



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



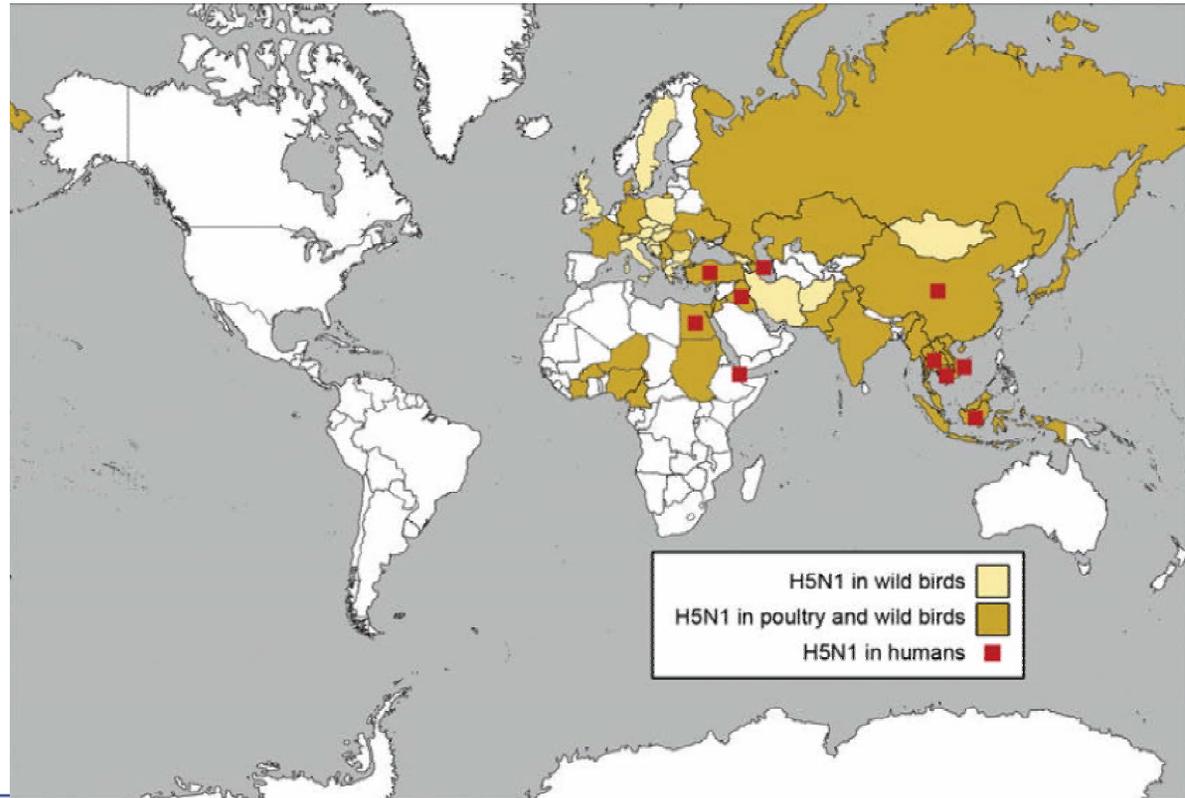


H5N1 Concern

- **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>



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



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?



