Training Objectives

- Describe and distinguish between seasonal and pandemic influenza.
- Provide a brief history of flu pandemics.
- Describe what is known about pandemic H1N1 2009 flu (swine flu) at the current time.
- Provide guidelines for care, treatment, infection control, and prevention of pandemic H1N1 in clinical and community settings.
What is seasonal influenza?

- Human respiratory infection caused by Influenza Type A or Type B
- Spread by contact with respiratory secretions from an infected person (coughing, sneezing, talking)
- Incubation period: 1 to 5 days from exposure to onset of symptoms (average of 2 days)
- Contagious period:
  - Maximum at onset of symptoms,
  - Infectious 1-2 days before symptoms to 4-5 days after symptom onset
- In New England, seasonal flu usually begins in Dec and peaks in Jan or Feb.
Symptoms of Seasonal Flu

- Sudden onset of fever (usually high)
- Headache
- Extreme tiredness
- Dry cough
- Sore throat
- Runny or stuffy nose
- Muscle aches
- Nausea, vomiting, and diarrhea can also occur but are more common in children than adults.
**Colds vs. the Flu**

<table>
<thead>
<tr>
<th>Important Differences Between Colds and the Flu</th>
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<tbody>
<tr>
<td><strong>WITH A COLD:</strong></td>
</tr>
<tr>
<td>You almost never have a fever.</td>
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<tr>
<td>You feel stuffiness in your head.</td>
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<tr>
<td>You feel a little sick.</td>
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<tr>
<td>You can have a cold any time of year.</td>
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<tr>
<td>There is no shot to protect you.</td>
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<tr>
<td>There are no prescription medicines to treat colds.</td>
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</tbody>
</table>
Impact of Seasonal Influenza

- 36,000 deaths annually in U.S.
  - Est. > 800 MA residents die from complications of influenza

- 200,000 or more hospitalizations in U.S.
  - Est. > 2,600 excess hospitalizations in MA
At High Risk for Complications from Seasonal Flu

- Children < 5 yrs of age
- Persons ≥ 65 yrs of age
- Persons with the following conditions:
  - Chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological (including sickle cell disease), neurologic, neuromuscular, or metabolic disorders (including diabetes mellitus)
  - Immunosuppression, inc. that caused by medications or by HIV
  - Pregnant women
  - Persons < 19 yrs who are receiving long-term aspirin therapy
  - Residents of nursing homes and other chronic-care facilities

See: [http://www.cdc.gov/h1n1flu/recommendations.htm](http://www.cdc.gov/h1n1flu/recommendations.htm)
Influenza Virus Type A

- Associated with annual epidemics and pandemics
- Causes moderate to severe illness
- Affects all age groups
- Infects humans and other species, such as pigs and birds
Influenza Type A Subtypes

- Influenza Type A infects many species.
- All known influenza A subtypes infect birds.
- Subtypes are designated by the hemagglutinin (H) and neuraminidase (N) proteins on the surface of the virus.
- To date, only H1, H2, and H3 subtypes have been efficiently transmitted from person to person.
**Flu virus is constantly changing**

- **Drift**: Minor change due to constant mutation
  - Reason why seasonal flu vaccine must be updated each year
- **Shift**: Major change with new virus causing human infection
  - Mutation
  - Reassortment
  - Pandemic potential ~ Shift happens!
What is a pandemic?

