

PANDEMIC INFLUENZA

LCCC SAFE 120

PowerPoint 2

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COURSE DESCRIPTION

- Effects of pandemic influenza
- Describe how to plan including COOP
- Measures to Limit spread of infection

DEFINITIONS #1

- Epidemic – “affecting or tending to affect a disproportionately large number of individuals within a population, community, or region at the same time”
- Pandemic – “occurring over a wide geographic area and affecting an exceptionally high proportion of the population”

• Source: Merriam-Webster

DEFINITIONS #2

- Influenza – “an acute, highly contagious, respiratory disease caused by any of three orthomyxoviruses [A, B and C]...” Source:
Merriam-Webster
- Seasonal Influenza – “viruses are influenza A and B viruses that spread and cause illness in people during the time of year known as the “flu season [US: Dec-April]. Seasonal influenza viruses cause annual U.S. influenza epidemics during fall, winter, and spring, and circulate among people worldwide. Seasonal influenza A and B viruses are continually undergoing evolution in unpredictable ways.” Source: CDC

REVIEW OF PAST PANDEMIC

See the CDC website:

[Explore CDC history of Pandemics](#)

The last one was in 2009-H1N1 Virus



WHEN WILL IT HAPPEN

- It is difficult to predict when the next influenza pandemic will occur or how severe it will be.
- Wherever and whenever a pandemic starts, everyone around the world is at risk.
- OSHA 3328-05R

INFLUENZA SUBTYPES

Classified by two proteins on the on the surface of the virus:

- Hemagglutinin (H)
- Neuraminidase (N).

Source: CDC FAQ

PANDEMIC STRAINS

2009 H1N1-pdm09

1968 H3N2

1957-1958 H2N2

1918 H1N1

**The 1918 and 2009
have the same surface
proteins but different
genetic structure**

credit: cdc

THE UNIQUE 1918 STRAIN

“Mortality was high in people younger than 5 years old, 20-40 years old, and 65 years and older. The high mortality in healthy people, including those in the 20-40 year age group, was a unique feature of this pandemic.”

source: CDC



Credit: CDC

INFLUENZA

FREQUENTLY COMPLICATED WITH

PNEUMONIA

IS PREVALENT AT THIS TIME THROUGHOUT AMERICA.

THIS THEATRE IS CO-OPERATING WITH THE DEPARTMENT OF HEALTH.

YOU MUST DO THE SAME

IF YOU HAVE A COLD AND ARE COUGHING AND
SNEEZING. DO NOT ENTER THIS THEATRE

GO HOME AND GO TO BED UNTIL YOU ARE WELL

Coughing, Sneezing or Spitting Will Not Be Permitted In The Theatre. In case you must cough or Sneeze, do so in your own handkerchief, and if the Coughing or Sneezing Persists Leave The Theatre At Once.

This Theatre has agreed to co-operate with the Department Of Health in disseminating the truth about Influenza, and thus serve a great educational purpose.

**HELP US TO KEEP CHICAGO THE
HEALTHIEST CITY IN THE WORLD**

**JOHN DILL ROBERTSON
COMMISSIONER OF HEALTH**

REPRODUCED FROM THE ORIGINAL POSTER

Credit: Office of the Public Health Service Historian

, https://web.archive.org/web/20160826144600/http://www.flu.gov/pandemic/history/1918/documents_media/posters/index.html

2009 STRAIN

“primarily affected children and young and middle-aged adults”

Source: CDC



credit: CDC

INFLUENZA

Seasonal

- Annually Dec-Feb
- Some immunity
- Vaccinations available
- Compromised population
- Medical care available
- Antivirals available
- Variable illness level
- Some impact on business

Pandemic

- Rare
- Very limited immunity
- Vaccination available late
- Healthy people also risk
- Medical overwhelmed
- Antiviral shortage
- Deaths could be higher
- Possible staffing shortages


2009 PANDEMIC UNITED STATES

- 60.8 million cases
- 274,304 hospitalizations
- 12,469 deaths
- First found in Mexico
- Spread through world
- April first cases in US


SCHOOL POSTER

Stop the spread of germs that make you and others sick!

Cover your Cough



Cover your mouth and nose with a tissue when you cough or sneeze or




cough or sneeze into your upper sleeve, not your hands.

