

Novel H1N1: What Community Health Professionals Need to Know

**DHHS Division of Public Health
August 2009**

OBJECTIVES:

1. Discuss current information about influenza: Seasonal and Novel H1N1.
2. Describe population-based strategies applied in local community settings to control influenza transmission in epidemic and pandemic situations.
3. Identify the contributions of registered nurses and other public health workers to effective influenza response.

Objective 1: Influenza and H1N1 Primer

- Influenza – **Seasonal** and Novel H1N1
 - Definitions
 - Historical perspective
 - Current status of H1N1 pandemic
 - Symptoms
 - Severity
 - Who is affected/at risk

Definition: What is ‘the flu’?

Answer: *An illness caused by influenza virus*

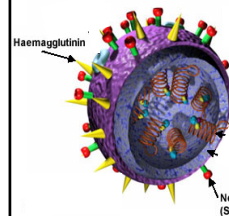
- A sudden onset respiratory illness with fever
 - Affects nose, throat, air passages, and lung
 - Yearly epidemics of seasonal influenza
 - Occurs worldwide causing significant illness and death every year
- NOT the nausea/vomiting/diarrhea that people call “the stomach flu” that only lasts 24 hours. This is most likely a gastrointestinal issue.

Are there different types of flu?

- **Answer:** Yes!
- Type A– moderate to severe illness
 - All age groups
 - Humans and other animals
- Type B– milder epidemics
 - Humans only
 - Primarily affects children
- Type C– rarely reported in humans
 - No epidemics

ABC's

H & N Protein Subtypes



- **Hemagglutinin**
 - Allows virus to stick to cells
 - 16 different types of “H”
- **Neuraminidase**
 - Helps release new virus from cells
 - 9 different types of “N”
- Current human subtypes
 - A(H1N1) NOT “novel” H1N1
 - A(H3N2)
- H and N subtypes
 - Basis for flu vaccines

How do yearly epidemics of Seasonal Influenza occur?

Answer: A process called antigenic **DRIFT**.

- Imperfect “manufacturing” of virus
 - Minor changes in same H and N
 - Partial immunity in population
 - Incomplete protection; still get sick
 - Need new flu vaccine every year

Immune System:
“Do I know you?
You look vaguely familiar!”

H3N2 $\xrightarrow{\text{Mutation}}$ **H3N2**



What are the consequences of yearly (Seasonal) epidemics in U.S.A?

- > 36,000 die and 200,000 are hospitalized
- 5 to 20% of general population infected
- Nursing home attack rates of up to 60%
- 85% of flu-related deaths in ages > 65
- Over \$10 billion lost in productivity and medical costs every year



What drives the occurrence of a pandemic?

Instead of antigenic **DRIFT** occurring, an antigenic...

SHIFT ...happens.

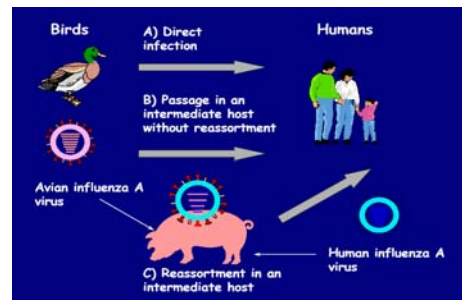
- Major change in H and/or N

H3N2 $\xrightarrow{\text{Shift}}$ **H?N?**

Immune System:
“Oh my gosh...I don't know you at all!”



How does antigenic **SHIFT** happen?



What about past flu pandemics?



Credit: US National Museum of Health and Medicine

1918: “Spanish Flu”
A(H1N1)

20-40 m deaths
675,000 US deaths

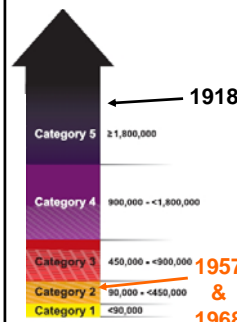
1957: “Asian Flu”
A(H2N2)

1-4 m deaths
70,000 US deaths

1968: “Hong Kong Flu”
A(H3N2)

1-4 m deaths
34,000 US deaths

What is Pandemic Severity Index?



- Based on mortality rate
- Assumes 30% attack rate
- Mortality estimates are based on not using interventions
- Not yet known for novel H1N1 strain.

What is required for a pandemic to occur?

