H1N1: Learning from the Past and Planning for the Future

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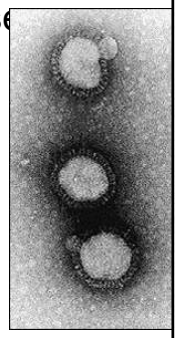
There is no commercial support.

Influenza Viruses

- Orthomyxoviridae
- Negative single-stranded, enveloped RNA viruses
- Considerable genome diversity
- Influenza A, B, and C viruses
  - Distinguished by antigenic differences between nucleocapsid and matrix proteins
  - Surface proteins for A and B viruses include hemagglutinin (HA) and neuraminidase (NA)

Influenza Disease

- Influenza A and B viruses are responsible for annual epidemics
- Influenza C usually produces milder disease and has not been associated with widespread outbreaks



Influenza Host Range

- Influenza A infects wide variety of avian species, humans, and other mammals
- Influenza B viruses infect humans (have been identified in harbor seals)
- Influenza C viruses infect humans (have been identified in swine in China)

Antigenic Drift

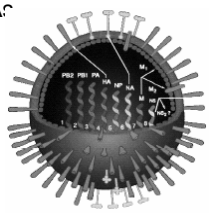
- Accumulation of amino acid changes leads to minor antigenic differences
- Results in seasonal epidemics
- Requires new influenza vaccine annually

Antigenic Shift

- Re-assortment of RNA segments between human and animal viruses
- Leads to a novel HA or NA that is immunologically distinct
- Shifts in influenza A viruses have resulted in pandemics

Influenza A Viruses

- Subtyped based on HA and NA
- Total 16 known HAs and 9 NAs
- Strains recently circulating in humans:
  - H1N1
  - H1N2
  - H3N2



Influenza A Susceptible Hosts

Pandemic Influenza

- Worldwide outbreak of a novel influenza virus
  - Influenza A only
- Occurs infrequently and at irregular intervals
- High potential for illness and death

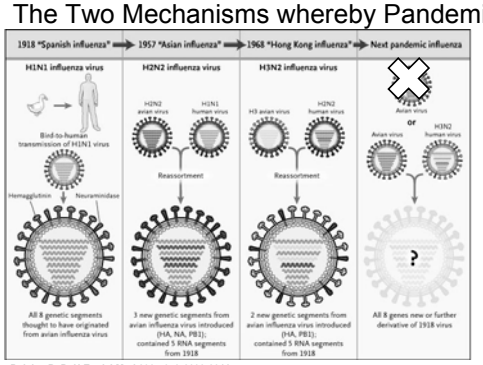
How Does a Pandemic Occur?

- 4 factors must be present
  1. Novel virus
  2. Virus capable of causing disease in humans
  3. Susceptible population
  4. Virus that is transmissible from person to person
- Current avian influenza outbreak in other parts of the world was and is ***not*** a pandemic

Influenza Pandemics in History

- **1918-1919:** "Spanish Flu" (H1N1)
  - > 500,000 US deaths
  - > 20 million deaths worldwide
- **1957-1958:** "Asian Flu" (H2N2)
  - 70,000 US deaths.
- **1968-1969:** "Hong Kong Flu" (H3N2)
  - 34,000 US deaths

The Two Mechanisms whereby Pandemic



Belshe, R. B. N Engl J Med 2005;353:2209-2211

1918 and the Pigs

- H1N1 virus derived from a possible avian source to humans--- and then soon to pigs
- 40-50 million people killed
- Herds of swine affected
- In 1930, H1N1 virus was isolated from swine
  - Also resembled 1918 human H1N1 virus
- 1930-1990s these classical swine viruses were antigenically relatively stable

Mortality and Pandemics

Mortality Associated with Influenza Pandemics and Selected Seasonal Epidemic Events, 1918–2009.*