Put your used tissue in the waste basket.



Clean your Hands

after coughing or sneezing.



Wash hands with soap and warm water for 20 seconds

or



clean with alcohol-based hand cleaner.



WHY WAS IT SWINE FLU?

“This virus was a unique combination of influenza virus genes never previously identified in either animals or people. The virus genes were a combination of genes most closely related to North American swine-lineage H1N1 and Eurasian lineage swine-origin H1N1 influenza viruses. Because of this, initial reports referred to the virus as a swine origin influenza virus. However, investigations of initial human cases did not identify exposures to pigs and quickly it became apparent that this new virus was circulating among humans and not among U.S. pig herds.” [Credit: CDC](#)

SYMPTOMS OF INFLUENZA

Fever

Myalgia

Headache

Malaise

Nonproductive cough

Sore throat,

Rhinitis

Children May also Have:

- Otitis media
- Nausea
- Vomiting

Symptoms usually 3-7 days but cough and malaise can persist for weeks

TRANSMISSION

- Adults can spread 1-5 days before onset
- Children 1-10 days before onset

This greatly reduces ability to limit transmission

COMPLICATIONS

- Viral pneumonia
- Exacerbate medical conditions
- Secondary bacterial infections
- Febrile seizures (children)
- Other serious complications

CONSIDER THE 2009 H1N1

- Pandemic can happen again
- Viruses can mutate
- Prepare vaccine from virus 4-6 months
- Vaccine distribution takes time
- Modern transportation spreads fast

PREVENTION

- Standard Hygiene practices –esp. handwashing
- Testing of respiratory samples CDC-Testing
- Isolation of ill population
- PPE by health care workers,
- Distribution of antiviral medications

DISCUSS THESE IMPACTS

- Family strains
- Major effect on community functions
- Businesses may lose staffing
- Overwhelming of local resources
- Shortage of funds at state and federal levels

IMPACTS OF A POSSIBLE PANDEMIC IN THE US

- Estimated 89,000 to 207,000 deaths
- 314,000 to 734,000 hospitalizations
- 18 to 42 million outpatient visits
- 20 to 47 million additional illnesses

Estimated economic impact would be \$71.3 to \$166.5 billion, excluding disruptions to commerce and society. [Source: CDC Paper](#)

VACCINATION

- Each year prepared from expected strains
- Lessens chance of getting sick
- Lessens severity of illness
- Herd Immunity – protects vulnerable population
- Very minimal side effects
- Cannot be used by those allergic to eggs

AVIAN INFLUENZA DEFINITION

“Avian influenza refers to the disease caused by infection with avian (bird) influenza (flu) Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other bird and animal species. Avian flu viruses do not normally infect humans.”

source: CDC

AVIAN INFLUENZA

- Low Pathogenic: Occurs in wild birds can spread to domestic birds – very mild, acute symptoms not a threat
- Highly Pathogenic: Spreads rapidly in avian population , high fatality rate in birds; H5N1 strain is rapidly spreading in birds (loss of poultry in china)
- This highly pathogenic strain has infected humans, but to date only human cases have involved contact with infected poultry; not passed human-human
- Not pandemic to date – endemic in China, closing markets destroying birds to slow spread

PANDEMIC INFLUENZA #1

- Epidemic over large area-global disease outbreak
- New or mutated virus becomes wide spread
- Serious symptoms, high death rate.
- Low levels of immunity in the population
- Very contagious-illness spreads easily
- Usually occurs in waves of cases for longer period than seasonal influenza

SEASONABLE INFLUENZA SYMPTOMS

- Fever (most people) or feeling feverish/chills
- Cough
- Sore throat
- Runny or stuffy nose
- Muscle or body aches
- Headaches
- Fatigue
- Vomiting and diarrhea, more common in children

source: CDC

AVIAN INFLUENZA SYMPTOMS

- Seasonal flu symptoms
- Conjunctivitis
- Nausea, abdominal pain, diarrhea, and vomiting,
- severe respiratory illness (e.g., shortness of breath, difficulty breathing, pneumonia, acute respiratory distress, viral pneumonia, respiratory failure)
- neurologic changes (altered mental status, seizures)
- involvement of other organ systems
- High fatality rate

