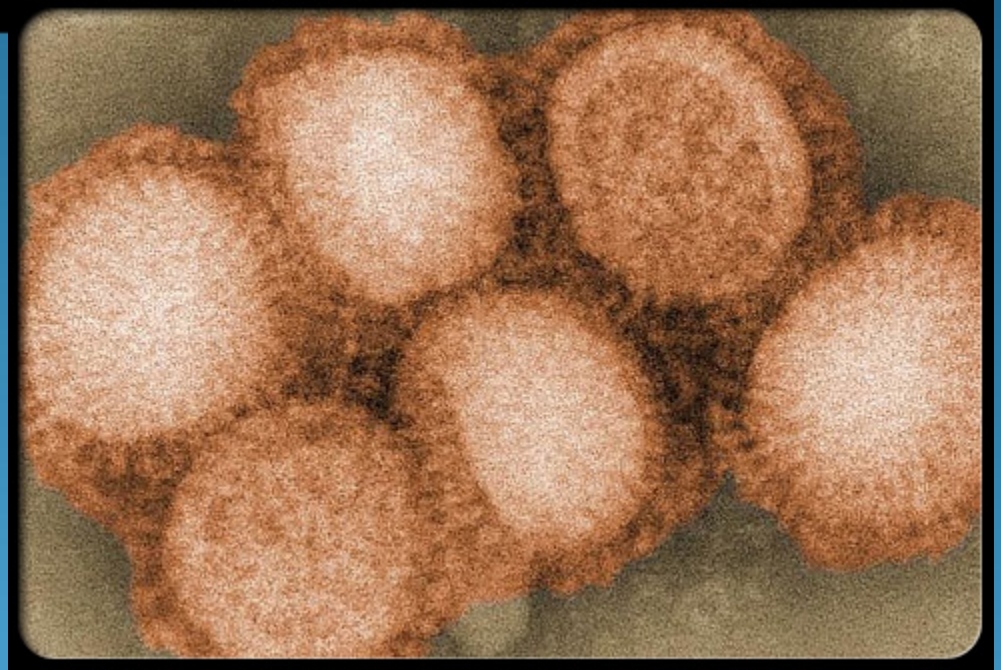


Part I--Understanding Influenza and the Current Influenza Pandemic



A “Just-in-Time” Primer on H₁N₁ Influenza A and Pandemic Influenza developed by the National Association of State EMS Officials and Revised by the Michigan Department of Community Health EMS and Trauma Systems Section

