H7N9 Avian Influenza: International Preparedness (Technical and research update)

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Presentation overview

- Pathogen recognition
- Appropriate diagnostics for early detection
- Research studies
  - Infection outcome
  - Host range
- Surveillance
- International preparedness?

Pathogen recognition

- H7N9 historically rarely detected
- Detailed characterisation in accord with OIE definition
  - Low pathogenicity for poultry
  - IVPI = 0 (no detectable signs in 6 week old chickens)
- H7N9 novel virus not detected in this form before
- Human infection extremely rare with LPAI
- Some unique genetic features may be influencing host range
  - Domestic poultry, humans and other mammalian species inc pigs

Diagnostics for H7N9

- International response to assess existing methods
  - Are they able to detect new virus should it spread to/within animal hosts
- Rapid Data exchange mediated through OFFLU
- Information directly informs global preparedness

Diagnostics for H7N9

- Primary approach to detect virus
  - Real time PCR for influenza A virus
  - Real time PCR specific for H7
  - Isolation of virus
- Secondary tool to use serological investigations
  - Serosurveillance using specified antigens

Diagnostics for H7N9

- Primary approach to detect virus
  - Real time PCR for influenza A virus √
  - Real time PCR specific for H7√
    - Some local caveats for America's; lower sensitivity
    - Design needs to consider context (scanning surveillance versus outbreak/incursion response)
  - Isolation of virus √
    - Virus can be identified using international standard reagents

- Secondary tool to use serological investigations

  Serosurveillance using specified antigens √

Infection dynamics in poultry –H7N9 (prelim data)

Infection		Transmission	
H7N9	Other LPNAI	H7N9	Other LPNAI
+++	+++	+++	+++
++	+++	nd	+++
+/-	+ /+++	-	-/+++

Infection in other hosts

- Quail, Geese, Pigeons, Muscovy & Pekin Ducks
- Apparent susceptibility
  - Chicken>Muscovy>Pekin>Geese>Pigeon

- Pigs
  - Infects but does not appear to transmit
- Ferrets
  - Infects and transmits but aerosol route needs further testing

Live bird markets have shown to be reservoir of infection:

Wider sector involvement under investigation

Surveillance systems

- Passive/Scanning
  - Lack of clinical signs reduces effectiveness
  - Commercial poultry production- impact?
  - Active infection can be detected using conventional PCR based tools
- Active
  - Serological surveillance valid
  - Relevant virus strains: those in use in many programmes appropriate

OBSERVATIONS

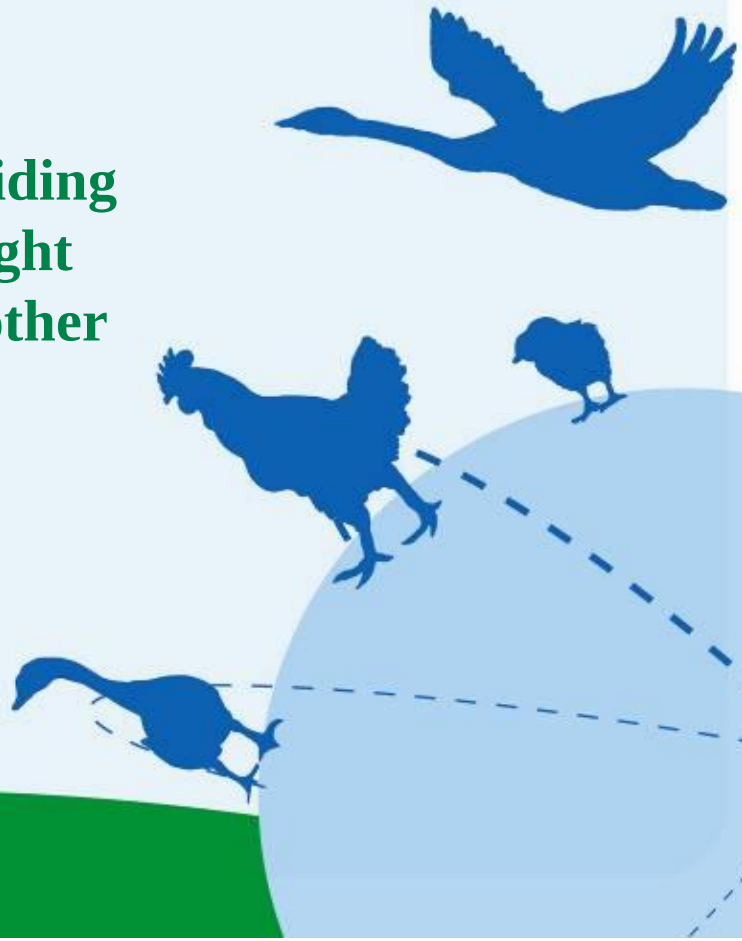
- Emergent H7N9 -novel event
- Extent of infection in poultry so far limited to LBM's
- Virus has acquired some changes associated with increased risk for humans and mammals
- International diagnostics in veterinary sector broadly fit for purpose should the virus spread beyond China
- Where well organised AI surveillance in place these systems should have utility for detection of H7N9

Future perspectives

- Ongoing vigilance important
- Maintenance of surveillance systems/strengthening as required
- Improved understanding of :
  - sectors/host that are key reservoirs
  - extent of infection/impact
- Monitoring the virus for change that might increase risk
  - Veterinary and public health
  - Continued cooperation
- Dissemination of reagents/tools/knowledge

OFFLU is an
International network of laboratories providing support to the global community in the fight against continued threat from Avian and other animal influenza viruses.
Liaison with WHO

Avian
Swine
Equine



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