Pandemic Influenza Planning

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New York State Department of Health

Definitions

- Seasonal flu is a contagious respiratory illness caused by influenza viruses.
- Pandemic flu is a flu that causes a global outbreak, or pandemic, of severe illness that spreads easily from person to person. Currently there is no pandemic flu.
- Avian flu is caused by avian influenza viruses, which occur naturally among birds.

What is Influenza?

Acute, febrile respiratory illness affecting nose, throat, bronchial tubes, lungs
Epidemics caused by Influenza viruses A and B, Type C uncommon in people
Occurs worldwide, causing considerable morbidity and mortality each year
Cross Species Infectivity

An Ancient Foe:
Origin of the name influenza 16th century Italy
Epidemics attributed to "influence of the stars"
Seasonal vs. Pandemic Flu

A pandemic is a world-wide epidemic.

- Pandemics result from the emergence of a new virus to which the overall population has no immunity.

- Unlike seasonal flu, which typically affects the elderly frail and sick, pandemic flu could present as much risk to the young and healthy.

- Could begin at any time of year.

- Asia is the source of many outbreaks.

Seasonal Influenza Symptoms

Patients can often recollect exact hour of onset; may say "feels like a truck hit me".

Complications: more common in the very young, very old, and chronically ill
- Pneumonia, encephalitis, "toxic shock" syndrome, worsening of underlying chronic illness, death.

Pandemic influenza Symptoms

- Pandemic flu: lack of immunity leads to more rapid, overwhelming illness that may affect young, otherwise healthy people predominantly.

- Clinical presentation will depend on the virus causing the pandemic.
How is Seasonal Influenza Transmitted?

- Typical incubation: 2 days
  Range: 1-4 days
- Viral shedding
  - Can begin 1 day before symptom onset
  - Peak shedding first 3 days of illness
  - Correlates with temperature
  - Subsides after 5 days in adults, can be 10+ days in children
  Transmission is predominately droplet spread

“Droplet” Transmission

- Flu virus is present:
  - In large droplets expelled when you cough or sneeze, which fall quickly to the ground or onto surfaces,
  - On the hand of ill people.
- Transmission occurs:
  - Usually from direct hand-to-hand or hand-to-surface contact.
  - Flu virus on the hands is easily transferred to the eyes, nose and mouth where flu virus can enter the body and cause infection
  - Less frequently by direct inhalation of flu virus in the air.
- Implication: hand washing is as important as respiratory precautions.

Individual Infection Control Strategies - 1

Respiratory hygiene/cough etiquette and hand hygiene are effective strategies
What is Respiratory Hygiene/Cough Etiquette?

- Cover mouth/nose when sneezing or coughing
  - If no tissue, use elbow instead of hands
- Use tissues and dispose of appropriately
- Perform hand hygiene after contact with respiratory secretions
- Distance yourself from others (more than 3 feet)

What is Hand Hygiene?

- Traditional hand washing
  - Soap and hot water
  - Minimum of 20 seconds (the time it takes to sing "Happy Birthday")
- Alcohol based hand rubs
  - Acceptable means to disinfect/EXCEPT when hands are visible

Control of Influenza: Vaccination

- **Seasonal influenza**: Illness and death can be lessened by annual vaccination
  - Persons targeted for annual vaccination
    - People aged 50 and older
    - Persons with chronic diseases, e.g. diabetes, lung or heart disease
    - Children 6 months to 5 years of age
    - Health care workers or family of high-risk patients
    - Pregnant women
- **Pandemic**:
  - Vaccine for a pandemic would not be available for 6 months,
  - Limited supply of vaccine/prioritization
  - Targeted groups may differ depending on disease impact. **New Prioritization**
Control of Influenza: Antivirals

- **Seasonal flu:**
  - Treatment of ill persons within 48 hours of illness.
  - Prophylaxis (preventive therapy) for high-risk persons or their contacts who are vaccinated late, not at all (allergic to vaccine), or who may not respond to vaccine (immunocompromised).
  - Control of outbreaks in nursing homes, institutions

- **Pandemic flu:** with limited supplies, current plans call for treatment only, with limited amounts for preventive therapy.

