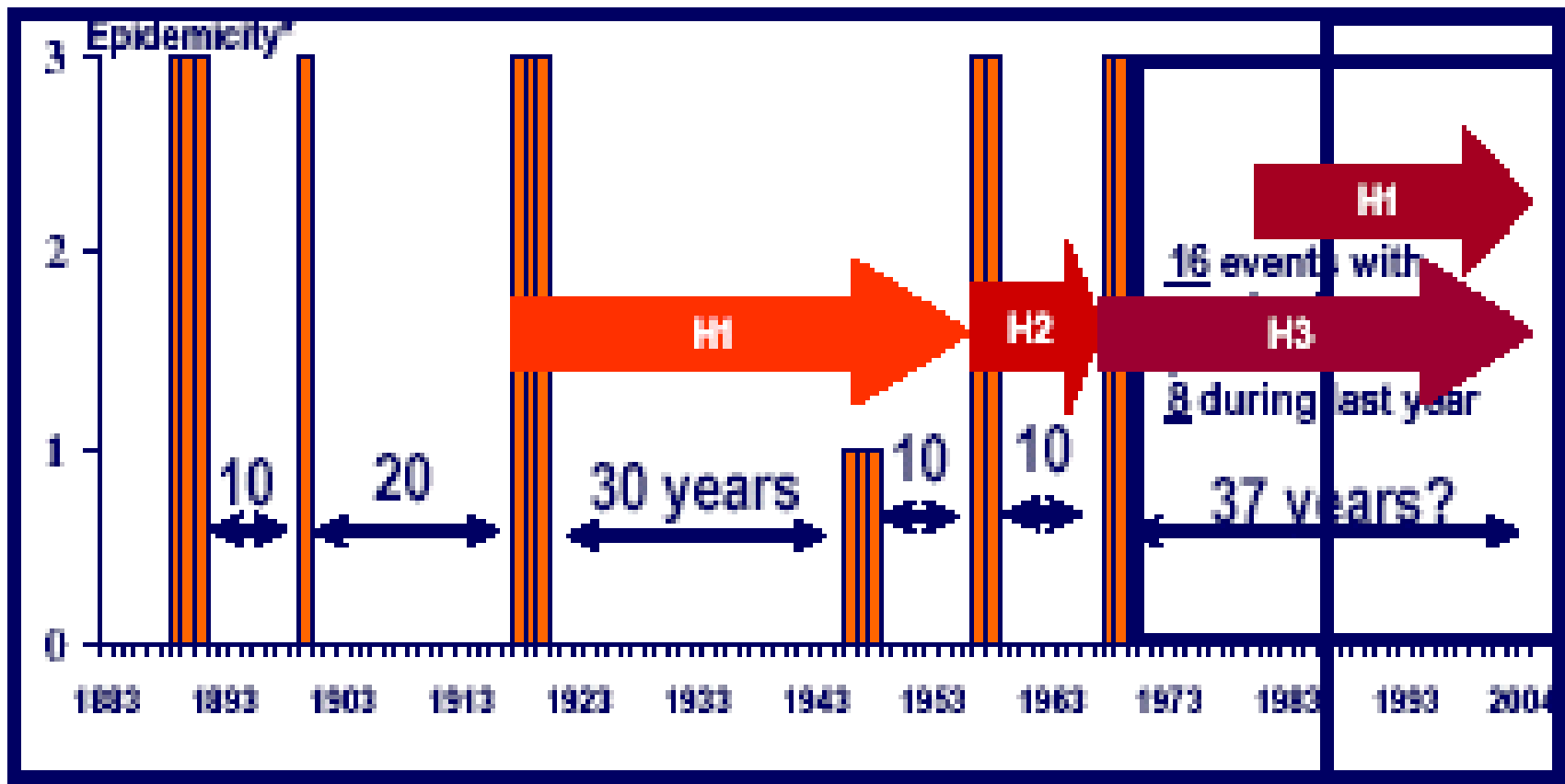


**Overview of  
Avian and Pandemic Influenza  
Preparedness and Response**

# Recorded Influenza Pandemics



1: epidemic, 2: probable pandemic, 3: pandemic

Potter, C.W: Textbook of Influenza by Nichols, Webster, Hay, Blackwell Science 1998

# Influenza Pandemics



**1918:**  
**"Spanish Flu"**

50 million  
deaths

A(H1N1)



