Infection Prevention, Influenza and You!

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Patient Safety Authority

SAVE THE DATE

P2S2

PENNSYLVANIA PATIENT SAFETY SUMMIT

MAY 2, 2019 ▪ SEVEN SPRINGS RESORT

STEP UP TO THE PLATE

Objectives

- Discuss influenza complications and at risk groups
- Identify best practices to prevent the spread of influenza and the importance of standard and special precautions in preventing the transmission of influenza
- Recognize the importance of influenza vaccination for residents and healthcare workers

Infection Prevention

"To ensure the protection of those who might be vulnerable to acquiring an infection both in the general community and while receiving care due to health problems, in a range of settings."

World Health Organization

Influenza

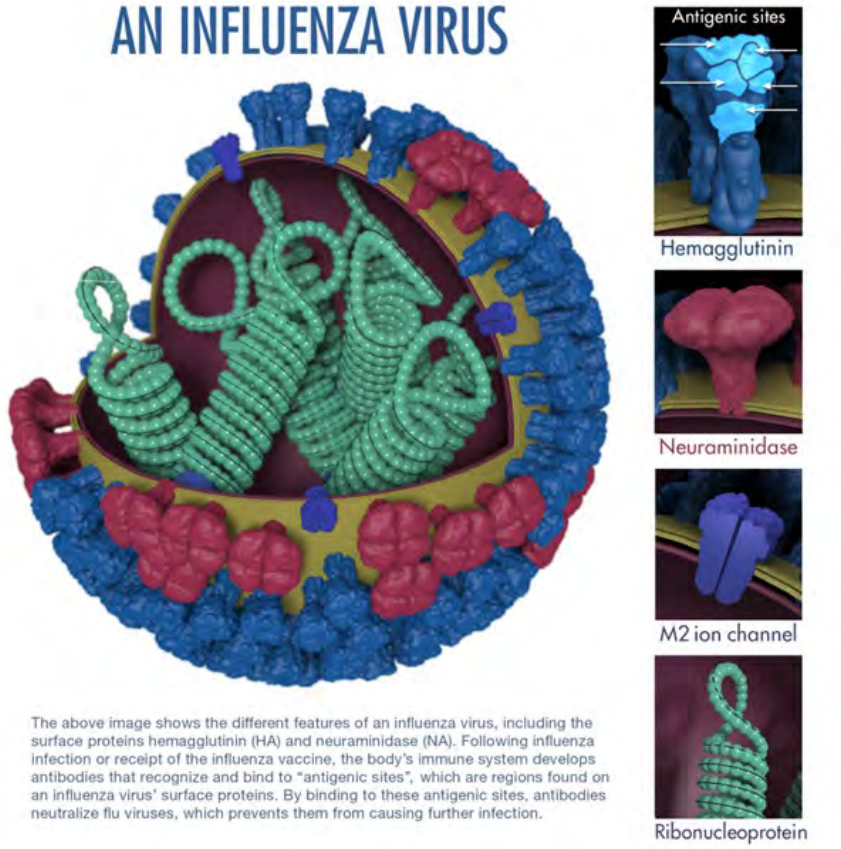
- Highly contagious
- Commonly known as the “flu”
- One of the most common infectious diseases of birds and mammals
- One of the ten leading causes of death in the US when combined with pneumonia
- Influenza viruses are unique in their ability to cause both recurrent annual epidemics and more serious pandemics

(CDC)

Pathophysiology

- Encapsulating, single strand RNA virus
- Orthomyxoviridae family
- 3 types of influenza
  - Influenza A
  - Influenza B
  - Influenza C

(CDC)



(PHIL)

Pathophysiology

- RNA core
  - 8 gene segments surrounded by coat of proteins
    - Influenza A – 10 proteins
    - Influenza B – 11 proteins
  - Most significant proteins
    - Haemagglutinin (H)
    - Neuraminidase (N)
    - Crucial antigens against which the host develops immunological defenses
  - To date 16 H types and 9 N types have been identified
    - The various combinations of these types results in 144 potential subtypes of influenza

(CDC)

Virulence Factors

- Influenza is a “moving target”
- Evolves rapidly by one of two mechanisms
- Antigenic Drift
  - Point mutations in certain error-prone regions of the genes
  - Mutations are ongoing and are responsible for the ability of the virus to evade annually acquired immunity in humans
  - Alters the virulence of the strain
- Antigenic Shift
  - Genes between 2 strains are reassorted presumably during co-infection of a single host

