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
- An ever-present threat
Pandemics Do Happen!

- **1918 Spanish Influenza (H1N1)**
- **1957 Asian Influenza (H2N2)**
- **1968 Hong Kong Influenza (H3N2)**
- **H5* (2003)**
- **H9* (1998-1999)**
- **H7* (1980)**
- **Avian Flu (2003-2006)**
H5N1 Influenza Severe Pneumonia - Vietnam 2004

Planning Assumptions: Health Care

- 50% of ill persons will seek medical care
- Hospitalization and deaths will depend on the virulence of the virus

<table>
<thead>
<tr>
<th></th>
<th>Moderate (1957-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>
</tr>
<tr>
<td>ICU care</td>
<td>128,750</td>
<td>1,485,000</td>
</tr>
<tr>
<td>Mechanical ventilation</td>
<td>64,875</td>
<td>745,500</td>
</tr>
<tr>
<td>Deaths</td>
<td>209,000</td>
<td>1,903,000</td>
</tr>
</tbody>
</table>
Pandemic Strain Emergence: Direct Infection

Avian virus
Avian Reservoir

Direct Avian - Human Infection

Human virus

Pandemic Strain Emergence: Reassortment of Influenza A Viruses
People and Poultry
Situation Report: Avian Influenza

- Widespread and spreading prevalence in migratory birds; broad host range
- Continued outbreaks among domestic poultry
- Mammalian infection (cats, pigs, etc.) lethal
- Virus is evolving
- Sporadic human cases (>200 reports to date)
  - Most in young and healthy
  - Case-fatality >50%
  - Rare person-to-person transmission
- Sustained and rapid person-to-person transmission
HHS Pandemic Influenza Doctrine: Saving Lives

• A threat anywhere is a threat everywhere!

• Quench first outbreaks: detect and contain where it emerges, if feasible
  - International collaborations
  - Frontline detection and response; rapid laboratory diagnosis
  - Isolation / quarantine / antiviral prophylaxis / social distancing / animal culling
HHS Pandemic Influenza Doctrine: Saving Lives

• Prevent or at least delay introduction into the United States
  – May involve travel advisories, exit or entry screening
  – For first cases, may involve isolation / short-term quarantine of arriving passengers
HHS Pandemic Influenza Doctrine: Saving Lives

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

- Communicate, communicate, communicate!
Our Health Protection Preparedness System
A NETWORK of Shared Responsibility!

- **Local - tribal - state - federal**
- Domestic – international
- Public – private
- Multi-sector
- Non-partisan
- Animal – human
- Health protection – homeland security – economic protection
Pandemic Vaccine: In-time domestic production of effective modern vaccine for all who need it

- Expand production of current (egg-based) vaccine
- Evaluate dose-sparing technology (adjuvants, intramuscular vs. intradermal route)
- Accelerate development of modern (non-egg) vaccines
- Target new antigens
- Working with the National Institutes of Health
  - Clade 1 H5N1 Vaccine – 40 million doses
  - Clade 2 H5N1 Vaccine – in progress
## Vaccine Production and Use: U.S Seasonal Influenza

<table>
<thead>
<tr>
<th>Year</th>
<th>Doses Produced (millions)</th>
<th>Doses Distributed (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>15.7</td>
<td>12.4</td>
</tr>
<tr>
<td>1985</td>
<td>23.1</td>
<td>20.1</td>
</tr>
<tr>
<td>1990</td>
<td>32.3</td>
<td>28.3</td>
</tr>
<tr>
<td>1995</td>
<td>71.5</td>
<td>54.9</td>
</tr>
<tr>
<td>1999</td>
<td>77.2</td>
<td>76.8</td>
</tr>
<tr>
<td>2000</td>
<td>77.9</td>
<td>70.4</td>
</tr>
<tr>
<td>2001</td>
<td>87.7</td>
<td>77.7</td>
</tr>
<tr>
<td>2002</td>
<td>95.0</td>
<td>83.0</td>
</tr>
<tr>
<td>2003</td>
<td>86.9</td>
<td>83.1</td>
</tr>
<tr>
<td>2004</td>
<td>61.0</td>
<td>56.5</td>
</tr>
<tr>
<td>2005</td>
<td>86.0</td>
<td>&gt; 80 so far</td>
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</table>
Expanding the Market for Seasonal Vaccine

- 6-23 months
- 50-64 years
- Household contacts
- Healthcare workers
- Nursing home residents
- Pregnant women
- Chronic medical condition
- ≥ 65 years
Influenza Antiviral Drugs and Medical Supplies

- **Stockpile**
  - Tamiflu: 5.1 million adult courses in SNS with 16.4 million ordered
  - Tamiflu oral suspension: 8,600 courses in SNS with 88,000 ordered
  - Relenza: 84,000 courses in SNS with 3.9 million ordered

- **Strategy**
  - Procure 81 million courses of antivirals
    - 6 million courses to be used to contain an initial U.S. outbreak
    - 75 million courses to treat 25 percent of U.S. population
  - Accelerate development of promising new antiviral drugs
State and Local Pandemic Influenza Planning Checklist

- Community Leadership and Networking
- Surveillance
- Health System Partnerships
- Infection Control and Clinical Care
- Vaccine Distribution and Use
- Antiviral Drug Distribution and Use
- Community Disease Control and Prevention
- Communications
- Workforce Support
Pandemic Influenza Checklists

- State and Local
- Business
- Preschool
- Schools (K-12)
- Colleges & Universities
- Faith-based & Community Organizations
- Physician Offices and Ambulatory Care
- Home Health
- Emergency Medical Services
- Travel Industry
- Correctional Facilities

www.pandemicflu.gov
Health Protection at the Frontline!
Influenza Preparedness: Return on Investment

- Saves lives during seasonal influenza outbreaks
  - Modern seasonal vaccine for all who need it
  - New antiviral drugs
- Protects communities from other threats
- Provides peace of mind
Complacency is the enemy of health protection!

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