**1957:**  
**"Asian Flu"**

1-4 million  
deaths

A(H2N2)



**1968: "Hong  
Kong Flu"**

1-4 million  
deaths

A(H3N2)



**2009:**  
**"Pandemic  
(H1N1)"**

332 deaths\*

A(H1N1)

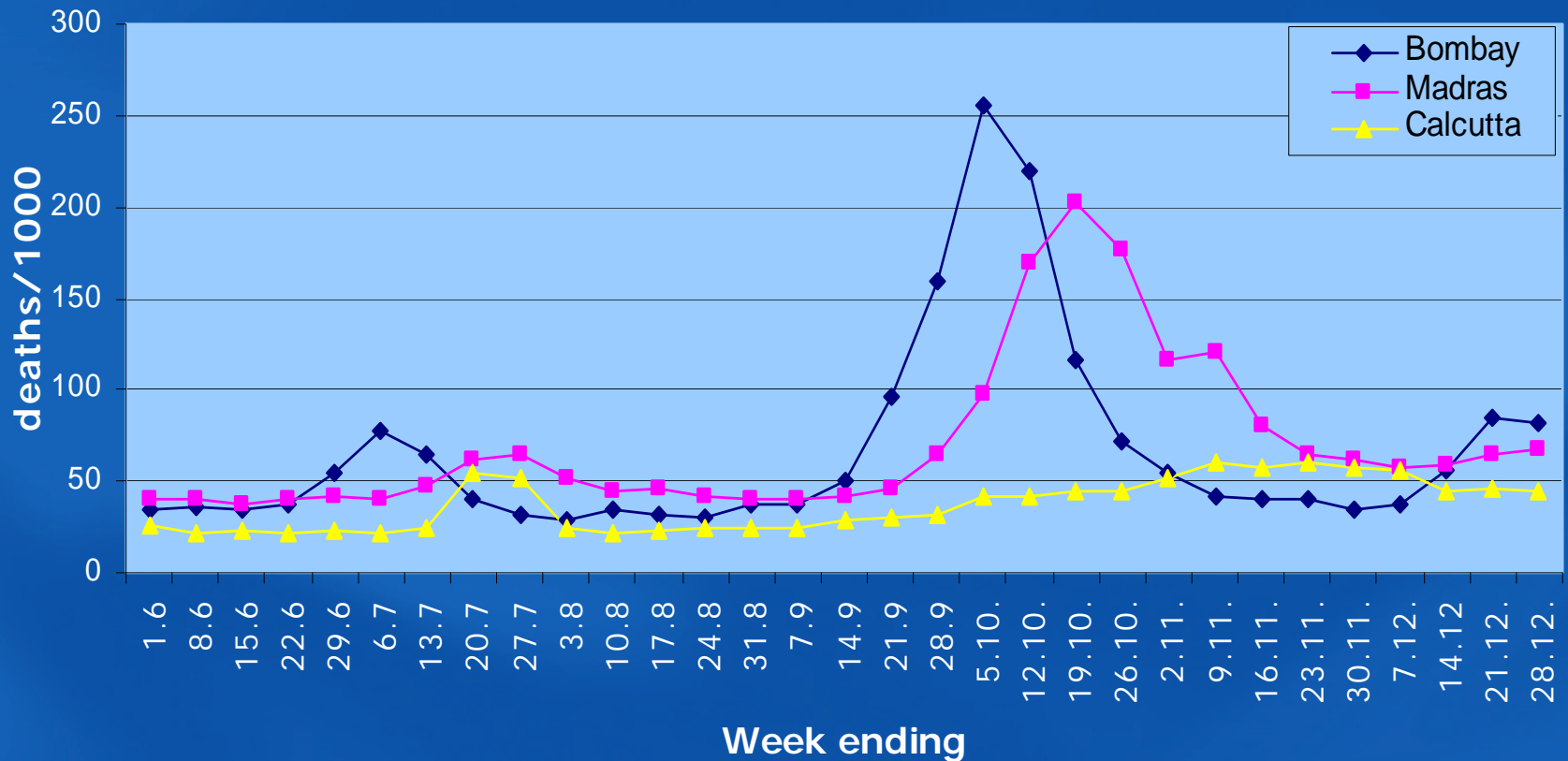
\* Data as on 1<sup>st</sup> July, 2009

# Deaths due to Influenza in India-1918

State	No. of Deaths	Death Rate/1000
Delhi	23,612	56.6
Bengal	386,572	8.5
Bihar	709,976	20.5
Assam	111,340	18.6
Agra&Oudh	2,034,257	43.4
Punjab	898,947	45.4
NWFP	89,035	43.6
Central Province	924,949	66.4
Madras	682,169	16.7
Coorg	2,014	11.5
Bombay	1,059,497	54.9
Burma	137,491	13.9
Ajmer-Merwara	29,835	59.5