The Burden of Influenza

**Seasonal Influenza**
- Globally: 250,000 to 500,000 deaths each year
- In the United States each year:
  - 36,000 deaths
  - >200,000 hospitalizations
  - $37.5 billion in economic costs from influenza and pneumonia

**Pandemic Influenza**
- 5-10-fold, or greater, impact

Pandemics Do Happen

<table>
<thead>
<tr>
<th>Year</th>
<th>Influenza Type</th>
<th>Deaths</th>
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<tbody>
<tr>
<td>1918</td>
<td>&quot;Spanish Flu&quot;</td>
<td>500,000</td>
</tr>
<tr>
<td>1957</td>
<td>&quot;Asian Flu&quot;</td>
<td>14,000</td>
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<tr>
<td>1968</td>
<td>&quot;Hong Kong Flu&quot;</td>
<td>34,000</td>
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</tbody>
</table>
Impact of an Influenza Pandemic

- WHO and CDC believe we may be closer to another pandemic than at any time since 1968.

Moderate pandemic:
- 865,000 hospitalizations
  209,000 deaths (U.S.)

Severe pandemic:
- 9.9 million hospitalizations
  1.9 million deaths (U.S.)

Will Avian Flu Cause the Next Pandemic Flu?

- No one knows!
- The H5N1 strain of avian influenza (bird flu) is present in birds in many countries across several continents.
- Bird flu is NOT the same as pandemic flu
- It could "swap genes" with another animal virus, or with a human flu virus. This change may or may not cause the virus to spread more easily among humans.

H5N1 virus has infected domesticated birds, including chickens, migratory and wild birds in 55 countries across Asia, Europe, and Africa. It seems likely to eventually reach the U.S. There have been only a few dozen human cases so far. However, the H5N1 virus could become a human pandemic strain, it isn't that at the current time.

If a Pandemic Happens: What to Expect...

- At the peak of a moderately severe pandemic influenza outbreak (i.e. 35% attack rate, 6 weeks duration), New York State (excluding New York City) can expect:
  - 14,916 influenza-related hospital admissions per week
  - 3728 influenza-related deaths per week
  - 2,609 deaths in the hospital
  - Influenza patients will most likely utilize:
    - 63% of hospital bed capacity
    - 125% of intensive care capacity
    - 65% of hospital ventilator capacity
Planning Assumptions

- First pandemic "wave" will be 6-8 weeks in duration.
- We can expect 2 waves
- Only limited assistance will be available from other states and the federal government.
- State legal authorities will be the basis for coordinating medical practice (physicians, nurses, others) and the health care system (hospitals).
- Federal (CDC) guidance will be available to establish the standards for public health actions and assure consistency from state to state.

WHO Pandemic Phases

<table>
<thead>
<tr>
<th>Interpandemic period</th>
<th>Phase 1: No new influenza virus subtypes in human; subtype that has caused human infection may be present in animals</th>
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</thead>
<tbody>
<tr>
<td>Pandemic alert period</td>
<td>Phase 2: As above, but circulating animal subtype poses substantial risk of human disease</td>
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<tr>
<td>Pandemic period</td>
<td>Phase 3: Human infection with new subtype, no human-to-human (HTH) spread, or rare spread to close contact</td>
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<td>Phase 4: Small clusters with limited HTH transmission, highly localized spread, suggesting virus not yet well adapted to human</td>
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<td>Phase 5: Larger clusters, but HTH spread still localized, virus increasingly better adapted to humans, but not yet fully transmissible</td>
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<td>Increased and sustained transmission in general population</td>
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United States Government Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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<tbody>
<tr>
<td>0:</td>
<td>New Domestic Animal Outbreak in At-Risk Country</td>
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<tr>
<td>1:</td>
<td>Suspected Human Outbreak Overseas</td>
</tr>
<tr>
<td>2:</td>
<td>Confirmed Human Outbreak Overseas</td>
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<tr>
<td>3:</td>
<td>Widespread Human Outbreaks in Multiple Locations Overseas</td>
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<tr>
<td>4:</td>
<td>First Human Case in North America</td>
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<tr>
<td>5:</td>
<td>Spread throughout United States</td>
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<tr>
<td>6:</td>
<td>Recovery and Preparation for Subsequent Waves</td>
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</table>
Pandemic Response: Early Phase

- Pandemic cases will occur first in other parts of the world.
- Initial steps to prevent entry into the U.S.
  - May involve travel advisories, exit or entry screening
  - For first cases, may involve isolation / short-term quarantine of arriving passengers
  - Similar to measures taken in 2003 for SARS

Pandemic Influenza Doctrine: Saving Lives

- Slow spread, decrease illness and death, buy time
  - Antiviral treatment and isolation for people with illness
  - Quarantine for exposed
  - "Social distancing"
  - Vaccine when available
  - Local decisions

Pharmaceutical Interventions

- Vaccines
  - This traditionally successful public health countermeasure will not be available for approx. six months once a pandemic strain is identified.
  - Only minimal quantities can be manufactured in an initial wave – enough to cover less than 2% of the population each week.