- Novel virus to which population has little or no immunity
- Virus that is pathogenic and virulent in humans
- Virus must be capable of sustained person-to-person transmission

Novel H1N1 - the current pandemic

Initially referred to as "swine flu" or "swine-origin influenza"

- Pigs can be infected with influenza A subtypes
- New strain first recognized in humans in Mexico
- New strain has genetic characteristics of bird, swine, and human strains.
- Swine-origin influenza is NOT transmitted through the preparation or consumption of pork.

How has Novel H1N1 affected U.S. Population?

- As of current date _____
 - _____ hospitalizations
 - _____ deaths
- On July 24, 2009: CDC discontinued reporting of individual confirmed and probable cases of novel H1N1 infection
 - 43,771 confirmed and probable cases
 - Estimated level of spread measured by:
 - Sentinel physician surveillance for influenza-like illness (ILI), monitors % of doctor visits for symptoms that could be the flu.
 - CDC will continue to report hospitalizations and deaths weekly.
- Estimated >1,000,000 people became ill

Estimated Levels of Spread of Influenza

- **No Activity:** No lab-confirmed cases and no reported increase in cases of ILI.
- **Sporadic:** Small numbers of lab-confirmed cases or a single lab-confirmed outbreak has been reported, but there is no increase in cases of ILI.
- **Local:** Outbreaks or increases in ILI cases and recent lab-confirmed influenza in a single region of the state.
- **Regional:** Outbreaks or increases in ILI and recent lab-confirmed influenza in at least two but less than half the regions of the state with recent lab evidence of influenza in those regions.
- **Widespread:** Outbreaks or increases in ILI cases and recent lab-confirmed influenza in at least half the regions of the state with recent lab evidence.

Current Status of Novel H1N1 in Nebraska

- As of current date _____
 - Level of influenza activity is "Regional"
 - _____ hospitalizations
 - _____ deaths

Influenza Symptoms

Symptom	Seasonal	Novel H1N1
Sudden onset of fever >100°F	✓	✓
Body (muscle) aches	✓	✓
Headache	✓	✓
Dry cough	✓	✓
Sore throat	✓	✓
Runny nose	✓	✓
Vomiting*		✓
Diarrhea*		✓
Nausea*		✓

* Does present for Seasonal influenza in 25% of pediatric cases.

Disease Transmission

Transmission	Seasonal	H1N1
Coughing	✓	✓
Sneezing	✓	✓
Talking (within 6 feet)	✓	✓
Contaminated hands	✓	✓
Contaminated objects	✓	✓
Contagious 1 day before	✓	✓
Viral shedding for 3 – 7 days	✓	✓

When Is Influenza Spread?

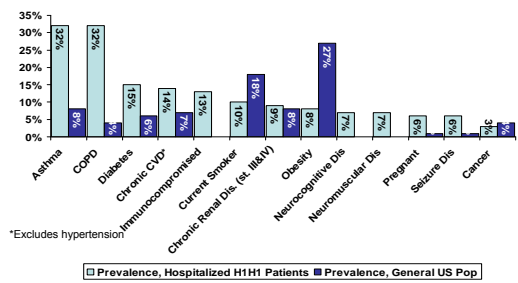
- Incubation– Typically 2 days
 - Range 1 to 4 days
- Viral shedding
 - Can begin 1 day BEFORE the onset of symptoms
 - Peak shedding first 3 days of illness
 - Correlates with fever
 - Subsides usually by 7 days
 - Can be 10+ days in children
- Safe to return to school or work
 - **CDC recommends that people with influenza-like illness remain at home until at least 24 hours after they are free of fever (100° F [37.8°C]) without the use of fever-reducing medications.**
 - Updates at <http://www.cdc.gov/h1n1flu/guidance/exclusion.htm>



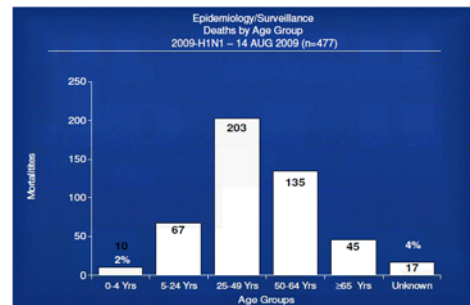
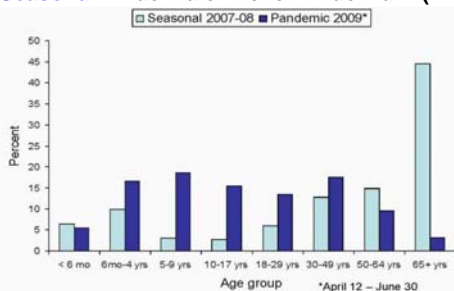
Populations Most At-Risk for Complications

