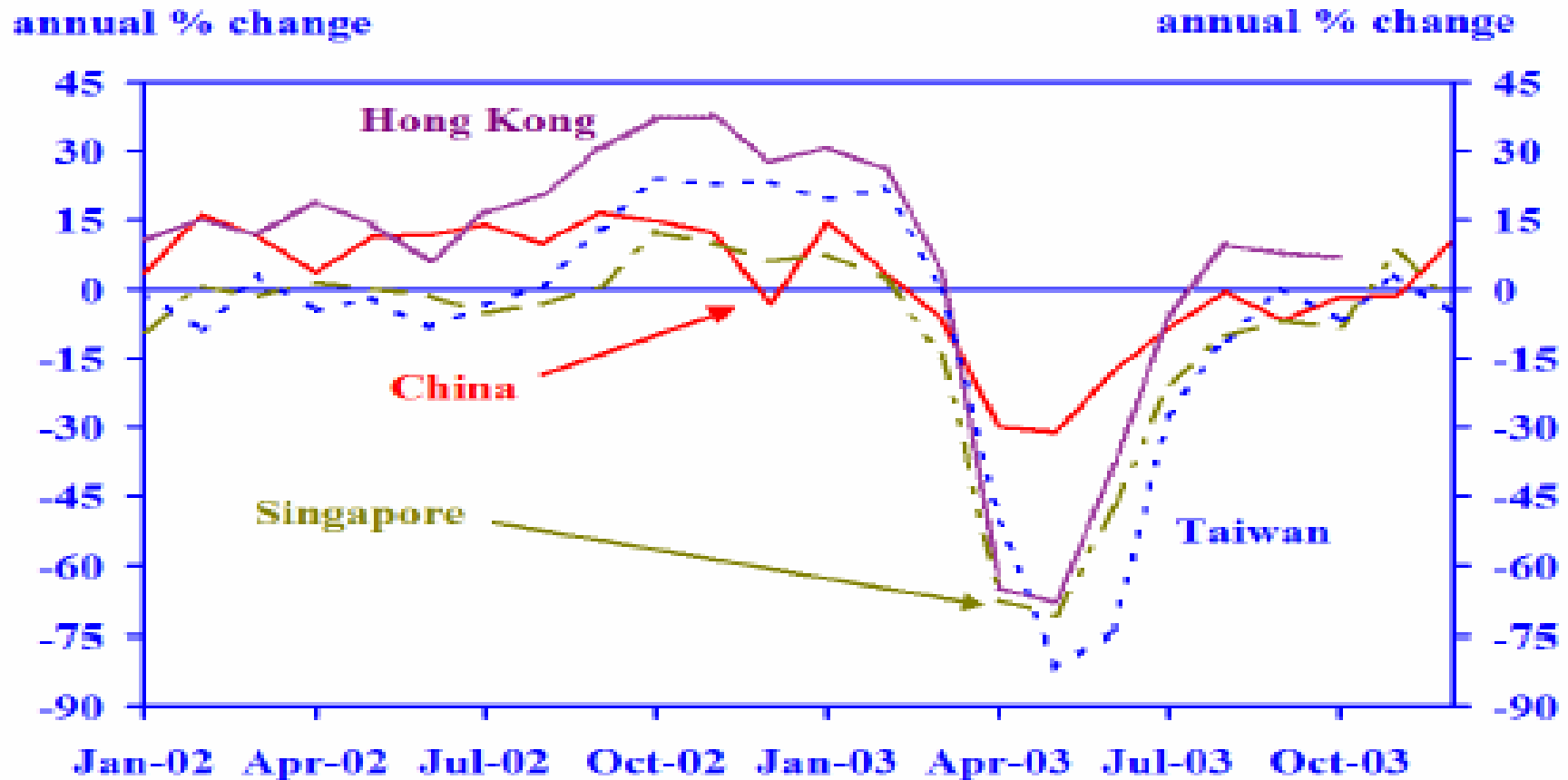


Figures are estimates and are presented as relative size.

Effect of SARS on Tourism in SE ASIA

14

Asia: Tourist arrivals



Source: CEIC data



Where to get more information

WHO global influenza sites:

General information:

www.who.int/csr/disease/influenza/pandemic/en

Updates on recent outbreaks:

www.who.int/csr/disease/avian_influenza/updates/en/



The image shows a close-up of a blue flag with the World Health Organization (WHO) logo. The logo consists of a white caduceus (a staff with two snakes) superimposed on a white map of the world, which is flanked by two olive branches. The flag is slightly wrinkled and has a white tassel hanging from the top. The text "World Health Organization" is printed in white at the bottom of the image.

World Health Organization

???

