

# Epidemiology of H7N9 Influenza

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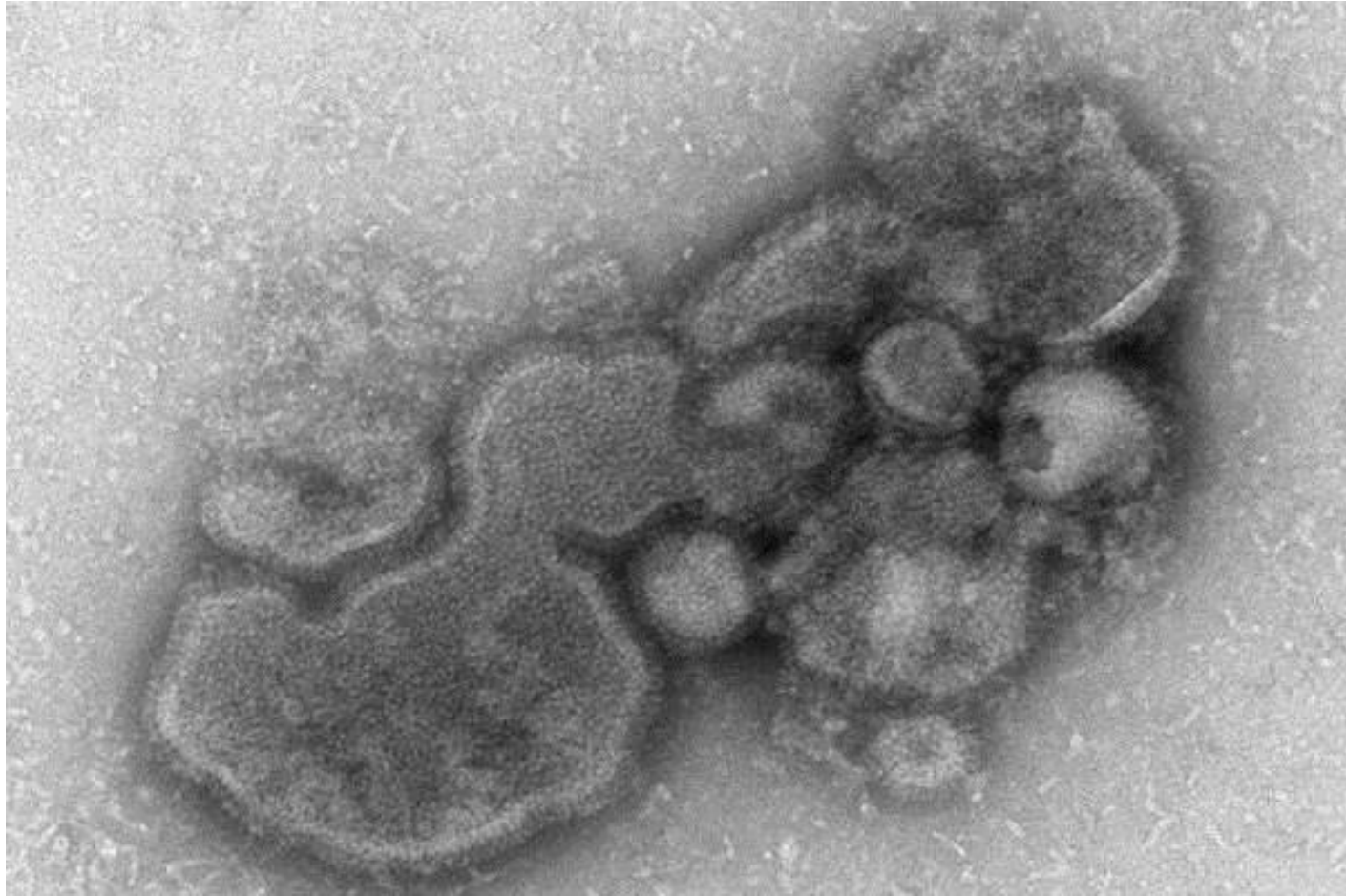
## **Global Alert and Response (GAR)**

### **Human infection with influenza A(H7N9) virus in China**

1 APRIL 2013 - On 31 March 2013, the China Health and Family Planning Commission notified the World Health Organization (WHO) of three cases of human infection with influenza A(H7N9). The cases were laboratory confirmed on 29 March by China CDC. Laboratory testing for influenza A(H3N2), A (H1N1) pdm09 and A(H5N1), as well as for novel coronavirus, has been negative.

