H1N1 101

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State Health Officer
Director, Maine CDC/DHHS

August 20, 2009
Where will H1N1 be taking us?
GOALS FOR ADDRESSING H1N1:

- To limit the burden of disease
- To minimize social disruption
H1N1  101

4 Major Pandemic Public Health Functions:

- Surveillance
- Mitigation
  - Prevention
  - Early Detection
  - Isolation
  - Treatment
- Vaccination
- Communication
Shared Responsibility
H1N1 Virus

- What is the influenza virus?
- What is the novel H1N1 “swine flu” virus?
- What are the types of influenza viruses?
- What is the meaning of the “H” and the “N” in the name of Influenza A viruses?
- What other animals are commonly infected by influenza viruses? Dogs? Cats?
- How do influenza viruses change over time?
The Two Mechanisms Whereby Pandemic Influenza Originates

<table>
<thead>
<tr>
<th>1918 “Spanish influenza”</th>
<th>1957 “Asian influenza”</th>
<th>1968 “Hong Kong influenza”</th>
<th>Next pandemic influenza</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1N1 influenza virus</strong></td>
<td><strong>H2N2 influenza virus</strong></td>
<td><strong>H3N2 influenza virus</strong></td>
<td><strong>Avian virus</strong></td>
</tr>
<tr>
<td>Bird-to-human transmission of H1N1 virus</td>
<td>Reassortment</td>
<td>Reassortment</td>
<td>or</td>
</tr>
<tr>
<td>Hemagglutinin</td>
<td>Neuraminidase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All 8 genetic segments thought to have originated from avian influenza virus</td>
<td>3 new genetic segments from avian influenza virus introduced (HA, NA, PB1); contained 5 RNA segments from 1918</td>
<td>2 new genetic segments from avian influenza virus introduced (HA, PB1); contained 5 RNA segments from 1918</td>
<td></td>
</tr>
</tbody>
</table>
The A/H1N1 virus

An unusual cocktail of avian, swine and human viruses

**Transmission**

Bird flu

Swine flu

Pigs may harbour several flu viruses simultaneously. The pathogens may mix to create a new viral strain

Human flu

**Symptoms**

Pig to human

By inhaling viral particles (there is no risk from eating cooked pork)

Human to human

By inhaling viral particles

High fever

Coughing, sneezing

Breathing difficulties

Loss of appetite
H1N1 101

- SURVEILLANCE
- Mitigation
  - Prevention
  - Early Detection
  - Isolation
  - Treatment
- Vaccination
- Communication
Pandemic is a public and private sector problem; the solutions are also public and private

I do!
What is disease surveillance as it applies to influenza?

What is surveillance NOT?

What data sources does influenza surveillance rely on?

Pandemic vs Epidemic vs Endemic
“Endemic” vs. “Epidemic

# of cases of a disease

Time

“Endemic”

“Epidemic”
World Health Organization
Pandemic Influenza Phases

Phases 1-3
- Predominantly Animal Infections; Few Human Infections

Phase 4
- Sustained Human-to-Human Transmission

Phases 5-6 / Pandemic
- Widespread Human Infection

Post Peak
- Possibility of Recurrent Events

Post Pandemic
- Disease Activity at Seasonal Levels
What has novel H1N1 surveillance shown us?

**MMWR**

Swine Influenza A (H1N1) Infection in Two Children — Southern California, March–April 2009

On April 21, this report was posted as an MMWR Early Release on the MMWR website (http://www.cdc.gov/mmwr).

- March 2009
  - 2 cases of febrile respiratory illness in children in late March
  - No common exposures, no pig contact
  - Uneventful recovery
  - Residents of adjacent counties in southern California
  - Tested because part of enhanced influenza surveillance
New Human influenza A (H1N1)
Number of laboratory confirmed cases and deaths

Status as of 3 May 2009
08:00 CET

Total:
787 cases
20 deaths

As reported by National Focal Points

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Map produced: 3 May 2009 12:07 CET

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization
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H1N1 Transmission