1918 INFLUENZA SYMPTOMS, H1N1

- Similar symptoms but more severe
- Young adults most affected
- Sudden onset, high severity
- Fatal in few days
- Many died from secondary bacterial pneumonia

2009 H1N1 OUTBREAK

- Novel virus version
- Similar symptoms to seasonal flu
- Vaccine developed late (November)
- Many people over 60 had some immunity
- 80% of deaths under age 60 (usually 70-90 percent of deaths over age 65)

Credit: CDC

HOW IS INFLUENZA A TRANSMITTED

- Droplet
- Contact
- Airborne aerosol

DROPLET

Occurs when large droplets generated by breathing, coughing or sneezing or talking

- Eyes
- Nose
- Mouth

These droplets can land in the eyes, mouths or noses of people who are nearby or inhaled into the lung, travel up to 6 feet

source: CDC

CONTACT

Contact with fomites (surfaces handled, toys, door knobs, telephones etc.) handled by others may be more common transmission between children

AEROSOL TRANSMISSION

Data is not clear:

[CDC - Aerosol Transmission of Influenza](#)

AVIAN TRANSMISSION

How Infected Backyard Poultry Could Spread Bird Flu to People

Human Infections with Bird Flu Viruses Rare But Possible

1 Direct Contact

(Most Common)

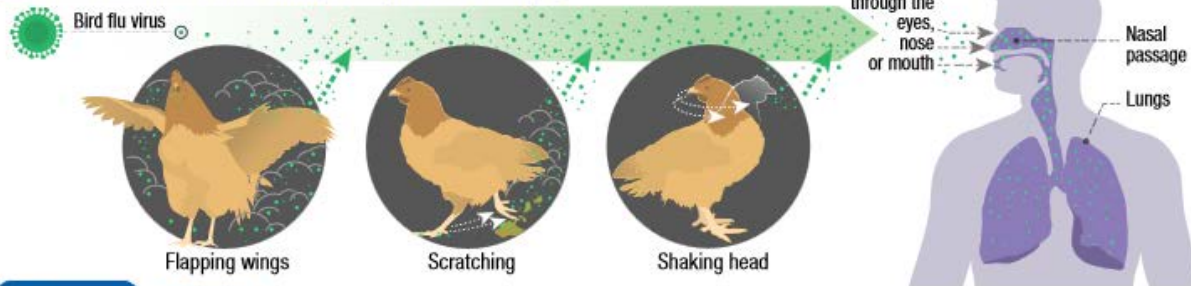


Infection can occur without touching poultry.

2 Contaminated Surfaces



3 Bird Flu Virus in the Air (in Droplets or Dust)



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

www.cdc.gov/flu/avianflu/avian-in-humans.htm

CS261152

AVIAN H5N1 NEXT PANDEMIC OCCUR?

- Limited immunity in old or young
- Virus transmission birds to human
- Human to human transmission
 - Not seen yet!

HOW DOES THE VIRUS WORK?

- NPR - Virus Animation
- NPR - 1918 Influenza
To order full video
- World Health Organization
WHO - Pandemic Phases