The cases were reported from Shanghai (2 cases) and Anhui province (1 case). All three cases presented with respiratory tract infection with progression to severe pneumonia and breathing difficulties. Disease onset was between 19 February and 15 March 2013. Two of the cases died. The third case is currently in critical condition.

## Avian Influenza A(H7N9)



# Avian Influenza A(H7N9) International Epidemiology Update for 20 MAY 2013

## Avian (H7N9) Summary — China

Cumulative counts since 19 Feb 2013	N
Number of provinces/municipalities/areas with confirmed cases	8 / 2 / 1
Number of confirmed cases* + (new confirmed cases)	132 + (0)
Number of confirmed cases hospitalized¥/recovered‡‡	127 / 77
Number of fatal confirmed cases	37
Cases of confirmed human to human transmission**	0
Number of probable clusters‡ + (new probable clusters)	0 + (0)
Number of confirmed clusters†† + (new confirmed clusters)	5 + (0)
Number of asymptomatic infections	1

\* Confirmed cases include persons with laboratory confirmation of H7N9 infection through report from China CDC or Provincial CDC

† New cases identified from 12:01 PM EDT of previous day to 12:00 PM on as of report date

\*\* Represents transmission from between confirmed cases

‡ Probable clusters include 1 or more close contacts of a confirmed case with respiratory illness,. H7N9 infection cannot ruled out because appropriate test not available.

†† Confirmed clusters are two or more confirmed cases of H7N9 that are close contacts of one another.

‡‡ Includes the asymptomatic infection who was discharged from quarantine

¥ Total number of hospitalized cases, data are incomplete for 3 cases



*These data include information received by 1200 EDT on the date prior to this report*

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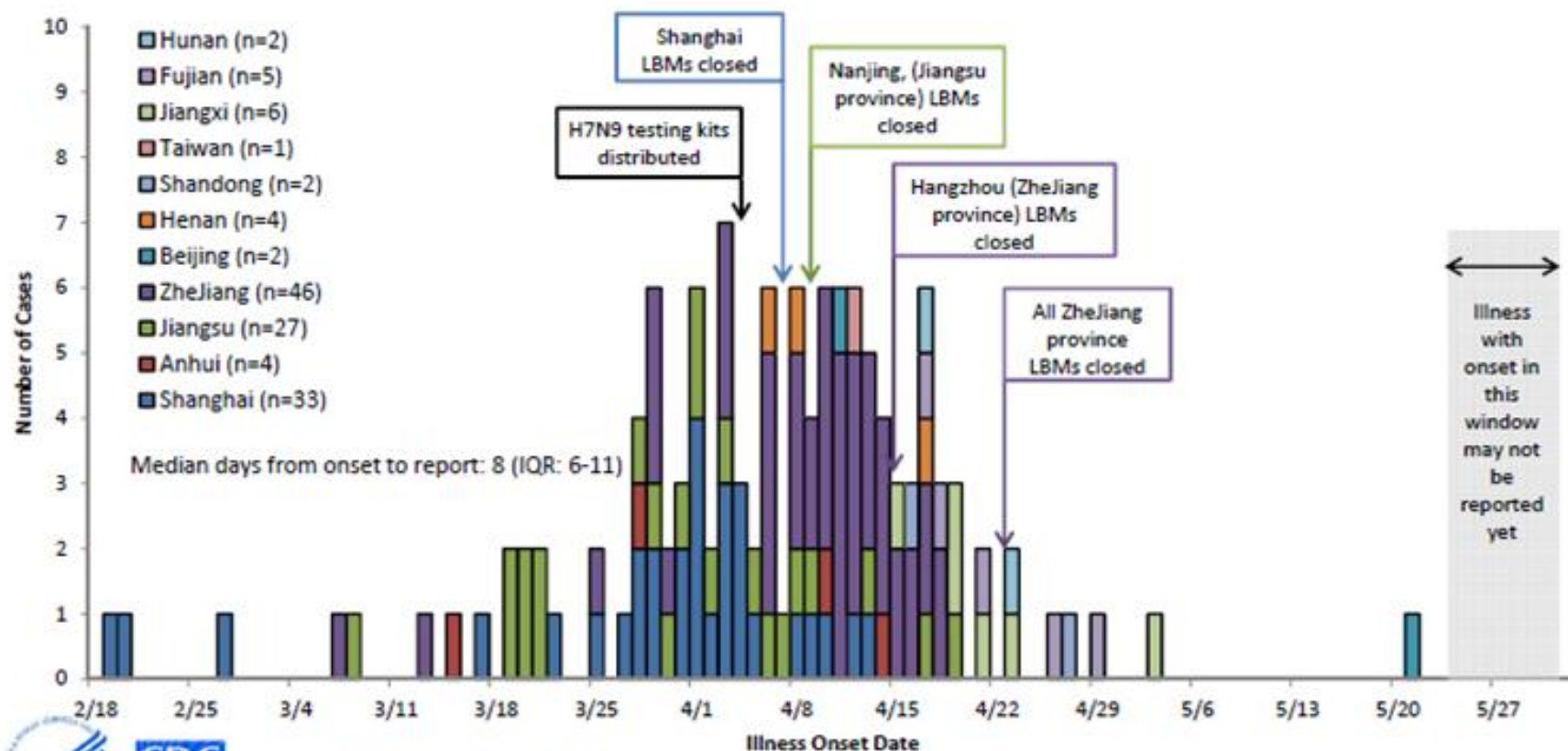
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# Epi-Curve of Avian Influenza A (H7N9) Virus Cases by Onset of Illness Date and Province, Municipality, or Area, 18 Feb – 30 May 2013 (N=132)