Years	Circulating Virus (Genetic Mechanism)	Excess Deaths from Any Cause (no. per 100,000 persons/yr
1918–1919	H1N1 (viral introduction), pandemic	598.0
1928–1929	H1N1 (drift)	96.7
1934–1936	H1N1 (drift)	52.0
1947–1948	H1N1 A' (intrasubtypic reassortment)	8.9
1951–1953	H1N1 (intrasubtypic reassortment)	34.1
1957–1958	H2N2 (antigenic shift), pandemic	40.6
1968–1969	H3N2 (antigenic shift), pandemic	16.9
1972–1973	H3N2 A Port Chalmers (drift)	11.8
1975–1976	H3N2 (drift) and H1N1 ("swine flu" outbreak)	12.4
1977–1978	H3N2 (drift) and H1N1 (viral return)	21.0
1997–1999	H3N2 A Sydney (intrasubtypic reassortment) and H1N1 (drift)	49.5
2003–2004	H3N2 A Fujian (intrasubtypic reassortment) and H1N1 (drift)	17.1
2009	H3N2 and H1N1 (drift) and swine-origin H1N1 (viral introduction), pandemic	?

* Mortality data include deaths associated with all influenza A and B viruses combined. Many of these data have been calculated with the use of differing methods and may not be strictly comparable.[1,2] The 1934, 1951, and 1997 data span 2 years.

Morens DM, et al. The Persistent Legacy of the 1918 Influenza Virus. NEJM 361: 225-9, 2009

Emergence of Triple-Reassortant Viruses ~1998

- Classical swine virus + human A (H3N2) + American lineage avian influenza (?subtype)= rH3N2 swine virus
- Then, more reassortment between rH3N2 and classical swine H1N1 virus= H1N1 and H1N2 swine viruses
- Multiple swine H1N1, H1N2, and H3N2 swine viruses circulating since late 90s

Human Infections from Triple-Reassortant Viruses

- First human infection 2005
- 2005-2009: 12 H1 swine virus infections in humans reported to CDC
- 9 of 11 patients had exposure to pigs
- Illness predominantly respiratory

11 Patients with Triple-Reassortant Swine Influenza A (H1) Viruses

Table 1. Demographic and Exposure Characteristics of 11 Patients Infected with Triple-Reassortant Swine Influenza A (H1) Viruses.

Patient No.	Age	Sex	State of Residence	Date of Illness Onset	Estimated Incubation Period	Exposure*	IR Swine Present
1	17 yr	M	WI	Dec. 2005	3 days	Butchered a pig (direct contact)	Not known
2	7 yr	M	MO	Jan. 2006	Not known	Reported no contact with a pig (unknown contact)	Not known
3	4 yr	F	IA	Nov. 2006	7–10 days	Had contact with patient with suspected case of swine influenza (epidemiologically linked contact)	Yes
4	10 yr	F	OH	Aug. 2007	3–4 days	Exhibited swine at fair, handled pigs (direct contact)	Yes
5	36 yr	M	OH	Aug. 2007	3–4 days	Exhibited swine at fair, handled pigs (direct contact)	Yes
6	48 yr	F	IL	Aug. 2007	7 days	Visited fair, did not step at piggen (near vicinity)	Yes
7	16 mo	M	MI	Aug. 2007	7 days	Visited fair, came within 1 m of pigs (close proximity)	Yes
8	2 yr	M	IA	Nov. 2007	1–10 days	Lived on swine farm, came within 1 m of pigs (close proximity)	Yes
9	26 yr	F	MN	Jan. 2008	9 days	Visited live-animal market, came within 1 m of piggen (close proximity)	Not known
10	14 yr	M	TX	Oct. 2008	3 days	Visited a swine farm, brought home and handled a pig (direct contact)	Yes
11	3 yr	M	IA	Feb. 2009	1–10 days	Visited swine farm owned by his family, touched pigs (direct contact)	Yes

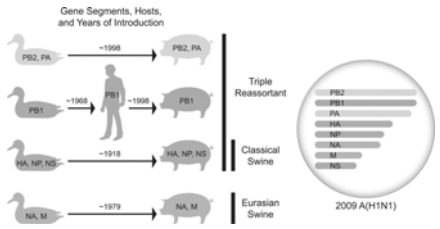
* Direct contact refers to touching or handling a pig; close proximity refers to standing within 1.83 m (6 ft) of a pig, without known direct contact; near vicinity refers to presence of pigs on the premises but not in close proximity; epidemiologically linked refers to a person who is epidemiologically linked to another person with a confirmed or suspected infection; and unknown refers to unknown contact or unavailable contact information.