Source: Annual Report of The Sanitary Commissioner with the Government of India

# Influenza - Weekly Death Rate in India 1918



Source: Annual Report of The Sanitary Commissioner with the Government of India

# Avian Influenza Panzootic

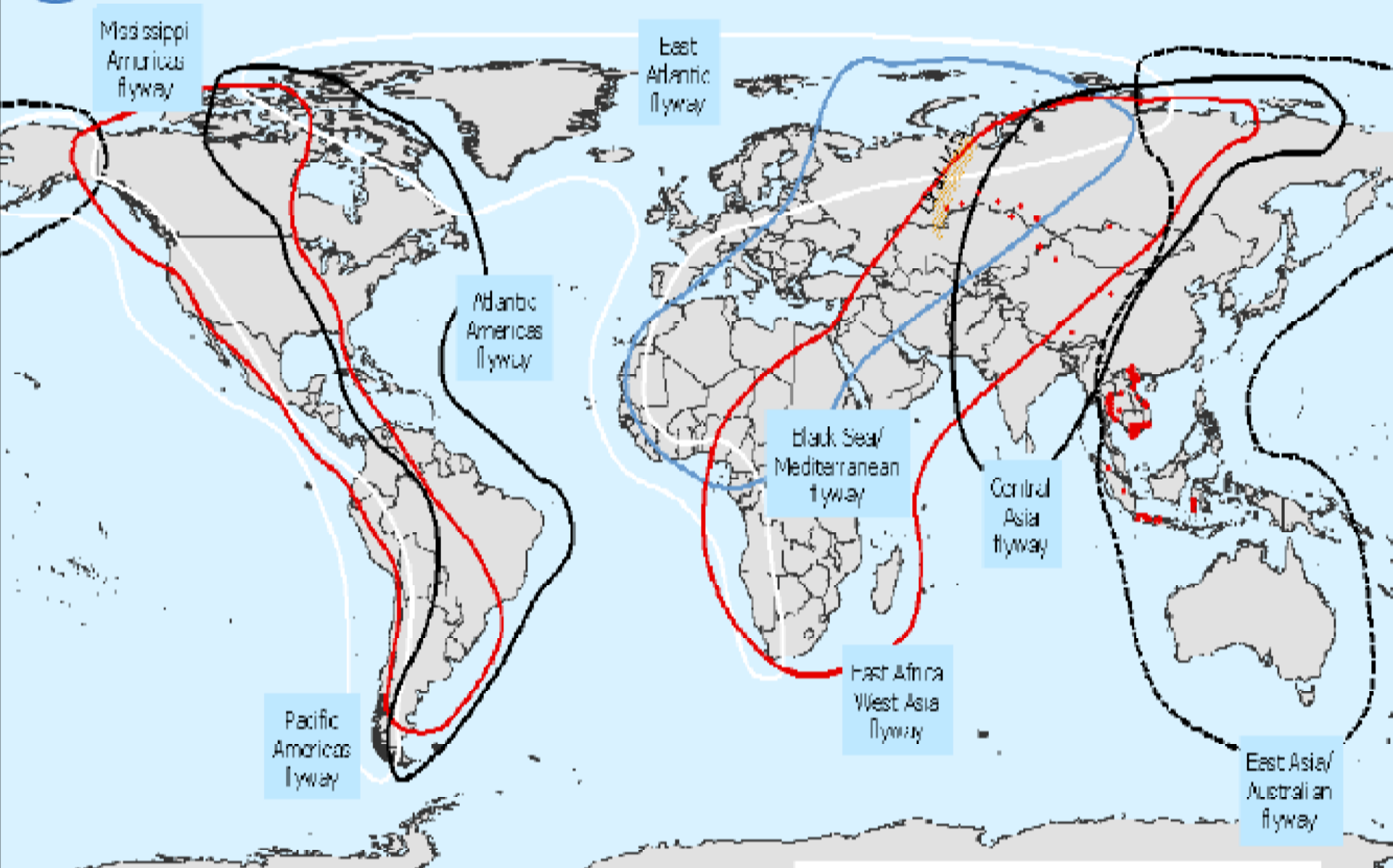
- 63 countries have reported avian influenza (H5) among birds/animals (as on May, 2009)