WHO

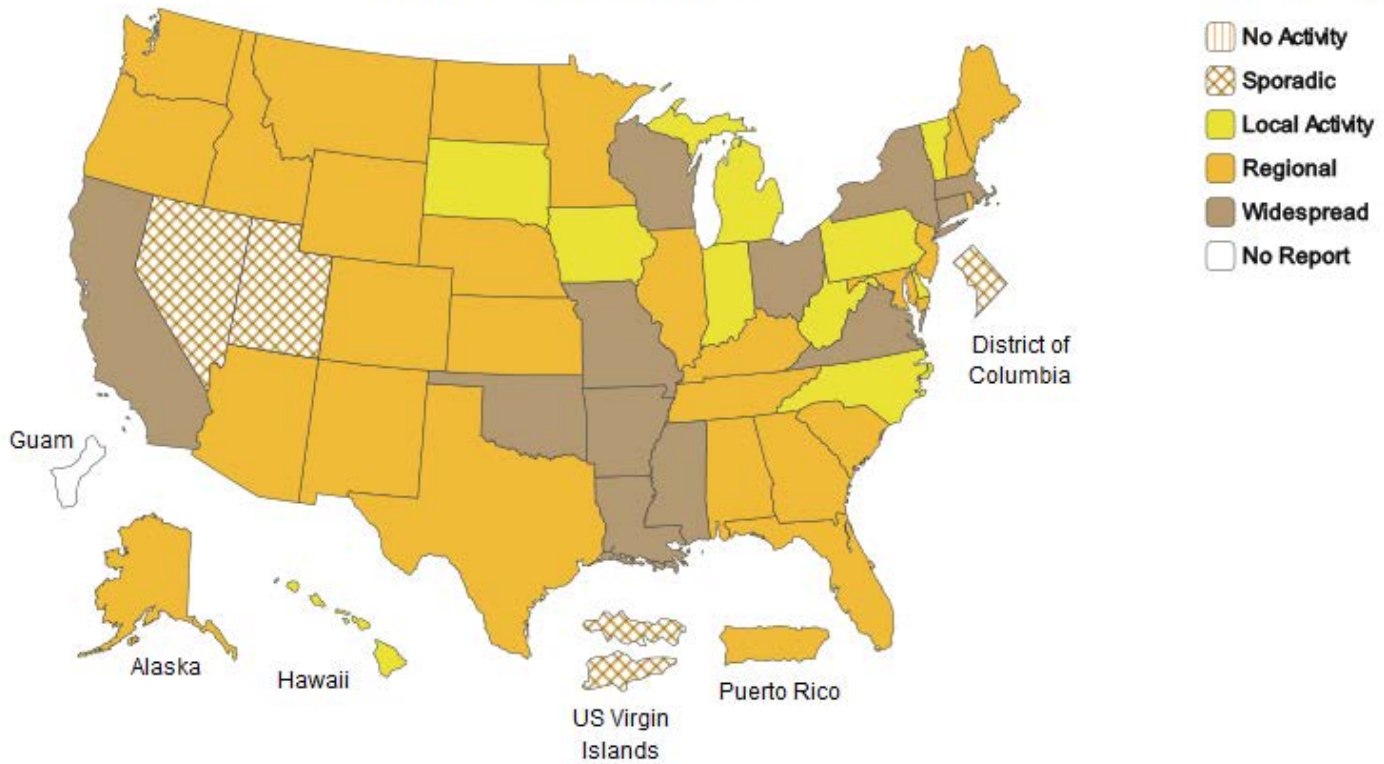
WORLD HEALTH ORGANIZATION

- “World health department”
- Not an enforcement agency
- Share ideas, information
- Track illnesses in world
- Coordinate world health activity

CDC TRACKS INFLUENZA

Week Ending Dec 09, 2017 - Week 49

Influenza Activity Estimates



Credit: CDC

CDC WEEKLY REPORT

- CDC Weekly report
- Archived report see: `cdc_flu_report.png`

CDC RECOMMENDATIONS SEASONAL/PANDEMIC

See chart: CDC_table1

OCCUPATIONAL RISK PYRAMID FOR PANDEMIC INFLUENZA



source: OSHA 3327

VERY HIGH EXPOSURE RISK ACTIVITY

Healthcare employees performing aerosol-generating procedures on known or suspected pandemic patients

- cough induction procedures,
- bronchoscopies
- dental procedures, or
- invasive specimen collection

Healthcare or laboratory personnel collecting or handling specimens from known or suspected pandemic patients

HIGH EXPOSURE RISK

- Healthcare delivery and support staff exposed to known or suspected pandemic patients
- Medical transport of known or suspected pandemic patients in enclosed vehicles
- Performing autopsies on known or suspected pandemic patients

MEDIUM EXPOSURE RISK

Employees with high-frequency contact with the general population

- Schools
- High population density work environments
- High volume retail
- Airports-others?

