

# Pandemic Influenza

## Be Informed. Get Prepared.

Bonnie S. Richter, M.P.H., Ph.D.  
Director, Illness and Injury Prevention Programs  
Office Health, Safety and Security  
U.S. Department of Energy  
Washington, D.C.



[www.hss.energy.gov/HealthSafety/avian.html](http://www.hss.energy.gov/HealthSafety/avian.html)

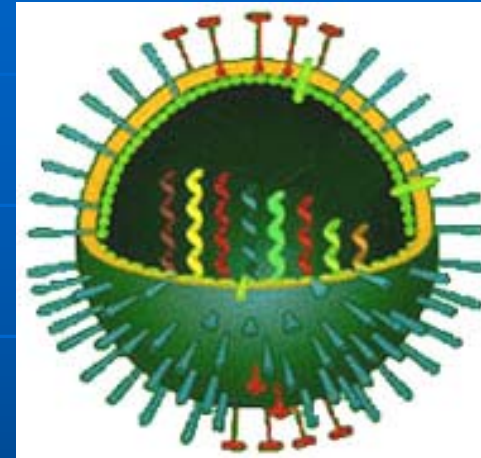
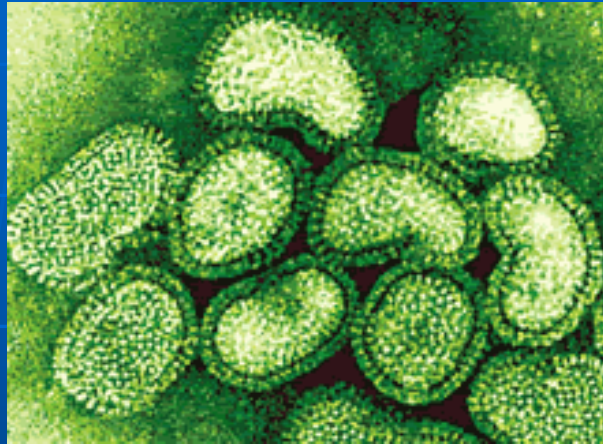




## Bird Flu or Avian Influenza

- Infects domesticated chickens, turkeys, ducks and a variety of birds, including migratory waterfowl (and sometimes other species)
- Highly contagious virus
- Two strains
  - Low pathogenic – mild
  - High pathogenic – almost always fatal
- Spread by contact with bird secretions
  - Saliva, nasal secretions, feces
- Virus can remain infectious for 3 months

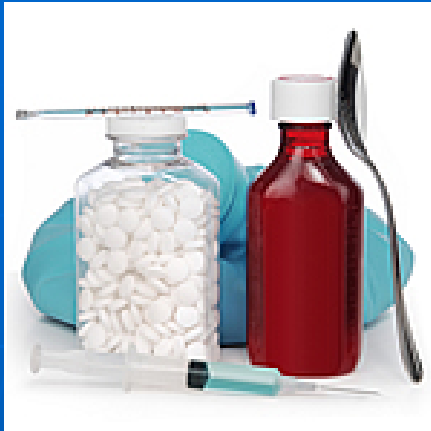
# H5N1 Influenza Virus Strain



**Viral particle is round and made up of RNA which provides the code for the surface protein**

**The surface has protrusions of either H (hemagglutinin) or N (neuraminidase) proteins**

**Minor changes in the structure of these proteins may mean the difference between a benign disease or a killer**



# FLU SYMPTOMS

## F.A.C.T.S.

**F**ever (102-104 F) lasting several days

**A**ches/pain

**C**hest discomfort (severe/pneumonia)

**T**iredness/Exhaustion

**S**udden onset

**H**eadache

**F**atigue lasting 2 – 3 weeks

**S**ore throat



## What is a Pandemic?

- A PANDEMIC is a global disease outbreak. A flu pandemic occurs when a new influenza virus emerges
- Currently H5N1 is not easily spread from human to human
- H5N1 has the potential to adapt into a strain contagious in humans
- Due to the new strain, people have no pre-existing immunity; it is likely that the disease will be serious and deadly
- Once a contagious virus emerges, it is expected to circle the world in about 3 months; all countries will be affected



# 20<sup>th</sup> Century Influenza Pandemics

- 1968 – 1969 Hong Kong Flu (H3N2)
  - Genes from human and avian influenza
  - 34,000 deaths in the US, primarily the elderly
  
- 1957- 1958 Asian Flu (H2N2)
  - Genes from human and avian influenza
  - 70,000 deaths in the US, 1<sup>st</sup> wave, primarily children
  
