Avian Influenza

NIEHS Course Overview
Protecting Avian Influenza Responders Conference
17-19 Sept 2007
Bethesda, MD
Avian Influenza (AI)

• What is avian influenza?

  – Avian influenza, or bird flu, is a contagious viral disease caused by certain types of influenza viruses that occur naturally among birds

  • Avian influenza viruses normally infect only birds; over 100 identified subtypes

  • Migratory water birds, act as hosts for influenza viruses; do not get sick

  – Avian influenza cases in Asia, Europe and Africa have prompted significant global concern because of the potential for a global pandemic outbreak
H5N1 Concern

- **First**, the virus has been shown to mutate rapidly, and has easily acquired new genes from other viruses through genetic re-assortment.

- **Second**, the strain has been found to be highly pathogenic, and can spread very easily and quickly among bird populations.

- **Finally**, the virus has a high rate of lethality among infected birds.
Status of H5N1 Outbreaks

- [http://www.pandemicflu.gov/#map](http://www.pandemicflu.gov/#map)
Avoiding Exposure

- Restrict regional travel in infected areas
- Avoid contact with live poultry

**Practices**
- Personal hygiene
- Social distancing
- Responsibility

**Vaccine/Medications**
Avian vs. Seasonal vs. Pandemic

- There is a great deal of confusion regarding various strains of influenza
- HPAI (H5N1) in poultry is **NOT** the same as seasonal influenza and is **NOT** the same as pandemic influenza
- Important to know differences and understand how each is transmitted and prevented
• **Avian influenza A (H5N1)**
  – Devastating global outbreak in poultry
  – Severe but rare human infections
  – Does *not spread easily* from person to person

• **Seasonal influenza** viruses
  – A public health problem *every year*
  – Circulates throughout the human population
  – Spreads easily from person to person

• **Pandemic influenza** virus
  – A *new influenza subtype* infecting humans
  – Causes *serious illness*
  – *Spreads easily* from person to person
Seasonal Flu

- Every year in the United States:
  - Average 5% to 20% of population contracts the flu
  - More than 200,000 people are hospitalized from flu complications
  - 36,000 to 45,000 people die from the flu annually
Mortality Curve of a Seasonal Flu

Increasing Mortality (Relative)

Very Young  Young  20-40 Years Old  Old  Very Old
Pandemic Influenza

- An new influenza strain for which people have little or no immunity
- Spreads easily from person to person with high morbidity and mortality rates
- The need for vaccine is likely to exceed availability
  - What is the public perception?
CCCHST NIEHS

0900 hrs    ID carrier            Hollywood Army   Monkey escape
1000 hrs    TV telecast & plea
1100 hrs    Fly to forest
1200 hrs    Bait monkey
1400 hrs    Catch monkey
1500 hrs    Helicopter dogfight
1600 hrs    Make antibodies
2000 hrs    Save World

Too bad it rarely happens this way!!

Real Army

Chase monkey
Chase monkey
Chase monkey
Chase monkey
Chase monkey
Chase monkey
Catch monkey
Eat takeout tacos

Courtesy: Dr Jerry Jaax, K- State
Cytokine Storm

• It is believed that cytokine storms were responsible for many of the deaths during the 1918 influenza pandemic, which killed a disproportionate number of young adults this phenomenon could repeat itself in future flu pandemics

  – In this case, a healthy immune system may have been a liability rather than an asset. Preliminary research results from Hong Kong also indicated this as the probable reason of many deaths during the SARS epidemic in 2003. Human deaths from the bird flu H5N1 usually involve cytokine storms.
Major Flu Outbreaks of 20th Century

- 1918: “Spanish” flu pandemic killed 50 million worldwide (2% of infected died)
- 1957-58: Flu spread from China killing 70K in the U.S.; 1-2 million worldwide
- 1968-69: “Hong Kong” flu affected millions worldwide and disrupted world economies
- 1997: First indication of avian “bird” flu in Hong Kong
Mortality Curve of a Pandemic Flu

Relative Age Groups:

- Very Young
- Young
- 20-40 Years Old
- Old
- Very Old

Increasing Mortality (Relative)
Pandemic Flu

- Emergence of pandemic flu could be devastating to world health and economic stability
  - U.S. projection models predict that a pandemic may cause over 500,000 deaths and 2 million hospitalizations
  - 21st Century estimated economic impact (based upon 1968 flu epidemic) at $166.5 billion* due to death and lost productivity