Shine V et al. Triple-Reassortant Swine Influenza A (H1) in Humans in the United States, 2005-2009. NEJM 360: 2616-25, 2009

April, 2009

- New virus isolated in Mexico and the US
- Unique combination of gene segments
- 6 gene segments from the known triple reassortant virus + 2 gene segments from Eurasian influenza A swine virus lineage
- Human, avian, swine unique gene combination
- 4th generation descendent of the 1918 virus

Fig. 1 Host and lineage origins for the gene segments of the 2009 A(H1N1) virus: PB2, polymerase basic 2; PB1, polymerase basic 1; PA, polymerase acidic; HA, hemagglutinin; NP, nucleoprotein; NA, neuraminidase; M, matrix gene; NS, nonstructural gene



R. J. Garten et al., Science 325, 197 -201 (2009)

Published by AAAS

Science
AAAS

MMWR

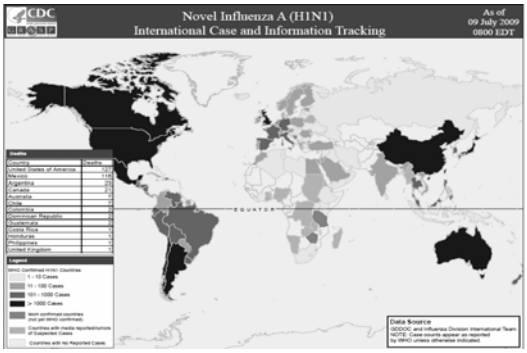
Swine Influenza A (H1N1) Infection in Two Children – Southern California, March–April 2009

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

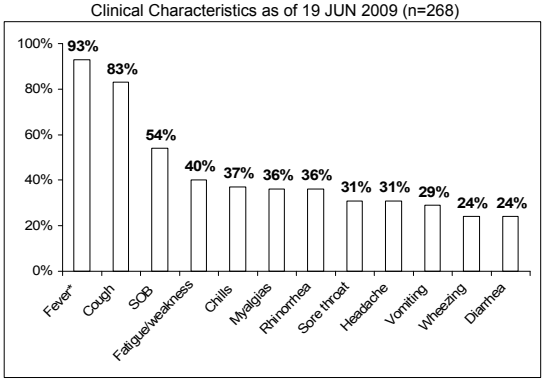
Novel Influenza A (H1N1) Detected

- **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**
- **Reported to CDC as possible Novel influenza A virus infections**
- **Swine influenza A (H1N1) virus detected on April 15th,17th at CDC**
- **Both viruses genetically identical**
  - **Contain a unique combination of gene segments previously not recognized among swine or human influenza viruses in the US**

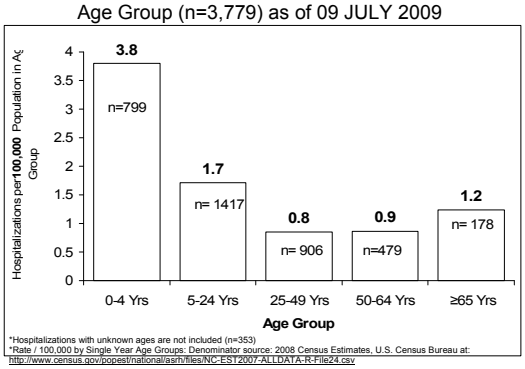
International Map
Pandemic H1N1 – 10 JUL 2009



Epidemiology/Surveillance
Pandemic H1N1 Hospitalizations Reported to CDC
Clinical Characteristics as of 19 JUN 2009 (n=268)



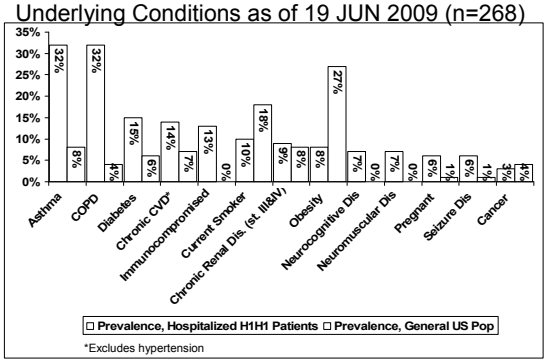
Epidemiology/Surveillance
Pandemic H1N1 Hospitalization Rate per 100,000 Population by Age Group (n=3,779) as of 09 JULY 2009