(CDC)

History of Influenza

- 1580 pandemic
  - 1st documented outbreak thought to be influenza
- 18th century – at least 3 pandemics
  - 1729-1730
  - 1732-1733
  - 1781-1782
- 20th century pandemics
  - 1918 – Spanish flu (H1N1)
  - 1957 – Asian flu (H2N2)
  - 1968 – Hong Kong flu (H3N2)
- 21st century pandemic
  - 2009 – "Swine flu" (H1N1)

(CDC)

Seasonal Influenza Statistics

- 5% - 20% of US residents acquire influenza yearly
- >200,000 are hospitalized each year for influenza related complications
- From 1976 – 2007 the average death rate in the US from 1.4 to 16.7/100,000 people
  - 3,349 deaths in 1986-1987 season
  - 48,614 deaths in 2003-2004 season
- Rates vary from season to season depending on the characteristics of the circulating virus strains
- Traditional season is November through March

(CDC)

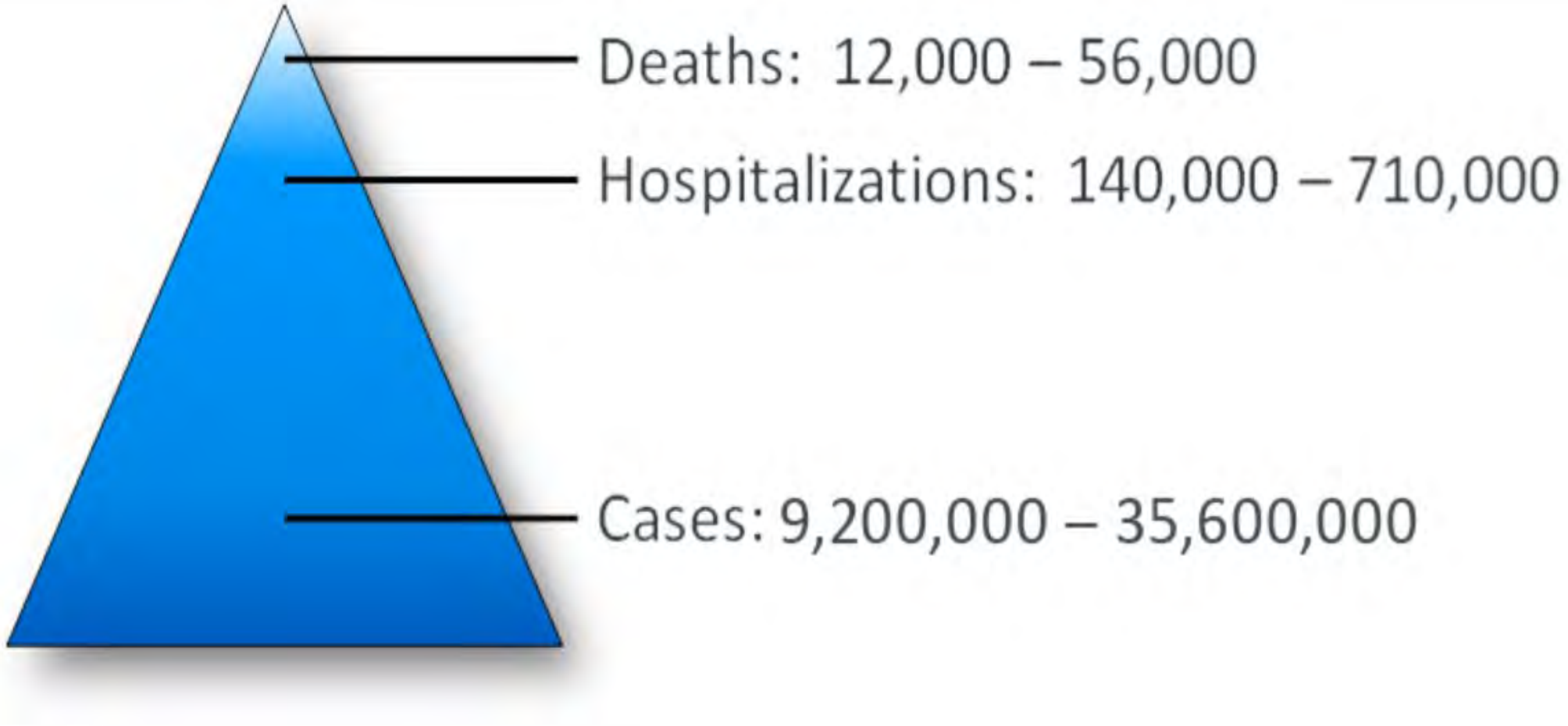
Influenza Season 2017-2018

- High severity season
  - Influenza A (H3N2) predominate strain. Influenza B became more common March through May.
  - High levels of outpatient and emergency room visits for influenza-like illness (ILI)
  - Elevated, widespread influenza activity for an extended period.
  - People 65 years and older accounted for approximately 58% of reported influenza-associated hospitalizations
  - About 900,000 hospitalized, the highest ever recorded
  - 80,000 deaths with 181 pediatric deaths

(CDC, MMWR)

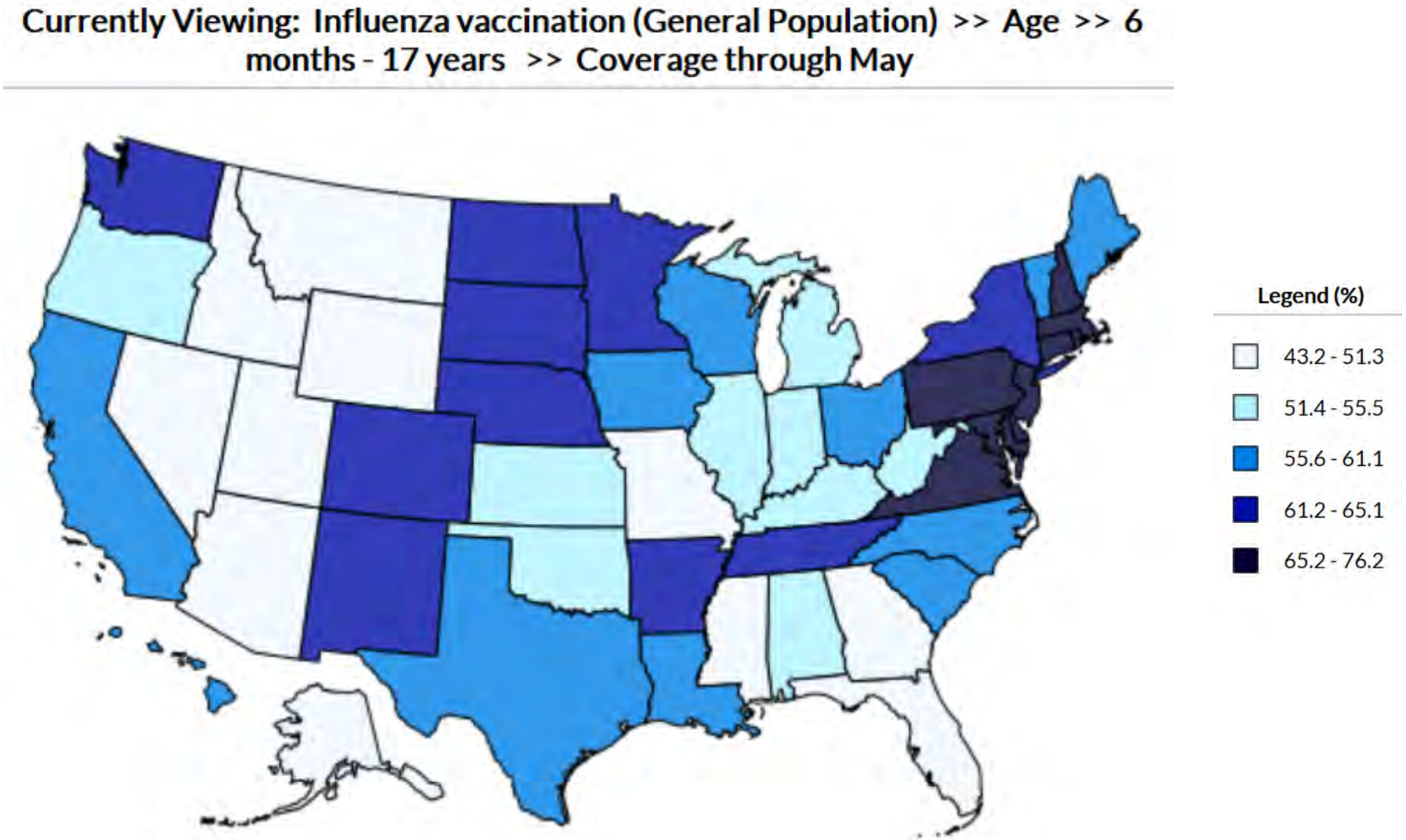
Influenza Season 2018-2019

Influenza Statistics 2010 - 2018



(CDC)