Year	Cumulative no. of countries
2003	2
2004	9
2005	17
2006	56
2007	60
2008	62
2009	63



# H5N1 outbreaks in 2005 and major flyways of migratory birds

Situation on 30 August 2005

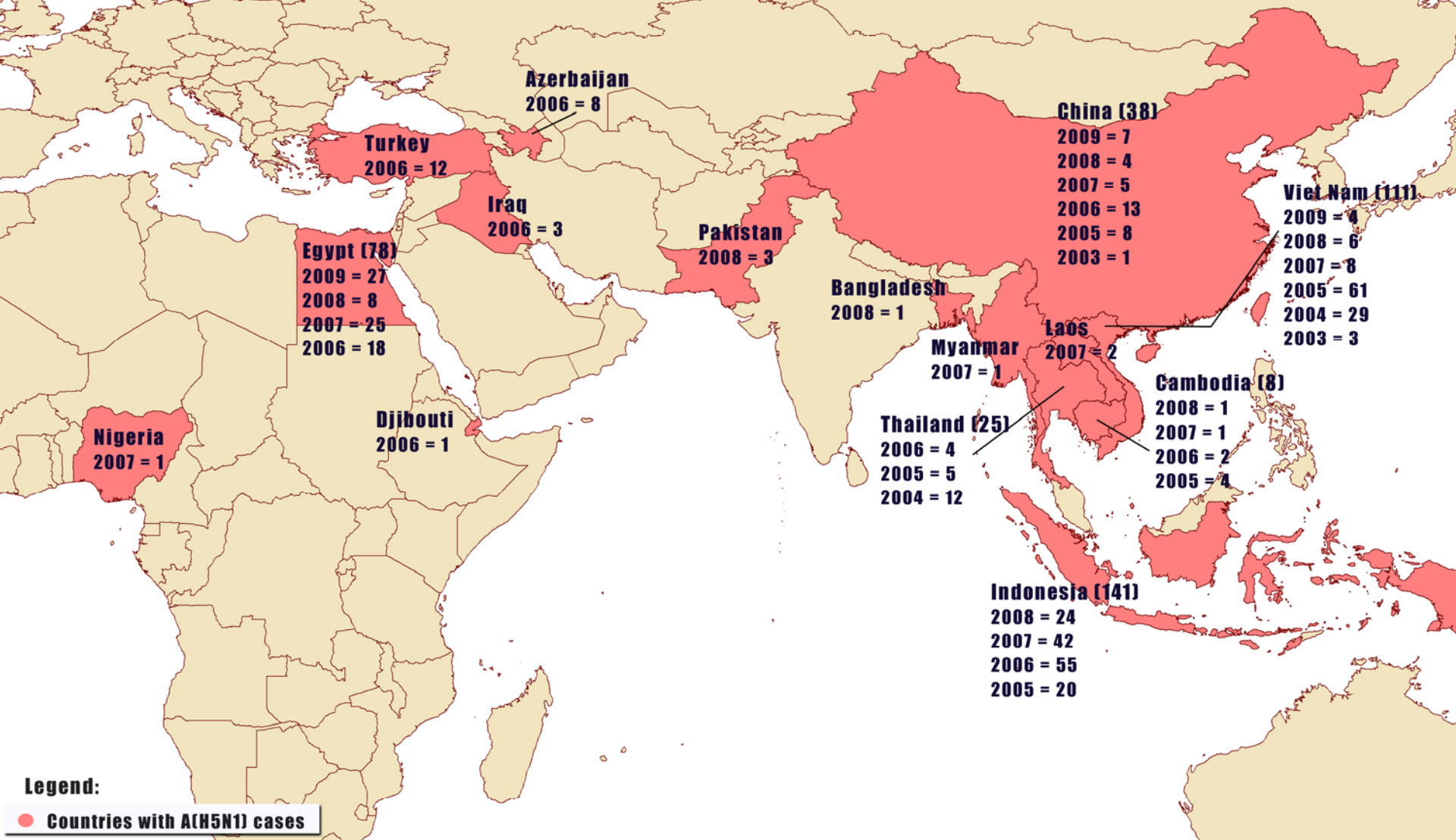


● Districts with H5N1 Outbreaks since January 2005

Sources: All outbreaks: OIE, FAO and Government sources.  
Flyways: Wetlands International