**Worldwide**
- April: 2 countries
- August: >200 countries

**US**
- Early April: 2 cases
- August: >1 million cases
  - Hospitalizations = 7,511
  - Deaths = 477
Influenza Disease

- **Spread**
  - Aerosolized droplets from coughing or sneezing up to a 6 foot radius
  - Hand to face contact (nose, eyes, or mouth) after touching infected areas
  - Virus infectious only up to 2-8 hrs on surfaces

- **Incubation period**
  - 1 to 7 days (avg H1N1 3-4 days)

- **Symptom duration**
  - 3 to 7 days but up to 14 days (avg H1N1 3-5 days)

- **Contagious**
  - 1 day before symptoms to 10 days after symptoms
  - peak period while febrile
Influenza Like Illness (ILI)

- **Symptoms to meet criteria for ILI:**
  - Fever plus sore throat or cough

- **Other common symptoms**
  - Headache
  - Muscle & joint aches
  - Nausea, vomiting, or diarrhea
  - Fatigue
  - Pneumonia
  - Shortness of breath
Symptoms of Swine flu

Systemic:
- Fever

Psychological:
- Lethargy
- Lack of appetite

Nasopharynx:
- Runny nose
- Sore throat

Respiratory:
- Coughing

Intestinal:
- Diarrhea

Gastric:
- Nausea
- Vomiting
Clinical Characteristics of H1N1
US CDC Data

- Fever*: 93%
- Cough: 83%
- SOB: 54%
- Fatigue/weakness: 40%
- Chills: 37%
- Myalgia: 36%
- Rhinorrhea: 36%
- Sore throat: 31%
- Headache: 31%
- Vomiting: 29%
- Wheezing: 24%
- Diarrhea: 24%
H1N1 Age Distribution

*Excludes 6,741 cases with missing ages

Rate/100,000 by Single Year Age Groups: Denominator Source: 2008 Census Estimates, U.S. Census Bureau
Hospitalization Rates

*Hospitalizations with unknown ages are not included (n = 273)
Rate/100,000 by Single Year Age Groups: Denominator Source: 2008 Census Estimates, U.S. Census Bureau

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Rate/100,000</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4 Yrs.</td>
<td>4.5</td>
<td>953</td>
</tr>
<tr>
<td>5-24 Yrs.</td>
<td>2.1</td>
<td>1,718</td>
</tr>
<tr>
<td>25-49 Yrs.</td>
<td>1.1</td>
<td>1,184</td>
</tr>
<tr>
<td>50-64 Yrs.</td>
<td>1.2</td>
<td>658</td>
</tr>
<tr>
<td>≥65 Yrs.</td>
<td>1.7</td>
<td>225</td>
</tr>
</tbody>
</table>
Death Rates
H1N1 U.S. Deaths, By Age Group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Mortalities</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4 Yrs.</td>
<td>7</td>
<td>2%</td>
</tr>
<tr>
<td>5-24 Yrs.</td>
<td>48</td>
<td>16%</td>
</tr>
<tr>
<td>25-49 Yrs.</td>
<td>124</td>
<td>41%</td>
</tr>
<tr>
<td>50-64 Yrs.</td>
<td>71</td>
<td>24%</td>
</tr>
<tr>
<td>≥ 65 Yrs.</td>
<td>26</td>
<td>9%</td>
</tr>
<tr>
<td>Unknown</td>
<td>26</td>
<td>9%</td>
</tr>
</tbody>
</table>
H1N1 Flu vs Seasonal Flu

H1N1 Flu
Median age for cases = 12 yo
Hospitalizations = 20 yo
Deaths = 37 yo

Seasonal Flu
2/3 of hospitalizations >65 yo
>90% of deaths in those >65 yo
Main Underlying Conditions for H1N1 Hospitalizations & Death

- Pregnancy
- Respiratory (Asthma, COPD, etc)
- Cardiovascular disease
- Diabetes
- Compromised immune system
- Neuromuscular disorders
H1N1 in Maine

- 354 confirmed cases
  - 200 in Maine residents
  - 154 in out of state residents
- 19 Hospitalizations
- 1 Death
H1N1 101 in Maine

- Number of Cases
  - <5: 12
  - 5 to 24: 108
  - 25 to 49: 54
  - 50 to 64: 24
  - >65: 2
H1N1 in Maine
H1N1 Surveillance: What Can You Do?