- 1918 - 1919 Spanish Flu (H1N1)
  - Origin of virus unknown (started in US)
  - 500,000 deaths in the US, primarily 20 -35 year olds
  - 40 - 50 million deaths world wide
  - 2.5 % of those infected died



## 1997 – Hong Kong

Bird flu virus transmitted  
directly from birds to people  
18 cases (6 deaths)

## 2003 – 2004

- **Outbreaks in chickens in Vietnam, Thailand, Korea, Japan , Cambodia, Laos, Indonesia, China**
- **100 million chickens died from the virus or were killed in an attempt to prevent its spread**
- **W.H.O. reports tiger and leopard deaths in a zoo in Thailand**
- **Over hundred human cases reported in Vietnam, Cambodia, Thailand and Indonesia; people exposed to sick birds**

## 321 Human Cases of Avian Influenza A (H5N1) Reported As of August 16, 2007 Mortality Rate 60%



Azerbaijan 8 (5), Cambodia 7 (7) China 25 (16)  
Djibouti 1 (0), Egypt 38 (15), Indonesia 104 (83)  
Iraq 3 (2), Lao 2 (2), Nigeria 1 (1), Thailand 25 (17)  
Turkey 12 (4), Vietnam 95 (42)





# 200? H5N1 Pandemic

- 5 - 15 % clinically ill with **seasonal flu**
  - 36,000 deaths
  
- 25 - 50% clinically ill in a **pandemic**
  - Potentially 80 million ill
  - Potentially 800,000 deaths
  
- 51 – 81 million deaths (96% in undeveloped countries)



# Occupational Exposure to Pandemic Influenza

## Risk levels dependent on:

- whether job requires close proximity to people potentially infected with the virus, or
- whether job requires repeated or extended contact with known or suspected sources of virus



# Occupational Risk Levels

- **Very High** – health care employees performing aerosol-generating procedures on patients; lab personnel handling specimens
- **High** – healthcare and support staff exposed to suspected pandemic patients
- **Medium** – employees with high-frequency contact with the general population
- **Lower** – employees with minimal occupational contact with the general public and other co-workers



# Vaccines

- There is NO VACCINE to protect one against the H5N1 virus; can't be produced until the pandemic emerges
- Developing pre-pandemic vaccines based on the lethal H5N1 (20 million doses stockpiled and to be distributed by Feds)
- Currently techniques are being developed to improve production capacity and to develop ways to expand supplies
- Initial stockpiles will go to priority groups: essential services, health care providers, public safety workers
- 4-6 months to develop a vaccine for the rest of us (300 million)
- You must get a seasonal flu vaccine!



# Antiviral Drugs

- Tamiflu™ and Relenza™ - N-inhibitors: Interfere with viral neuraminidase enzymes found on the surface of the virus
  - Reduces severity of symptoms, duration, and contagiousness.
  - Prevents infection
- Concerns
  - Must be used within first 48 hours
  - Expensive - \$90/5 doses
  - Virus may mutate
  - Doses not known
  - Very limited supply; 25 million courses stockpiled



# Face Masks and Respirators



**Face masks** – loose fitting, disposable, inexpensive, stops droplets

**Respirators** – OSHA rated (N 95 or higher) designed to stop particles  $\geq 0.3$  micron; must have tight fit; may be problematic for persons with health problems

## CDC Interim Guidance

Little research about the value of masks in a public setting

No proof of effectiveness

In combination with other actions, may prevent spread of influenza

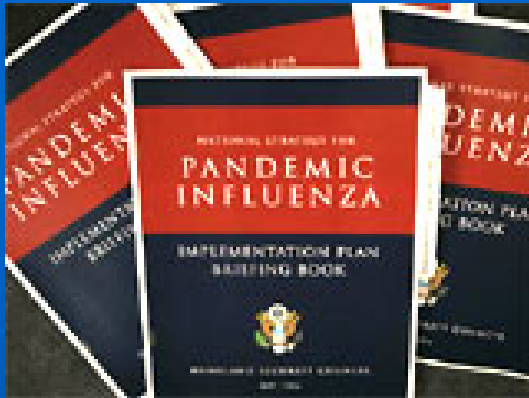
Use an N 95 respirator if caring for pandemic flu patient at home or close contact with sick people in a pandemic



