Pandemic Influenza: Tackling the Tough Issues

Introduction

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Session Objectives

• Identify the perils associated with pandemics in general and pandemic influenza specifically

• Describe the response actions of various emergency services disciplines as they relate to crisis communications, social distancing, travel restrictions, and quarantine
Session Objectives

• Explain the importance of rapidly expanding the capacity of the existing health care system in order to provide triage and medical care

• Update World situation with HPAI Asian type H5N1 & Swine Flu H1N1 type A influenza viruses
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Defining the Threat

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Influenza and Its Cause

- The flu is a viral respiratory disease that occurs throughout the world every winter.

As soon as the weather starts to get a little chilly, everyone starts to worry about the flu.

Seasonal Nature of Flu
www.patienteducationcenter.org
Influenza and Its Cause

• Responsible for ~35,000 deaths each year in the United States

• Most fatalities from seasonal flu are children and the elderly and those with debilitating medical conditions
Types of Influenza Virus—Influenza Virus A

- Multihost pathogen
  - Humans
- Avian Influenza
  - Most virulent group

Cross Section of Influenza Virus
www.cs.indiana.edu
Types of Influenza Virus—Influenza Virus A

- Classification by surface antigens into subtypes
  - Hemagglutinin (H or HA)
  - Neuraminidase (N or NA)
Influenza Virus A

- Surface antigens and subtypes
- 16 HA and nine NA
  - All in aquatic birds
- Hemagglutinin (HA)
  - Sites for attachment to infect host cells

Neuraminidase (NA)

Hemagglutinin (NA)
Influenza Virus A . . .

- Surface antigens and subtypes
  - Neuraminidase (NA)
    - Remove neuraminic acid from mucin and release from cell
Influenza Virus A (continued)

Host Range

Type A Host Range Courtesy of CDC Influenza Branch
Influenza Virus A (continued)

- Mutate frequently
- Antigenic drift
  - Point mutations accumulated during virus replication
Influenza Virus A (continued)

• Antigenic shift
  • Hybrid virus emerges when cell infected with two different influenza viruses
  • Transfer of influenza virus to a different species
Genetic Variability

16 HAs
9 NAs

Non-human virus

Human virus

DIRECT

Mixing Scenario
Source: CDC Influenza Branch

Reassortant virus

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The Flu Virus as a Contagion

• One of the most infectious pathogens

• Transmission: Droplets, aerosol, and contact

Sneeze Profile
www.people.virginia.edu
The Flu Virus as a Contagion

- Survive off the host for 48 hours!
- Peak transmission in United States
- Many strains circulating

Sneeze Profile  www.people.virginia.edu
The Flu Virus as a Contagion (continued)

Infectious (Shedding Virus)

DANGER OF INFECTION

Incubation Symptomatic (Sick) Recovering

Work, etc. Work/Home/Hospital Back to work, etc

Day 0 Day 2 Day 4 Day 11 Day 15

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Pandemic Periodicity

- Influenza pandemics—frequency
- Occur about every 50 years
- New strain of flu virus not recognized by the immune systems of the population
- Rapidly spread worldwide

www.globalchicago.org
Severe Influenza Pandemics

- 1580 – silk routes
- 1729
- 1732
- 1781
- 1830
- 1833
- 1889 – Asiatic Flu
- 1918 – Spanish Flu
- 1933