Update on HPAI in Viet Nam

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Outlines

• Temporal and spatial patterns
• Some epidemiological features
• The challenges for AI control
Temporal Pattern of HPAI outbreaks in Vietnam
Temporal Pattern of 2003/4 (1st), 2004/5 (2nd), late 2005 (3rd) and 2006/7 (4th) AI Epidemics

- 45 mil. poultry culled;
- 27 human cases (16 fatal)
- 2 mil. poultry culled;
- 64 human cases (21 fatal)

- 4 mil. poultry culled;
- 2 human cases

- 99,040 poultry culled;
- No human cases

Tet holiday Feb 9-11, 2004
Tet holiday Feb 11-13, 2005
Tet holiday Jan 29-31, 2006
Vaccination Campaign
Tet holiday Feb 16-22, 2007
## Summary of HPAI epidemic waves in Viet Nam

<table>
<thead>
<tr>
<th>Wave</th>
<th>Time</th>
<th># provinces infected</th>
<th># districts infected</th>
<th># communes infected</th>
<th># poultry culled or died</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Dec 03 – Feb 04</td>
<td>57</td>
<td>381</td>
<td>2,574</td>
<td>43,900,000</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>Dec 04 – Apr 05</td>
<td>36</td>
<td>182</td>
<td>670</td>
<td>1,931,278</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>Oct 05 – Dec 05</td>
<td>24</td>
<td>108</td>
<td>305</td>
<td>3,973,000</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Dec 06 – Mar 07</td>
<td>11</td>
<td>33</td>
<td>83</td>
<td>103,094</td>
</tr>
<tr>
<td>Sporadic</td>
<td>May 06 – present</td>
<td>23</td>
<td>70</td>
<td>167</td>
<td>294,849</td>
</tr>
</tbody>
</table>
Affected Communes - 2nd wave (2004-2005)
Affected Communes – 3\textsuperscript{rd} wave (late 2005)
Affected Communes – 4th wave (Dec 2006 – Mar 2007)
Epidemiological features

- Outbreaks have been identified always in unvaccinated flocks, particularly in ducks. No reports of disease in fully vaccinated poultry.
- Recent marked increase in duck population (subsequent to cessation of the ban on hatching waterfowl)
- Backyard poultry has been seen as the most vulnerable group though it is more likely to detect outbreaks from Sector 3.
- The effects of vaccination difficult to separate from that of other measures. However, vaccination would have reduced the susceptibility of a significant part of the poultry population.
Epidemiological features

• Post-vaccination surveillance: Demonstrated that Chinese vaccines used are capable of producing ‘acceptable’ levels of immunity one month post-vaccination based on empirical criteria (Taylor & Dung, 2007)

• Virus sequencing work: minor changes (Clade 1 and 2.3 present), not yet affect immunity.

• Pathogenicity testing proved that the circulating viruses are more virulent to ducks, therefore, ducks often now show symptoms and died.
Overview of HPAI control strategies

• Late 2003 – July 2005:
  – Surveillance
  – Rapid destruction of birds in infected farms and at-risk farms
  – Rapid response: Movement control, disinfection of infected premises
  – Ban of hatching of water fowls
  – Closure of live bird markets in urban areas
  – Communications
  – Etc.

• Aug 2005 - present: Vaccination added as a supplement measures.
Measures implemented in 2005

• In the second half of 2005 a number of measures were implemented or strengthened to reduce the risk of infection with H5N1 viruses
• Vaccination was initially implemented in all provinces covering most high risk populations of poultry
• Vaccination included village households where most of the human cases had occurred
• Other measures included bans on duck breeding (not strictly enforced), public awareness campaigns and closure of urban markets – all leading to a reduced demand for poultry by consumers
The challenges for AI control

- Slow progress toward the improvements of poultry production, slaughtering, processing and marketing
- Difficult to maintain high commitments from local authorities over time
- Vaccination:
  - reduced cooperation from farmers due to 12 month outbreak-free period (Dec05-Dec06)
  - currently all vaccines must be imported
  - Vaccine delivery: farmers not easy to access to vaccines
The challenges… (Cont’d)

- Inadequate capacity and capability of veterinary services
  - Surveillance and outbreak reporting
    - Procedures
    - Rely too much on Animal Health Workers
  - Poor epidemiological study capacity
  - Legislation and regulations
- Poor field surveillance
Issues with vaccination

Vaccination has proven to be challenging

- Logistics: vaccines, cold chains, etc.
- Vaccinator training
- Payment of vaccinators
- Sustainability
- Cost (and benefits) – about 2c/dose
- Lab and field capacity to do surveillance
- No availability of vaccines that could be used for day-old ducks.
- Current vaccines can not prevent infection
Issues need further study

- Decision model on controlling of outbreaks
- Ecology and epidemiology of avian influenza virus
- Molecular epidemiology
- Role of migratory birds
- Humane methods for culling
- Vaccine efficacy trials;
- Survey of free-ranging ducks
- Develop risk-reduction strategies for free-ranging ducks