*Hospitalizations with unknown ages are not included (n=353)
*Rate / 100,000 by Single Year Age Groups: Denominator source: 2008 Census Estimates, U.S. Census Bureau at: http://www.census.gov/popest/national/asrh/files/NC-EST2007-ALLDATA-R-File24.csv

Epidemiology/Surveillance

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



*Excludes hypertension

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

	Influenza viruses			
Antiviral	**Seasonal A (H1N1)**	**Seasonal A (H3N2)**	**Seasonal B**	**Pandemic H1N1**
Adamantanes	Susceptible	**Resistant**	**No activity**	**Resistant**
Oseltamivir	**Resistant**	Susceptible	Susceptible	**Susceptible**
Zanamivir	Susceptible	Susceptible	Susceptible	**Susceptible**

CDC

Oseltamivir-resistance among Pandemic H1N1 viruses

3 oseltamivir-resistant isolates of Pandemic H1N1 detected
- 2 cases found to have resistant strain while on oseltamivir chemoprophylaxis
  - Japan and Denmark
- 1 case detected by Hong Kong Department of Health reported a resistant virus isolated from a 16 year-old girl who had a fever upon arrival at the Hong Kong International airport
  - Illness began prior to boarding the plane in San Francisco
  - No exposure to
  - No illness among close contacts
  - No sign of community transmission
- All recovered uneventfully

No change in recommendations for treatment or prophylaxis of persons with influenza

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)**

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

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

Specific Diagnosis

NO

- Rapid antigen tests are unreliable

YES

- Reverse transcriptase polymerase chain reaction (RT-PCR) will distinguish different influenza A strains

Importance of RT-PCR

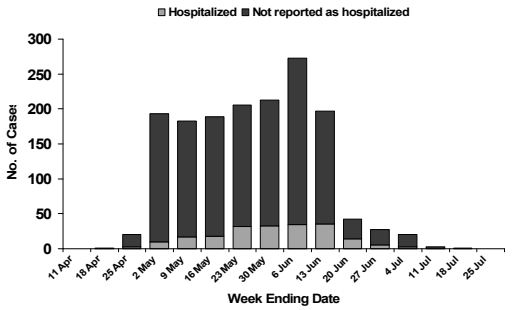
- Will be the laboratory technique used to distinguish different influenza subtypes
- May play a role in determining therapeutic options for hospitalized patients with Influenza A
- Test results within 24 hours at an experience laboratory

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

	Influenza viruses			
Antiviral	**Seasonal A (H1N1)**	**Seasonal A (H3N2)**	**Seasonal B**	**Pandemic H1N1**
Adamantanes	Susceptible	**Resistant**	**No activity**	**Resistant**
Oseltamivir	**Resistant**	Susceptible	Susceptible	**Susceptible**
Zanamivir	Susceptible	Susceptible	Susceptible	**Susceptible**

CDC

Pandemic H1N1 Cases* by Onset Date and Hospitalization Status, Chicago, April-July, 2009 (N=1568)



*Reported through July 22, 2009

Pandemic H1N1 Confirmed Cases, Chicago, April 24 – July 22

- 1,568 reported
  - 50% female
  - Median age: 12 years

Age Group (yrs)	No.	%
0 – 4	248	16
5 – 14	632	41
15 – 29	349	23
30 – 59	279	18
60+	41	2

Pandemic H1N1 Hospitalized Cases, Chicago, April 24 – July 22

- 204 reported
  - 53% female
  - Median age: 16 years

Age Group (yrs)	No.	%
0 – 4	54	27
5 – 14	47	23
15 – 29	29	14
30 – 59	57	28
60+	16	8

Hospitalized: Chronic Conditions

- Pregnant: 10
  - Out of 40 hospitalized women 15-45 yrs old
- Asthma: 36 (18%)
- Diabetes: 13 (6%)
- No reported chronic condition: 106

WHO Pandemic Phases

Inter-pandemic phase	Low risk of human cases	1
New virus in animals, no human cases	Higher risk of human cases	2
Pandemic alert	No or very limited human-to-human transmission	3
New virus causes human cases	Evidence of increased human-to-human transmission	4
	Evidence of significant human-to-human transmission	5
Pandemic	Efficient and sustained human-to-human transmission	6