- Maine CDC Weekly Wednesday Update
  [www.maineflu.gov](http://www.maineflu.gov)

- H1N1 In-Depth Breakout – Health Care Providers

- Community Response Breakout – Local Health Officers, Schools, and Emergency Management
H1N1 101

- Surveillance
- **MITIGATION**
  - Prevention
  - Early Detection
  - Isolation
  - Treatment
- Vaccination
- Communication
Hope for the best and...
...prepare for the worst
Figure 1. Goals of Community Mitigation

1. Delay outbreak peak
2. Decompress peak burden on hospitals / infrastructure
3. Diminish overall cases and health impacts
H1N1 101 Mitigation

PREVENTION

- How long can influenza virus remain viable on objects (such as books and doorknobs)?

- What kills influenza virus?

- What surfaces are most likely to be sources of contamination?

- What are some prevention steps we can use at work, home, and at school?
Are you the office sprinkler?

Try a tissue or sneeze into your arm.

www.TalkToTheFifthGuy.com
Tissue, Please

If you cough
Or if you sneeze
Cover your mouth
With a tissue, please
If no tissue
Is in site
Use your sleeve
It is polite!

http://www.coughsafe.com/
Maine’s own Dr. Ben Lounsbury

Cover it!

www.cdc.gov/h1n1flu »
Coughs and Sneezes Spread Diseases
As Dangerous as Poison Gas Shells
SPREAD OF SPANISH INFLUENZA MENACES OUR WAR PRODUCTION
U. S. Public Health Service Begins Nation-wide Health Campaign.
"We've considered every potential risk, except the risks of avoiding all risks."
H1N1 101 Mitigation

EARLY DETECTION

What are some early detection strategies we can implement in our community?

- Active - testing or prompting
- Passive – reminders
- Context
H1N1 101 Mitigation

ISOLATION

- Isolation vs Quarantine
- What are the new CDC recommendations for isolation?
  - 24 hours symptom free
  - 7 days in high-risk settings (hospitals, infant day care)
Should I consider wearing a mask?

- If I have ILI and must go near others (breastfeeding, doctor’s office visits, etc.)
- If I am high-risk and must be in a crowded setting or caring for someone with ILI
Masks and PPE

For details of health care and non-health care settings see:

- [http://www.cdc.gov/h1n1flu/masks.htm](http://www.cdc.gov/h1n1flu/masks.htm)

- H1N1 In-Depth Breakout will have more info
School Mitigation

If H1N1 severity is same as Spring, 2009:

- Stay home when sick
- Quickly separate ill staff and students
- Emphasize respiratory hygiene
- Routine cleaning
- Early treatment of high-risk who are ill
- Consider selective school dismissal
School Mitigation

If H1N1 severity increases:

- Active screening for fever
- High-risk students and staff stay home
- Those with ill household member stay home
- Increased social distancing
- Extend isolation period to >7 days
- Consider school dismissal – reactive vs preemptive
H1N1 101 Mitigation

TREATMENT

- What should I do if I get sick?
- If someone in my household has novel H1N1 flu, should I go to work?
- What medicines are there to treat novel H1N1 infection?
<table>
<thead>
<tr>
<th>Antiviral</th>
<th>Seasonal A (H1N1)</th>
<th>Seasonal A (H3N2)</th>
<th>Seasonal B</th>
<th>Pandemic H1N1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adamantanes</td>
<td>Susceptible</td>
<td>Resistant</td>
<td>No activity</td>
<td>Resistant</td>
</tr>
<tr>
<td>Oseltamivir</td>
<td>Resistant</td>
<td>Susceptible</td>
<td>Susceptible</td>
<td>Susceptible</td>
</tr>
<tr>
<td>Zanamivir</td>
<td>Susceptible</td>
<td>Susceptible</td>
<td>Susceptible</td>
<td>Susceptible</td>
</tr>
</tbody>
</table>
H1N1 101

- Surveillance
- Mitigation
  - Prevention
  - Early Detection
  - Isolation
  - Treatment
- VACCINATION
- Communication
Promote vigilance and preparation
Influenza Vaccine 2009-2010