<sup>1</sup> Onset dates not available for all cases

These data include information received by 1200 EDT on the date prior to this report

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# Confirmed Cases and Deaths from Avian Influenza A (H7N9), China – 2013 30-May-2013

Influenza Division (NCIRD) and Global Disease Detection Operations Center (CGH)



## Human Cases Influenza A (H7N9)

Size of circle = Number of cases by Province



Shanghai (33/14/15) Cases/Deaths/Recovered

- City with at least one reported H7N9 case
- Red outline indicates city with at least one poultry market, farm, or household with a positive H7N9 animal result

## First Level Administrative Boundary (Province/Municipality/Area)

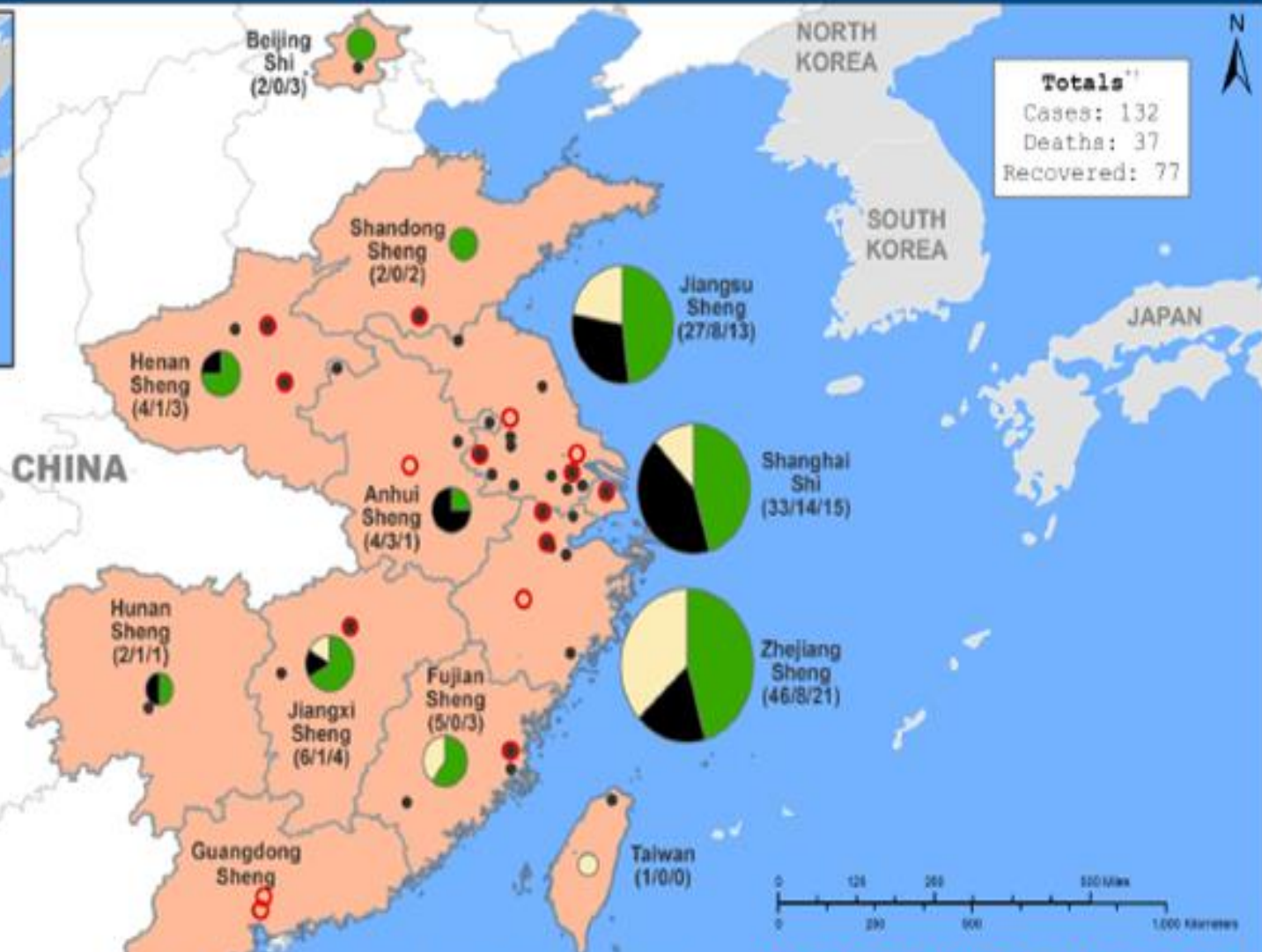
- Confirmed animal or human case
- No case