Community Mitigation

- School closure
- Restricting air travel
- Cancellation of public gatherings
- Encouraging telecommuting for businesses

- **Infection control**

Infection Control

- Hand hygiene
- Cough etiquette
- General disinfection
- Ill persons stay at home until 24 hours after resolution of fever (without taking antipyretics)

Seasonal Influenza Vaccine

~~Impact of Influenza, 1990-1999~~

- Approximately 36,000 influenza-associated deaths during each influenza season
- Persons 65 years of age and older accounted for more than 90% of deaths
- Deaths of 89 children 0-18 years provisionally reported for 2008-2009
- Average of 226,000 hospitalizations during each influenza season

MMWR 2009;58(RR-8); *J Am Med Assoc* 2003;289:179-86; *J Am Med Assoc* 2004;292:1333-40

Influenza Vaccine ~~Recommendations, 2009-2010~~

- All children 6 months through 18 years
- While transitioning, focus remains on
  - All children 6 months through 59 months
  - Annual vaccination of older children with conditions that place them at increased risk for complications from influenza

MMWR 2009;58 (RR-8)

Influenza Vaccines

- Inactivated subunit (TIV)
  - intramuscular
  - trivalent
  - contains egg protein
- Live attenuated vaccine (LAIV)
  - intranasal
  - trivalent
  - contains egg protein

MMWR 2009;58 (RR-8)

Inactivated Influenza Vaccine Recommendations, 2009-2010

- Conditions that increase the risk of influenza infection or complications:
  - Age
    - 65 years and older
    - 50 through 64 years
    - 6 months through 18 years
  - Pulmonary (emphysema, asthma)
  - Cardiovascular
  - Metabolic (diabetes)
  - Renal dysfunction
  - Hemoglobinopathy
  - Immunosuppression, including HIV infection
  - Conditions that compromise respiratory function or increase the risk of aspiration

MMWR 2009;58 (RR-8)

Inactivated Influenza Vaccine Recommendations, 2009-2010

- Persons at increased risk of influenza complications
  - Residents of long term care facilities
  - Persons 6 months to 18 years of age receiving chronic aspirin therapy
  - Pregnant women
    - ACIP recommends vaccination with inactivated influenza vaccine for all women who will be pregnant during influenza season (usually December through March)

MMWR 2009;58 (RR-8)

Influenza Vaccine Recommendations, 2009-2010

- Household members of high-risk persons
- Healthcare personnel, including home care
- Employees of long-term care facilities

MMWR 2009;58 (RR-8)

Influenza Vaccine Recommendations, 2009-2010

- Immunization providers should administer influenza vaccine to any person who wishes to reduce the likelihood of becoming ill with influenza or transmitting influenza to others

MMWR 2009;58 (RR-8)

Live Attenuated Influenza Vaccine (LAIV)

- Approved only for healthy persons 2 years through 49 years of age who are not pregnant
  - healthcare personnel
  - persons in close contact with high-risk groups
  - persons who want to reduce their risk of influenza

MMWR 2009;58 (RR-8)

Timing of Influenza Vaccination

- Influenza activity can occur as early as October
- In more than 80% of influenza seasons peak activity has not occurred until January or later
- In more than 60% of seasons the peak was in February or later

MMWR 2009;58 (RR-8)

Timing of Influenza Vaccination

- Immunization providers should begin offering vaccine as soon as it becomes available
- Providers should offer vaccine during routine healthcare visits or during hospitalizations whenever vaccine is available

MMWR 2009;58 (RR-8)

Timing of Influenza Vaccination

- Continue to offer influenza vaccine in December, especially to healthcare personnel and those at high risk of complications
- Continue to vaccinate throughout influenza season (December-March)

MMWR 2009;58 (RR-8)

Vaccine Supply, 2009-10

- 120 million doses expected
  - Mid-August: 15 million doses
  - Early September: 40 million doses
  - Early November: 108 million doses
- Preservative-free and infant-toddler doses formulations included in early releases

Pandemic Influenza Activity

Current Status

- Vaccine is being manufactured
- Voluntary vaccination program likely
  - Epidemiology of H1N1 disease in the US
  - Epidemiology of H1N1 disease in countries in the southern hemisphere