LOW EXPOSURE RISK

Employees who have minimal occupational contact with the general public and other coworkers nor frequent close contact (within 6 feet)

1918 INFLUENZA IMPACTS

- Global mortality from the 30 and 50 million
- Estimated 675,000 Americans among the dead
- Overwhelming demand medical services
- Severe disruption in the economy
 - Life insurance claims skyrocketed
 - Small businesses, unable to operate during the pandemic, went bankrupt
 - Loss of services

1918 INFLUENZA DEATHS

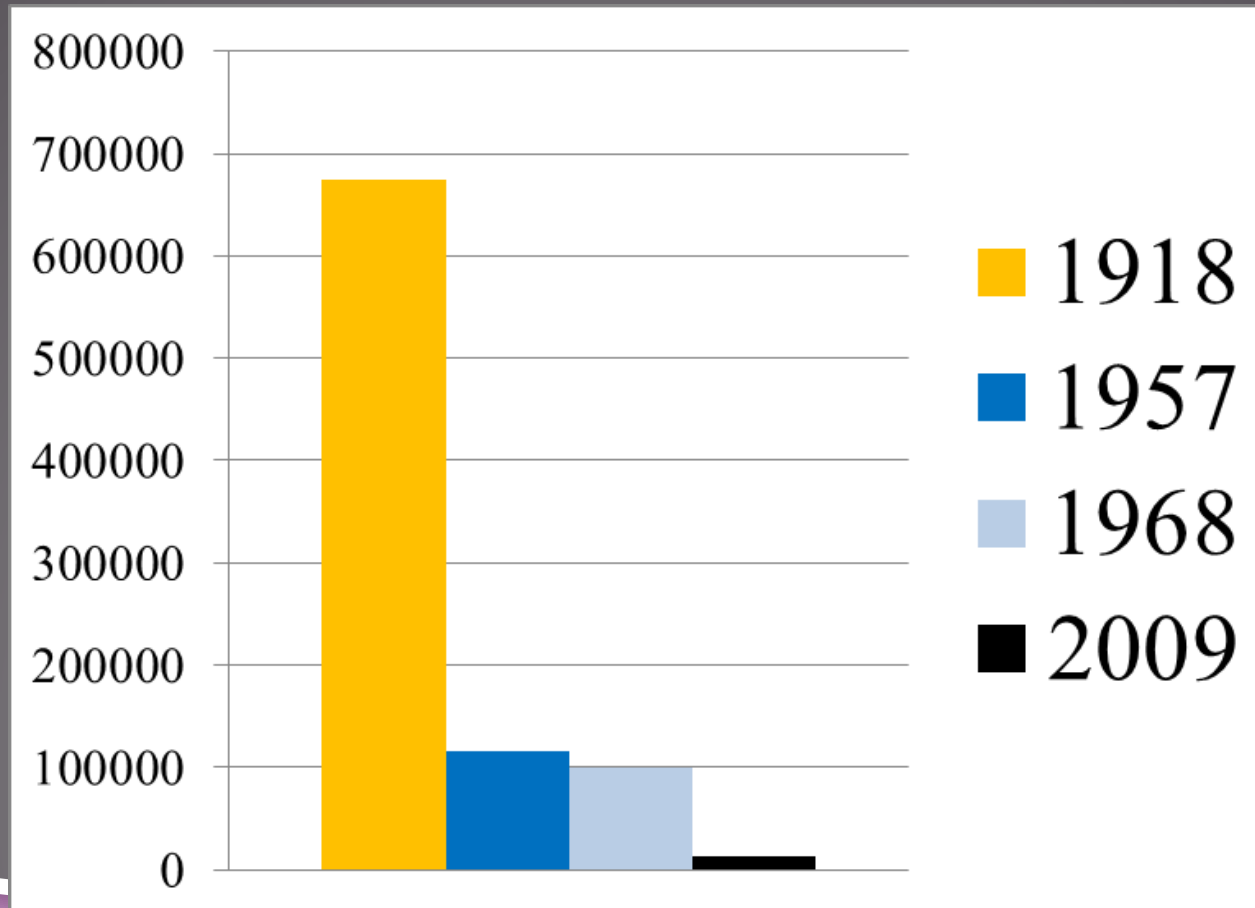
US population 1918 = 103,208,000 source: US Census

Influenza deaths 1918 = 675,000 source: CDC

This is 0.654 % of the population or

More than 6.5 deaths for every 1000 people

US DEATHS INFLUENZA EVENTS



HEALTH CARE SYSTEM

“Pandemic influenza has the potential to place great strain on the healthcare system. Effective pandemic preparedness will require the engagement of the entire health community, and healthcare assets from across the spectrum of care will need to be prepared to meet the increased demands.” source: CDC

HOSPITAL BED OCCUPANCY

Normal 2014 Data

Beds: 902,202

Occupancy: 64.8%

source: CDC

Pandemic Conditions

2 million?