Data as of 30-May-2013

In Collaboration With: Influenza Division (NCIRD) and Global Disease Detection Operations Center (CGH)

Data Sources: NCIRD, CGH, People's Republic of China, Nat'l Health and Family Planning Commission, China Ministry of Agriculture

Map Creation Date: 30-May-2013



**Totals\*\***  
Cases: 132  
Deaths: 37  
Recovered: 77

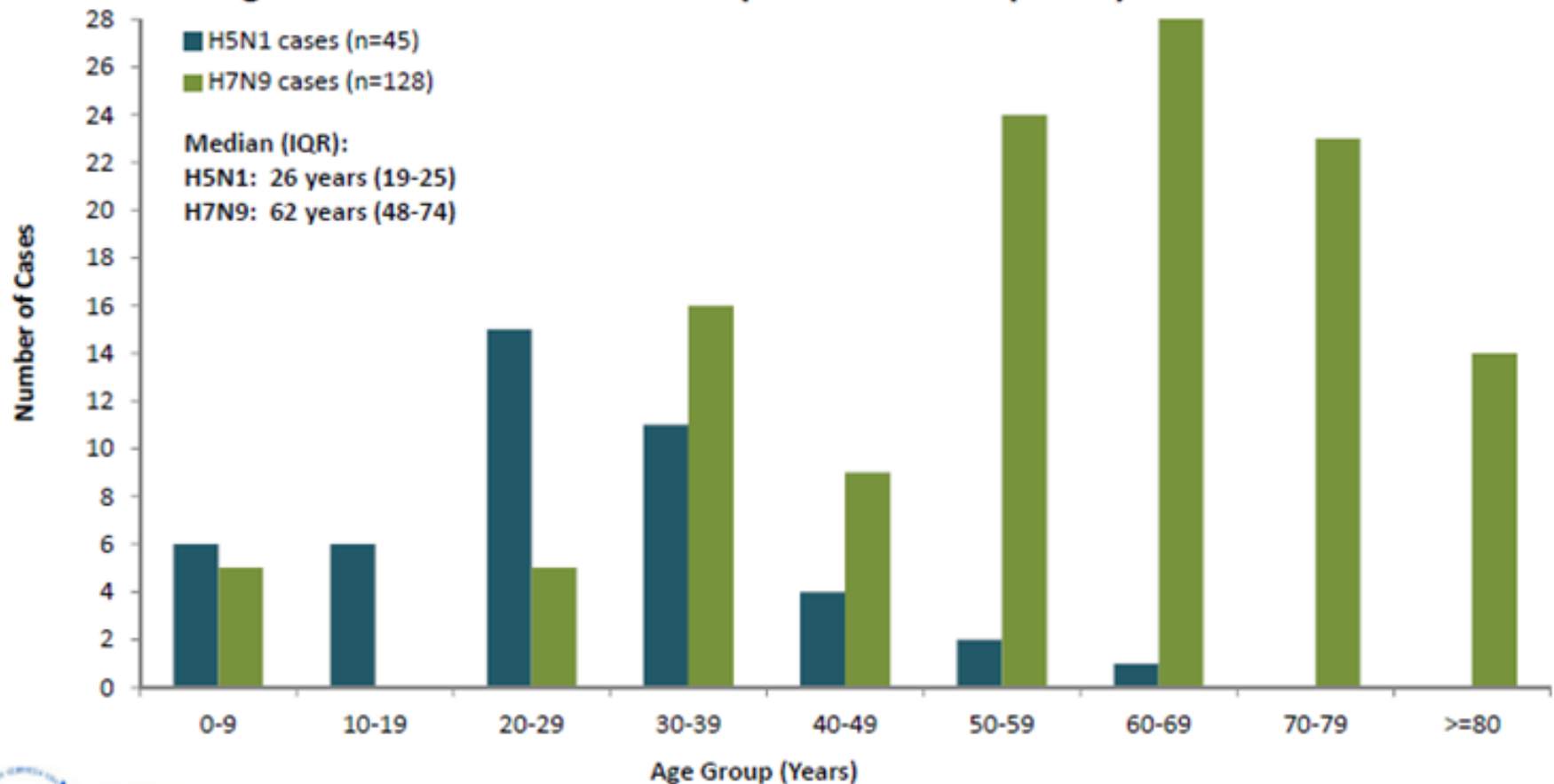
\* One asymptomatic infection is counted in the number of discharges and not in the case count.  
† These totals include 16 recoveries for whom a province could not be assigned.