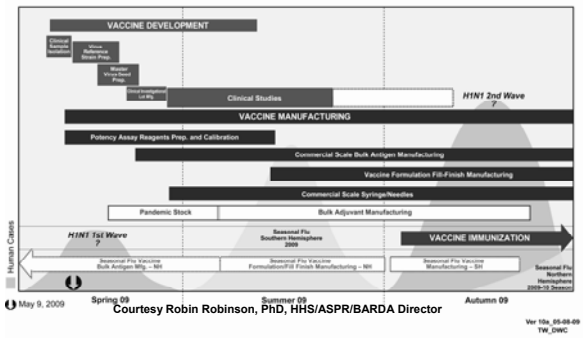
H1N1 Vaccine Plans

- National Strategy for Pandemic Influenza goal is to provide vaccine to everyone in U.S. within 6 months of pandemic onset
- Clinical studies will inform vaccine formulation and safety profile

Phases of a vaccination program

- Vaccine development
- Commercial scale manufacturing
- Distribution and administration
- Post-launch effectiveness, safety and utilization monitoring

U.S. 2009-H1N1 Vaccine Strategy



Courtesy Robin Robinson, PhD, HHS/ASPR/BARDA Director

Resolved Issues

- Production goal: 600 million doses
  - Five manufacturers
    - TIV and LAIV
    - Adjuvanted and un-adjuvanted products
    - Preservative-free products
- Public Health will coordinate vaccine distribution
- ACIP Recommendations

Pandemic H1N1 Vaccine Recommendations*, ACIP, July 2009

- Pregnant women
- Household and caregiver contacts of children younger than 6 months of age
- Health care and emergency medical services personnel
- Children and young adults ages 6 months through 24 years
- Persons aged 25 through 64 years who have medical conditions which put them at high risk for complications or death from influenza

* Unadjuvanted vaccine

Remaining Questions

- When will vaccine be available?
- How much vaccine will be available?
- How many doses will be required?
- Can seasonal and pandemic vaccines be administered at the same time?
- How will disease activity correlate with vaccine availability?
  - Healthcare resources
  - Demand for vaccine

Chicago Department of Public Health (CDPH) Plans

- Mass vaccination
- Private sector vaccination
  - Hospitals, LTCFs, primary care clinics, retail pharmacies, occupational health

Possible Scenarios and Vaccinators

	Supply ⇧ Disease Activity ⇧	Supply ⇧ Disease Activity ⇩	Supply ⇩ Disease Activity ⇧	Supply ⇩ Disease Activity ⇩
Mass Vaccination	☒	☒	☒	☒
Hospitals, LTCF	☒	☒	☒	☒
Clinics	☒ limited	☒		
Retail pharmacies	☒	☒		

Emergency Use Authorization

"… use of an unapproved medical product or an unapproved use of an approved medical product during a declared emergency …"

- **Unadjuvanted pandemic H1N1 vaccine may be licensed in a manner similar to a seasonal flu vaccine strain change and therefore would not need an EUA**
- **Adjuvanted vaccines, if used (for the 2009-10 flu season), will be administered under an EUA**

Assumptions for ACIP Recommendations

- Severity of illness and groups at higher risk for infection or complications
- Safety profile and antigen content of novel H1N1 vaccines
- Adequate supplies of unadjuvanted vaccine can be produced for all by approximately February, 2010
- Vaccines for all will not be available before the next pandemic wave
- Pandemic vaccine and seasonal vaccine availability will overlap and both will be recommended for many population groups
- 2 doses will be needed for protection, and 1 dose will provide minimal or no protection
- Initial demand for vaccination ~ seasonal vaccine but could increase quickly if community transmission increases
- Vaccine distribution will be timely

Monitoring vaccine safety

- Vaccine Adverse Event Reporting System (1-800-822-7967, http://vaers.hhs.gov/contact.htm) for signal detection
- Network of managed care organizations representing approximately 3% of the U.S. population, the Vaccine Safety Datalink (VSD) to test signals.
- Active surveillance for Guillain Barre Syndrome through states participating in Emerging Infections Program.