Revised 11/10/2009

National Association of State EMS Officials



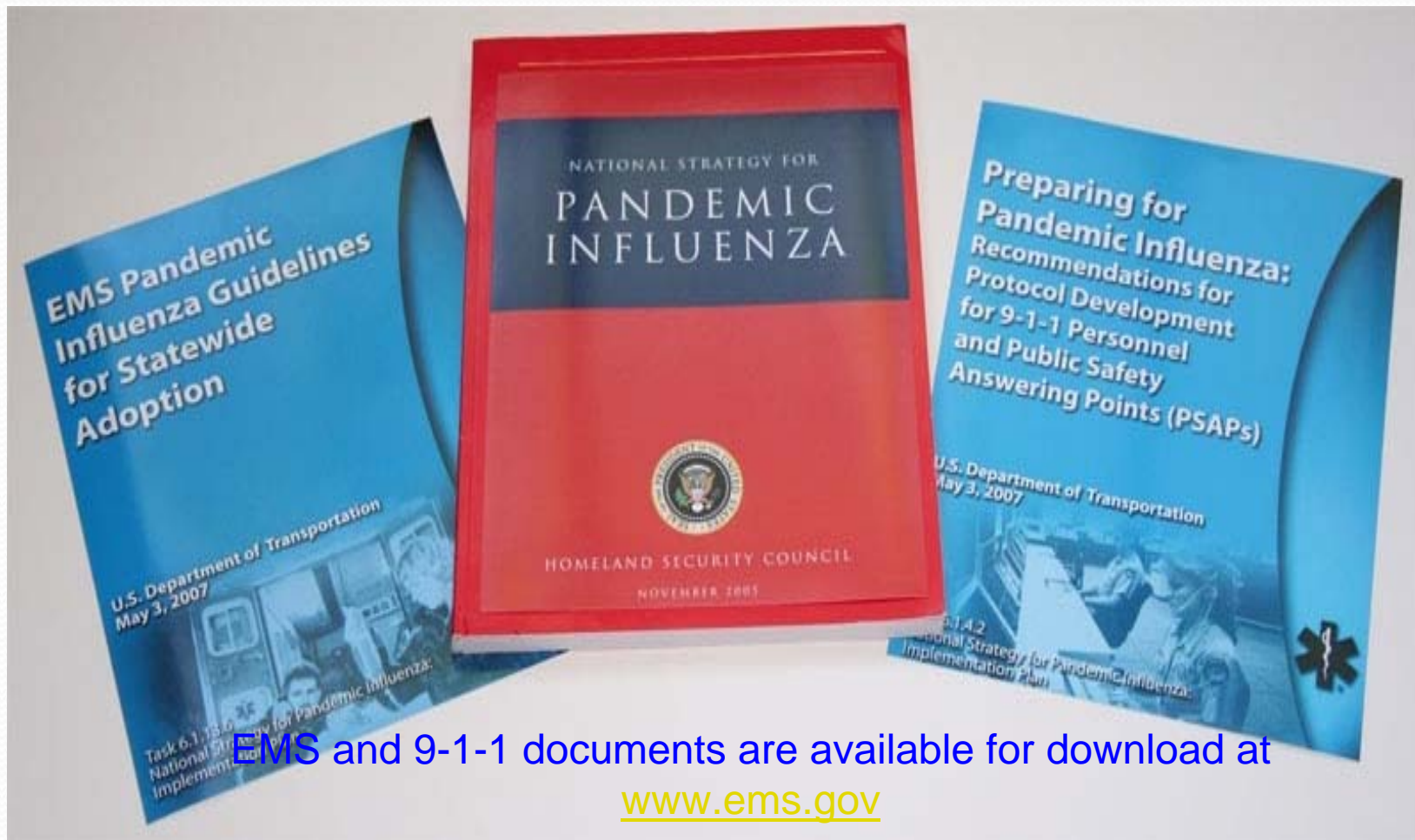
- This educational program was developed using material provided by the National Association of State EMS Officials (NASEMSO).
- The MDCH EMS and Trauma Systems Section is grateful to NASEMSO for their assistance .
- This program has been revised and updated to reflect the most current information available as of November 10, 2009.
- During this pandemic, information, guidelines and recommendations change rapidly. Stay current at:
 - www.cdc.gov/h1n1 or www.michigan.gov/flu

Objectives

- Describe the typical healthcare and economic impact of seasonal influenza in the United States
- Distinguish between “swine flu” and 2009 H₁N₁
- Define the term “Acute Febrile Respiratory Illness”
- Identify risk factors for complications from both seasonal and 2009 H₁N₁ influenza
- Describe the mechanism of transmission of both seasonal influenza and 2009 H₁N₁ influenza
- Identify common signs and symptoms of influenza
- List basic steps EMS personnel can take to remain safe

EMS & 9-1-1

Critical Components of the National Strategy



EMS and 9-1-1 documents are available for download at

www.ems.gov

Current H1N1 Overview

- Most people recover from infection without the need for hospitalization or medical care.
- Overall, national levels of severe illness from 2009 H1N1 influenza appear similar to levels seen during local seasonal influenza periods, although high levels of disease have occurred in some local areas and institutions.
- Overall, hospitals and health care systems in most countries have been able to cope with the numbers of people seeking care, although some facilities and systems have been stressed in some localities.