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# Epidemiologic Investigation

- ❑ **Median age – 61 years (IQR 48-74), 21%  $\geq$  75 years**
- ❑ **Very few cases among children**
- ❑ **71% of cases male**
- ❑ **76% of cases had at least one underlying health condition**
- ❑ **Most cases had severe respiratory illness (99% required hospitalization)**

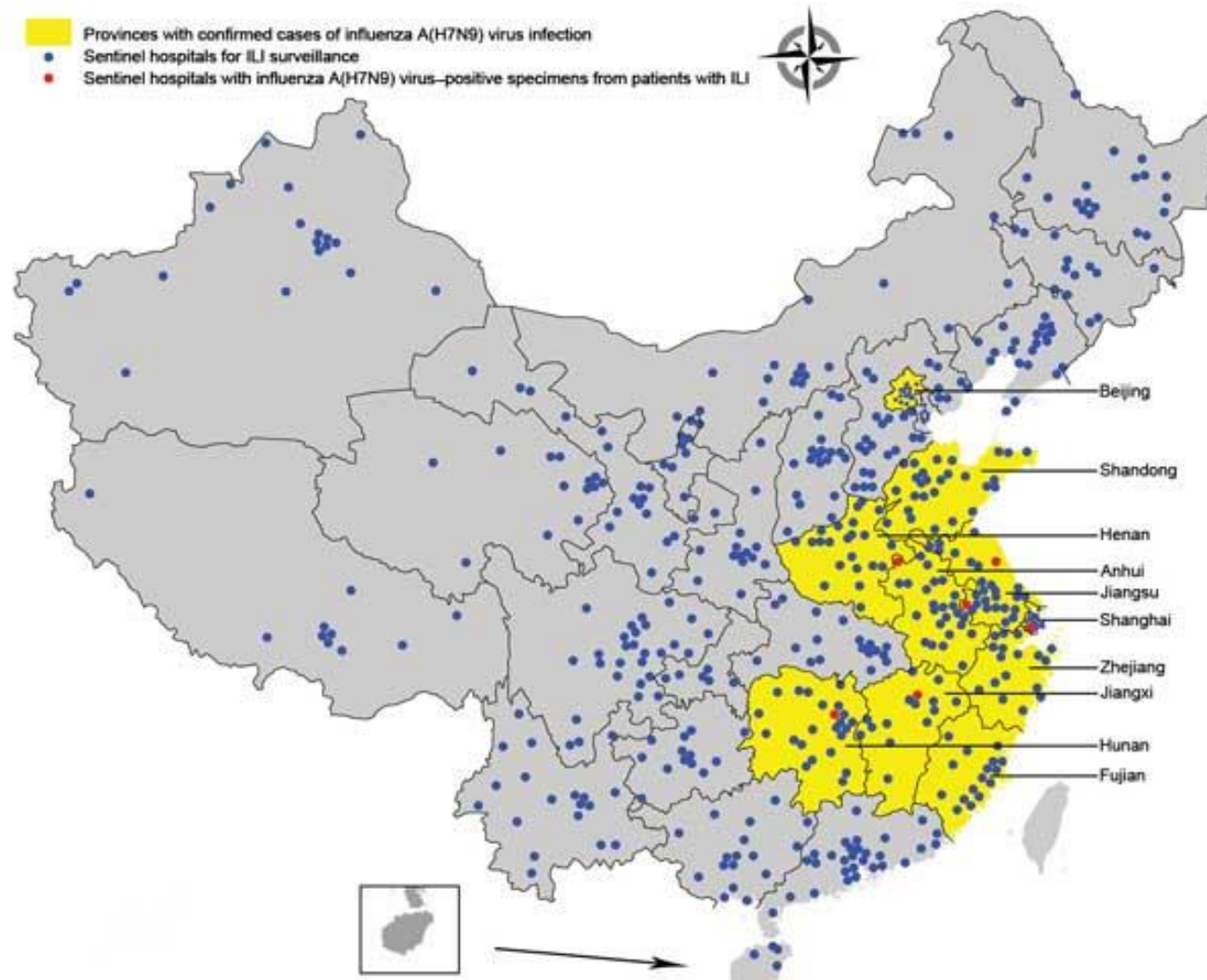
## Age Distribution of H5N1 Compared to Avian (H7N9) cases in China



