Pandemic Influenza: Building a Prepared Community

Bobby Kennedy
Mecklenburg County Health Department

May 4, 2007
When people and pathogens combine...
Someone Unaware of $H_5N_1$
(Bird Flu)
How do we build a more prepared person?

- Being informed
- Planning
- Acquiring supplies
Being Informed - Flu Symptoms

Fever (> 100F)
Headache
Extreme tiredness
Dry cough
Sore throat
Runny or stuffy nose
Muscle aches
Stomach symptoms – nausea, vomiting, diarrhea

Note - Infectious 1 day prior and 5 days after onset of symptoms, children longer;
Sick 7 days
Pandemic Flu

Versus

- Avian flu
- Seasonal flu
Seasonal Versus Pandemic Flu

**Seasonal**
- 5-20% infected
- 200,000 hospitalized
- 36,000 deaths/year
- Very young and elderly at greater risk
- October - May

**Pandemic**
- 20-35% infected
- 10 million hospitalized
- 2 million deaths
- Possibly all age groups at risk
- Possibly all months
Criteria for Pandemic

- Novel (new) virus
- Virus of significant virulence
- Easily transmitted from person to person
Is the Current H5N1 (Bird Flu) Outbreak a Pandemic?

- No, not in humans
  - Human H5N1 infection from fowl is still very rare
  - Human-to-human transmission rarer

Pandemic Criteria

1. Novel Virus – Yes
2. Causes significant health impact – Yes
3. Easily transmitted from person-to-person - NO
### People and Poultry in China

<table>
<thead>
<tr>
<th></th>
<th>1968</th>
<th>2004</th>
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<tbody>
<tr>
<td>People</td>
<td>790 million</td>
<td>1.3 billion</td>
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<tr>
<td>Poultry</td>
<td>12 million</td>
<td>15 billion</td>
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Number of H<sub>5</sub>N<sub>1</sub> Outbreaks in Animals = 89 since 2003
Number of H<sub>5</sub>N<sub>1</sub> Cases = 24 since 2003

Ref. CIDRAP, U of Minn
# H5N1 on WHO Pandemic Risk Scale

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Level</th>
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<tbody>
<tr>
<td>Inter-pandemic phase</td>
<td>Low risk of human cases</td>
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<tr>
<td>New virus in animals; no human cases</td>
<td>Higher risk of human cases</td>
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<tr>
<td>Pandemic alert</td>
<td>No or very limited human-to-human transmission</td>
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<tr>
<td>Virus causes human cases</td>
<td>Evidence of increased human-to-human transmission</td>
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<tr>
<td>Pandemic</td>
<td>Evidence of significant human-to-human transmission</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Efficient &amp; sustained human-to-human transmission</td>
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# Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO

**11 April 2007**

<table>
<thead>
<tr>
<th>Country</th>
<th>2003 cases</th>
<th>2003 deaths</th>
<th>2004 cases</th>
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<th>2006 deaths</th>
<th>2007 cases</th>
<th>2007 deaths</th>
<th>Total cases</th>
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<td>4</td>
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<td>2</td>
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<td>0</td>
<td>8</td>
<td>5</td>
<td>13</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>24</td>
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<td>25</td>
<td>17</td>
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<td>Turkey</td>
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<td>12</td>
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<td>0</td>
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<td>0</td>
<td>12</td>
<td>4</td>
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<tr>
<td>Viet Nam</td>
<td>3</td>
<td>3</td>
<td>29</td>
<td>20</td>
<td>51</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>93</td>
<td>42</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
<td><strong>4</strong></td>
<td><strong>46</strong></td>
<td><strong>32</strong></td>
<td><strong>98</strong></td>
<td><strong>43</strong></td>
<td><strong>115</strong></td>
<td><strong>79</strong></td>
<td><strong>28</strong></td>
<td><strong>14</strong></td>
<td><strong>291</strong></td>
<td><strong>172</strong></td>
</tr>
</tbody>
</table>

- Total number of cases includes number of deaths.
- WHO reports only laboratory-confirmed cases.
- All dates refer to onset of illness.
Primary Risk Factor for Human H5N1 Cases
Why the Concern?