# Challenges and Preparation



- Pandemic outbreaks may include up to 3 “waves” lasting 6 to 8 weeks separated by months
- Essential services you depend on may be disrupted (banks, government offices, health care facilities, transportation, etc.)
- Food and water supplies may be interrupted and limited
- Being able to get to work may be difficult or impossible
- Schools and daycare may be closed to limit the spread of flu and help prevent infection in children
- Medical care for people with chronic illness may be disrupted as doctors offices and hospitals are overwhelmed



# The Government Pandemic Effort

- November 05: President releases *National Strategy for Pandemic Influenza*
  - Clarifies roles and responsibilities of the government
  - Each Agency plan to develop plans and cover 4 areas:
    1. Protecting the health of employees
    2. Maintaining essential function during times of significant absenteeism
    3. Supporting the Federal response
    4. Communicating guidance to stakeholders
- November 06 "Checklist of key elements of Influenza Operations Plan" distributed.
  - DOE certified it is addressing the applicable elements, Dec 06



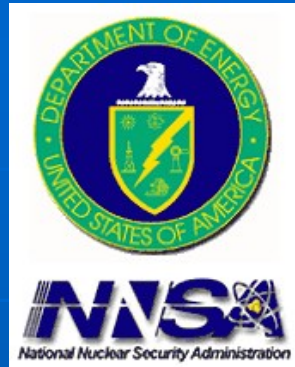


## DOE's Pandemic Planning

- Deputy Secretary memo issued March '06 assigning responsibilities for the development of Pandemic Influenza Preparedness Plan
- Chief Health, Safety and Security to chair and organize biomedical expertise through the Biological Event Monitoring Team (BEMT)

### Biological Event Monitoring Team

- Evaluates infectious disease threats
- Formulates recommendations to protect the health of DOE employees and the mission
- Promotes worker health education
- Coordinates the Departments response related to health issues



# DOE Continuity of Operations

Basic Continuity of Operations Plan (COOP) concepts are applicable BUT traditional COOP plans (relocating personnel or function) may not work

- Absenteeism may run as high as 40% across the complex
- Interruption of utilities, deliveries, supplies
- Long term - months vs. 30 days
- Medical response capabilities overwhelmed
- Protect employees from disease, especial those at high risk

COOP response will be activated based reported cases and transmission



# Developing a DOE Preparedness Plan



- Review Continuity of Operations Plan
  - Identify Mission Essential Functions
  - Prepare "3 deep"
  - Establish accountability – employees call in
- Promote Employee Assistance Programs
- Social distancing
  - Telework/flexiplace
  - Adjust work hours to minimize contact
- Quarantine healthy workers
- Educate/Promote public health measures
  - [www.hss.energy.gov/HealthSafety/avian.html](http://www.hss.energy.gov/HealthSafety/avian.html)
- Stockpile/provide surface disinfectants (alcohol/bleach)
- Exercise the plan



# Psychological and Psychosocial Issues

- During a pandemic, psychological distress responses can include: grief, anger, fear, depression, and psychosomatic illness
- Fear or dread of disease can lead to changes in behavior
- Stigmatization, discrimination manifest in antisocial behavior: avoidance, segregation, abuse, violence against people and property
- Fear of being socially marginalized may cause people to deny early clinical symptoms and delay medical care



## Countermeasures

- Behavioral and habit changes reinforced through communication and training
- People ahead of mission
- Measures to support personnel in critical functions
- Communication – credible, reliable, and accurate
- Group leadership – key to maintaining a physically and mentally healthy workforce



# Protect Yourself from the Flu



- Avoid close contact with people who are sick; if you are sick, stay at home
- Cover your mouth and nose when sneezing or coughing. If you do not have a tissue, it is best to sneeze or cough into your sleeve rather than into your hands: [www.coughsafe.com](http://www.coughsafe.com)
- Wash your hands often with soap and water or alcohol based gel
- Avoid touching your eyes, nose, and mouth; viruses are easily spread through these routes
- Stay Healthy: Stay well rested, engage in regular physical activity, manage your stress, drink plenty of fluids, and eat nutritious food
- Children are major contributors to flu infection. Teach them to good hygiene.

# Tips to help you prepare for an Influenza Pandemic

[www.pandemicflu.gov](http://www.pandemicflu.gov)



- Have a 2-3 week supply of food and water  
1 gallon water/day per person

Non-perishable food items – canned/dried foods; pet food  
hand-operated can opener

- Prescription and non-prescription drugs
- First aid kit, soap, bleach
- Plans for senior citizens and people with disabilities  
Who will care for the sick?
- Practice good hygiene