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## Geographic distribution of national Influenza like illness surveillance sentinel hospitals

Xu et al, EIDJ May 2013

## Number of ILI patients, by age, positive for avian influenza A(H7N9) virus, China, March 4–April 28, 2013\*

Patient age, y	No. positive/no. tested	
	Persons from 10 affected provinces	Persons from 21 non-affected provinces
0–4	2 / 6,333	0 / 10,419
5–14	0 / 3,702	0 / 4,452
15–24	0 / 3,210	0 / 3,259
25–59	3 / 6,109	0 / 6,627
>60	1 / 1,385	0 / 1,311
Total	6 / 20,739	0 / 26,068

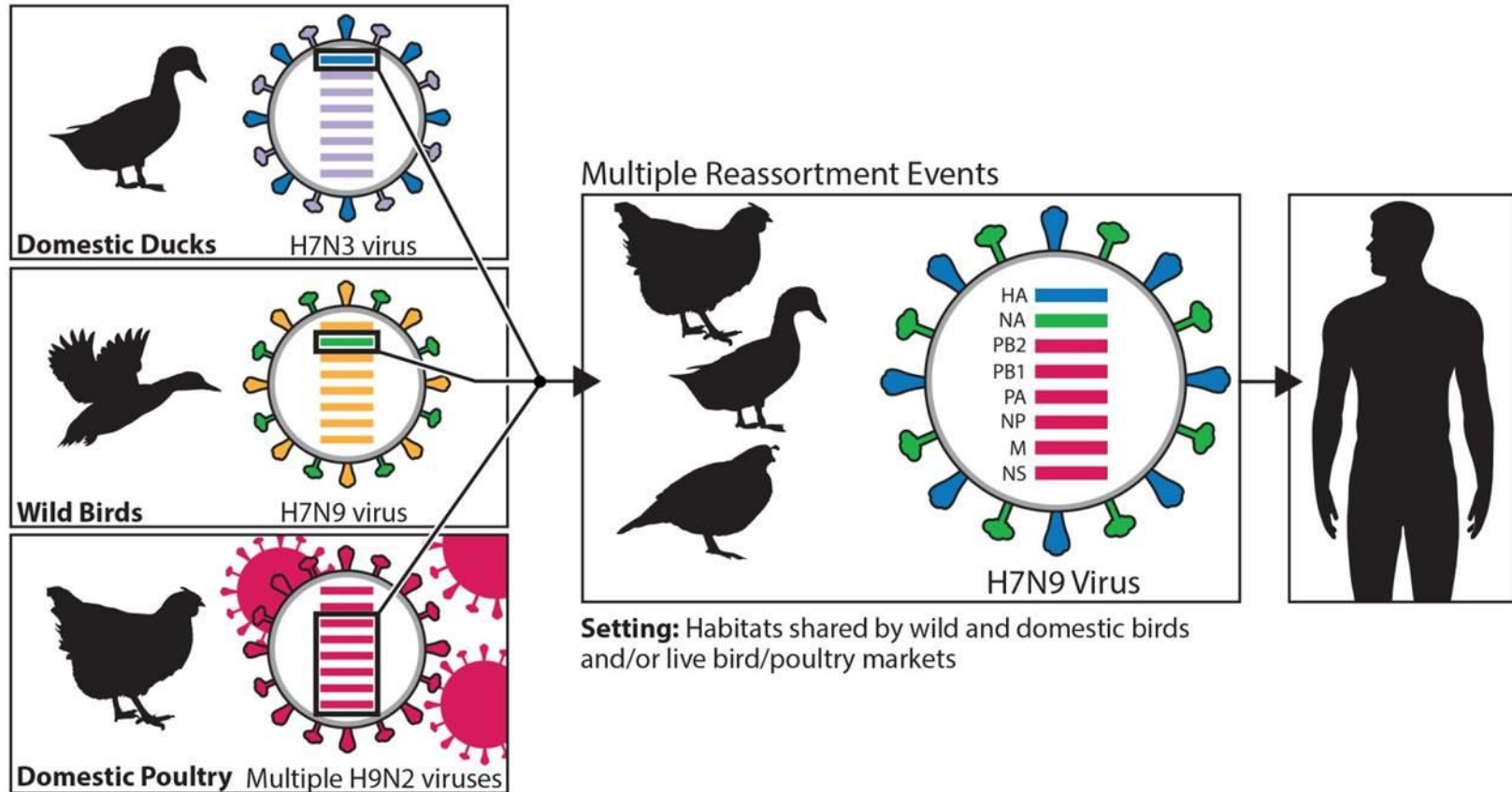
\*ILI, influenza-like illness.