An epidemic occurring worldwide, or over a very wide area,
- crosses international boundaries, and
- usually affects a large number of people
- Ex: plague, smallpox, polio, influenza

An influenza pandemic is caused by a new strain of the influenza Type A virus.
- Because the virus is new, virtually no one is immune - all exposed could get sick.
Influenza Pandemic Prerequisites

1. A new influenza virus subtype emerges;
2. It infects humans, causing serious illness; and
3. It spreads easily and sustainably among humans.
Influenza Pandemic Characteristics

- Spread rapidly throughout the world
- Result in an unusually high number of cases and deaths
- Last 1 - 2 years; may have a second wave
- Occur in ~ 10-40 year intervals
1918 influenza pandemic

Most deadly outbreak of infectious disease ever

- 20 - 40 million or more died worldwide, 500,000 in U.S.
- 20% - 40% of population sick
- Quick to kill, especially healthy young adults
1957 and 1968 influenza pandemics

- **1957 Asian Flu (H2N2)**
  - 70,000 Americans died

- **1968 Hong Kong Flu (H3N2)**
  - 34,000 Americans died
Pandemic H1N1 2009 ~ Description

- Novel virus not previously detected in pigs or humans
- Contains genetic elements of avian, swine, and human viruses
- CDC estimates > million cases of novel H1N1 in the U.S between April and June 2009.
- Most ill people have recovered.
- CDC estimates a pandemic severity index of 2 (similar to the 1957 flu pandemic).
Confirmed Cases of H1N1 in Massachusetts (November 12, 2009)

- 1,659 confirmed cases
- No. of hospitalized: 235
- No. of deaths: 15
- Median age of cases: 14 years
- School-aged individuals (5-18 years) have been most affected with 62% of cases age 18 or younger
### Pandemic H1N1 2009 Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
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<tbody>
<tr>
<td>3-18-09</td>
<td>Mexico reports cases of influenza-like illness (ILI)</td>
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<tr>
<td>4-13-09</td>
<td>First “swine flu” death in Mexico</td>
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<tr>
<td>4-15-09</td>
<td>Confirmation of 1(^{st}) U.S case (from CA)</td>
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<tr>
<td>4-27-09</td>
<td>Canada and Spain report cases; WHO raises pandemic alert level to 4</td>
</tr>
<tr>
<td>4-29-09</td>
<td>WHO raises pandemic alert level to 5</td>
</tr>
<tr>
<td>5-12-09</td>
<td>CDC reports severe cases in pregnant women</td>
</tr>
<tr>
<td>5-20-09</td>
<td>Worldwide cases surpass 10,000</td>
</tr>
<tr>
<td>6-11-09</td>
<td>WHO declares pandemic level 6</td>
</tr>
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</table>
Symptoms of Pandemic H1N1 2009

- Symptoms are similar to seasonal flu.
- Most common symptoms:
  - fever (100.4° F)
  - cough
  - sore throat
  - Headache, body aches
  - chills
  - fatigue
- Diarrhea, vomiting and shortness of breath reported more frequently than with seasonal flu
Transmission of Pandemic H1N1 Flu

- Transmission through respiratory droplets (cough, sneeze) and by indirect contact (touching doorknobs, shaking hands, etc)
- Infectious period - 1 day before symptoms, to 5 -7 days after symptoms begin
- Children and immuno-compromised people may shed the virus for a longer period.
Treatment for Pandemic H1N1 2009

Two antiviral drugs recommended for treatment or prophylaxis of high risk contacts:
- Oseltamivir (Tamiflu®)
- Zanamivir (Relenza®)

Focused on suspect or confirmed cases:
- hospitalized, or
- higher risk for complications of influenza

Works best within 48 hours of symptom onset.

Limited resistance to Tamiflu (Denmark, Japan, Hong Kong, Canada, and U.S.)
Vaccines for Pandemic H1N1 2009

- Pandemic H1N1 vaccine is undergoing clinical trials.
- Pandemic H1N1 vaccine does not replace seasonal vaccine.
- Vaccine priority groups are based on epidemiological data from spring 2009.
- Children younger than 10 years will require 2 doses.
Vaccine Safety

- H1N1 vaccine in U.S. will be made by 5 manufacturers licensed by the FDA.
- H1N1 vaccine is made and tested the same way as seasonal flu vaccine.
- Flu vaccine is safe for most people.
- Safety of H1N1 vaccine will be carefully watched.
Monitoring Vaccine safety