General Population Vaccination Rates



(CDC)

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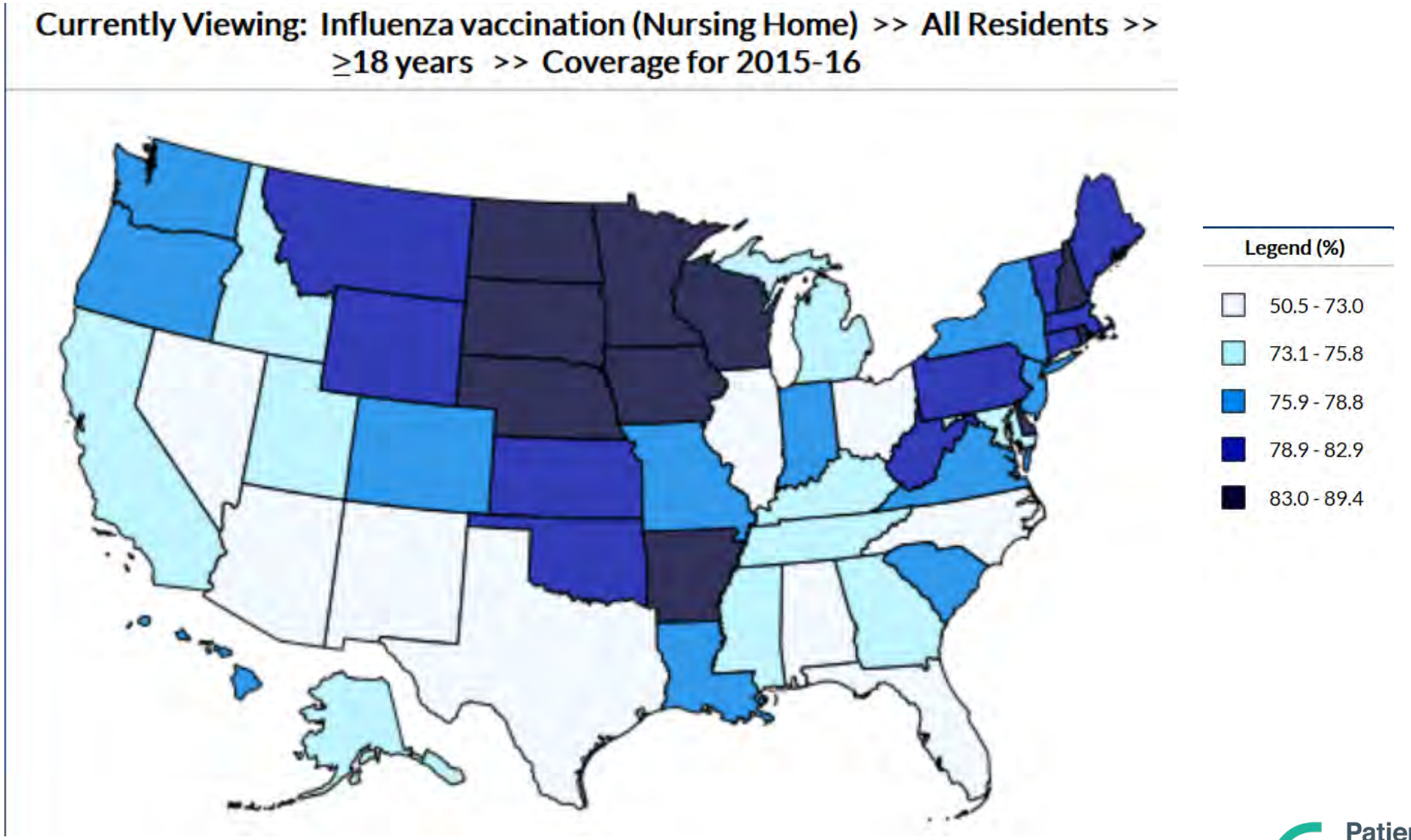
Nursing Home Resident Vaccination Rates