†Areas include Beijing and Shanghai Municipalities and Anhui, Jiangsu, Zhejiang, Shandong, Henan, Fujian, Jiangxi, and Hunan Provinces.

## **Influenza-Like Illness Surveillance**

- ❑ Proportion of all outpatient visits for influenza like illness increased in 7 of 10 affected provinces**
- ❑ No increase in influenza A positive or unsubtypeable specimens**
- ❑ No evidence that H7N9 was causing widespread influenza like illness**

# Origins of H7N9 genes





# **Animal Investigation and US Animal Health Preparedness Activities**

- ❑ Low pathogenic avian influenza virus – birds are either asymptomatic, presenting a challenge to control efforts**
- ❑ H7N9 virus confirmed in chickens, ducks, pigeons (feral and captive), and environmental specimens**
- ❑ Swine samples negative**

# **U.S. Response and Preparations**

- ❑ Epidemiology and Laboratory**
- ❑ Vaccine development**
- ❑ Medical countermeasures**
- ❑ Communication**

# Distribution of CDC rRT-PCR H7N9 Kits, as of 17 May



# **CDC's H7N9 Response**

- **Treatment guidelines (April 18)**
- **Interim guidance for infection control within healthcare settings (April 11)**
- **Travel Notice about H7N9 outbreak for travelers (April 5)**
- **Article in MMWR (April 30)**
- **Frequent teleconferences with State and Local Health officials**



# Summary

- ❑ **H7N9 causes severe disease in humans**
- ❑ **No sustained human-to-human transmission**
- ❑ **Excellent collaboration with Chinese authorities**
- ❑ **Establishing global reference diagnostic capacity**
- ❑ **Planning for diverse interventions underway**
- ❑ **Many questions remain**

## Extra slides

# Laboratory Investigation

- ❑ **25 partial or complete genome sequences of H7N9 viruses posted online (from 18 humans, 5 birds, 2 environmental specimens)**
- ❑ **All 8 genes are of avian origin – related most closely to three Eurasian influenza virus lineages from birds**
- ❑ **Virus has genetic changes seen that have been associated with adaptation to mammals and with increased severity of infection**

# Tracking the birds

- ❑ **No positives on farms to date**
- ❑ **Positives all in live bird markets**
  - ❑ Chickens common denominator – other species likely bystanders
  - ❑ But initially infected birds come from somewhere
  - ❑ Tracing back chickens up through market chain and dealers not easy
  - ❑ Some birds may leave the market and go elsewhere, possibly back to a farm / backyard thereby spreading infection
  - ❑ Pulse of infected chickens passing through also possible