Pandemics in the Past 300 Years

- Range: 10 to 49 years between pandemics. Average: 24 years
- 1732-33
- 1781-82
- 1800-02
- 1830-33
- 1847-48
- 1857-58
- 1889-90
- 1918-19
- 1957-58
- 1968-69
Why the Concern?

- Many Errors in Replication of Influenza A Virus Genetic Material
Why the Concern?

- If large enough mutation, no one will be immune
- Infectious before symptoms
- Influenza is very infectious
- Influenza can cause severe health effects
- An influenza can cause severe social and economic effects
Reservoirs of Influenza A Virus
The Influenza Virus Exposure Pathway

Reservoir for 16H and 9N Influenza Viruses

High/Low Path Avian Influenza

Reassortment or Key Mutation Pandemic

Reassortment Pandemic

“One-Off” Avian Influenza Transmission to Humans

Seasonal Influenza

CIDRAP
World Bird Migration Patterns — World Health Organization
Charlotte-Douglas Int. Airport

- 2006 –
  - 18th ranked airport for passengers in nation
  - 29,693,949 assengers

**AIRPORT IS NATION'S FASTEST GROWING**

- Fueled by cutbacks at other hubs and growth in local passenger traffic, Charlotte/Douglas International Airport has become the fastest-growing major airport in the country.

- As recently as a year ago, passenger traffic was stagnant as US Airways, Charlotte’s dominant carrier, had reduced flights after its merger with America West. But now US Airways and other airlines are growing rapidly, and the airport handled 9,300 additional passengers a day on average in the past six months....

*Published on 2007-04-18, Page 1A, Charlotte Observer, The (NC) STEVE HARRISON, SHARRISON@CHARLOTTEOBSERVER.COM*
## Pandemic Influenza Scenarios

### US Dept of HHS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Moderate (1958/68-like)</th>
<th>Severe (1918-like)</th>
</tr>
</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>64,975</td>
<td>742,500</td>
</tr>
<tr>
<td>Deaths</td>
<td>209,000</td>
<td>1,903,000</td>
</tr>
</tbody>
</table>
Pandemic Severity Index
(Centers for Disease Control, 2/07)

Figure A. Pandemic Severity Index

Case Fatality Ratio vs. Projected Number of Deaths*
US Population, 2006

- Category 5: ≥ 2.0%, ≥ 1,800,000
- Category 4: 1.0 < 2.0%, 900,000 < 1,800,000
- Category 3: 0.5 < 1.0%, 450,000 < 900,000
- Category 2: 0.1 < 0.5%, 90,000 < 450,000
- Category 1: < 0.1%, < 90,000

*Assumes 30% illness rate and unmitigated pandemic without interventions.
Potential Impact in Mecklenburg County

- Number Sick in Mecklenburg County Eight Week Period
  - Up to 280,000 sick
  - Up to 27,000 hospitalized
  - Up to 6,000 dead
There are drugs for flu, right?

6-8 Months to manufacture vaccine

Currently produce 350 million doses globally

Insufficient amount to treat/prophylax everyone

No guarantee will work on future virus
Additional Concerns

- Wide spread
- Long duration
- The number of ill
  - Many infected at same time
  - Shortage of goods and services
- Hospitals filled to capacity
  - Shortage of medical supplies, hospital staff and beds
- 30-50% worker absenteeism
Approximate beginning of the epidemic, 1918

Source: America’s Forgotten Pandemic - The Influenza of 1918 - 1919
Long Duration

Three pandemic waves: weekly combined influenza and pneumonia mortality, United Kingdom, 1918–1919

Source: CDC Emerging Infectious Diseases; Vol. 12, No. 1, January 2006
Link: http://www.cdc.gov/ncidod/EID/vol12no01/05-0979.htm
Potential Service Shortages

- Medical care
- Hospitals
- Nursing homes
- Day care
- Transportation
- Communications
- Schools
- Banks
- Stores
- Restaurants
- Utilities
- Police
- Fire and EMS
- Agriculture
Shortages of Goods: Global Economy – Just in Time Supply Chain
What’s being done/planned for?