# Geographic Distribution of Human Avian Influenza A (H5N1) Cases (2003-2009)

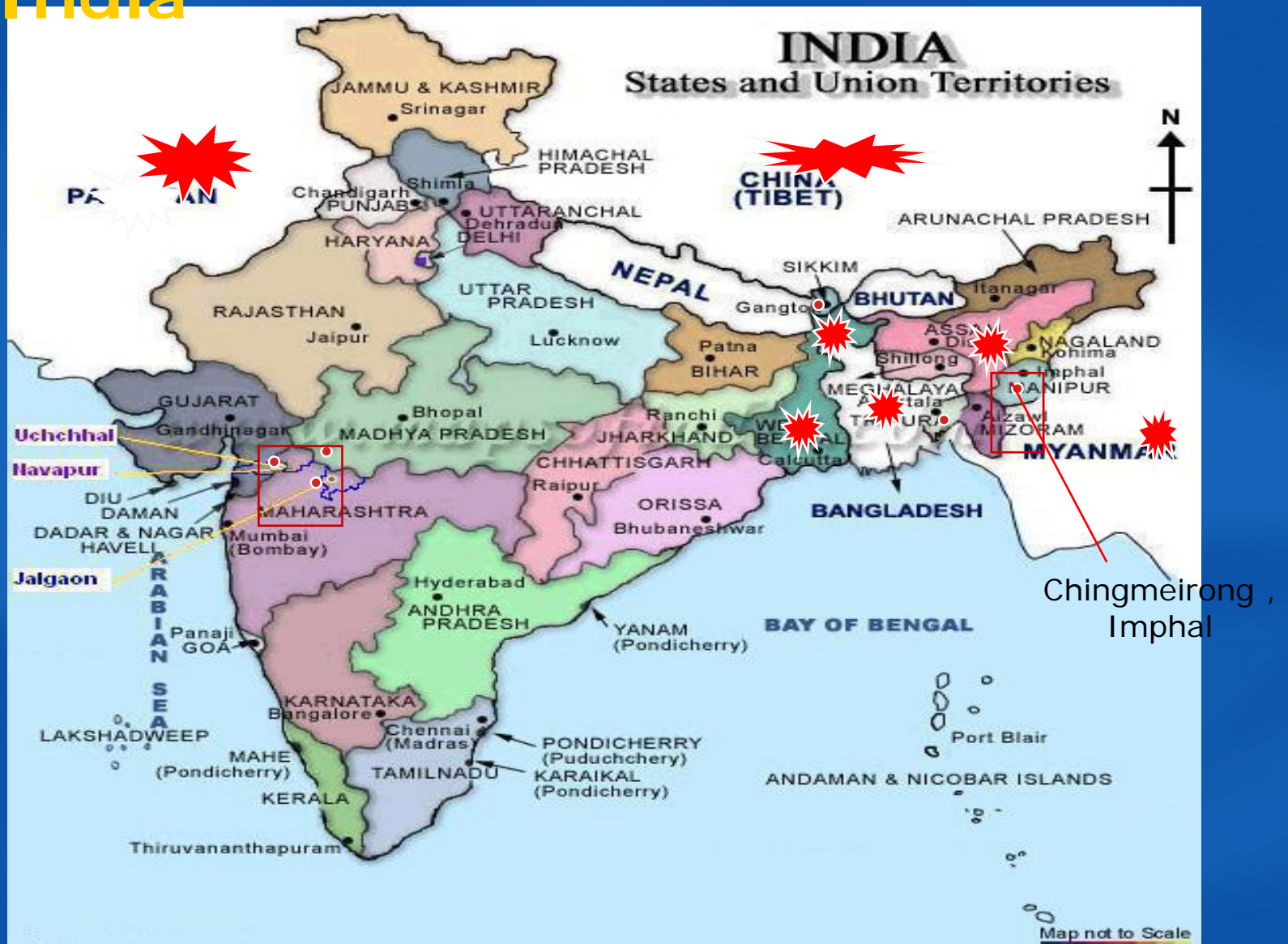
As of 30 June 2009



# Avian Influenza Poultry Outbreaks in India

2006	Maharashtra, Gujarat, Madhya Pradesh
2007	Manipur
2008	West Bengal, Tripura, Assam, Meghalaya
2009	West Bengal, Sikkim