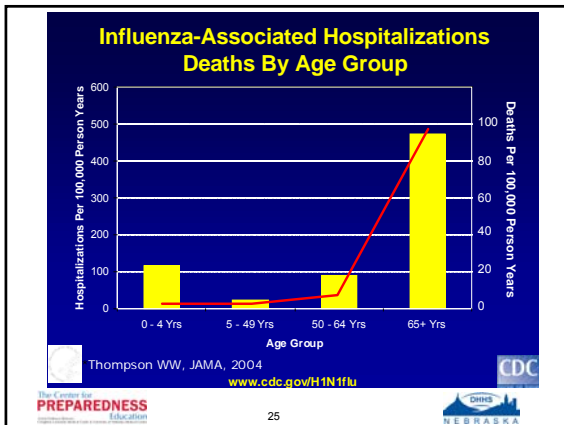
At-risk for Complications	Seasonal	H1N1
People age 65 years and older	✓	
Children less than 5 years old	✓	✓
Pregnant Women	✓	✓
People of any age with chronic conditions: Asthma, Diabetes, Heart Disease	✓	✓
People age 5 – 24 years		✓

Novel Influenza A (H1N1) Hospitalizations Reported to CDC Underlying Conditions as of 19 JUN 2009 (n=268)



Distribution by Age Group of Persons Hospitalized with Lab-Confirmed Seasonal Influenza or Novel Influenza A (H1N1)





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Objective 2: Population-based Strategies

- Describe population-based strategies applied in local community settings to control influenza
 - The role of public health – state and local
 - National recommendations
 - Community planning
 - Schools, Child care, Public gatherings
 - Health care facilities
 - Mass vaccination planning
 - Key public education messages

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DHHS Division of Public Health – Overview

- Communication
- Planning
- Surveillance
- Funding
- Non-pharmaceutical interventions (NPIs)
- Vaccination; Strategic National Stockpile

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DHHS: Communications

- CDC national conference calls
- LHD conference calls
- Health Alert Network
- Disease management group meetings
- News releases and briefings as needed
- Web site updates: www.dhhs.ne.gov/h1n1flu.

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DHHS: Planning

- Pan Flu Plan– “Evergreen” document
- Develop detailed response plans & practice
- Engagement of stakeholders and citizens
- Widespread education of providers and guidance on prioritization for vaccine and antiviral use
 - To be modified by CDC based on H1N1 epidemiology
- Enhanced surveillance
- Stockpile antivirals and vaccine
- Non-pharmaceutical Interventions (NPI)

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DHHS: Surveillance

- Sentinel providers reporting Influenza Like Illness (ILI)
- School absenteeism surveillance and school dismissal monitoring
- ELIRT – Electronic Lab Information Reporting Technology utilized by the Nebraska Public Health Laboratory
- Epi-X – The Epidemic Information Exchange
- Contacts and info sharing with other states
- Good relationships with providers
- NEDSS – National Electronic Disease Surveillance System

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DHHS: Funding

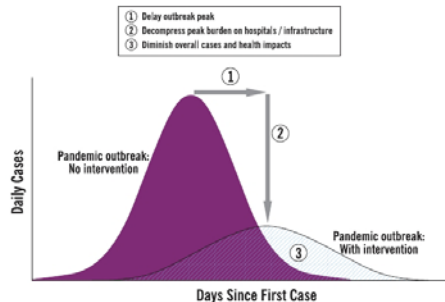
- Hospital preparedness: \$521,951.00
 - Health care worker personal protective equipment and infection control education
- Comprehensive coalition strategy for optimization of health care
 - Alternate sites capability
 - Collect and disseminate situational awareness data
 - Media strategies
- Public health preparedness
 - Planning and response: vaccination, antiviral distribution & dispensing, community mitigation: \$1,134,533.00
 - Laboratory testing, epidemiology and surveillance: \$378,178.00

Non-Pharmaceutical Interventions (NPIs)

The application of multiple, partially effective measures other than medication.

- Potential community interventions
 - Isolation (of the sick) and treatment
 - Voluntary home quarantine (of the exposed but not yet sick)
 - Dismissal of students from school activity/childcare
 - Social distancing
- Timing and intervention choice depends on Pandemic Severity Index
- In 1918, cities that instituted NPI's early had reductions in death rate compared to cities that had more delay

What are the goals of NPI's?



