

# 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)

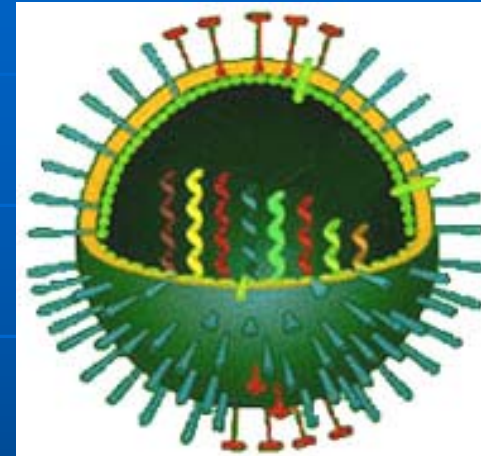
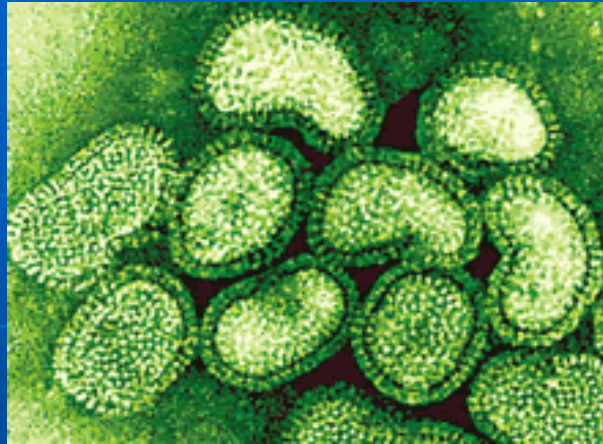




# Bird Flu or Avian Influenza

- 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

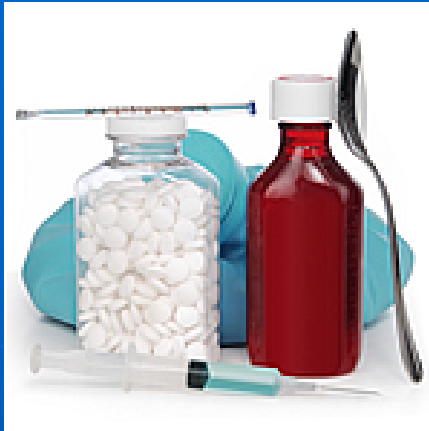
# H5N1 Influenza Virus Strain



**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
  - People have no pre-existing immunity
  - the virus is easily spread from human to human
- **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





## Avian Influenza H5N1



### 1997

Hong Kong: Bird flu virus (H5N1) transmitted directly from birds to people 18 cases (6 deaths). All poultry culled

### 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

## 378 Human Cases of Avian Influenza A (H5N1) Reported\* As of April 3, 2008. Mortality Rate 63%



Azerbaijan 8 (5), Cambodia 7 (7) China 30 (20)  
Djibouti 1 (0), Egypt 47 (20), Indonesia 132 (107)  
Iraq 3 (2), Lao 2 (2), Myanmar 1 (0), Nigeria 1 (1),  
Pakistan 3 (1), Thailand 25 (17), Turkey 12 (4),  
Vietnam 106 (52) \*Reported to WHO





# 200? H5N1 Pandemic

- 5 - 15 % clinically ill with **seasonal flu**
  - 36,000 deaths; 200,000 hospitalizations
- 25 - 50% clinically ill in a **pandemic**
  - Potentially 90 million ill
  - Potentially 200,000 – 1.9 million deaths depending on severity
- 51 – 81 million deaths (96% in undeveloped countries) worldwide