- Governments global, national, state/local
  - Surveillance (animal/human)
  - Disease investigation
  - Quick treatment for ill
  - Isolation/Quarantine
  - Communication
  - Biosecurity
  - Education
  - Stockpiling
  - Handling deceased
  - Increasing capacity of vaccine/antiviral production
  - Research – virus, intervention measures
  - Collaboration
  - Compensation for animal losses
  - Increasing laboratory capacity
NC Influenza Surveillance

INFLUENZA SURVEILLANCE, NC 2006-2007

Influenza-Like Illness in Sentinel Site Patients (Solid Line)

Comparative prior years, Dashed Lines

-- Data available as of 05 April, 2007 --
Non-Pharmaceutical Interventions

- Do not involve drugs

- Strategies:
  - Limit person-to-person contact
  - Limit the transmission of virus
Community-Based Interventions

1. Delay disease transmission and outbreak peak
2. Decompress peak burden on healthcare infrastructure
3. Diminish overall cases and health impacts

Pandemic outbreak:
No intervention

Pandemic outbreak:
With intervention

Days since First Case

Daily Cases
If Virus is being Transmitted Easily among Humans
Influenza Virus Transmitted among Humans
1918 Death Rates: Philadelphia v St. Louis

Deaths Rates / 100,000 Population

(Annual Basis)

Date

Philadelphia
St. Louis

Non-Pharmaceutical Interventions

What Would Monk Do?
Limit Personal Contact

- Limit travel, outings, visitors
- Isolate, care for, monitor ill people
- Monitor and/or quarantine contacts of ill
- Avoid crowds/confined spaces
- Social distancing – cancel large gatherings, schools, daycares
- Adjust leave policy, make sick leave more liberal
- Advise sick to stay at home
- Adjust work shifts so fewer people are in building/room at same time
- Telecommute/Work from home
- Maintain a healthy lifestyle
Isolation and Quarantine

Isolation of Sick

Quarantine of Exposed

BIRD FLU QUARANTINE!
Trick-or-Treat at your own risk!!!
- Separation or restriction of movement of select person(s)
- For people exposed but not ill
- Home, institutional, or other forms (“work quarantine”)
- Voluntary vs. compulsory
How is Influenza Virus Transmitted?
Infection Control –

- Respiratory etiquette
- Screening – look for symptoms
- Throw soiled tissues in trash
- Protective Personal Equipment
- Hand washing
- Avoid touching surfaces
- Avoid shaking hands
- Avoid touching nose, mouth, eyes
- Disinfect environmental surfaces
- Wear masks around ill persons
- Mask the ill
- Self-monitor health – recognize symptoms, daily temperatures, assessment
- Look for and avoid sick people when congregating
- Post signs/posters
  http://www.cdc.gov/flu/protect/covercough.htm
- Don’t share items
- Education
Practice Good Hand Washing

- After coughing, sneezing, or blowing your nose
- Before and after helping a sick person
- Before and after food preparation
- Before serving or eating food
- After using the restroom
- After changing diapers
- After touching animals
- After cleaning the bathroom or handling trash
To Wash Your Hands Well:

- Wet hands with warm water
- Lather with soap and scrub all surfaces for 15-20 seconds.
- Rinse thoroughly and dry with clean towel.
- Use paper towel to turn off faucet and open door.
- Alcohol-based rubs may be used if hands are not soiled.
Practice Cough and Sneezing Protection

When coughing or sneezing:
- Move and/or turn away from others.
- Cover your mouth and nose with a tissue or paper towel and then throw it away.
- If you do not have a tissue, use the crook of your elbow or your sleeve; do not use your hand.
- After coughing or sneezing, always wash your hands with soap and warm water.
Sneeze onto Sleeve Technique
Individual and Family Preparedness is Crucial!

- We might have to take care of ourselves and those around us
- Would you be ready?
Home Care

- Isolate sick
- Liquids
- Rest
- Monitor symptoms
- Aspirin/acetaminophen
- Provide comfort/care for ill and their family members
- Infection control
Cleaning and Disinfecting

Prevent spreading germs:

- Disinfect countertops, sinks, doorknobs, tables and telephones on a regular basis.
- Never share personal items, such as toothbrushes, drinking cups, and cosmetics.
- Over 5,000 antimicrobial products registered w/ EPA

MO State HD
Wear gloves and a gown when directly handling soiled items
Do not shake soiled items, limit handling
Place clothes/linen directly in laundry bag in patient’s room
Wear gloves when carrying bag
Wash hands after removing gloves
Wash and dry items
Dishes and Eating Utensils