Vaccination for Seasonal Flu

- Latest Advisory Committee on Immunization Practices (ACIP)
 - Annual vaccination should begin as soon as the 2009-10 influenza vaccine is available.
 - Children aged 6 months – 8 years who have never received influenza vaccine should receive 2 doses – **4 weeks apart**.
- 2009-10 Seasonal vaccine contains 2-A and 1-B:
 - There is no clear evidence that immunity declines.
 - Additional doses do not increase antibody response.
 - A/Brisbane/59/2007 (H1N1)-like
 - A/Brisbane/10/2007 (H3N2)-like
 - B/Brisbane/60/2008 – like antigens

Priority Groups for Seasonal Flu Vaccination

- Children aged 6 months – 18 years
 - All children 6 months – 4 years (59 months) with underlying conditions primary focus
- All persons age 50 and older
- All persons who live with or care for persons at high risk for influenza-related complications, including contacts of children aged 6 months or less Residents of nursing homes and other long-term care facilities;

Priority Groups for Seasonal Flu Vaccination, cont.

- All persons who are at increased risk for severe complications
 - Women who will be pregnant during the flu season
 - Adults and children who have chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, neurological/neuromuscular, hematologic or metabolic disorders (including diabetes mellitus);
- Adults or children who have immunosuppression (including immunosuppression caused by medications or by HIV); and
- Residents of nursing homes and other long-term care facilities.

Vaccination Plan for Novel H1N1

- Vaccine will be available in Mid-October 2009
- The number of doses of vaccine required for immunization against novel influenza A (H1N1) has not been established
 - All individuals may receive 2 doses given at least **3 weeks apart**
 - You may not be covered by just one dose
 - You will have immunity 2 weeks after the last dose
- Simultaneous administration of inactivated vaccines against seasonal and novel influenza A (H1N1) viruses is permissible if different anatomic sites are used.
 - It will be difficult to identify source of adverse events if this is done.
- Simultaneous administration of live, attenuated vaccines against seasonal and novel influenza A (H1N1) virus is not recommended.

Initial Target Groups for Novel H1N1 Vaccination

1. Pregnant women,
2. Persons who live with or provide care for infants aged <6 months (e.g., parents, siblings, and daycare providers),
3. Health-care and emergency medical services personnel,
4. Persons aged 6 months – 24 years, and
5. Persons aged 25 – 64 who medical conditions that put them at higher risk for influenza-related complications

Subset of Target Groups *If Novel H1N1 Vaccine Supply is Limited*

1. Pregnant women,
2. Persons who live with or provide care for infants aged <6 months (e.g., parents, siblings, and daycare providers),
3. Health-care and emergency medical services personnel who have direct contact with patients or infectious material,
4. Persons aged 6 months – 4 years, and
5. Children and adolescents aged 5 – 18 years who medical conditions that put them at higher risk for influenza-related complications.

CDC RESOURCES

- Pandemic Preparedness and Response
- Care for the Ill at Home
- Clinical Topics
- Facts and Figures
- Exclusion/Return to Work or School
- Nurse Call Centers
- Schools, child care programs, and colleges and universities; public gatherings
- Vaccination

Key Public Education Messages

- ✓ Hand hygiene
- ✓ Cough etiquette
- ✓ Routine cleaning and other infection control measures
- ✓ Stay home when ill
- ✓ High risk seek early treatment
- ✓ Pregnant women are a high risk group for complications
- ✓ Get vaccinated

Objective 3: Community Health Worker Role

- Medication treatment recommendations including antiviral medications.
- Prophylaxis
- Recommendations for health care workers/facilities
- Personal precautions
- Questions and Discussion

Influenza Treatment

Antivirals that are “N” inhibitors. **Not antibiotics.**

Amantadines – Adam Ant – A only

- amantadine
- rimantadine

oseltamivir (“O” I know that one) = Tamiflu
capsules and oral liquid

zanamivir = Relenza®

- Inhaled powder – in the “Noze”

- Can lessen symptoms and speed recovery if taken in first 48 hours of symptoms.