Part I

Understanding influenza and the current influenza pandemic

Definitions

- Endemic is the constant presence of a disease or infectious agent in a certain geographic area or population group.
- Epidemic is the rapid spread of a disease in a specific area or among a certain population group.
- Pandemic is a worldwide epidemic; an epidemic occurring over a wide geographic area and affecting a large number of people.



Seasonal Influenza

- Seasonal influenza viruses:
 - Are a public health problem every year.
 - Circulate throughout the human population.
 - Spread easily from person to person.
 - Generally do not reach pandemic proportions.

Incidence of Seasonal Influenza

- Seasonal influenza results in 200,000 hospitalizations annually in the United States.
- Seasonal influenza causes 36,000 thousand deaths each year in the US, ranking it among the nation's top 10 causes of death.
- Influenza related deaths are usually due to secondary pneumonias, exacerbated cardiopulmonary conditions, or other chronic diseases.

Populations Most Seriously Affected by Seasonal Influenza

- Rates of serious illness and death as a result of the seasonal flu are greatest:
 - among people aged 65 and older.
 - children under the age of two.
 - those with underlying chronic medical conditions (e.g., diabetes mellitus; chronic lung, liver, kidney & heart disease; HIV infection; and cancer).

Economic Impact of Seasonal Influenza

- Seasonal influenza's total economic burden is estimated at \$87.1 billion (2003 dollars).
- Direct medical costs total \$10.4 billion, which includes 3.1 million hospitalized days and 31.4 million outpatient visits.
- Persons aged 18 to 64 incurred 30% of these hospitalizations and outpatient visits, which translates into 128,000 life years lost as a direct result of the flu.

Source: unpublished CDC data



Influenza Viruses

- There are three types of influenza virus—
 - A, B, and C
- Only the A and B types can cause flu epidemics.
- Influenza A virus is found in humans and many other animals.
- There are over 100 subtypes of Influenza A virus.

Source: CDC at <http://www.cdc.gov/flu/avian/gen-info/transmission.htm>

Modes of Influenza Transmission

- The vast majority of influenza is spread from person to person by **droplet spread or direct contact**. Outside the body the influenza virus may persist for sometime, especially in conditions of low relative humidity and cooler temperatures. Specifically, the influenza virus can survive for 1-2 days on hard surfaces, 8-12 hours on soft surfaces, and 5 minutes on hands, resulting in some spread by indirect contact.
- Recently, the 2009 H₁N₁ influenza virus was found to also spread by small particle aerosols

Source: Toronto Pandemic Influenza Plan (2005)

http://www.cdc.gov/h1n1flu/guidelines_infection_control.htm (10/14/2009)

Beyond Seasonal Influenza

- Outbreaks of influenza in animals, especially when happening simultaneously with annual outbreaks in humans, increase the chances of a pandemic, through the merging of animal and human influenza viruses.

Source: WHO at <http://www.who.int/csr/disease/influenza/pandemic/en/>

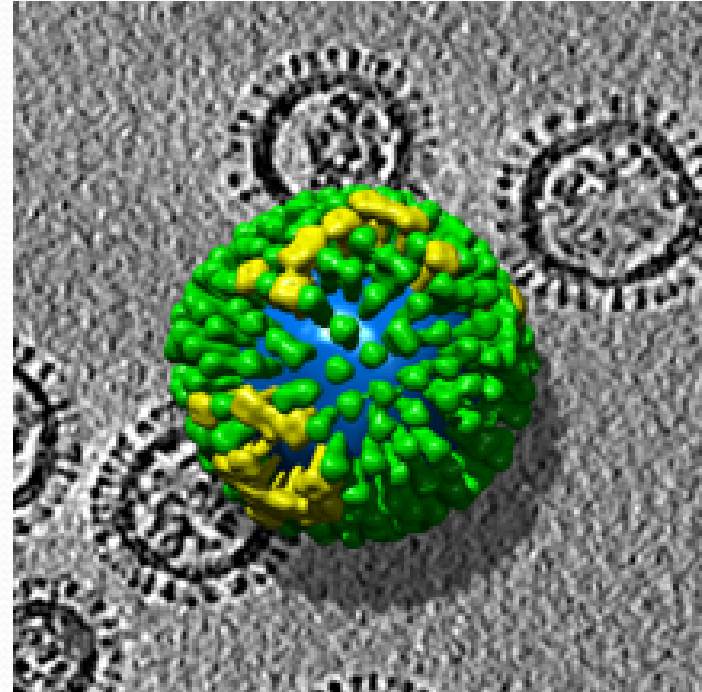
Potential Affects of a Pandemic in the US