# Avian Influenza Poultry Outbreaks in India

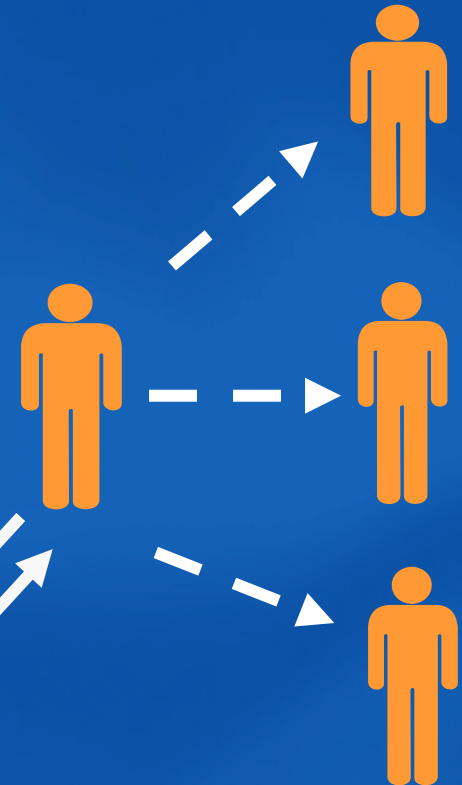
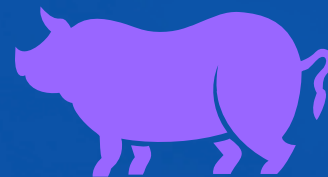


# Transmission of Avian Influenza

Migratory water birds



Domestic birds



# Human Cases of Avian Influenza

(as on 30<sup>th</sup> June, 2009)

Country	Cases	Deaths
Azerbaijan	8	5
Bangladesh	1	0
Cambodia	8	7
China	38	25
Djibouti	1	0
Egypt	81	27
Indonesia	141	115
Iraq	3	2
Laos Republic	2	2
Myanmar	1	0
Nigeria	1	1
Pakistan	3	1
Thailand	25	17
Turkey	12	4
Viet Nam	111	56
Total	436	262

# Current H1N1 Pandemic Virus

- ❑ Influenza A (H1N1) virus (initially called swine flu)
- ❑ Re-assorted segments from American swine, Eurasian swine, Avian and Human virus
- ❑ Have not been previously detected in pigs or humans
- ❑ Sensitive to oseltamivir, but resistant to both amantadine and rimantadine

# Public Health Concern

- ❑ Number of affected countries with influenza A H1N1 increasing rapidly
- ❑ Number of human cases of influenza A H1N1 increasing rapidly
- ❑ The majority of the human population has no immunity to this virus
- ❑ Potential to further mutate to a lethal novel influenza virus

# Pre-requisites for an Influenza Pandemics

- i. Emergence of a novel virus to which all humans are susceptible
- ii. New virus is able to replicate and cause diseases in humans
- iii. New virus is transmitted efficiently from human-to-human

**All Criteria Met for the Novel Influenza A H1N1**

# Influenza Pandemics—Global Health Implications

- ❑ Disease and death
  - About 500 million are expected to fall ill
  - A significant proportion will require medical care
  - 6.4–28.1 percent hospitalizations
  - 2 to 7 million deaths, even with low case fatality rate of 0.6 percent
- ❑ Few weeks duration
- ❑ Several waves

(Source: WHO)

# Influenza Pandemic—Impact

- ❑ Will affect essential medical services
- ❑ Will equally affect other essential community services
  - Public transport, police, fire brigade, food supplies, air traffic, petrol stations, teachers, administrative functions, and many other sectors
  - Social and political disruption may occur
  - Considerable economic loss

# Strategic Approach

6. Pandemic

Sectoral coordination C&C  
Surge capacity to handle large number of cases,  
Triage, Domicillary care,  
Maintain essential services  
Continuity of business

Minimize losses

5. Significant increase in man-to-man Tx, extended outbreak

Contain outbreaks

Surveillance and investigation, contain outbreak at source, manage cases, Quarantine, social distancing increase risk com.

