The Threat Of An Influenza Pandemic: Real or Imagined?

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Outline

• Brief History of Influenza Pandemic
• Current Situation - Avian and Human
• Prerequisites of Influenza Pandemic
• WHO Actions on Pandemic Preparedness
• Conclusions
Three Kinds of Influenza

- **Seasonal Influenza**
  - "The Flu"
  - Human viral respiratory infection
  - Self-limiting, but can be serious & fatal in elderly & very young ~ 500,000 deaths globally each yr.
  - Occurs seasonally
  - Routine vaccination available

- **Avian Influenza**
  - "Bird Flu"
  - Bird virus - different from human influenza virus
  - Spreads from birds to birds
  - Can sometimes infect humans
  - Can sometimes mutate into human virus

- **Pandemic Influenza**
  - "A Pandemic"
  - Global outbreak of new human influenza (different from seasonal and avian influenza)
  - Rare event
  - Associated with increased morbidity & mortality. Last 3 pandemics in last 100 yrs – 1918 (48-50m deaths), 1957 (2m deaths) and 1968 (1m deaths)
Influenza pandemics in 20th century

1918: “Spanish Flu”
- 40-50 million deaths
- A(H1N1)

1957: “Asian Flu”
- 1-4 million deaths
- A(H2N2)

1968: “Hong Kong Flu”
- 1-4 million deaths
- A(H3N2)
The origin of pandemic influenza viruses
Current Situation

✓ Avian influenza A (H5N1) virus has become firmly entrenched, particularly in Asia
✓ Human infections of H5N1 continue to occur
✓ H5N1 virus has been evolving rapidly and distinct genetic groups identified
✓ Pandemic threat still persists
Poultry outbreaks in Thailand 2004

Improve bio-security in industrialized farms

October Campaign

30 million poultry culled

1.6 million poultry culled

Avian influenza A (H5N1) virus has become firmly entrenched, particularly in Asia

(T. Tiensin et al. Emer Inf J, 2005 Nov
World Health Organization, Regional Office for The Western Pacific)
Poultry outbreaks in Thailand 2005 (to end October)

(Source: DLD Thailand)
Areas reporting H5N1 outbreak in poultry and wild birds
(Cumulative: since 2003 to 18 June 2007)
Areas reporting H5N1 outbreak in poultry and wild birds
(The year 2007: 1 January - 18 June)

Areas reporting confirmed occurrence of H5N1 avian influenza in poultry and wild birds since 1 January 2007

Areas reporting occurrence in poultry
Areas reporting occurrence only in wild birds

Data Source: World Organisation for Animal Health (OIE) and national governments
Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS) World Health Organization
Areas with confirmed human cases of H5N1
(Cumulative: since 2003 to 15 June 2007)

Areas with confirmed human cases of H5N1 avian influenza since 2003 *

Country, area or territory
Cases: cumulative number
Deaths: cumulative number

Areas with confirmed human cases

* All dates refer to onset of illness

Data Source: WHO / Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS) World Health Organization
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Areas with confirmed human cases of H5N1
(The year 2007: 1 January - 15 June)

Areas with confirmed human cases of H5N1 avian influenza since 1 January 2007

- **Egypt**: Cases: 18, Deaths: 5
- **Nigeria**: Cases: 1, Deaths: 1
- **Lao People's Democratic Republic**: Cases: 2, Deaths: 2
- **Cambodia**: Cases: 1, Deaths: 1
- **Indonesia**: Cases: 25, Deaths: 22
- **China**: Cases: 3, Deaths: 2

Data Source: WHO / Map Production: Public Health Mapping and GIS
Communicable Diseases (CDS) World Health Organization

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Human Avian Influenza A (H5N1) Cases by Onset Date and Country
(as of 15 June 2007)

CFR Trend

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viet Nam</td>
<td>91</td>
</tr>
<tr>
<td>Thailand</td>
<td>25</td>
</tr>
<tr>
<td>Cambodia</td>
<td>7</td>
</tr>
<tr>
<td>Indonesia</td>
<td>92**</td>
</tr>
<tr>
<td>China</td>
<td>25</td>
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<tr>
<td>Azerbaijan</td>
<td>8</td>
</tr>
<tr>
<td>Egypt</td>
<td>27**</td>
</tr>
<tr>
<td>Turkey</td>
<td>12***</td>
</tr>
<tr>
<td>Iraq</td>
<td>2**</td>
</tr>
<tr>
<td>Nigeria</td>
<td>0**</td>
</tr>
<tr>
<td>Djibouti</td>
<td>1</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>2</td>
</tr>
</tbody>
</table>

No. of cases
0 5 10 15 20 25 30
H5N1 virus has been evolving rapidly and distinct genetic groups identified.