- Vaccine Adverse Event Reporting System (VAERS) [http://vaers.hhs.gov/](http://vaers.hhs.gov/)
- Active Surveillance
  - MCOs representing 3% of the U.S. pop.
  - Vaccine Safety Datalink (VSD)
**Flu Mist Vaccine**

- Active immunization for individuals 2-49 years of age
- Does not contain thimerosal
- Should not be given to:
  - Pregnant women
  - Children younger than 24 months
  - Individuals with history of hypersensitivity to eggs
Flu Mist Vaccine

Should not be given to:
- Children and adolescents receiving aspirin
- Anyone with a weakened immune system
- Anyone with:
  - heart disease
  - kidney or liver disease
  - lung disease
  - diabetes
  - asthma
  - children younger than 5 years with asthma
Pregnant Women and Pandemic H1N1

- Severe illnesses among pregnant women and infants have been reported in this outbreak.
- Pregnant women with influenza-like illness (ILI) should be treated as soon as possible.
- Fever in pregnant women may pose a risk to fetus; acetaminophen is best option.
- Antivirals are not a contraindication for breastfeeding.

CDC: http://www.cdc.gov/h1n1flu/clinician_pregnant.htm
Priority Groups for Pandemic H1N1 Vaccine

- All pregnant women
- All people 6 months through 24 years of age
- People who live with or care for children younger than 6 months of age
- Healthcare and emergency services personnel, and
- People aged 25 through 64 years who have health conditions associated with higher risk of medical complications from influenza

http://www.cdc.gov/h1n1flu/recommendations.htm
Non-Pharmaceutical Interventions (NPIs)

Measures used in addition to vaccines and antiviral drugs to mitigate the impact of a pandemic

- Isolation of ill people
- Quarantine of contacts
- Social distancing measures:
  - School closure (dismissal), if pandemic is severe
  - Adapted work schedules
  - Cancellation of public gatherings
- Hand hygiene, respiratory etiquette, and PPE
Using Masks for Pandemic H1N1

- Not recommended in community settings where exposure to pandemic H1N1 is unlikely
- Ill persons should wear masks when in contact with others, e.g. breastfeeding a baby
- Well persons should wear masks when close contact with a sick person is unavoidable, e.g. caregivers at home
“Flu?
If we but knew
The cause of flu
And whence it came and what to do,
I think that you
And we folks, too,
Would hardly get in such a stew.
Do you?”

Illinois Health news, vol. 9, November 1918
Flu Care at Home Materials

See Flu Care at Home booklet for more information.
Flu Care at Home

Uncomplicated cases of H1N1 Flu can be cared for at home:

- Stay hydrated: water, broth, sports drinks in moderation, non-caffeinated beverages
- Get plenty of rest
- Eat well
- Avoid close contact with others until symptoms resolve
- Check with health care provider about special care and medications.
H1N1 Flu Prevention and Control

- Get a seasonal flu shot every year!
- Get the H1N1 flu shot this year!
- Wash your hands; use hand sanitizer!
- Practice cough etiquette (cover your mouth and nose; discard used tissues)
- Avoid touching your eyes, nose, or mouth.
- Stay 3-6 feet away from people who are coughing and sneezing.
Pneumococcal Disease and Vaccination

- Common complication of influenza
- Increasingly antibiotic-resistant
- Unable to conduct pneumococcal vaccine campaigns during pandemic
- Recommendations for adults were expanded in 2009 schedule.

Vaccinating everyone at risk for pneumococcal disease protects them now, and during the pandemic!
MDPH Pandemic H1N1 Website for

- General Public
- Parents
- Schools and Colleges
- Providers
- Special risk groups
- Businesses
Resources for Pandemic Flu

- Mass 211: http://www.mass211.org/emergencyinfo.html
- Massachusetts Department of Public Health: http://www.mass.gov/dph/swineflu
- Centers for Disease Control and Prevention: http://www.cdc.gov/h1n1flu/
- U.S. Department of Health & Human Services: http://www.flu.gov/