Canada’s Inter-agency Wild Bird Influenza Survey

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Survey Background
How the survey works
Some results
Opportunities and successes
Ongoing challenges
Reasons to initiate a survey

• HPAI H7N3 outbreak in BC poultry - 2004
  – Large economic consequences
  – Lack of baseline data about AI in wild birds
• Spread of HPAI H5N1 in Asia
  – Increasing concern worldwide
    • Fatal human disease and wild bird mortality
    • High socio-economic consequences
Survey planning

• Planning – initiated December 2004

• Collaborators:
  – Federal/provincial/territorial agencies:
    • Wildlife
    • Agriculture
    • Public Health
  – NGOs
  – Academic institutions
Survey Goals

• To inventory and characterize Influenza A viruses
• To survey for avian influenza viruses of national and international concern
• To establish an archive
• To enhance field, laboratory, and communications networks
• To complement surveillance activities in US and Mexico
• To enhance detection of HPAI strains in Canada
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Survey management

• Canadian Cooperative Wildlife Health Centre coordinates the survey
• Survey Steering Committee
  – Representatives from all collaborating agencies and organisations
• Survey Executive Committee
  – Representatives from primary federal and provincial/territorial agencies
• AI coordinator based at CCWHC headquarters.
Survey overview

- Live bird survey
  - Seasonal (summer and fall)
  - Across Canada
  - Focus on waterfowl
  - Healthy birds

- Testing of birds found dead
  - Year round
  - Across Canada
  - Some targeted species
    - Outbreaks and species at risk
  - Healthy and sick birds
Matrix PCR

Characterization of isolate

Virus isolation

Virus isolation

Diagnosis

Archive

GenBank
Matrix PCR

Sample

H5 and H7 PCR

Storage

Primary Lab

Sample

Dead bird

Virus isolation

Characterization of isolate

Archive

Diagnosis

GenBank

Sample

Primary Lab

+ +

- +

National Lab

+ +

Dead bird

Sample

Matrix PCR

H5 and H7 PCR

Storage

Virus isolation

Characterization of isolate

Archive

Diagnosis

GenBank
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<table>
<thead>
<tr>
<th>Survey Component</th>
<th>Year</th>
<th>Number of birds tested</th>
<th>Number of birds that tested positive by RRT-PCR (%)</th>
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<tr>
<td>Live wild ducks</td>
<td>2005</td>
<td>4268</td>
<td>1572 (37)</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>3843</td>
<td>1173 (31)</td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>5488</td>
<td>1342 (25)</td>
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<tr>
<td></td>
<td>2008</td>
<td>1445</td>
<td>33 (2)</td>
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<td>Other live waterfowl</td>
<td>2006</td>
<td>5763</td>
<td>327 (6)</td>
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<tr>
<td></td>
<td>2007</td>
<td>1200</td>
<td>6 (1)</td>
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<tr>
<td></td>
<td>2008</td>
<td>634</td>
<td>0</td>
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<tr>
<td>Birds found dead</td>
<td>2005</td>
<td>165</td>
<td>20 (12)</td>
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<tr>
<td></td>
<td>2006</td>
<td>2863</td>
<td>105 (4)</td>
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<tr>
<td></td>
<td>2007</td>
<td>3354</td>
<td>43 (1)</td>
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<tr>
<td></td>
<td>2008</td>
<td>3014</td>
<td>45 (1)</td>
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</tbody>
</table>
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Survey successes

- Timely screening of over 30000 samples
- Hundreds of viruses detected, characterized and archived
- Field, laboratory and communications networks and systems have been strengthened and improved
Other opportunities

• New research questions identified
  • Sampling method
  • Trapping method
• New research and surveillance partnerships and collaborations established
  • Moving beyond the survey to population and disease modelling and pandemic preparedness
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Challenges – the successes of the future

• We can do better at collaboration
  • Need to practice to get better
  • Independent third party?
• Communication challenges
  • How to be relevant to all partners?
• Data management
  • Storage and retrieval