4. Increased man-to-man Tx limited outbreak

Prevent infections

Surveillance, risk communication, case management,

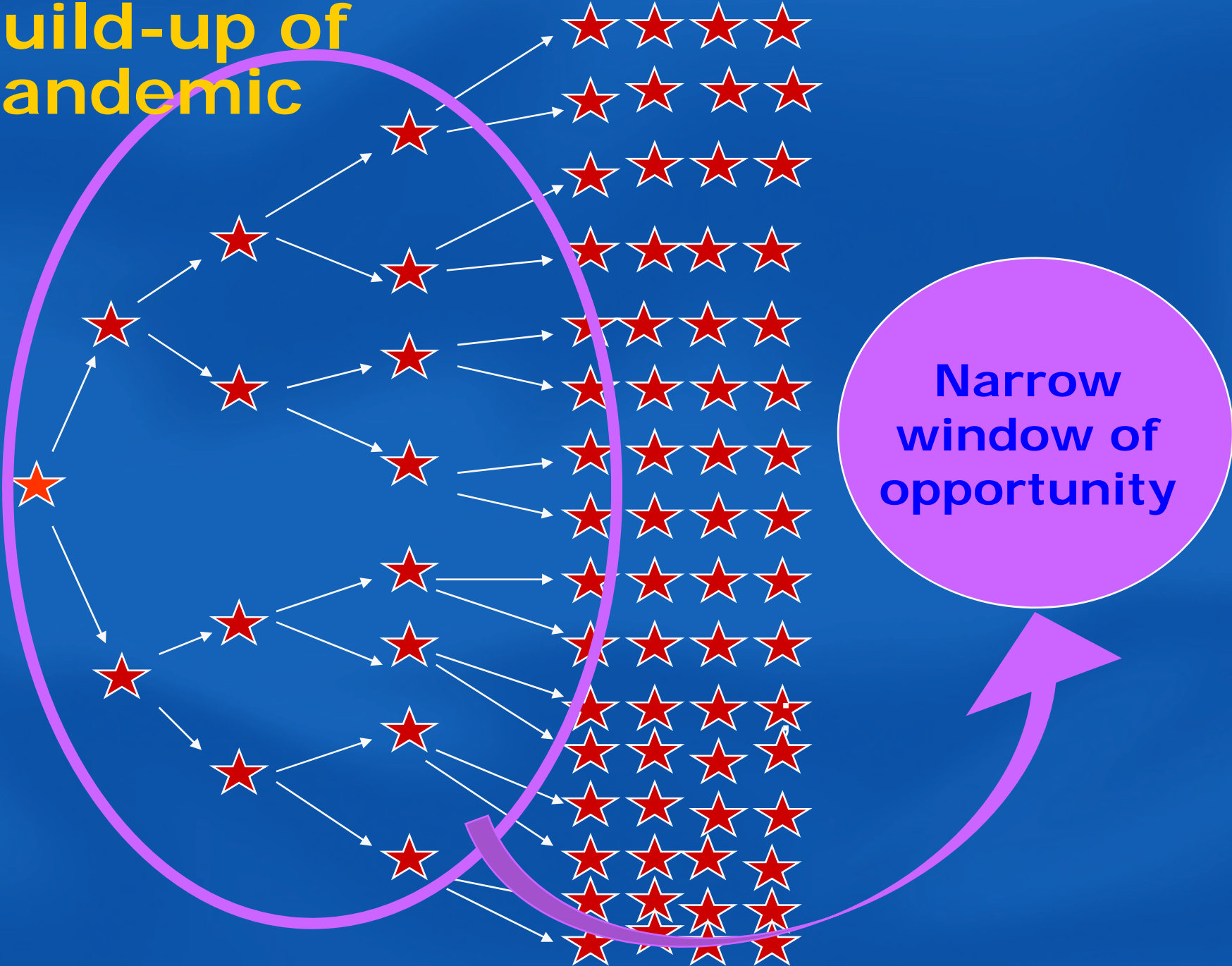
3. Human infections, no or only inefficient man-to-man Tx

2. High risk for human

1. New influenza virus in animals low risk for human

Source: WHO

# Build-up of Pandemic



# AI/PI Preparedness and Response Strategies

- ❑ Planning activities started in 2004 in India
- ❑ Highest political commitment for preparedness
- ❑ National consultation for strategy development
- ❑ Multi sectoral involvement for AI preparedness & response
- ❑ Knowledge gap filled through WHO guidelines

# AI/PI Preparedness and Response Strategies

## Legal and Institutional Framework

- ❑ National Disaster Management Act-2005
- ❑ Epidemic Act 1897
- ❑ National Crisis Management Committee
- ❑ National Influenza Pandemic Committee
- ❑ Inter-ministerial Task Force for Sectoral Coordination
- ❑ Joint Monitoring Group for monitoring
- ❑ National Task Force on Communications in I&B Ministry
- ❑ Technical Committee for laboratory strengthening, vaccines, import of poultry products etc.

