



Harris County
HCPHES
Public Health & Environmental Services
www.harriscountyhealth.com

Pandemic Influenza:
Local Preparedness & Response

Overview

- Influenza Facts
- Contextual Framework: Public Health Practice
- HCPHES Responsibilities and Activities
- HCPHES Draft Pandemic Influenza Plan
- Complex Issues

Influenza Facts

Influenza – the viruses

- Three types
 - Influenza A viruses
 - Influenza B viruses
 - Influenza C viruses

Influenza – the viruses

■ Influenza A viruses

- classified on the 2 main surface glycoproteins:
 - hemagglutinin (HA) – 16 known HA subtypes
 - neuraminidase (NA) – 9 known NA subtypes
- infects multiple species (e.g. humans, birds, pigs, horses, dogs...)

Influenza – the viruses

■ Influenza B viruses

- No additional subtype classification
- Usually found only in humans
- Epidemics usually less severe than those seen with influenza A
- Have not caused pandemics

Influenza – the viruses

- Influenza C viruses
 - No additional subtype classification
 - Mild illnesses in humans
 - Do not cause epidemics or pandemics

What is Public Health?

“what we as a **society do collectively** to assure **the conditions** in which people can be healthy”

The Future of the Public's Health in the 21st Century, IOM 2003

Cornerstone of public health practice
is a **population health approach**
that considers the **multiple**
determinants of health

Public Health Agencies

- **Local**
 - Harris County Public Health & Environmental Services
 - Houston Department of Health & Human Services (HDHHS)
- **State**
 - Texas Department of State Health Services (DSHS)
- **Federal**
 - Centers for Disease Control & Prevention (CDC)
 - Overarching federal – U.S. Department of Health and Human Services (DHHS)

Population Served by HCPHES

- Ranges from estimated 1.2 to 3.6 million persons
 - 1.2 million in unincorporated Harris County (all of our services)
 - 1.6 million in unincorporated Harris County plus combinations of municipalities except Houston (many of our services)
 - 3.6 million in entire county (e.g. mosquito control)

Public Health Activities

- **Assessment**, e.g. ongoing monitoring of the community's health status
- **Policy Development and Education**, e.g. informing and empowering the public, mobilizing community partnerships, developing policies and plans
- **Assurance**, e.g. enforcing laws and regulations, assuring a competent public health workforce

Public health-speak (*it's Greek to me*)

- Epidemic
 - from Greek *epi* (upon) and *demos* (people)
- Pandemic
 - from Greek *pan* (all) and *demos* (people)

Influenza-speak

- Seasonal flu
- Avian flu
- Pandemic flu

Seasonal flu

- Illness **in humans** caused every year by influenza viruses
 - e.g. H1N1, H1N2, H3N2 influenza A viruses, influenza B viruses
- 5%-20% U.S. population gets the flu every year
- Estimated 36,000 annual deaths in U.S.
- Contagious spread by “respiratory droplets” (coughing, sneezing)
 - Usually person-to-person: can infect others **from 1 day before getting sick** to 5 days after becoming sick
 - Sometimes from touching infected surfaces
- Vaccine offers effective protection

Adapted from CDC Influenza (Flu) Key Facts

Avian (Bird) flu

- Illness **in birds** caused by **avian influenza viruses**
 - low pathogenic type
 - highly pathogenic type (e.g. H5N1)
- Illness **in humans** caused by **avian influenza viruses**
 - contagious spread by direct or close contact with infected poultry or contaminated surfaces
 - no vaccine currently commercially available

Adapted from CDC Influenza (Flu) Key Facts

Pandemic flu

- Results from new combinations on HA and/or NA proteins: i.e. a major change in influenza A virus (“antigenic shift”)

Adapted from CDC Influenza (Flu) Key Facts

Flu Pandemics last 100 years

- 1918-1919: H1N1 influenza A virus
 - 500,000 U.S. deaths
 - 20-50 million worldwide deaths
 - H1N1 still in circulation today
- 1957-58: H2N2 influenza A virus
 - 70,000 U.S. deaths
- 1968-1969: H3N2
 - 32,000 U.S. deaths
 - H3N2 still in circulation today

Adapted from CDC Influenza (Flu) Key Facts

Planning for Pandemic Influenza

WHO Pandemic Phases

Inter-Pandemic Period

- **Phase 1:** No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in humans, the risk of human infection or disease is considered low
- **Phase 2:** No new influenza virus subtypes have been detected in humans. However a circulating animal influenza virus subtype poses a substantial risk of human disease

WHO Pandemic Phases

Pandemic Alert Period

- **Phase 3:** Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact. (concern for H5N1)
- **Phase 4:** Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.
- **Phase 5:** Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk)

WHO Pandemic Phases

Pandemic Period

- **Phase 6:** Pandemic – increased and sustained transmission in the general population