- **Seasonal flu vaccine**
  - Expected in August/September
  - Will begin prior to H1N1 vaccination program
  - Usual recommendations for who should get it

- **H1N1 flu vaccine**
  - Initial supply expected in fall
  - Clinical trials currently underway
  - Likely two shots, 3-4 weeks apart
  - Given to priority groups first
Seasonal Flu Vaccine

Get it early, in August or September

People recommended for seasonal influenza vaccination during the 2009-10 season remain the same as the previous season:

- All 6 months through 18 years old
- Pregnant women
- People 50 and older
- Any age with certain chronic medical conditions
- Residents of LTC
- Health care workers
- Caregivers of people at high risk and infants <6 months
H1N1 Vaccine

Current Tier I CDC Priority Groups

- Pregnant women
- Caregivers & household contacts for infants under 6 months of age
- Children 6 months to 25 yrs of age
- Health care workers including EMS
- Adults 25 to 65 with chronic medical conditions at risk for influenza complications
H1N1 Vaccine

- **Will this vaccine be mandatory?**
  Not at this point in time

- **How will I know where to obtain one?**
  Mass media, Maine CDC website, health care providers

- **May I get the seasonal flu vaccine at the same time as the H1N1 vaccine?**
  Most likely
H1N1 Vaccine

- Will it have thimerosal?
  There will be some t-free for young children and pregnant women

- What about the clinical trials?
  Determining dosage

- Will it have an adjuvant?
  Likely not

- Will the vaccine be administered under EUA?
  Unlikely
What about the 1976 swine flu and vaccine safety concerns?

- Winter: ~230 infected in Fort Dix, NJ, Jan/Feb
- No spread
- Fall: 40 million vaccinated
- GBS associated with infections, include ILI
- GBS 1/100,000
- 1976 vaccine excess of GBS = 1/100,000
- GBS decrease since 1990
- Enhanced monitoring planned
- Must weigh risks and benefits
H1N1 Vaccine

- **What will its costs be?**
  Vaccine and supplies are free
  Administration may cost – TBD

- **Will health care providers get reimbursed for administration?**
  Most likely from major insurers

- **What about those who cannot pay?**
  Free clinics TBD
H1N1 Vaccine

- **What about vaccine supplies?**
  Needles, syringes, sharps containers, and alcohol swabs are planned to be shipped with vaccine. No gloves.

- **How much vaccine is expected to be shipped?**
  To be determined, but may likely be ~180,000 in mid-October, then ~80,000 doses per week.
H1N1 Vaccine

- How will it be distributed?
- Who will administer it?
- What settings will it be administered?
- What about active military and tribal members?
  - DOD will vaccinate active military
  - State and local need to plan with Tribes
Existing players, new model for coordination

- 8 DHHS Districts
- Strengthened Local Health Officer system
- Some core public health functions carried out by Healthy Maine Partnerships
- 8 District Coordinating Councils (DCCs)
- District Public Health Units
- Maine CDC District Public Health Liaison
H1N1 Vaccine

District H1N1 Vaccine Teams:

- Maine CDC Vaccine Coordinators (District Liaisons, Tribal Liaisons, Others) Check [www.maineflu.gov](http://www.maineflu.gov) and Wednesday Update for contact information

- Regional Resource Centers (EMMC, MMC, CMMC)

- Emergency Management
# H1N1 Vaccine

## PRIORITY GROUPS FOR H1N1 VACCINE

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td>1%</td>
<td>8,500</td>
</tr>
<tr>
<td>Caregivers of infants &lt;6 months old</td>
<td>3%</td>
<td>18,500</td>
</tr>
<tr>
<td>6 months – 24 years of age</td>
<td>64%</td>
<td>390,000</td>
</tr>
<tr>
<td>25 – 65 year olds with chronic conditions</td>
<td>25%</td>
<td>155,000</td>
</tr>
<tr>
<td>Health care workers</td>
<td>6%</td>
<td>37,000</td>
</tr>
<tr>
<td>EMS</td>
<td>1%</td>
<td>6,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>615,000</strong></td>
</tr>
<tr>
<td>Group</td>
<td>Quantity</td>
<td>Percentage</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Physicians (MDs and DOs)</td>
<td>3,800</td>
<td>15%</td>
</tr>
<tr>
<td>Nurses</td>
<td>19,000</td>
<td>74%</td>
</tr>
<tr>
<td>Physician Assistants</td>
<td>500</td>
<td>2%</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>500</td>
<td>1%</td>
</tr>
<tr>
<td>EMS vaccinators</td>
<td>2,000</td>
<td>8%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>25,500</strong></td>
<td><strong>8%</strong></td>
</tr>
</tbody>
</table>
Ballpark Figures
(Assumptions likely to change)