- Distinct generic groups have been identified.
- Different clades and subclades circulating in different parts of the world.
Pandemic Influenza: Prerequisites

- A new influenza virus emerges to which the general population has little/no immunity
- The new virus must be able to replicate in humans and cause disease
- The new virus must be efficiently transmitted from one human to another

NOT TO DATE
WHO Actions on Pandemic Preparedness

- Advise countries to have pandemic preparedness plan
- Plan should include pharmaceutical and non-pharmaceutical interventions
- Capacity building
- National legislation should be in place to meet country needs
- Global anti-viral and vaccine stockpile
WHO Global Strategies for Responding to the Avian Influenza Pandemic Threat

• Pre-pandemic
  – Reduce opportunities for human infection
  – Strengthen the early warning system

• Emergence of a pandemic virus
  – Contain or delay spread at the source

• Pandemic declared and spreading internationally
  – Reduce morbidity, mortality and social disruption
National Pandemic Preparedness

• Well-developed preparedness plan essential to minimize the impact on health, economic and social disruption
• Must involve multiple sectors
• Building on a regionally-implemented strategy for strengthening national early warning and response systems
• Rapid increase in number of countries with plans or with plans in preparation
National Pandemic Preparedness

• Next steps are ……
  – Operationalization and implementation of plans
  – Exercises/Rehearsals – discover opportunities for improvement
  – International coordination of plans (e.g. borders, stockpiles)
## WHO Actions on Pandemic Preparedness

<table>
<thead>
<tr>
<th>Interpandemic phase</th>
<th>Pandemic Alert</th>
<th>Rapid Containment</th>
<th>Pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Animal influenza outbreaks&quot;</td>
<td>Low risk for humans</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High risk for humans</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>&quot;New influenza subtype in humans&quot;</td>
<td>No or only inefficient H2H transmission</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Evidence for increased H2H transmission</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significant increase in H2H transmission</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pandemic</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Government Leadership During Emergencies Continuum

Averting avian influenza

Rapid Containment

Pandemic response

Inter Pandemic (1 & 2)

Pandemic alert (3,4,5)

Pandemic (6)

National Gov’t

Local Gov’t
Rapid Containment Strategy

Basis: Routine early detection & rapid response

Rapid Containment

Action 1: Assessment & decision making

Action 2: Containment operations
Pandemic Response

Medical Interventions
- Antiviral drugs
- Vaccines, etc
- Medical care, PPE

Non-Medical interventions
- Personal hygiene
- Travel restriction
- Quarantine
- Social distancing
- Risk Communication

Social Services (Business continuity plan)
- Security
- Food & water supply
- Power supply
- Transportation
- Telecommunication
- Other essential services

Public Health Measures

Local Responsibility?
IHR (2005)

- **Entered into force on 15 June 2007, legally binding**

- **The purpose** is to prevent the international spread of disease and response to the Public Health Emergency of International Concern (PHEIC) and to avoid unnecessary interference with international traffic and trade
Five objectives of APSED

- Reduce the risk of emerging diseases
- Strengthen early detection of outbreaks
- Strengthen rapid response
- Strengthen effective preparedness
- Develop sustainable technical collaboration within the Asia Pacific Region
Risk Assessment

- The risk of a pandemic is HIGH
- The risk will persist
- The evolution of the threat cannot be predicted
- A pandemic will cause significant disease, death and will stress health, social and economic systems
- We have a window of opportunity to prepare!
- We have a chance to fundamentally strengthen national and international public health systems to deal with epidemics!
Conclusions

The Threat of an Influenza Pandemic: Real or Imagined?

The Threat is Real!
Thank you!