Acknowledgements

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  - Julie Morita
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  - Stephanie Black
  - Joshua Jones
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  - Fadila Serdarevic
  - CDC

Post test questions with answers Susan Gerber, MD

Lecture: Novel H1N1: Learning from the Past and Planning for the Future

1. Which previous pandemic influenza outbreak was caused by an H1N1 strain?

Multiple choice:

a. 1918

b. 1957

c. 1968

2. Which is the best technique to identify novel H1N1?

Multiple choice:

a. Rapid antigen test

b. Reverse transcriptase polymerase chain reaction

c. Blood serology

3. What are examples of non-pharmacologic interventions that may slow transmission of influenza during a pandemic?

Multiple choice:

a. Closing schools

b. Restricting air travel

c. Canceling public gatherings

d. Encouraging telecommuting for businesses

e. All of the above

4. True or false for following statement:

The current novel H1N1 strain is generally resistant to oseltamivir, much like the seasonal H1N1 strain

5. Name the target groups of individuals who have been identified to potentially receive the pandemic influenza vaccine?

Multiple choice:

a. Children and young adults aged 6 months- 24 years

b. Health care workers

c. Household and caregivers of children < 6 months of age

d. Emergency services workers

e. Pregnant women

f. Non-elderly adults (aged 25 years-64years) who are at increased risk of death from influenza infection

g. All of the above

Disaster Planning for a Pandemic at the Institutional Level

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The speaker has no conflict of interest to disclose.

Objectives

- Identify essential components of a pharmacy pandemic emergency plan at an institutional level
- Describe how the pandemic plans of the institution, local health department and federal community can be integrated
- Discuss an example of an emergency training exercise for staff

Examples of Hospitals Overwhelmed

Cries for help; Hospitals overwhelmed by Katrina's aftermath. (hospital information systems collapsed due to Hurricane Katrina). Article from: **Modern Healthcare** Article date: **September 5, 2005** Author: **Becker, Cinda; Mantone, Joseph**

Implications of Hospital Evacuation after the Northridge, California, Earthquake. *Carl H. Schultz, M.D., Kristi L. Koenig, M.D., and Roger J. Lewis, M.D., Ph.D.* **NEJM Volume 348:1349-1355** April 3, 2003 **Number 14.**

Psychosocial Effects of SARS n Hospital Staff: Survey of a Large Tertiary Care Institution. CMAJ 2004;170:793-798.

Disaster Preparedness, Triage, and Surge Capacity for Hospital Definitive Care Areas: Optimizing Outcomes when Demands Exceed Resources. Anesthesiology Clinics - Volume 25, Issue 1 (March 2007)

Key Components of a plan from an Institutional Perspective

- Involvement
- Inventory
- Education

Involvement

- True or False statements
  - "Hospital disaster preparedness can only be achieved by the active participation of all key medical services providers within a multidisciplinary team".
  - "Pharmaceutical services represent one of the most important and yet under- recognized services in mass casualty care and disaster medical services".
  - "Proper integration of pharmaceutical services can represent the difference between a successful operation and a chaotic one".

Hospital Disaster Preparedness in the United States: New Issues, New Challenges. Journal of Rescue and Disaster Medicine 2005: 5 (2).

Involvement

- Multidisiniplary team approach
  - Find an individual who is enthusiastic to become involved
  - Involvement on several levels
    - Hospital committee
    - Between area hospitals
    - City, state and federal level

Involvement

- Understand current organizational structures that impact the institution
  - Hospital Incident Command System (HICS)
  - National Incident Management System (NIMS)
  - Joint Commission
- All the above will increasingly impact your institution!

Involvement

- Collaborate in development of institutional policies
  - Internal and external disasters
    - Biological, chemical, radiation, environmental
- Integrate pharmacy departmental polices with institutional goals

Involvement

- Example of a plan
  - Pharmacy disaster plan
    - Components:
      - Pharmacy notification
        - » Called and deployed to a staging area to perform responsibilities
      - Internal and external incidents
        - » Pharmacist and pharmacy technician will have multiple critical roles in each situation
        - » So, organize in advance

Involvement

- Departmental disaster policy
  - Integrated into our institutional disaster plan
    - Example:
      - Activation for pandemic flu
- Institutional disaster policy
  - Coordinated with the city and state's response plan to a pandemic
    - Which is coordinated with the federal community
      - But need to understand their role

Inventory

- Determine critical drug list
  - Includes; biological, chemical, pandemic flu, radiation
    - Based on efficacy and cost-effectiveness
  - Assist in constructing a list of supportive medications
    - Pressers, steroids, hypertension meds, insulin, antibiotics, etc…