Summary of Antiviral Resistance, U.S. 2008-09

Antiviral	Influenza viruses			
	Seasonal A (H1N1)	Seasonal A (H3N2)	Seasonal B	Pandemic H1N1
Adamantanes -amantadine -rimantadine	Susceptible	Resistant	No activity	Resistant
oseltamivir (Tamiflu®)	Resistant	Susceptible	Susceptible	Susceptible
zanamivir (Relenza®)	Susceptible	Susceptible	Susceptible	Susceptible

Antiviral Treatment Recommendations

Priority: Hospitalized Patients with suspected or confirmed pandemic H1N1 virus infection

- Treatment recommended with oseltamivir or zanamivir
- Treat patients as soon as possible (duration: 5 days)

Outpatients with suspected or confirmed pandemic H1N1 virus infection who are at high risk for complications

- Persons with chronic pulmonary, cardiac, renal, hepatic, metabolic, hematological disorders; immunosuppression, pregnant women, children <5 years; adults ≥65 years
- Treatment recommended with oseltamivir or zanamivir
- Treat patients as soon as possible (duration: 5 days)

Antiviral Chemoprophylaxis

- Post-exposure chemoprophylaxis with oseltamivir or zanamivir can be considered:
 - Close contacts of cases who are at high risk for complications of influenza
 - Health care personnel, public health workers, first responders with unprotected close contact exposure to an ill person with pandemic H1N1 virus infection while in the infectious period
 - Chemoprophylaxis: 7-10 days after last known exposure

<http://www.cdc.gov/h1n1flu/recommendations.htm>

Treatment of Symptoms

- Check ingredient labels on over-the-counter cold and flu medications to see if they contain aspirin.
- Children 5 years of age and older and teenagers with the flu can take medicines **without** aspirin, such as acetaminophen (Tylenol®) and ibuprofen (Advil®, Motrin®, Nuprin®), to relieve symptoms. **NO ASPIRIN.**
- Children younger than 4 years of age should **NOT** be given over-the-counter cold medications without first speaking with a health care provider.

What can healthcare facilities do to prepare?

Answer: Create continuity of operations plan.

- Identify staff to carry out critical functions
- Identify functions that could be suspended
- Build depth by cross-training workers
- Plan for alternative work schedules
- Explore telecommuting possibilities
- Explore role in community/health district
- Teach workers cough “etiquette” and hand hygiene (soap & water or alcohol-based hand gel)
- Use government pandemic planning checklist
 - <http://www.pandemicflu.gov/plan/>



What's on the clinic checklist?

- Written plan elements:
 - Surveillance of flu activity in patients and staff
 - Communication plan
 - PH contacts, clinic point person, contact info for other facilities, info on coordination with local or regional plans
 - Provide education for patients and staff
 - Triage and management of patients
 - Infection control plan
 - Vaccine and antiviral use plan
 - Occupational health plan
 - Sick leave, evaluation prior to shift, mental health resources
 - Surge capacity plan
 - staff develop family plan, calc min number to keep clinic open, resource needs (masks, gloves, hand hygiene [stockpiling at least a week's worth])

What about masks in a pandemic?

Answer: Masks outside a healthcare setting can be considered in some circumstances.

- Does not reduce need for other NPI's
- Facemasks considered for crowded settings (avoid if possible and minimize time)
 - Protect wearer from others' cough and protect others from wearer's cough
 - Single use
- Respirators (N95) considered when close contact with infected person is unavoidable
 - Requires fit-testing to be effective
 - Single use

For more see: <http://www.cdc.gov/h1n1flu/masks.htm>

Response Strategies for Community Health Professionals

- Personal Preparedness and Safety
- Community-level planning with good communication among partners, led by local public health.
- NIMS training
www.fema.gov/pdf/emergency/nims/NIMS_core.pdf
- Surge preparedness
- Identification, isolation, exclusion of the ill person from work, school or child care.
- Identify medically fragile and encourage early treatment for ILI.
- The Registered Nurse role in vaccination services

How can I prepare?

- Practice cough etiquette
- Wash hands or use alcohol-based hand gel often
- Keep hands away from eyes and mouth unless hands were washed
- Annual flu vaccine to prevent seasonal flu
- Pneumonia shot if in high risk group
- Avoid others if you are sick or if they are sick
- Think through your own contingency plans: school closure, additional assignments, increased social distancing.
- Individual checklist: <http://www.pandemicflu.gov/plan/>
- **DO NOT STOCKPILE TAMIFLU OR RELENZA**

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ACKNOWLEDGMENTS

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*The only thing more difficult
than planning would be
explaining why you did not
do it!*

-- Marja Esveld

Healthcare Inspectorate, The Netherlands