## Non-pharmaceutical interventions

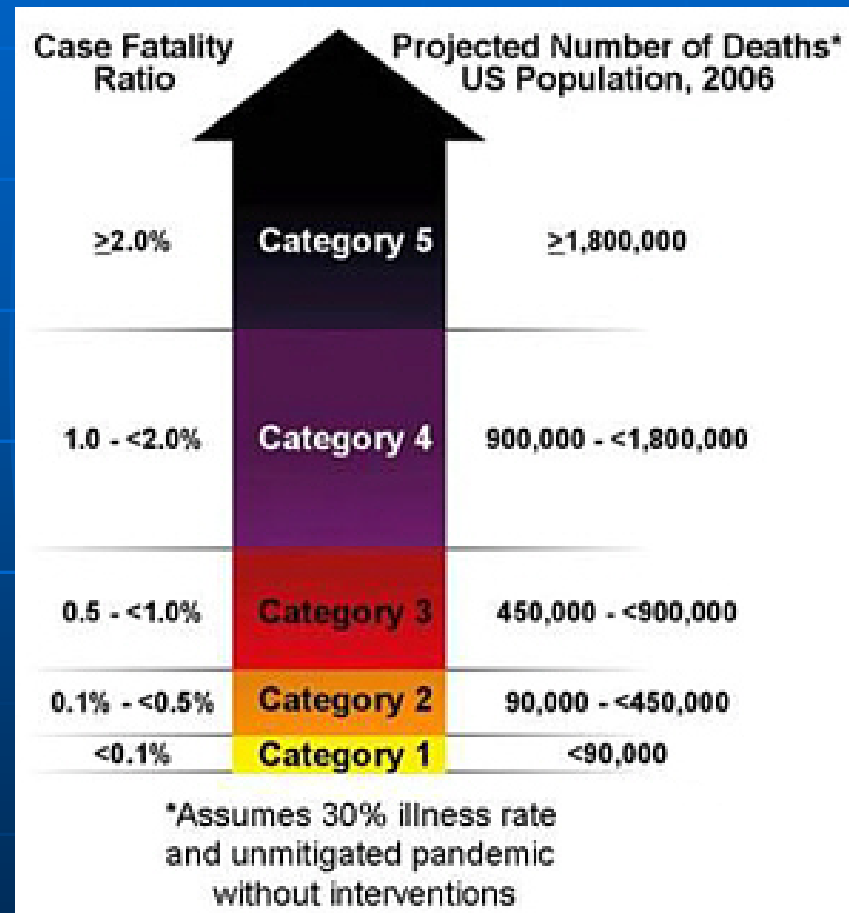
- Social distancing measures to reduce contacts.
- Voluntary isolation of persons with confirmed or probable influenza.
- Voluntary quarantine of members of a household where there are cases of flu. Persons may not be sick.
- School dismissal (public, private and universities) and childcare closings
- Public health hygiene (hand washing, sneezing practices, not touching eyes, nose, mouth)