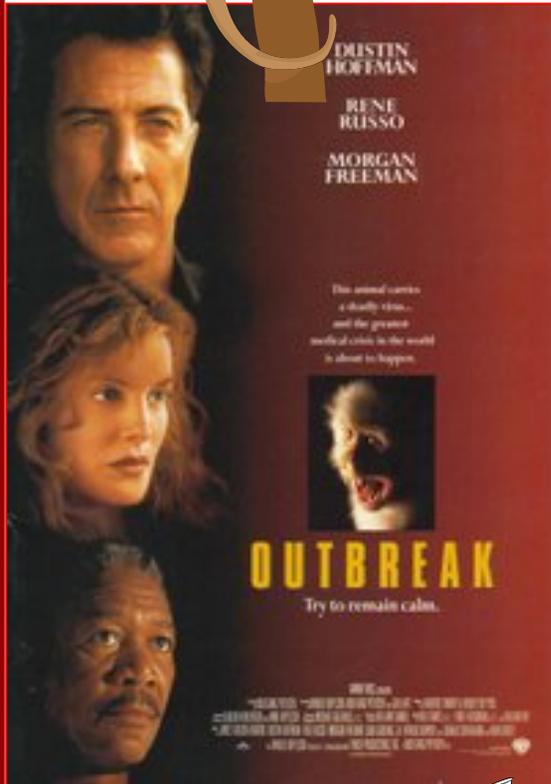


Courtesy: Dr Jerry Jaax, K- State

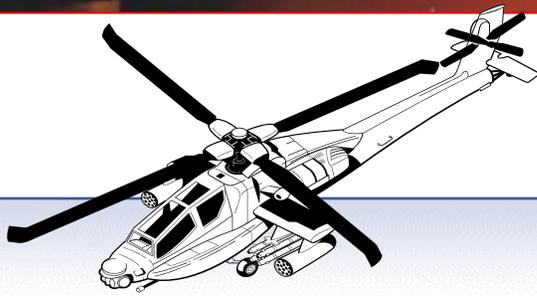


Hollywood Army

Real Army



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



Too bad it rarely happens this way !!



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.

