Pandemic Flu: Non-pharmaceutical Public Health Interventions

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Pandemic Influenza Planning Challenges

- Cannot predict from where or when pandemic virus will first appear
- Cannot predict the impact
  - Populations affected
  - Severity of disease
  - Duration of the outbreak
- Primary prevention strategies (i.e., vaccine) and antiviral prophylaxis/treatment will/may be limited initially
Pandemic Influenza Planning Challenges

- Pandemic influenza is unlike other hazard events
  - Lasts weeks/months with several epidemic waves possible
  - Affects many areas concurrently
  - Affects an entire community; healthcare facilities and personnel are extensions of the larger community
  - Physical and psychological exhaustion evident
Pandemic Response Components

- Pandemic influenza disease
- Interventions to prevent disease transmission
- Antiviral treatment & prophylaxis
- Vaccination

Time

Impact
Overarching Goals

- Delay entry of a novel, pandemic virus through air- and sea ports and land border crossings of the United States
- Prevent transmission of infection in healthcare and community sectors
Community Containment

- **Individual-level measures**
  - Patient isolation and identification
  - Quarantine of contacts

- **Community-level measures**
  - Measures that affect groups of exposed or at-risk
  - Measures that affect communities
    - Snow days
    - Closure of office buildings, schools etc
Community-wide Infection Control Measures

• “Masks are not recommended as a public health control measure at this time. Nevertheless, persons may also choose to wear a mask as part of individual protection strategies that include cough etiquette and avoiding public gatherings. Mask use may be most important for persons who are at risk for complications, those who cannot avoid close contact with others or must travel for essential reasons such as seeking medical care”
Community-wide Infection Control Measures

- Respiratory hygiene/cough etiquette
  - Cover nose/mouth when coughing or sneezing
  - Use tissues to contain respiratory secretions
  - Perform hand hygiene
IMPORTANT NOTICE TO ALL PATIENTS

Please tell staff immediately if you have flu symptoms

Flu symptoms include fever, headache, tiredness, dry cough, sore throat, nasal congestion and body aches.

1. Cover Your Cough and Sneeze
   - Use a tissue to cover your mouth and nose when you cough or sneeze.
   - Drop your used tissue in a waste basket.
   - You may be asked to wear a mask if you are coughing or sneezing.

2. Clean Your Hands
   - Wash your hands with soap and warm water or clean with gels or wipes with alcohol.
   - Cleaning your hands often keeps you from spreading germs.
Key Areas for Healthcare
Facility/Organization Planning

- Surveillance
- Communications
- Education and training
- Occupational health
- Patient triage and evaluation
- Facility access

- Use of vaccines and antiviral medications
- Surge capacity
  - Supply chain and access to critical consumable/durable resources
  - Staffing
  - Mortuary issues
Pandemic Influenza Transmission: Key Assumptions

- Pandemic influenza will be spread in the same way as seasonal influenza
  - Primary – mucous membrane exposure to respiratory secretions via direct or indirect contact
  - Possible – small particle aerosols and direct and indirect contact
Droplet Precautions

For infections spread by large droplets generated by coughs, sneezes, etc. (e.g. pertussis).

- Face shield or goggles, and a surgical mask (not N-95) are worn when within 1 meter of the patient.
- Private room or room shared with patients with the same infection status.
- Patient should wear a surgical mask when outside of the patient room.
- Negative pressure room is not needed.
Airborne Isolation

For infections spread by particles <5µ that remain infectious while suspended in the air (TB).

• Negative pressure room with air exhausted outside.
• Fit tested, NIOSH certified particulate respirator (e.g. N-95 mask) for personnel inside negative pressure room.
• Patient should wear a surgical mask when outside of the patient room.
Common Principles of Infection Control for Pandemic Influenza

• Contain respiratory secretions
  – respiratory hygiene/cough etiquette

• Limit contact between infected and non-infected persons
  – Isolation/cohorting of persons with pandemic influenza
  – Limit non-essential personnel and visitor contact with patients
  – Promote spatial separation in common areas
Common Principles of Infection Control for Pandemic Influenza

• Protection of healthcare providers
  – Masks for close contact (Droplet Precautions)
  – Gloves (gowns if needed) for contact with respiratory secretions (Standard Precautions)
  – Hand hygiene (Standard Precautions)
  – Additional protection (e.g., N-95 respirators) during aerosol-generating procedures (e.g., intubation, open suctioning, bronchoscopy)
  • Negative pressure room if available
Table 1. Number of Episodes of Illness, Healthcare Utilization, and Death Associated with Moderate and Severe Pandemic Influenza Scenarios*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Moderate (1958/68-like)</th>
<th>Severe (1918-like)</th>
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</thead>
<tbody>
<tr>
<td>Illness</td>
<td>90 million (30%)</td>
<td>90 million (30%)</td>
</tr>
<tr>
<td>Outpatient medical care</td>
<td>45 million (50%)</td>
<td>45 million (50%)</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>865,000</td>
<td>9,900,000</td>
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<tr>
<td>ICU care</td>
<td>128,750</td>
<td>1,485,000</td>
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<tr>
<td>Mechanical ventilation</td>
<td>64,875</td>
<td>742,500</td>
</tr>
<tr>
<td>Deaths</td>
<td>209,000</td>
<td>1,903,000</td>
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</tbody>
</table>

* Estimates based on extrapolation from past pandemics in the United States. Note that these estimates do not include the potential impact of interventions not available during the 20th century pandemics.

Source: HHS Pandemic Influenza Plan 2005
Examples of Potential Need for Masks and N-95 Respirator

• Healthcare sector: approximately 1.5 billion surgical/procedure masks and 93 million N-95 respirators
  • Hospital (ICU, wards, emergency departments)
  • Residential facilities (staff and residents)
  • Outpatient care
  • Home health

• Public sector: approximately 1.1 billion surgical/procedure masks
  • Ill patients
  • Caretakers in patient households
  • General public (not ill)

*Extrapolated from 1918
How to address this challenge?

• Maximizing the use of existing resources
  – Educating the public
  – Educating healthcare personnel
  – Extending the usability of N-95?

• Creating new options
  – a reusable mask?
Factors to Consider

• Purpose:
  – Barrier from out → in
  – Barrier from in → out

• Comfortable breathing, easy to wear and remove

• Accommodates easily to all faces, not need to adjust frequently

• Practical approach for taking care of patient safety

• No hazard to children