(Based on 1918
pandemic deaths
corrected for population)

HOW COULD PANDEMIC INFLUENZA EFFECT YOUR BUSINESS?

COULD BUSINESS HANDLE 40% STAFF SHORTAGE?

- Employee illness or death
- Caring for family members
- Child care
- Schools closed
- Fear of others

“A pandemic could affect as many as 40 percent of the workforce during periods of peak influenza illness.

"source: [OSHA](#)

OTHER EFFECTS

- demand for some items increased
see: OSHA H1N1 Respirators
- Demand of other items decreased
- More shopping in off hours
- More online shopping
- Shipping delays or cancelation

NORMAL OPERATIONS DISRUPTED

- Delayed, or canceled delivery
- Normal communications disrupted
- Normal routine of orders changed
- Materials and supplies may not be available
- Trend today is lack of stock – “just in time”

BUSINESS BENEFITS EFFECTS

- Workers compensation
- Disability claims
- Family and Medical Leave Act
- American With Disabilities Act
- Health insurance

WORKERS COMPENSATION

Employees who become injured or ill due to workplace exposures:

- Medical payments - related to injury or illness
- Temporary disability - for period cannot work
- Permanent disability – partial or total

DISABILITY (PRIVATE INSURANCE)

Covers non-work related disability

- Can employee return to work?
- Able to do the job?
- Can illness affect other employees?

FAMILY AND MEDICAL LEAVE ACT

FMLA

- Public Employees
- Private employers who have more than 50 employees
- Employee must have at least 20 weeks of work
- Up to 12 weeks of leave
- For serious medical or other conditions
- See: [USDOL - FMLA](#)

AMERICANS WITH DISABILITY ACT ADA

- Public Employers
- Private Employers with more than 15 employees
- Prohibits discrimination
- Requires reasonable accommodation
- PPE modification is reasonable accommodation

ENGINEERING CONTROLS

- Clear sneeze barriers
- Drive through windows
- Negative pressure ventilation
(healthcare)



By Contributor(s): Queensland Newspapers Pty Ltd - Item is held by John Oxley Library, State Library of Queensland., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=12711512>

ADMINISTRATIVE CONTROLS

- Hygiene –make handwashing supplies available
- Cough etiquette
- Encourage ill employees to stay home
- Avoid travel to high impacted areas
- Telecommuting, limit office staff on site
- Deliver goods to customers homes
- Develop emergency communication plans

PPE

- Gloves
- Goggles
- Face Shields
- Surgical Masks
- Respirators

SURGICAL MASKS

- Stop large droplets
- Worn by ill patients
- Worn by health care staff for wound contamination
- Worn by employees to protect from splashes
- Prevent hand contact with nose and mouth

RESPIRATORS

- Protect wearer from airborne contaminants
- Need comprehensive respirator program
- Fit testing
- Medical evaluation
- Training
- Written program
- Provide no protection for others

N95 RESPIRATOR

- Tight seal on face
- 95% filter efficiency (no oil)
- Protects against airborne contaminants
- For employees not for patients
- PAPR better for some individuals
- Types of respirators (16 min) -OSHA -Types

PLANNING

- Review State and Local Health Dept. plans
- Prepare for Reduced staffing
- Contact Suppliers
- Sick leave policy
- Review exposure risks
- Limit exposures to staff and public
- Identify essential staff and functions

PLANNING CONTINUED

- Recognize non-occupational risks (family members)
- Stockpile handwashing supplies and PPE
- Determine who will provide information
- Address transportation, childcare
- Train employees
- Stress management

source: OSHA 3327

REVIEW THE PLAN OF DEPARTMENT OF THE INTERIOR

Plan example

Dept. Interior plan

PLANNING WILL

- Allow operations to continue
- Prevent spread in staff
- Prevent illness in staff by limit exposure
- Protect vulnerable population
- Serve to assure safe practices followed (Hygiene)
- Help employees get to work
- Reduce stress increase productivity



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