(CDC)

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Incubation Period

- Incubation period is 1-4 days
- Adults shed virus from the day before symptoms begin up to 10 days after onset
- Children shed virus several days before onset and 10 or more days after onset
- Severely immunocompromised people can shed virus for weeks or months
- Spreads from person to person mainly through coughing or sneezing of infected people
- Touching objects that are contaminated with the flu virus and then touching your mouth, nose or eyes may also cause infection

(CDC)

Symptomatology

- Abrupt onset
- Fever
- Myalgia
- Headache
- Malaise
- Nonproductive cough
- Sore throat
- Rhinitis
- Children may also exhibit otitis media, nausea and vomiting

(CDC)

Influenza Complications

- Influenza viral pneumonia
- Secondary bacterial pneumonia
- Exacerbation of underlying medical conditions
- Secondary sinusitis or otitis media
- Can contribute to co-infections of other viral or bacterial pathogens

(CDC)

High Risk Populations

- Children from 6 months to 4 years
- People 50 and older
- People with chronic medical conditions
- Pregnant women
- Children 6 months to 18 years receiving long term aspirin therapy
- Morbidly obese people
- Residents of nursing homes and other chronic-care facilities
- American Indians/Alaska Natives
- Household contacts of children ≤ 5 and adults ≥ 50
- Household contacts and caregivers of high risk people
- Healthcare workers (HCW)

(CDC)

Transmission

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Transmission

- Spreads from person to person mainly through coughing or sneezing of infected people
- Touching objects that are contaminated with the flu virus and then touching your mouth, nose or eyes may also cause infection

(CDC)

Differences between Cold and Influenza

Common Cold

- Gradual onset
- No fever
- No headache
- Mild myalgia
- Mild malaise
- Rhinitis and sneezing
- Sore throat
- Dry, hacking cough

Influenza

- Abrupt onset
- Fever (greater than 100ºF)
- Myalgia
- Headache
- Malaise
- Moist, productive cough
- Sore throat sometimes
- Rhinitis

(CDC)

Infection Control

Healthcare Workers

- Vaccination
- Hand hygiene
- Cough etiquette
- Stay home if ill
- Staff can return to work when 24 hours fever free without antipyretics. Wear a mask for a lingering cough.

(APIC, CDC)

Residents and Visitors

- Vaccination
- Droplet precautions
- Hand hygiene
- Cough etiquette
- Spatial separation
- Encourage ill visitors to stay home

Preventative Actions

Healthcare Workers

- Hand hygiene
- Cough and sneeze etiquette
- Follow Standard Precautions
- Avoid touching eyes, nose and mouth

Residents and Visitors

- Hand hygiene
- Social distancing
- Cough and sneeze etiquette
- Avoid touching eyes, nose and mouth

(APIC, CDC)

Prevent the Spread at Work

Healthcare Workers

- Frequent hand hygiene
- Follow healthy basic hygiene practices
- Follow standard and droplet precautions
- Frequently disinfect high touch surfaces and equipment
- Promote individual activities
- Go home if ill
- Play down perfect attendance

(CDC)

Residents and Visitors

- Follow healthy basic hygiene practices and hand hygiene
- Keep symptomatic persons at a distance
- Keep objects and surfaces clean
- Cuddle carefully
- Educate on proper hand hygiene, cough etiquette and influenza symptoms
- Encourage ill visitors to stay home

Prevent the Spread at Home

- If a member of your household becomes ill with the flu the risk of other members getting the flu increases by 10 – 20%.
  - Spatial separation
  - Keep objects and surfaces clean
  - Discourage sharing
  - Cough etiquette
  - Cuddle carefully
  - Air out the house
  - Bide your time

(CDC)