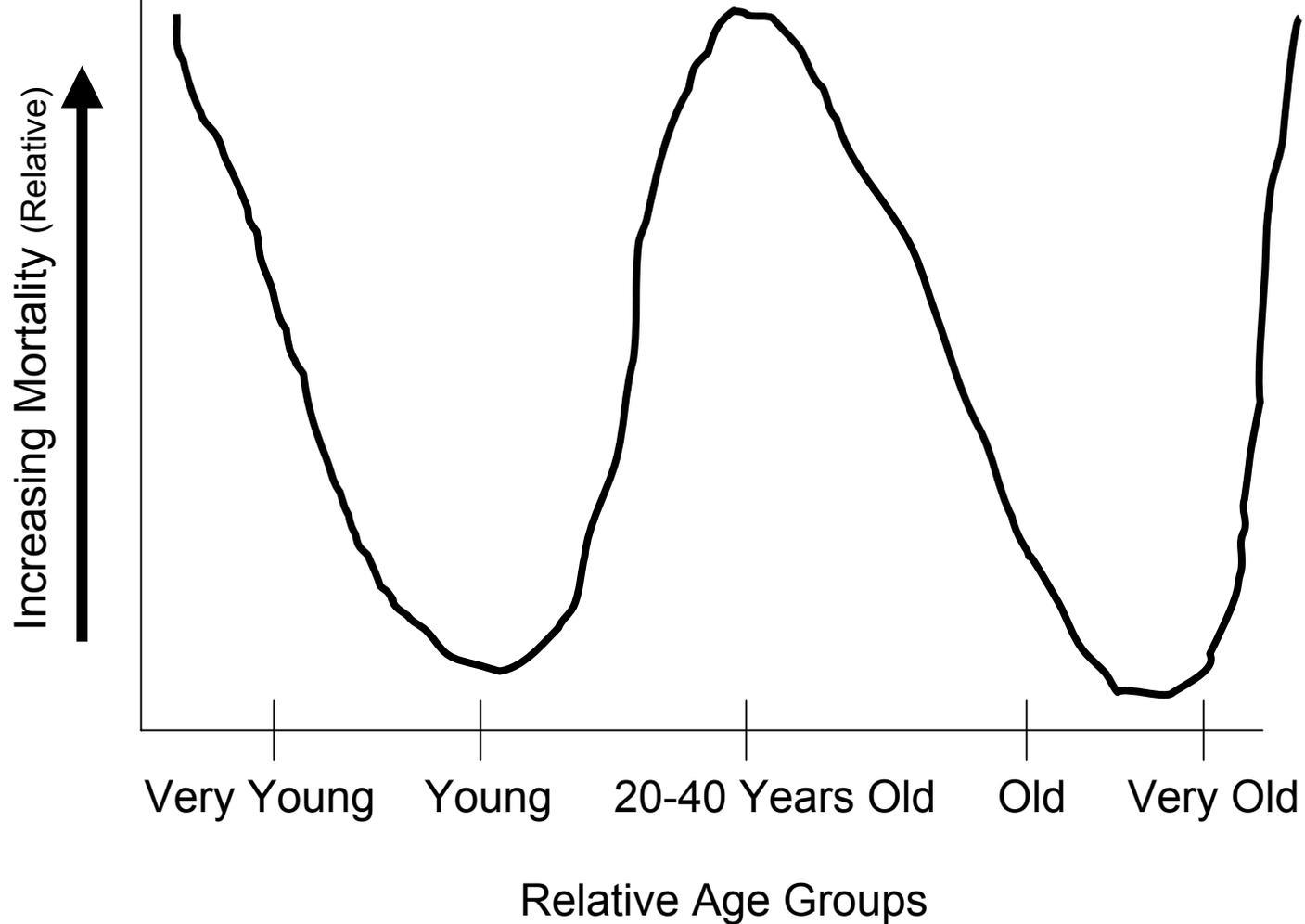


Major Flu Outbreaks of 20th Century

- 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





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
 - ▶ GOARN Global Outbreak Alert and Response Network
 - ▶ IHR International Health Regulations
 - ▶ 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



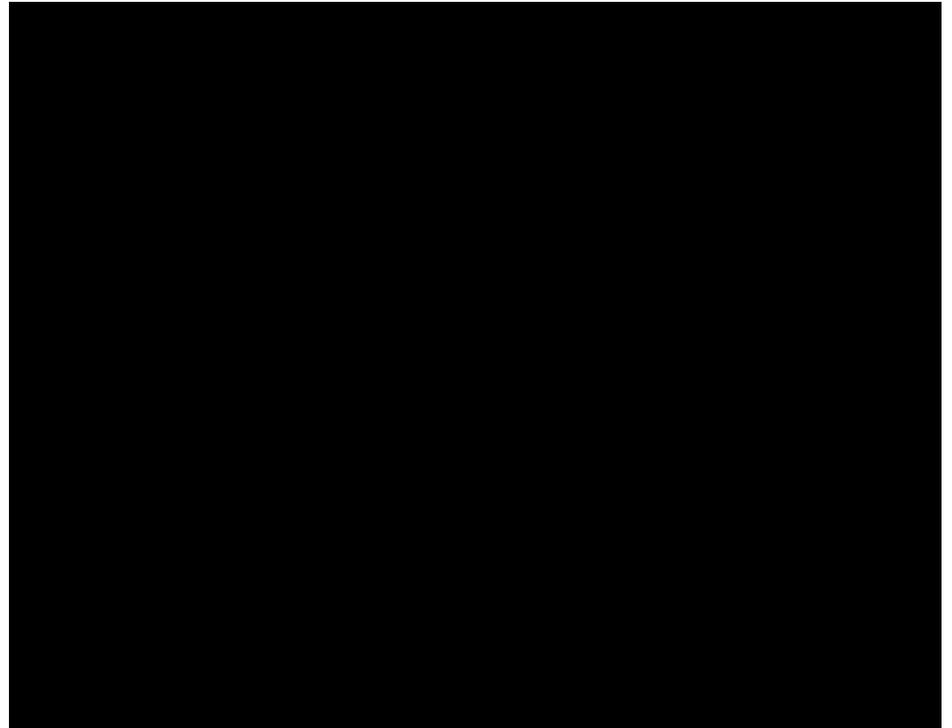


Another Thought on Perception

**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?



Safety is an activity function driven by what we do daily

- The primary goal for any safety process is to cultivate
- Safer change risk po do so



nance
or at
then



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...