*Excludes other disruptions to commerce and society
Examples of Economic Loss

- Production losses
- Quarantine and euthanasia expenses
- Loss of animal populations and genetics
- Loss of international trade, market losses, or export barriers
- Income losses for producers, food processors, and exporters
- Movement restrictions for animals and people
- C & D costs for farms or processing and distribution facilities
- Higher prices of commodities
- Loss of consumer confidence in food supply
Government & Business Action

- International Influenza Monitoring Agencies
  - WHO
  - IHR International Health Regulations
  - GOARN Global Outbreak Alert and Response Network
  - PAHO Pan American Health Organization

- Culling of Infected/Exposed Poultry

- U.S. Government Pledge
  - $334 Million to Global Campaign

- EU extension of Monitoring Program

- Business Pandemic Contingency Planning
Short, Medium, Long-term Planning

• There will be more than one wave of infection during a pandemic event
  – Each wave could typically last about 8 weeks

• Businesses should plan for 30-50% employee absences for periods of about two weeks

• Continuity planning is a must
Continuity Planning

- Planning should include:
  - Identification of essential business activities
  - Mitigation of business/economic disruptions
    - This includes shortages of supplies
  - Minimizing illness in employees and customers
Continuity Planning

- Identify essential employees and critical inputs
- Train and prepare ancillary workforce
- Determine impact on company business
- Determine impact on business related travel
- Establish emergency communications plan
- Implement and **EXERCISE** the plan
Continuity Planning

- Forecast and allow employee absences
- Encourage and track influenza vaccination
- Identify employee and key customers with special needs
- Provide information for the at-home care of ill employees
- Ensure communications are culturally and linguistically appropriate
Identification of Core People and Skills

• What are the essential parts of the business?
• Who are the core people to keep it running?
• What are the core skills to keep it running?
• Are there sufficient back-up for people and skills? Who and where are they?
Pandemic Challenges and Preparation

- Social disruption may be widespread
- Ability to work may be difficult or impossible
- Schools may be closed for extended periods
- Transportation services may be disrupted
- People will need advice and help at work and home
Be Prepared (not just for pandemic)

- Store a supply of water and food
  - All hazards preparedness
- Stockpile of prescription and non-prescription medications and supplies
- Wash your hands, wash your hands, wash your hands
- Cover coughs and sneezes
Training
Standards of Performance

• We can train responders to perform safely once we understand why they engage in unsafe acts

• Performance is a function of its consequences

• People do what they do because of:
  – What happens to them
  – What does not happen to them
Perceived Value

• A responder's perception of the consequences of his or her performance focuses largely on "perceived value"

• Values vary greatly among individuals
Another Thought on Perception

When a 3 yr old is asked about monsters
Consequence Factors

- Timing
  - soon
- Consistency
  - certain
- Significance
  - positive
Why Train to Change Performance?

So we that will not operate in a logic free environment!

IDIOT
Why Train to Change Performance?

• Keeps people from getting hurt
• Equipment is not damaged
• Keeps the response moving forward
• Time is not wasted
Safety is an activity function driven by what we do daily

- The primary goal for any safety process is to cultivate safer responders.
- Safer responders are a result of performance changes, in that they recognize unsafe or at-risk performance for what it is, and then do something about it.
The primary factors for causing at risk or unsafe performance are:

- Hurrying
- Frustration
- Fatigue
- Complacency (attitude)
Eyes Not on Task
(especially with today’s gas prices)
Mind Not on Task
Loss of balance; traction; grip
Stay out of the line of fire…
Stay out of the line of fire...
Eyes and mind not on task while losing balance, traction and grip and placing self in the line of fire
Safety

- People
- Environment
- Property
DHS

Foreign Animal Disease Response
Training for Responders
DHS

Avian Influenza Response
Training for Responders
Focus of DHS Programs

- Collaborate with State Departments of Agriculture and State Departments of Homeland Security to deliver training to our response community
- Train Master Trainers in all states that will train Training Officers from all jurisdictions and disciplines to reach 300,000 responders across the nation
Questions?

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