- Antivirals
  - Using these medications for the treatment of ill persons will reduce suffering and death, but will only modestly affect community transmission.
Non-Pharmaceutical Interventions

- Infection Control
  - Respiratory hygiene/cough etiquette
  - Hand hygiene
  - Mask and respirator use
- Voluntary isolation of ill persons for 7-10 days
  - Most persons will be cared for at home (not critically ill)
  - Include antiviral treatment as appropriate
- Voluntary quarantine of household members exposed to ill persons for 7 days after last person becomes ill
- Social Distancing
  - Children, Teenagers: School
  - Adults: Workplace/Community

Infection Control Strategies

- Isolation and quarantine: reduces influenza transmission by separating infected persons from uninfected persons, and exposed persons from non-exposed persons.
- Isolation of ill persons will be valuable during all phases of pandemic influenza.
- Quarantine of those exposed to ill persons is justified when there is a limited number of cases.

Respiratory hygiene/cough etiquette and hand hygiene are effective strategies to stop the spread of germs. Voluntary isolation (stay at home) for people who are ill with flu. Use of masks. Voluntary temperature monitoring and isolation if becoming ill for contacts.

Individual and Family Preparedness

- To plan for a pandemic
  - Store a supply of food and water (3 weeks worth)
  - Have non-prescription drugs and other supplies on hand
  - Get involved in community preparations
  - What would you do if schools were closed for 2 weeks?

We must take care of ourselves and those around us.
During a pandemic, public health will maximize resources for the greatest impact on the population as a whole.
Colleges and universities should communicate with local/state public health agencies and/or emergency responders about the assets/services you could contribute to the community.

Additional Resources:
http://www.nyhealth.gov/environmentalemergency/index.htm
http://www.cdc.gov/flu/plan/about.htm
Work or School Based Infection Control Strategies

- Respiratory hygiene/cough etiquette, hand hygiene
- Stay away if ill (staff stay home, students do not go to classes)
- Encourage self-reporting of illness that develops
- Active screening for illness in staff/students
- Send staff home (with mask if ill)

Structure of the draft guidance on Prioritization of Pandemic Influenza Vaccine: Who should get vaccinations first?

- Vaccination will occur by tiers
- Target groups are defined in categories
  - Healthcare and community support services
  - Critical infrastructure
  - Homeland and national security
  - General population
- Within categories, target groups are clustered in levels
  - Each group in a level has similar priority for vaccination
- Tiers combine target groups across categories
- Target groups are defined based on pandemic severity
- [http://www.pandemicflu.gov/vaccine/prioritization.html](http://www.pandemicflu.gov/vaccine/prioritization.html)

Why prioritize pandemic vaccine?

- Everyone will be susceptible
- Current minimum of ~20 weeks to first pandemic vaccine availability
- U.S.-based production capacity currently is not sufficient to make vaccine rapidly for the entire population
- Targeting groups for earlier or later vaccination will best support pandemic response goals to reduce health, societal, and economic impacts
### Initiatives to increase pandemic influenza vaccine availability

"Preparedness now decreases the need for allocation decisions later" Kathy Kilbow, MDiv, Emory Univ.

- HHS has invested over $1 billion to:
  - Increase vaccine production capacity
  - Develop and license new vaccine production technologies (e.g., cell culture, recombinants) that will increase surge capacity and reduce time to availability
  - Evaluate adjuvanted vaccine formulations

### Unclear timing and supply of vaccine for the first pandemic wave

- Unclear timing of pandemic spread
  - Mathematical modeling predicts <55 days to first U.S. case and 80-120 days from first case to peak of first wave
  - Substantial uncertainty
    - Wide range around point estimates
    - Unknown when a pandemic will start
    - Potential impact of seasonality
- Unclear vaccine supply
  - Depends on U.S.-based capacity when a pandemic occurs
  - Depends on antigen concentration per dose
  - For H1N1 vaccines, antigen concentration in clinical trials ranged depending on formulation