- The US Department of Health and Human Services has previously estimated that in a moderate influenza pandemic, the United States might experience 209,000 deaths, with 128,750 patients requiring ICUs and 64,875 patients needing mechanical ventilators.

Source: <http://www.pandemicflu.gov/plan/pandplan.html>

Influenza Viruses

- Influenza viruses contains two glycoproteins: hemagglutinin (HA) and neuraminidase (NA). These two proteins determine the subtypes of Influenza A virus. There are 16 H subtypes and 9 N subtypes.
- This is where the 2009 “H₁N₁” receives its name.



Influenza A virus particles

Courtesy of Audray Harris, Bernard Heymann and Alasdair C. Steven, LSBR, NIAMS, NIH.



Influenza A Virus

- All Influenza A virus subtypes have been found in wild birds, which are thought to be a natural reservoir of Influenza A virus and the source of influenza A viruses in all other animals.

Source: www.cdc.gov/flu/about/viruses/transmission.htm



The Perfect Epidemiologic Storm

Three essential conditions must be met for an outbreak to begin:

- A new flu virus must emerge from the animal reservoirs that have produced and harbored such viruses —one that has never infected human beings and therefore one for which no person has developed antibodies.
- The virus has to make humans sick (most do not).
- It must be able to spread efficiently, through coughing, sneezing, or a handshake.



Part II

UNDERSTANDING THE TERMINOLOGY



What is “Swine” Flu?

- Swine flu is NOT a human disease. It is a respiratory illness of pigs caused by a type A influenza virus that regularly causes outbreaks of influenza in pigs.
- Swine flu viruses cause high levels of illness and low death rates in pigs.

Source: CDC at www.cdc.gov/flu/swine/key_facts.htm and www.usda.gov



What is “Swine” Flu?

- There is no evidence that swine in the United States are infected with this virus strain and therefore, this is not an animal health or food safety issue.

Source: CDC at www.cdc.gov/flu/swine/key_facts.htm and www.usda.gov



How to Define the Current 2009 H1N1 Influenza A Outbreak

- “Swine flu” is a misnomer and **should not be used** to describe the current 2009 H1N1 outbreak in the human population.
- The proper name is “2009 H1N1 Influenza”.
- The World Health Organization has stopped using the term "swine flu" to avoid confusion over the influenza found in pigs.



Concerns About the 2009 H1N1 Influenza Strain

- This (H₁N₁) outbreak currently appears to be at least as serious as seasonal flu if not more so.
- Because this is a new (“novel”) virus, most people will not have immunity to it and so illness may be more severe and widespread as a result.
- The farther the virus spreads, the more chance it will mix, or “reassort” with other flu viruses in circulation and turn into something more lethal.

Source: ScienceNow Daily News at <http://sciencenow.sciencemag.org/cgi/content/full/2009/429/1>

Updated Info on the Virus

- The overwhelming majority of cases have been mild and self-limiting, with no need for treatment.
- Unlike seasonal flu, few cases of severe illness associated with 2009 H1N1 have been reported among people 65 years of age and older.
- In one study, 45% of the patients hospitalized in this study were children younger than 18 years old, and 50% were adults, ages 18 to 64.