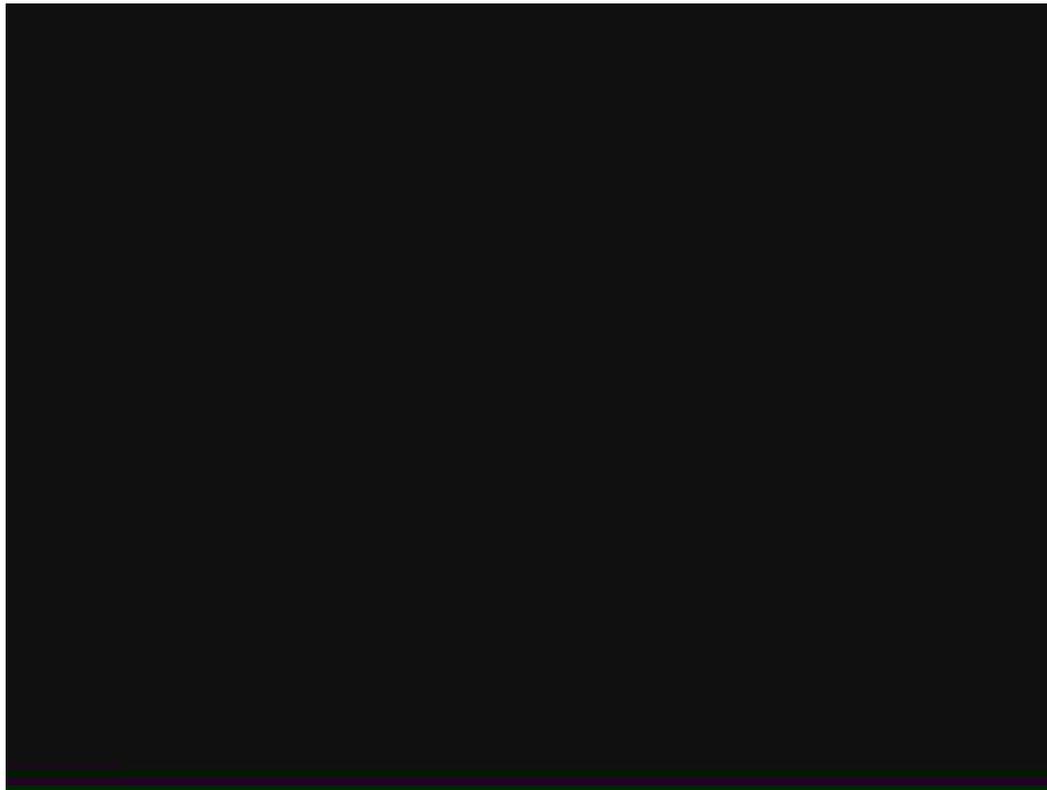


Stay out of the line of fire...





Eyes and mind not on task while losing balance, traction and grip and placing self in the line of fire



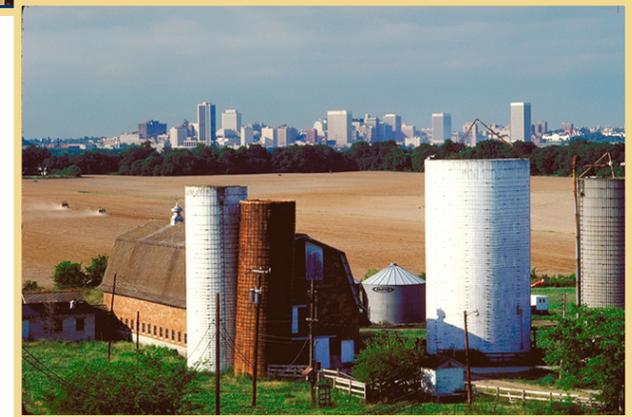


Safety

- 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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