Highly Pathogenic Avian Influenza (H5N1)

About the FAO Policy Learning Programme
This programme aims at equipping high level officials from developing countries with cutting-edge knowledge and strengthening their capacity to base their decisions on sound consideration and analysis of policies and strategies both at home and in the context of strategic international developments.

Related resources
- See all material prepared for the FAO Policy Learning Programme
- See the FAO Policy Learning Website: http://www.fao.org/tc/policy-learning/en/
Highly Pathogenic Avian Influenza (H5N1)

By
Katalin de Balogh, Response Manager
Crisis Management Centre, Animal Health Service, Animal Production and Health Division, FAO, Rome, Italy

About EASYPol
The EASYPol home page is available at: www.fao.org/easypol

This presentation belongs to a set of modules which are part of the EASYPol Resource package: FAO Policy Learning Programme: Specific policy issues: Food safety policies and regulatory frameworks

EASYPol is a multilingual repository of freely downloadable resources for policy making in agriculture, rural development and food security. The resources are the results of research and field work by policy experts at FAO. The site is maintained by FAO’s Policy Assistance Support Service, Policy and Programme Development Support Division, FAO.
Background

Highly pathogenic avian influenza
Key influenza viral features

- Surface proteins (major antigens)
  - Hemagglutinin (HA)
    - Site of attachment to host cells
    - Antibody to HA is protective

- Neuraminidase (NA)
  - Helps to release virions from cells
  - Antibody to NA can help modify disease severity
The virus

- Avian Influenza A: 16 H & 9 N subtypes
- Highly pathogenic: H5 & H7 subtypes
- New strains emerge by adaptive mutation or reassortment with other influenza virus strains
- Highly pathogenic H5N1 causative virus in present worldwide outbreak
Ecological process: interplay among reservoir, spillover, aberrant hosts
Distribution of highly pathogenic avian influenza (H5N1)

Outbreaks reported as from
2004-2005
Spread of the disease over time
HPAI outbreaks: Outbreaks reported in poultry and cases in wild birds

Six months period (16 Nov 06 – 16 May 07)
HPAI outbreaks: Outbreaks reported in poultry and cases in wild birds

Six months period (16 Nov 06 – 16 May 07)
HPAI current situation in animals

- First outbreak confirmed in poultry **late 2003**
- Countries affected so far **59**
- **>250 million** poultry died or culled
- Enormous economic impacts
- Loss of livelihoods
H5N1 current situation in humans

- First outbreak in humans late 2003 (China)
- Countries with human cases: **12**
- Human cases: **307** deaths: **186 (61%)**
- 70% cases in Vietnam, Indonesia and Egypt
- symptoms→death (average 9 days)
Factors at the origin of H5N1
Urban and rural population – 1950 to 2030

Urbanization to accelerate

Assumptions

Billion people

Source: UN, World Population Assessment 2002
## China

<table>
<thead>
<tr>
<th></th>
<th>1968</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human population</td>
<td>790 million</td>
<td>1.3 billion</td>
</tr>
<tr>
<td>Pigs</td>
<td>5.2 million</td>
<td>508 million</td>
</tr>
<tr>
<td>Poultry</td>
<td>12.3 million</td>
<td>13 billion</td>
</tr>
</tbody>
</table>
Increase in duck meat production 1961-2005

Duck Meat Production (Tons)

- China
- Cambodia, Indonesia, Lao, Thailand and Vietnam
Poyang Lake
Rice-duck open production system
Number of rice crops and H5N1 outbreaks
## Poultry classification system

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Type</th>
<th>Biosecurity</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector 1</td>
<td>Industrial – integrated</td>
<td>High</td>
<td>Exportation</td>
</tr>
<tr>
<td>Sector 2</td>
<td>Medium sized commercial</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Sector 3</td>
<td>Small-scale commercial</td>
<td>Low/minimal</td>
<td>Live-bird markets</td>
</tr>
<tr>
<td>Sector 4</td>
<td>Village or Backyard</td>
<td>Minimal</td>
<td>Mixed farming systems</td>
</tr>
</tbody>
</table>

*Source: FAO, 1995*
Poultry production sectors

1.

2.

3.

4.
What is the role of wildbirds in the spread of H5N1?
Migratory pattern
HPAI outbreaks (1 Jan – 31 May 2006)
Wild bird tracking
Whooper swan tracking: 28 May 2007
South Pole

Influenza type A virus ecology, bird migration, continental drift and geospatial occupancy
Holarctic centred migration

Holarctic - northern areas of the earth (Nearctic and Palearctic regions)
What is the role of trade in the spread of H5N1?
Animal protein trade

Poultry trade flow
Beef trade flow
Pork trade flow
Live bird markets and trade
Emergence of HPAI in Asia

Livestock Production systems

Virus eco-epidemiology

Goose/GD/96
China, Guandong, 1996

Pandemic threat

Human behaviour
Biosecurity
Quarantine and movement control

Outbreak site sealed off by national authorities in Anhui province in China
Stamping out

Disinfection in a farm in Cambodia

Depopulated small egg farm, West Java, Indonesia
Vaccination of poultry
Public awareness
Some policy issues

- Emergency preparedness and contingency plan
- Legislative framework
- Veterinary services/disease control policies (movement control, emergency fund, border controls, vaccination, compensation, training, etc)
- Import and export restrictions
- Establishment of task force (animal + human health)
FAO’s Crisis Management Centre: Animal Health

- Launched in Oct 2006
- Avian influenza and other TADs
- Respond to countries with new outbreaks
- Country request through FAO-R 24/7
- Deployment in 48-72 hours of missions
- SOP’s, joint missions with OIE/WHO
Lagos, Nigeria

Human cases confirmed February 2007
A global problem in need of an international response