# AI/PI Preparedness and Response Strategies

## AI/PI Plans

- ❑ National pandemic preparedness plan
- ❑ Contingency plan for managing avian influenza in poultry
- ❑ Contingency plan for management of human cases of avian influenza
- ❑ Plan for management of cases of H1N1 influenza

# Prioritisation of Strategies for Action Plan-1

## Surveillance-Human and Animal Health

- Short term
  - Surveillance – representative sample, focus on vulnerable states
    - Poultry surveillance both backyard and farms
    - Surveillance of wild/migratory birds, major water bodies
    - Human influenza surveillance in selected areas
  - Active event based house to house surveillance during avian influenza outbreak/or during containment of cluster of cases caused by influenza A H1N1
  - IDSP to report cluster of influenza like illness (ILI) and severe acute respiratory illness (SAR)
- Long term
  - Integrated Disease Surveillance Program both for animal and human health

# Prioritisation of Strategies for Action Plan-2

## Laboratory Surveillance-Human and Animal Health

### □ Short term

- Establish adequate BSL-3 labs in human health sector to cover the country on regional basis
- Establish five BSL-3 in addition to the existing BSL-4 in animal health

### □ Long term

- Nation-wide laboratory network under Integrated Disease Surveillance Program

# Prioritization of Strategies for Action Plan-3

## Training Human Resource for Pandemic Preparedness

- ❑ Table Top Exercises (TTX) to review the state plan
- ❑ Training of Rapid Response Teams (RRT) both in human and animal sector at National, state and district Level
- ❑ Clinicians training on respiratory/ventilatory management
- ❑ Mock drill of preparedness plans
- ❑ Health worker training in PPE/field surveillance/home care
- ❑ CME for medical practitioners on management of AI/PI
- ❑ Training of security agencies on the non-pharmaceutical interventions
- ❑ Training of volunteers on home care

# Prioritisation of Strategies for Action Plan-4

## Building Capacity for Drugs and vaccines

### ❑ Oseltamivir

- Five manufacturers licensed for bulk/formulations
- About ten million capsules in stock. Another six million in banking arrangement with manufacturers

### ❑ Vaccine

- Serum Institute of India (SII) one of the six companies supported to manufacture a Pandemic Influenza Vaccine by WHO
- SII, Bharat Biotech (BB) and Panacea Biotech (PB) have been issued licence to import the seed virus by the Drug Controller General of India. BB and PB have technical know how to produce pandemic influenza vaccine on cell based technology

# Prioritisation of Strategies for Action Plan-5

## Hospital Strengthening

- Short term
  - Stockpiling of ventilators, blood analysers
  
- Long term
  - Strengthening of hospital infrastructure for isolation facility and critical care

# Prioritisation of strategies for Action Plan-6

## Risk communication

### □ Avian Influenza

- Target groups
  - Live poultry markets, backyard poultry, poultry farms, community, high risk personnel
- Communication clusters
  - Preventing an outbreak of bird flu; controlling an outbreak; emergency response to a pandemic

### □ Influenza A H1N1

- Flu wise campaign
- Flu care campaign

# AI/PI Plan-Indian Perspective

## Critical Issues

- ❑ Sectoral coordination
- ❑ Surveillance
- ❑ Augmenting critical care
- ❑ Stockpiling tamiflu for cluster containment
- ❑ Quarantine/social distancing for containment
- ❑ Management of mass casualties
- ❑ Disposal of dead bodies
- ❑ Border/port/airport control
- ❑ Imposing trade and travel restrictions

# Influenza Pandemic

- ❑ Influenza pandemics cause global health emergencies, but the damage can be reduced with adequate preparedness
- ❑ Various scenarios of health impact of influenza pandemics exist. Even the most optimistic one causes concern
- ❑ National pandemic preparedness is the key
- ❑ An influenza pandemic was overdue, with the last one occurring in 1968
- ❑ As expected a pandemic (due to H1N1) emerged suddenly and rapidly
- ❑ These preparedness activities are helping in our response to the H1N1 pandemic
- ❑ The window of opportunity to act was used in preparing for an expected pandemic due to H5N1

**Thank You**