Source: http://www.cdc.gov/h1n1flu/njem_qa.htm (10/23/2009)



Current Outbreak of 2009 H1N1 Influenza Virus

- The current outbreak is believed to have started in March 2009. Local outbreaks of an influenza-like illness were first detected in three areas of Mexico, but the virus responsible was not clinically identified as a new strain until April 24, 2009.

Source: Wikipedia at http://en.wikipedia.org/wiki/2009_swine_flu_outbreak

Populations at Greatest Risk to H1N1 Flu Related Complications

- Children younger than 2 years old and adults 65 years and older
- Pregnant women
- Persons with the following conditions:
 - Chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological (including sickle cell disease), or metabolic disorders (including diabetes mellitus);
- Disorders that that can compromise respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration
 - (e.g., cognitive dysfunction, spinal cord injuries, seizure disorders, or other neuromuscular disorders)
- Immunosuppression, including that caused by medications or by HIV;
- Persons younger than 19 years of age who are receiving long-term aspirin therapy, because of an increased risk for Reye syndrome.

Source: <http://www.cdc.gov/H1N1flu/HAN/101909.htm> (10/19/2009)

Definition of Acute Febrile Respiratory Illness

- A measured temperature of at least 100 degrees Fahrenheit **and**
- Recent onset of at least one of the following: cough, rhinorrhea (nasal congestion), or sore throat.
- Also Know As: **Influenza-Like Illness**

Source: CDC at http://www.cdc.gov/h1n1flu/guidance_ems.htm



Common Symptom Set of 2009 H1N1 Influenza

- Fever
- Cough
- Body aches
- Nasal congestion / sore throat
- A significant number of people have reported vomiting and diarrhea

Definition of a Pandemic

- Pandemic is a worldwide epidemic; an epidemic occurring over a wide geographic area and affecting a large number of people.

Part III

UNDERSTANDING 2009 H1N1 INFLUENZA

What You Need to Know About the H1N1 Influenza A Virus

- Influenza viruses are not transmitted by food.
- You cannot get influenza from properly handled and cooked food, eating pork or pork products.
- Our food supply is protected.
- Testing programs are in place.
- All animals used for food, including pigs, are inspected by USDA.

Source: CDC at http://www.cdc.gov/swineflu/key_facts.htm and www.usda.gov

How does H1N1 Influenza spread?

- 2009 H₁N₁ influenza virus appears to be transmitted from person to person through close contact in ways similar to other influenza viruses. Although the relative contribution of each mode is uncertain, influenza virus can potentially be transmitted through:
 - Droplet exposure of mucosal surfaces (e.g., nose, mouth, and eyes) by respiratory secretions from coughing or sneezing;
 - Contact, usually of hands, with an infectious patient or fomite (a surface that is contaminated with secretions) followed by self-inoculation of virus onto mucosal surfaces such as those of the nose, mouth, and eyes; and
 - Small particle aerosols in the vicinity of the infectious individual.
- Transmission of influenza through the air over longer distances, such as from one patient room to another, is thought not to occur.

Source:

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

A Diagnostic Challenge

- A pandemic flu carrier might not show any symptoms for up to two days while still shedding the virus, thus making it harder to isolate.