### Ethics Considerations by the Interagency Working Group

- Participation by NIH ethicist and ethicists from MN Center for Healthcare Ethics
- Process issues
  - Transparency, inclusiveness, reasonableness
  - Content issues
    - Preserving society considered before protecting individuals
    - Fairness - value all equally; treat all in a priority group the same
    - Reciprocity - protect those who assume occupational risk
    - Flexibility - reconsider strategy periodically and at the time of a pandemic
Decision analysis

- **Methods**
  - 57 groups considered defined by job, age, and health status
  - Interagency group rated extent to which each group met occupationally related objectives
  - CDC and external influenza experts rated extent to which each group met "science based" objectives
  - Vaccine effectiveness, risk of severe illness and death, and likelihood to transmit infection
  - Weights applied based on public and stakeholder values
  - Highest ranked groups included public health responders, HCWs, EMS providers, law enforcement, and children

<table>
<thead>
<tr>
<th>Category</th>
<th>Method</th>
<th>Group</th>
<th>Score</th>
<th>Weight</th>
<th>Objective 1</th>
<th>Objective 2</th>
<th>Objective 3</th>
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<tbody>
<tr>
<td>Target groups for pandemic vaccination by pandemic severity</td>
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Emergency management is a continual process that includes four phases: Mitigation/Prevention, Preparedness, Response, and Recovery. All four phases of emergency management are interconnected.

Emergency management and crisis planning should take an all-hazard approach.

Emergency management efforts must be conducted in partnership with public health, mental health, law enforcement, public safety, and local government.
Prevention/Mitigation:
- Prevention is taking action to decrease the likelihood that an emergency will occur.
- Mitigation: Mitigation is taking action to eliminate or reduce the loss of life and property related to an event(s) that cannot be prevented.

Preparedness:
- Preparedness is developing policies and protocols, incident command systems, training, planning, coordination, and exercises for potential crises.

Response:
- Response is taking action to effectively contain and resolve the crisis or emergency.

Recovery:
- The recovery phase is designed to assist in the healing process & to restore operations.

Colleges & Universities Checklist
Selected Points

**Planning and Coordination**
- Contingency planning:
  - Suitability of housing for ill/exposed students
  - Research laboratories and animals
- Determine legal authority, decision makers, trigger points/thresholds for infection control/community containment measures (cancelling classes, movement restrictions, case reporting, isolation, healthcare on campus).
- Work with local health department to discuss operational plan for surge capacity for healthcare, mental health and social services to meet the needs of the college/university and community.

Source: As released by HHS on 03/21/2006
Full checklist available at: www.pandemicflu.gov
Colleges & Universities Checklist
Selected Points - 2

- **Continuity of Student Learning and Operations**
  - Develop and disseminate alternative procedures to assure continuity of instruction (e.g., web-based distance instruction, telephone trees, mailed lessons and assignments, instruction via local radio or television stations) in the event of college/university closures.
  - Develop a continuity of operations plan for maintaining essential functions including payroll; ongoing communication with employees, students and families; security; maintenance; housekeeping; and food service for student housing.

Source: As released by HHS on 03/21/2006
Full checklist available at: www.pandemicflu.gov

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Colleges & Universities Checklist
Selected Points - 3

- **Infection Control Policies and Procedures**
  - Promote infection prevention measures. Procure, store and provide infection prevention supplies (e.g., soap, alcohol based hand hygiene products, tissues and receptacles for their disposal).
  - Employees and students with known or suspected pandemic influenza should not remain on campus. Establish sick leave policies for employees (e.g., non-punitive, liberal leave) and special considerations for student absences.
  - Establish a pandemic plan for campus-based healthcare facilities (www.cdc.gov/flu/pandemic/healthprofessional.htm). Ensure critical supplies to support a surge in demand for health services have been identified and are on hand.
  - Adopt CDC travel recommendations.

Source: As released by HHS on 03/21/2006
Full checklist available at: www.pandemicflu.gov

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Colleges & Universities Checklist
Selected Points - 4

- **Communications Planning**
  - Develop and test platforms (e.g., hotlines, telephone trees, dedicated websites, local radio or television) for communicating pandemic status and actions to employees, students, and families.
  - Disseminate information regarding college/university preparedness activities, pandemic influenza fundamentals, infection control, individual/family protection strategies. (Ensure language, culture and reading level appropriateness.)

Source: As released by HHS on 03/21/2006
Full checklist available at: www.pandemicflu.gov