- 2 doses of vaccine x 615,000 priority population x 70% = 861,000 shots
  - 861,000 divided by 2,500 likely willing and able vaccinators = 350 shots per vaccinator for high priority populations

- 2 doses of vaccine x 1.3 million total population x 85% = 2.21 million shots
  - 2.21 million shots divided by 2,500 likely willing and able vaccinators = 884 shots per vaccinator for most of the population
Common Settings

- Health care settings
- Schools
- Employment settings
- Retail
- Day care, WIC, preschools
- Large scale clinics
- Homes
- Other
H1N1 101

- Surveillance
- Mitigation
  - Prevention
  - Early Detection
  - Isolation
  - Treatment
- Vaccination
- COMMUNICATION
H1N1 101 Communication

Stay Informed:

  - Wednesday Updates
  - Subscribe to Health Advisories
- Maine CDC Facebook, Twitter, My Space, Blog
- Maine CDC Conference Calls
- Call or Email Maine CDC
- US CDC  [http://www.cdc.gov/h1n1flu/](http://www.cdc.gov/h1n1flu/)
Basic Communications on H1N1

Messaging:

- What we know
- What we do not know
- What we are doing
- What you (the audience you’re communicating with) can do
Whom are you reaching and NOT reaching?

- Linguistic barriers
- Cultural barriers (youth, immigrants)
The Future? (changes likely)

- Presently it is expected that the current pandemic will affect 30% population over six month period with ~1% mortality rate.

- Most cases will be mild:
  - People will be sick at home for a week
  - High risk groups more likely to be hospitalized or die

- Vaccines available for
  - Seasonal influenza (now)
  - H1N1 (later in fall)

The Unknown???
Major Strategies

- **Prevent people from becoming ill**
  - Vaccination
  - Hand washing

- **Prevent spread between people**
  - Hand washing
  - Cover nose/mouth with arm/tissue: not with your hand
  - Stay home when you are ill until fever-free for 24 hrs

- **Treat people who are ill**
  - Mild disease: stay home, rest, fluids, acetaminophen
  - Call physician if ill or have chronic medical condition
  - No aspirin for <18 yr olds
H1N1 101

- **AM Breakouts**
  - H1N1 In Depth for medical providers
  - Community Response
  - Vaccine Refresher
  - Vaccine Clinics 101

- **Lunch**

- **PM Breakouts**
  - Tabletop exercises for each district and one for statewide
  - To plan for H1N1 Vaccine distribution and administration
Where will H1N1 be taking us?
Influenza epidemics are lived forward and understood backward.  (paraphrasing Kierkegaard)
Recent Pandemics

- **1918** Spanish flu (H1N1)
  - 5,000 deaths in Maine
  - 500,000 in U.S.
  - 40,000,000 worldwide

- **1957** Asian flu (H2N2)
  - 70,000 deaths in U.S.
  - 1-2,000,000 worldwide

- **1968** Hong Kong flu (H3N2)
  - 34,000 deaths in U.S.
  - 700,000 worldwide
### Past Pandemic Influenza Estimates for Maine

<table>
<thead>
<tr>
<th></th>
<th>Moderate (1957/1968)</th>
<th>Severe (1918)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness</td>
<td>390,000</td>
<td>390,000</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>5,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Deaths</td>
<td>1,100</td>
<td>9,100</td>
</tr>
</tbody>
</table>
Things will change; be creative and flexible
Maine CDC H1N1 Exec Team
But the cause for which we fought was higher; our thought wider...
That thought was our power

- Joshua Chamberlain