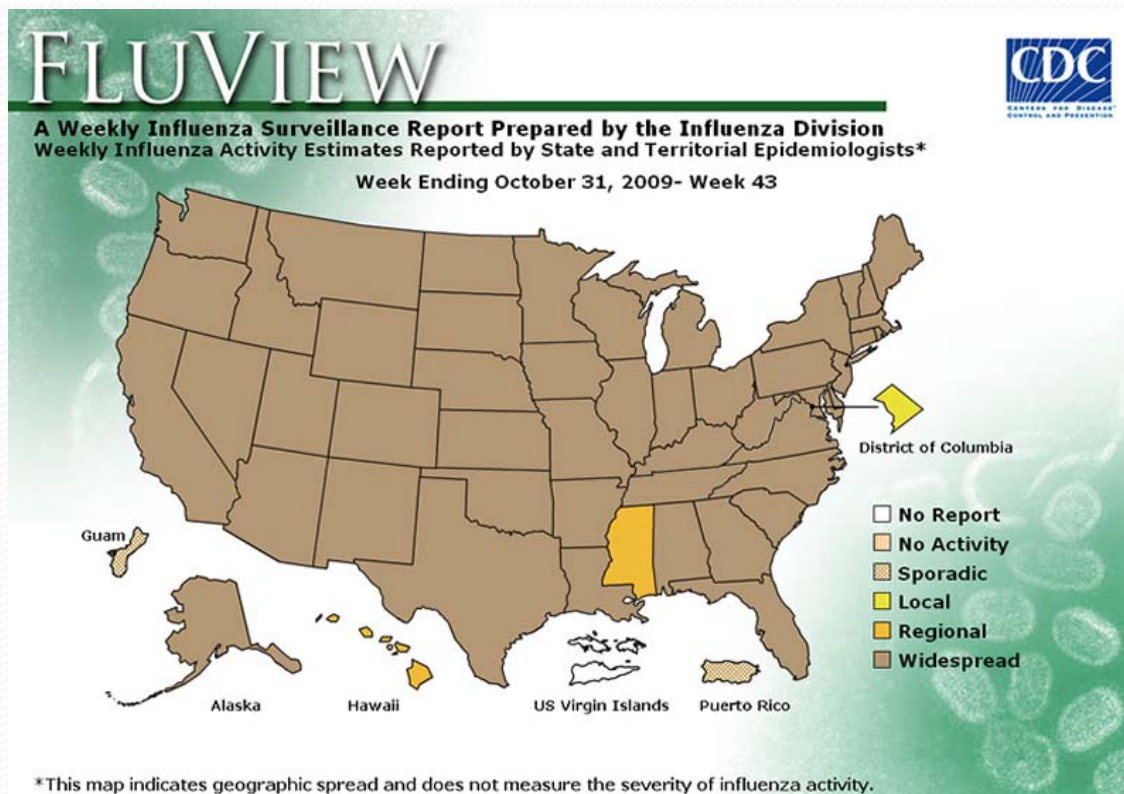
Source: NGA Pandemic Primer, 2007

<http://www.nga.org/Files/pdf/o6o7PANDEMICPRIMER.PDF>

Update on Cases

November 2009

- 2009 H1N1 Influenza is now widespread in Michigan as well as almost every state in the nation



Protecting EMS Personnel

- Get Vaccinated
- Practice great hand hygiene
- Stay home when you're ill
- Minimize close exposure to patients
- Place surgical or oxygen mask over suspected flu patients
- Maximize use of ambulance air flow systems
- Use appropriate respiratory protection
 - N-95 vs. surgical mask

SEE MODULE 2 FOR PROTECTIVE COUNTERMEASURES

Actions by MDCH EMS and Trauma Systems Section

- Establish 2009 H1N1 Protocols
- Establish model protocols authorizing EMS personnel to assist in vaccination efforts
- Develop educational material
- Work closely with MDCH Office of Public Health Preparedness
 - Assist in allocation of federal grant funds to EMS

CDC Interim Guidance Is Currently Available

- Multiple topics to meet a variety of needs
- This is a rapidly evolving situation
- All guidance should be considered interim and checked frequently for updates
- <http://www.cdc.gov/h1n1/guidance/>

Summary

- Both seasonal influenza and the 2009 H1N1 influenza have serious effects on the public's health.
- The impact of influenza on our healthcare system and economy is significant.
- While most people with influenza do not require hospitalization, a subset are seriously ill requiring intensive care and mechanical ventilation.
 - More young adults and children are being hospitalized with 2009 H1N1 influenza than usually occurs with seasonal flu
- EMS personnel are considered on the “front lines” and must be knowledgeable about influenza.