- Wear gloves when handling and transporting patients, trays, dishes, and utensils
- Wash reusable dishes and utensils in dishwasher or sink – HOT Water
- Disposable items should be discarded with general waste
Environmental Cleaning

- Wear gloves
- Keep areas around patient free of unnecessary items
- Use anti-microbial disinfecting solution
- Attention to frequently touched surfaces (tv remote, telephone, light switch, doorknobs)
- Clean and disinfect spills of blood or bodily fluids
- No special treatment for curtains, ceilings, or walls unless soiled
Personal Protective Equipment (PPE)
Are you ready to start building?
Sources Planning Building Materials

- www.pandemicflu.gov
- http://www.ready.gov/
- http://www.redcross.org/services/prepare/0,1082,0_239_,00.html
- http://www.fema.gov/areyouready/emergency_planning.shtm
Planning:
What do **YOU** need?

MASLOW'S HIERARCHY OF NEEDS:

- **PHYSICAL**
  (the need for air, water, food, exercise, rest, freedom from diseases and disabilities)

- **SECURITY**
  (the need for safety, shelter, stability)

- **SOCIAL**
  (the need for being loved, belonging, inclusion)

- **EGO**
  (the need for self-esteem, power, recognition, prestige). These needs are met through achievement, recognition, promotions and bonuses.

- **SELF-Actualization**
  (the need for development, creativity). These needs are met through autonomy and achievement.
Planning Considerations for Pandemic:

- Duration
- Lack of Services
- Lack of Goods
- Home Health Care
- Credible Information Sources
- Impact of Social Distancing (closures, lack of services)
- Transportation
- Pets
- Your Medical Needs
- Personal Protective Equipment (PPE)
- Needs of those close to you
Creating a Plan

- Know how to reach your family members if someone gets sick
- Determine care needs for family members
- Be sure you consider:
  - If you have a child in school or day care
  - What to do about your job
  - If you have special needs or care for someone who does
  - Plan for societal changes and different ways to meet ends.

- Business Owners - Continuity of Operations
  - How are you going to maintain operation/services?
What should you be doing?
Prepare your family

- Teach your children and model the behavior:
  - To wash hands frequently with soap and water
  - To cover coughs and sneezes with tissues
  - To stay away from others as much as possible if they are sick
  - To stay home from work and school if sick.
Be Active in Preparing Your Neighborhood and Community

- Continue learning about pandemic flu.
- Be a leader in your neighborhood in making plans.
- Talk to neighbors who may need help.
- Discuss pandemic preparations at community groups.
What else can you do?

- Maintain healthy lifestyle
- Get flu shots every year
Listen for Information

Public health and other authorities will spread the word of an oncoming flu pandemic through your local media. You will receive important information on:

- actions to take to protect yourself from the disease
- the flu in your area
- services available to you
- symptoms to look out for, and what to do if these symptoms appear
Supplies

- Have at least a **2-week** supply of basic items.
- Include a variety of supplies that will help you survive at home with little or no outside help.
- A wave of influenza may run as long as 6 to 8 weeks.
Supplies

- Water – at least 1 gallon per person per day
- Canned or dried food
- Prescription medicine
- Non-aspirin pain reliever
- Thermometer
Supplies

- Household cleaning supplies
- Extra bath and hand soap
- Alcohol hand sanitizers
- Battery powered radio
- Manual can opener
- Flashlight
- Extra batteries
- First aid kit
- Medical supplies for treating sick
  - Anti-diarrheals
  - Aspirin/Acetaminophen
  - Electrolyte fluids
  - Masks
  - Gloves
  - Eye shields
If you have special needs, your supplies should include:

- A list of your medicines
- A list of allergies and other medical conditions
- Extra eyeglasses and hearing-aid batteries
- Extra wheelchair batteries or other special equipment
- A list of the brand/style and serial numbers of medical devices
If you have special needs, your supplies should include:

- Copies of medical insurance and Medicare and Medicaid cards
- A list of doctors
- A list of emergency contacts and family
- Phone numbers of close neighbors who can help
Why Pandemic Flu Preparedness?

- Building a more prepared citizen will lead to a healthier community
  - People are part of our environment
  - Infected people can spread virus
  - The influenza virus can adversely affect health

- Better individual preparedness will limit the number of infected people leading to a healthier community
Why Prepare for Pandemic Flu?
Questions?