Lee, J. Am J Health-Syst Pharm. 2009;66:570-5

Inventory

- Utilize specialties to help assist in selection
  - Infections disease, toxicology, emergency medicine, etc…
- Define quantities needed
  - At County, we use a tool developed by Dr. Rebecca Roberts
    - Assisted by a multidisciplinary team
    - Tool called ChicagoSurge© Software
      - Available at; www.emrocch.org/disastersurge
  - Based on Hospital bed size

Inventory

- Ensure medications are purchased
  - At County we are limited in only using our distributor
- Secure a location to store the drug cache
  - Rotate drug cache with hospital inventory to avoid expired drug
    - » Call FDA Emergency Operations Center for antivirals near expiration at 301-443-1240

Available at www.fda.gov

Inventory

- Maintain log on quantities, dispensing, expiration dates
  - If dispense full take-home home prescription in outpatient setting follow FDA Emergency Use Authorization (EUA) requirements
    - Available at www.cdc.gov
- Other Critical Drugs
  - At County
    - Maintain quarterly reports on inventory for selected drugs
      - Biological, pandemic flu, chemical
      - Reports discussed at our emergency preparedness meetings

Inventory

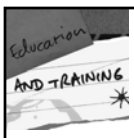
- Special Example: Pandemic
  - Stockpile (Drug Cache)
    - Key antivirals selected
      - Oseltamivir, Rimantidine, Zanamivir
        - » Don't forget about the Pediatric patients!
      - Amount based on hospital bed count
    - Funding
      - Able to secure monies
        - » Health Resources and Services Administration (HRSA)
        - » Assistant Secretary of Preparedness and Response (ASPR)

Inventory

- Obtain
  - Chicago Department of Public Health (CDPH)
    - » Established a Pharmacy Hotline for H1N1
    - » Additionally, CDC holding stock for Chicago
  - Hospital Distributor
  - Private sectors
    - » Roche Antiviral Purchase Program (RAPP)
    - » GlaxoSmithKline, (P.R.E.P)

Inventory

- What about the Vaccine?
  - Great Question
    - At the time presentation was submitted still unclear
  - 5 manufacturers
  - Possibility of two doses
  - Available October 2009?
  - Sent to state-designated receiving sites
    - NOT through Strategic National Stockpile (SNS)



Education

- Pharmacist on Emergency Preparedness Committee
  - HICS and NIMS training
    - Available through Federal Emergency Management Agency (FEMA) websites
  - Training offered through local health departments

Education

- Participate in drills at the National level
  - Our institution played in three Region V flu drills
    - Evaluators from California and New York
- Participate in City drills
  - Break down of Federal SNS stockpile upon arrival into city

Education

- Participate in hospital drills
  - At County
    - Six city-wide and regional exercises
- What steps would you consider important to include during a hospital drill?
  - Example drill: Cholera
    - Players walked into emergency department with unknown signs and symptoms
    - Internal hospital disaster policy was activated
    - Internal pharmacy department policy started
    - Pharmacist and pharmacy technician assigned to area to carry out responsibilities

Education

- Other Educational Responsibilities
  - Assist in educating hospital employees
    - Disaster fair for all three shifts
    - During spring H1N1 outbreak
      - Memos and hospital website with flu section
  - Lectures for pharmacy staff
    - Components
      - Potential disasters, policies, critical drugs, efficacy, quick inventory, mobilization, required documentation
      - Conduct mini internal drills “call downs”

Summary

- Get involved and be prepared
- Understand and assist in policy development
- Integrate your institutional plan with local and federal community authorities
- Participate in exercises and have fun with them

Questions?

Post-test Questions- ICHP 2009
Topic: Disaster Planning for a Pandemic at the Institutional Level
Presenter: Joanne C. Witsil, R.N, Pharm.D., BCPS

1) What are the essential components for a pandemic plan at an institution?

a. Involvement, storage, planning

b. Involvement, inventory, education

c. Inventory, involvement, storage

d. Planning, purchase, inventory

2) Institutional plans should NOT be integrated with local, state and federal plans?

a. True

b. False

3) When conducting an exercise drill, National table-top drills are the best way to .test. the institution's plan?

a. True

b. False