Public Health Responds to Avian Influenza Outbreaks in Commercial Poultry: Lessons from Nigeria

Lora Baker Davis, DVM, MPH
Washington State Dept of Agriculture
Avian Influenza Surveillance Activity
Learning Objectives

1. Explain the difference between avian influenza and pandemic influenza.

2. Recognize the importance of biosecurity and why it’s important to emergency responders.

3. Compare and contrast the primary lessons learned in Nigeria to potential problems that may be encountered during an emergency avian influenza response in the United States.
Question

Have you ever done public health work in a developing country?

A. Yes

B. No
Presentation Outline

- Review of influenza viruses: [http://www.nwcphp.org/training/hot-topics](http://www.nwcphp.org/training/hot-topics)
- Review of pandemic influenza and avian influenza
- Introduction to Nigeria
- Overview of H5N1 in Nigeria
- Agricultural response
- Public health response
- Lessons learned
Pandemic Influenza

- A global disease outbreak that occurs when a new influenza virus emerges for which people have little or no immunity.

- Disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time.

3/5 workers at New England hospital said they would stay home if avian influenza was diagnosed in the U.S.
How well is your jurisdiction prepared for the introduction of pandemic influenza into the U.S.?

A. Very prepared
B. Somewhat prepared
C. Not prepared
D. Don’t know
Avian Influenza

Pandemic Influenza ≠ Avian Influenza

Viral disease of domestic and wild birds caused by Influenza A virus (AI)

- Circulates in migratory waterfowl without apparent disease
- Causes disease in domestic poultry
- Humans are incidental hosts
- Current AI virus of concern: Asian H5N1
Question

How well is your jurisdiction prepared to assist in response to an outbreak of Highly Pathogenic Avian Influenza (HPAI) in the U.S.?

A. Very prepared
B. Somewhat prepared
C. Not prepared
D. Don’t know
Nigeria: Geography

Approximately twice the size of California

Arid in north

Tropical in south
Nigeria: Demographics

- Population: 135,031,164
- Life expectancy at birth: 47 years
- > 250 ethnic groups:
  - Hausa
  - Fulani
  - Igbo
- Religions:
  - Muslim 50%
  - Christian 40%
  - Indigenous beliefs
- English (official)
- Government: federal republic—gained independence from UK in Oct. 1960
Nigeria: Economy

- Export commodities:
  - Petroleum and petroleum products 95%
  - Cocoa
  - Rubber

- Moving toward diversifying export commodities: poultry (140 million population)
H5N1 in Nigeria

- **January 8, 2006:** First clinical signs of HPAI H5N1 in poultry
- **February 8, 2006:** FAO lab confirmation
- **January 31, 2007:** First human case reported
Avian Influenza Task Force

Partners

- Nigeria Federal Ministry of Health (FMoH)
- Nigeria Federal Ministry of Agriculture (FMoA)
- Nigeria Federal Ministry of Information (FMoI)
- Food and Agriculture Organization of UN (FAO)
- Nigeria National Veterinary Research Institute
- World Health Organization (WHO)
- Kenya International Emerging Infectious Diseases Program (FELTP)
- Centers for Disease Control and Prevention (CDC)
FMoA Response to Avian Influenza H5N1

- “Stamping out”: poultry depopulation
  - HPAI affected premises
  - All poultry on premises within 3 km radius
- District-wide quarantines
- Restriction on interstate and intrastate movement of live poultry
- Farm biosecurity awareness campaigns
Depopulation
MAP OF NIGERIA SHOWING HPAI POSITIVE LGAs AS AT 14TH MARCH 2006

KEY
Positive LGAs *

*LGA: Local Government Area
FMoH Approach to Human H5N1 Surveillance

- Rapid response
  - Active human surveillance
    - Health care facilities
    - High risk groups
  - Community surveillance and mobilization

- Long-term capacity building
  - Integrated disease surveillance and response (IDSR) training
Rapid Response Team Demonstration

Capacity-building to conduct active surveillance for human avian influenza in communities reporting highly pathogenic avian influenza H5N1 outbreaks in poultry
Bauchi State, Nigeria
29 March–8 April 2006
Rapid Response Objectives

1. At the site of recent outbreak:
   - Implement and demonstrate appropriate epidemiologic field response methods
   - Ensure capacity for early detection and reporting
   - Ensure capacity of state and Local Governmental Area (LGA) health communities to address:
     - case management
     - case-patient isolation
     - contact tracing
2. Determine if human AI cases are occurring
3. Educate area healthcare workers
4. Strengthen capacity of FMoH, state, and local health authorities
Suspected-Case Definition for Influenza A (H5) in Humans

- Documented temperature of >38°C
  and one or more of the following:
  - Cough
  - Sore throat
  - Shortness of breath

  and

- History of contact with poultry in an H5N1-affected country within 7 days of symptom onset
Confirmed-Case Definition for Influenza A (H5) in Humans (cont.)