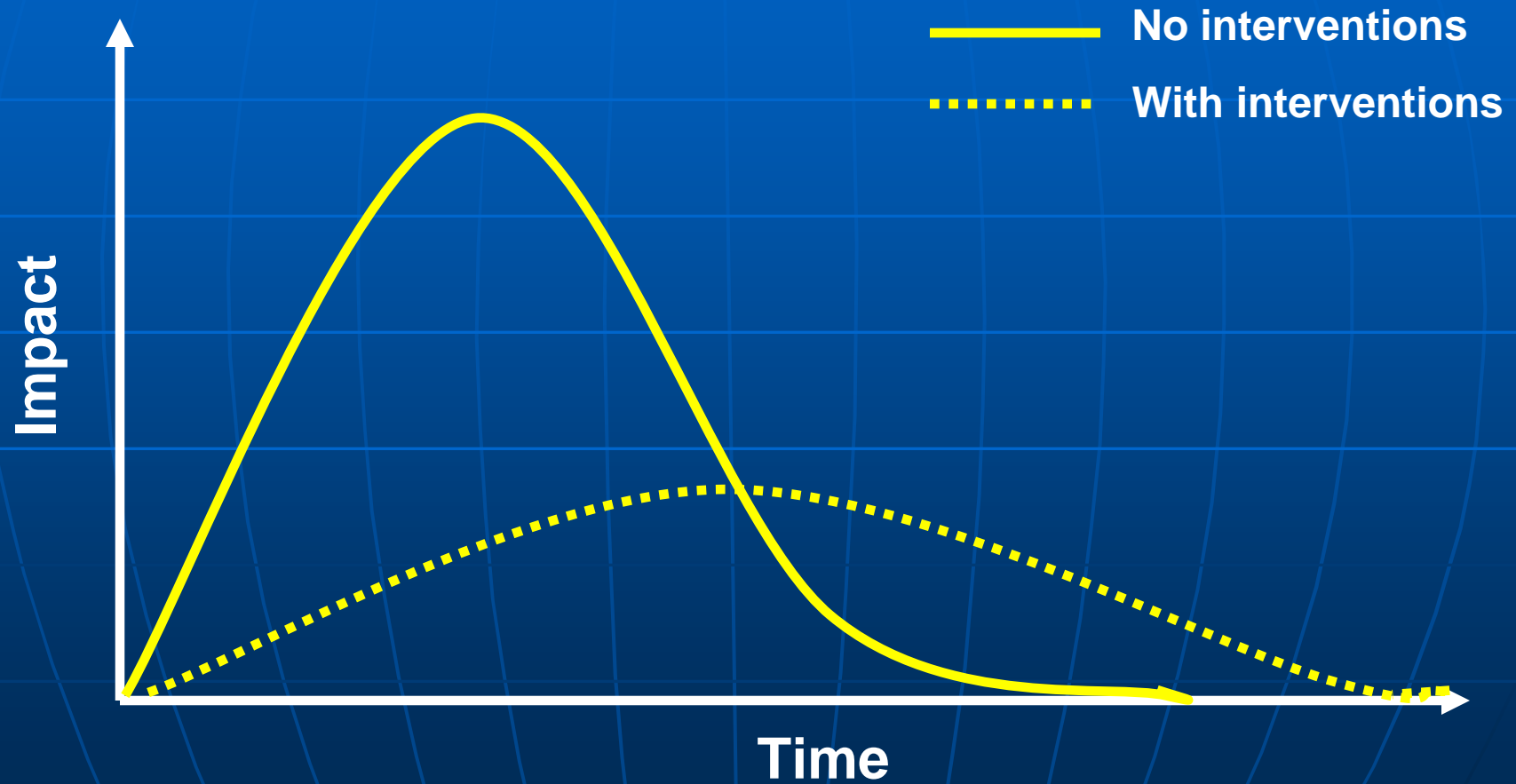
# Challenges

- 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

# Pandemic Severity Index A Guide to Community Intervention



# Delay and Limit New Cases







# 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<sup>TM</sup> (Roche) and Relenza<sup>TM</sup> (Smith Kline Glaxo) - 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



## National Antiviral Drug Program

- Target: 81 million treatment courses

Treatment courses	Stockpile	Purpose
6 M	HHS	"quenching"
44 M	HHS	treatment
31 M	State	treatment
81 M	TOTAL	treatment

HHS will have 50 M courses on hand by Feb 08  
States have ordered 18M courses on hand



# 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

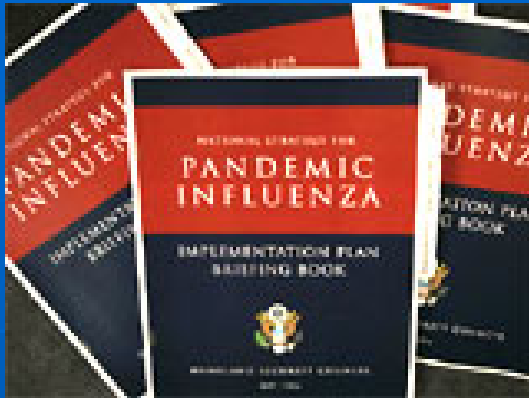
## CDC Interim Guidance

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



# The Government Pandemic Effort

- November 05: President releases *National Strategy for Pandemic Influenza*
  - Clarifies roles and responsibilities of the government; each Agency 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 (sustain infrastructure and mitigate impact to the economy and the functioning of society)
    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



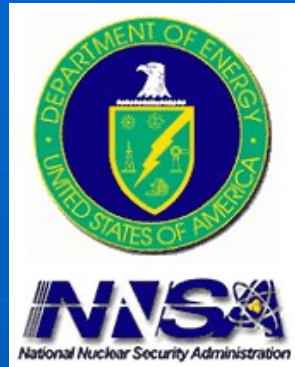


## DOE's Pandemic Planning

- 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 Biologic Effects Monitoring Team (BEMT)

### Biologic Effects Monitoring Team

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



# DOE Contingency of Operations

Basic Continuity 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
- VOLUNTARY isolation of sick; voluntary quarantine
- Educate/Promote public health measures/Communicate
- 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



# 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