HCPHES Pandemic Influenza Plan

- Delineates HCPHES responsibilities
- Companion to and should be interpreted in context of:
 - Texas DSHS Pandemic Influenza Preparedness Plan
 - U.S. DHHS Pandemic Influenza Plan
- In process of being coordinated with HDHHS, Harris County Hospital District and Mental Health and Mental Retardation Authority
- Serves as template for response to outbreaks of other highly contagious respiratory illnesses

HCPHES Pandemic Influenza Plan

- Assumptions
- Command and Control Activities
 - *Interpandemic*
 - *Pandemic Alert*
 - *Pandemic*
- Surveillance Activities
- Prevention and Containment Activities
- Emergency Response, Health Systems & Critical Infrastructure
- Communicating with the Public
- Appendices
 - Estimates of Priority Populations for Antivirals
 - Estimates of Priority Populations for Vaccine
 - Considerations for Avian influenza
 - Health Care System Guidance

Assumptions

- 30% of population may become ill
 - *1,093,286 persons ill in Harris County*
- 15% of population will seek outpatient care
 - *546,643 persons in outpatient settings*
- 0.3 to 3% of population hospitalized
 - *10,933 - 109,328 persons hospitalized*
- 0.04 to 0.5% of population requiring ICU
 - *1,458 - 18,221 persons in ICU*
- 0.02% to 0.25% of population requiring mechanical ventilation
 - *728 - 9,111 requiring vents*
- 0.07 to 0.64% of population may die
 - *2,551 - 23,323 deaths*

Command and Control (*highlights*)

Pandemic Alert Period

- Delineates specific roles and responsibilities for HCPHES staff for actions such as:
 - Communicating with local, state, and federal partners
 - Engaging in a variety of surveillance and monitoring activities
 - Disseminating information to the public

Surveillance (*highlights*)

Pandemic Alert Period

- Engage in a variety of human surveillance and monitoring activities (sentinel provider network, school nurses, infection control practitioners, influenza research center, etc.)
- Partner with state agencies, local live bird industries and local veterinarians to conduct animal surveillance
- Monitor secure public health information networks (e.g. CDC Epi-X, Texas HAN)
- Work with hospitals to assist in planning and to provide ongoing guidance regarding specimen collection and handling
- Work with businesses to develop their pandemic preparedness plans

Prevention & Containment (*highlights*)

Pandemic Alert Period

- Community Control Measures, e.g.
 - Hand hygiene and cough etiquette
 - Isolation and quarantine
 - Social isolation
 - Cancellation of mass events
 - Travel advisories
- Antivirals
- Vaccination

Prevention & Containment (*highlights*)

Pandemic Alert Period

- Type of community control measures implemented will be dependent upon location of cases, size of clusters, availability of vaccine, etc.
 - Measures if cases are first detected outside of the U.S.
 - Measures if cases are first detected in the U.S., outside of Harris County
 - Measures if cases are first detected in Harris County

Priority Populations for Vaccine

- **1A** Healthcare workers with direct patient contact plus essential healthcare support staff
- **1B** Persons in the highest-risk groups
 - Persons >64 years with 1+ high-risk conditions
 - Persons 6 months-64 years with 2+ high-risk conditions
 - Persons with a hospitalization in prior years with pneumonia or influenza or a high-risk condition
- **1C** Household contacts of children less than 6 months and persons who are severely immunocompromised; pregnant women
- **1D** Key government leaders and critical public health pandemic responders

Priority Populations for Vaccine

- **2A** Persons in the remaining high risk groups
 - Persons ≥ 65 years with no high-risk conditions
 - Persons 6 months-64 years with 1 high-risk condition
 - Persons 6-23 months

Priority Populations for Vaccine

- **2B** Persons in critical infrastructure groups
 - Other public health emergency responders
 - Public safety personnel (fire, police, 911 dispatchers, correctional facility staff)
 - Utility workers essential for maintaining power, water & sewage systems
 - Transportation workers critical for transporting fuel, food, water and medical supplies and for public ground transportation
 - Telecommunications/IT personnel essential for maintaining functional communication and network operations

Priority Populations for Vaccine

- 3 Other key government health decision makers and mortuary services
- 4 Healthy persons aged 2-64 years not included in above categories

Priority Populations for Antivirals

- A Hospitalized patients with influenza
- B Healthcare workers with direct patient contact; emergency medical services personnel
- C Highest-risk outpatients
- D Pandemic health responders, public safety personnel and key government decision makers

Priority Populations for Antivirals

- **E** Increased-risk outpatients (*post-exposure prophylaxis*)
- **F** Outbreak response personnel
- **G** Healthcare personnel working in emergency rooms, intensive care units, emergency medical services and dialysis (*prophylaxis*)
- **H** Pandemic society responders and other healthcare workers
- **J** Other outpatients (*prophylaxis*)
- **K** Other healthcare workers with patient contact (*prophylaxis*)

Final thoughts...

Complex issues

- Aligning economic incentives to support compliance with prevention and containment measures
- Procuring resources to meet surge demand erupting simultaneously across the nation
- Public-private vaccine distribution strategies
- Balancing potential conflicts between continuity of operations objectives (e.g. 30% workforce absent) and social isolation measures



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