Suspected case or any individual for whom laboratory testing demonstrates:

- Positive PCR for Influenza A (H5)
- or
- Positive viral culture of Influenza A (H5)
- or
- Four-fold rise in Influenza A (H5) specific antibody titer
Active Surveillance at Health Care Facilities

Team Members
- FMoH
- Bauchi State Ministry of Agriculture
- CDC
Identify Health Care Facilities

Private and government-supported health care facilities in Bauchi State

- Bauchi LGA: 9 visited
- Other LGAs: 3
- One major government hospital visited
Train Health Care Workers

- Met with hospital administrators
- Trained health care workers
  - 30 minute presentation
Establish Background Rate of Influenza-Like Illness

- Admission logs and patient records reviewed at 3 health care facilities

- November to December 2006

- Patient diagnoses:
  - pneumonia
  - septicemia
  - acute febrile illness
Identify Case-Patients

- Visited hospital wards
  - No inpatients met suspected AI case definition
Active Surveillance of High-Risk Communities

Team Members
- FMoH
- FMoI
- Bauchi State Ministry of Agriculture
- Bauchi LGA Government
- CDC
Identify Persons at High Risk

Communities at high risk:

- Poultry workers
- Other workers on poultry farm/compound
- Farm residents
- Workers participating in culling and disinfection activities
Visit H5N1 Confirmed Farms

- Ostrich farm
  - March 21, 2006: sick ostriches/cranes
  - March 30, 2006: ostriches depopulated

- Backyard poultry farm
  - March 21, 2006: 50 sick/dead chickens
  - March 26, 2006: 800 birds depopulated
Contact Tracing

- March 31–April 8, 2006: Followed those identified as persons at high-risk

- 12% persons reported one or more symptoms of influenza-like illness (ILI)
  - All but one person with ILI were tested
  - 50% met case definition for suspected AI
  - No confirmed case-patients
Lessons Learned: Outreach

Do not “descend” upon the community

- Community education and awareness
- Respect cultural differences
Lessons Learned: Planning

Pre-determine official isolation hospital, wards, and transportation
Lessons Learned: Provisions

Provisions for suspected case-patients and hospital staff should be prearranged

- Personal protective equipment (PPE) for hospital staff
- Food, water, and laundry service
- Full medical examination
- If warranted, treatment with Tamiflu
Form interdisciplinary collaborations

- Establish liaison with state and LGA MoH, MoA, and MoI
  - Obtain list of hospitals and physicians from liaison early
  - Obtain employee list from producers early
  - Mobilize community educators early
Lessons Learned: Expertise

Utilize interdisciplinary expertise

- Social workers/educators
- Law enforcement

Suspected case-patients

- Fled
- Refused to be tested and quarantined
- Untruthful about health condition
Lessons Learned: Education

Education, education, education

- Health care workers
  - Human avian influenza diagnosis and treatment
  - Importance of maintaining accurate patient records

- Farmers
  - Importance of maintaining employee records
  - Farm biosecurity
Question

I believe my jurisdiction would have access to contact information for poultry farm employees if needed.

A. Yes

B. No

C. Don’t know

D. No foreseen reason to access these records
Lessons Learned: Laboratory Capacity

Ensure laboratory capacity and cold-chain specimen transfer
Lessons Learned: Biosecurity

Respect farm biosecurity measures

- Reduces spread of disease
- Maintains interdisciplinary relationships
Farm Biosecurity

All activities undertaken to preclude the introduction of disease agents
How Poultry Disease Spreads
Farm Biosecurity: General Considerations

1. Clean vehicle
2. Park vehicle as far from animal areas as practical
3. Only essential personnel should enter premises
4. Use clean coveralls and footwear for each visit
5. Appropriate PPE and decontamination equipment
6. Clean and disinfect boots upon exiting premises
7. Maintain “clean” and “dirty or contaminated” areas of your vehicle
8. Leave trash on-site for disposal
Farm Biosecurity: Premises Entry & Exit

Response zone

- Infected / Unknown

Response missions
- Surveillance
- Depopulation
- Decontamination
- Repopulation

Clean zone

exit decon
What Worked Well?

- Team communication
  - CDC issued cell phones
  - Phone lists
  - Daily planning and debriefing meetings
- Team members spoke local languages
- MoI community education very effective
  - Community sensitization
  - Media contacts
Questions?

Special thanks to Eileen Farnon and Diane Gross for photos used in this presentation.