Highly Pathogenic Avian Influenza Surveillance in Wild Birds Across the United States of America

U.S. Interagency Steering Committee for Highly Pathogenic Avian Influenza in Wild Birds

2016 USAHA Committee on Transmissible Diseases of Poultry and Other Avian Species
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Outline

- National Surveillance
- Targeted on-farm investigations
- Raptor Surveys
- Current Status in Wild Birds
Eurasian H5 HPAI Introduction

- December 2014– June 2015:
  - 7,084 wild waterfowl sampled
    - Atlantic Flyway: 1,000
    - Mississippi Flyway: 2,079
    - Central Flyway: 539
    - Pacific Flyway: 3,374
    - American Oceania: 92
  - 65 Confirmed Positive
  - 33 PCR Positives
National Surveillance Goals

- Identify distribution across U.S.
- Detect spread into new flyways/regions
- Provide flexible surveillance framework that can monitor for:
  - re-assortments of influenzas
  - introductions of new viruses
  - estimate prevalence once detected in an area of concern
Active Surveillance

- Maximize ability to detect HPAI
  - Prevalence $\approx 1\%$
- Focused on dabbling ducks
  - Geese and diving ducks
- Viral Shedding
  - Exception = Raptors
    - Exposure
Targeted Watersheds

- Three selections metrics
  - Areas important to wild duck occurrence and areas with mixing in-between flyways
    - Buhnerkempe et al. 2016
  - LPAIV clusters in wild birds from previous surveillance
  - Areas with high numbers of domestic poultry
    - Number of birds per farm
National Surveillance Strategies

- **Sampling**
  - **Passive (morbidity/mortality)**
    - Year round
    - All Species
  - **Active (apparently healthy birds)**
    - Dabbling ducks
    - Post nesting season (summer)
    - Fall Migration
    - Winter
  - **Environmental Fecal**
    - Targeted year round
Surveillance Results

- **July 2015– June 2016:**
  - 45,549 wild waterfowl sampled
    - Atlantic Flyway: 10,663
    - Mississippi Flyway: 13,792
    - Central Flyway: 9,202
    - Pacific Flyway: 11,868
    - American Oceania: 24

- **Only 2 Unconfirmed PCR Positives**
  - Mallards
    - Great Salt Lake, UT
    - Oregon
Surveillance Results

- 1 July 2016– 7 October 2016:
  - 12,594 wild waterfowl sampled
    - Atlantic Flyway: 3,385
    - Mississippi Flyway: 4,009
    - Central Flyway: 2,002
    - Pacific Flyway: 3,138
    - American Oceania: 0
  - 1 Confirmed Positive
    - Mallard
      - Fairbanks, AK
Alaska Detection

- 6-14 August 2016
- 188 dabbling ducks sampled
  - 48 Influenza A detections
  - Only 1 H5 = EA/NA H5N2 HPAIV
Monthly Surveillance Summaries

HPAI H5N2 Outbreak Investigations

- 10 paired facilities in Iowa
  - 5 influenza A negative
  - 5 HPAI positive
- 3 opportunistic sites
- Sampled mammals and birds
- Laboratory Testing
  - RT-PCR test for viral RNA
  - ELISA screening (birds)
  - HI test for antibodies
HPAI H5N2 Outbreak Investigations

- **Mammals**
  - All swabs, tissues, and blood negative

- **Birds**
  - All CL/TR swabs
  - 14 serologic flu positives
    - 3 Eurasian H5 positive
      - American robin
      - European starling
  - One Eurasian H5 RNA positive lung tissue
    - Juvenile European starling
  - All positives from an infected farm
Raptor Study

- Particularly sensitive to infection with Eurasian H5 HPAI
- Goal: Evidence of viral shedding/exposure in wild
- Tested ≈ 500 birds to date
  - No Swab positives
  - Serology
    - 4 positive for Type A Influenza
    - No Eurasian HPAI positive to date
  - Further testing underway
Current Status

- Dabbling Ducks are primary reservoir
  - Exhibit little to no signs
  - AK detection suggests wild bird/environmental persistence

- Canada Geese
  - Primarily die from infection
  - Goslings acutely sensitive
  - Good sentinel

- Unidentified number of raptors affected
  - No evidence of exposure
Current Status

- Other wildlife
  - Unconfirmed black-capped chickadee in MN
    - No viral shedding
    - PCR lung tissue positive, no virus isolated
  - Peridomestic species in IA
    - No viral shedding mammals/birds
    - EA H5 antibody positive: 3 passerines
    - One unconfirmed PCR positive lung tissue
Current Status

- **Other wildlife**
  - Unconfirmed black-capped chickadee in MN
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- **Peridomestic species in IA**
  - No viral shedding mammals/birds
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