Treatment

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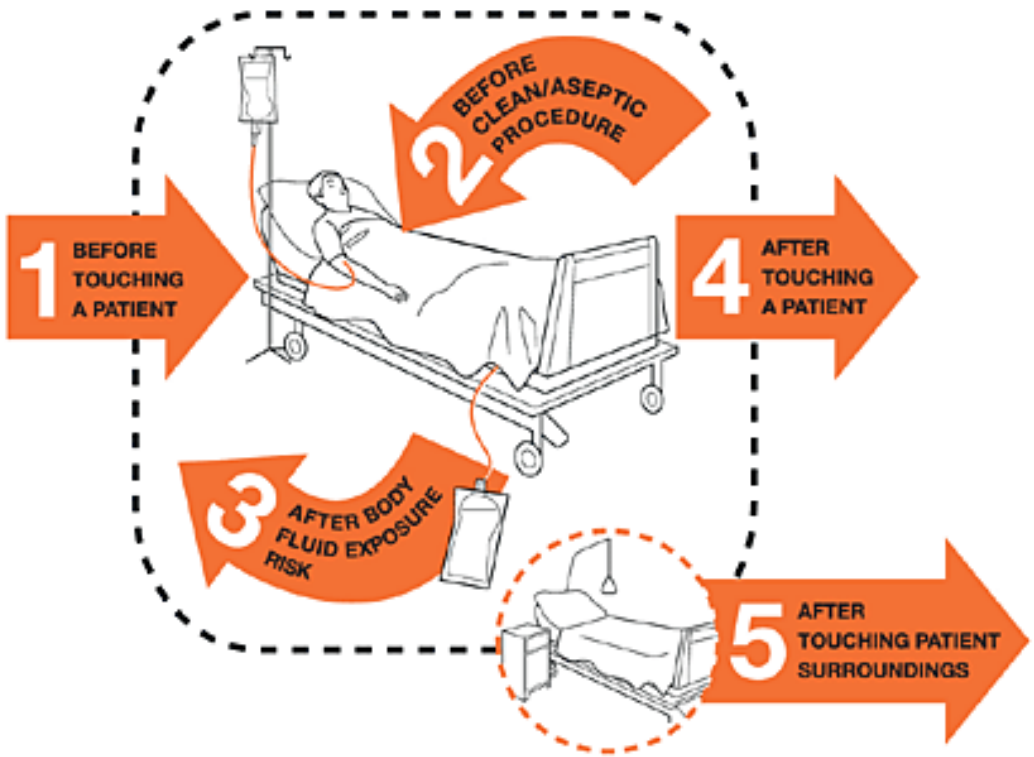
Hand Hygiene

- The most important measure you can use to prevent the spread of infection
- Critical step in preventing healthcare-associated infections
- An excellent tool to assist in hand hygiene compliance is available at http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/handhygiene/Documents/map.pdf

(APIC, CDC, WHO)

World Health Organization Five Moments for Hand Hygiene

- before touching a patient/resident
- before clean/aseptic procedures
- after body fluid exposure/risk
- after touching a patient/resident
- after touching patient/resident surroundings



(WHO)

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Standard Precautions

- The **minimum** infection prevention measures that apply to all care, regardless of suspected or confirmed infection status of the resident
- Evidence-based practices designed to protect healthcare personnel and prevent the spread of infections among residents

(APIC, CDC)

Droplet Precautions

- Used for influenza, meningitis, mumps
- Required PPE: Surgical mask, gloves and eye protection when working closely with the resident (within 3-6 feet)
- Hand hygiene

(APIC, CDC)

Environmental Cleaning and Disinfection

- Establish policies and procedures for routine cleaning and disinfection
  - Focus on high touch surfaces, shared equipment and surfaces in proximity to the resident
- Select EPA-registered disinfectants or detergents/disinfectants with label claims for use in healthcare
- Follow manufacturer's recommendations for use of cleaners and EPA-registered disinfectants

(CDC)

Treatment of Influenza

- Antiviral drugs
- Antipyretics
  - No aspirin products for children
- Fluids
- Stay home if ill

(CDC)

Antiviral Drugs

- Neuraminidase Inhibitors – majority of currently circulating viruses are susceptible to these drugs. Active against influenza A and B viruses. Recommended by CDC to treat influenza.
  - Oseltamivir (Tamiflu, available as generic)
  - Zanamivir (Relenza)
  - Peramivir (Rapivab)
  - Treatment recommended within 48 hours of developing symptoms
- Adamantanes – widespread resistance; not active against influenza B viruses
  - Amantadine
  - Fimantadine (Flumadine)

(CDC)

Neuraminidase Inhibitors

- Must be started within 2 days of onset of symptoms
- Reduce the virus' ability to replicate by:
  - Interfering with the release of virus from infected cells.
  - Causing the aggregation of virus.
  - Perhaps helping the respiratory (lung and airway) secretions make the virus inactive.

(CDC)

Xofluza (baloxavir marboxil)

FDA News Release

FDA approves new drug to treat influenza

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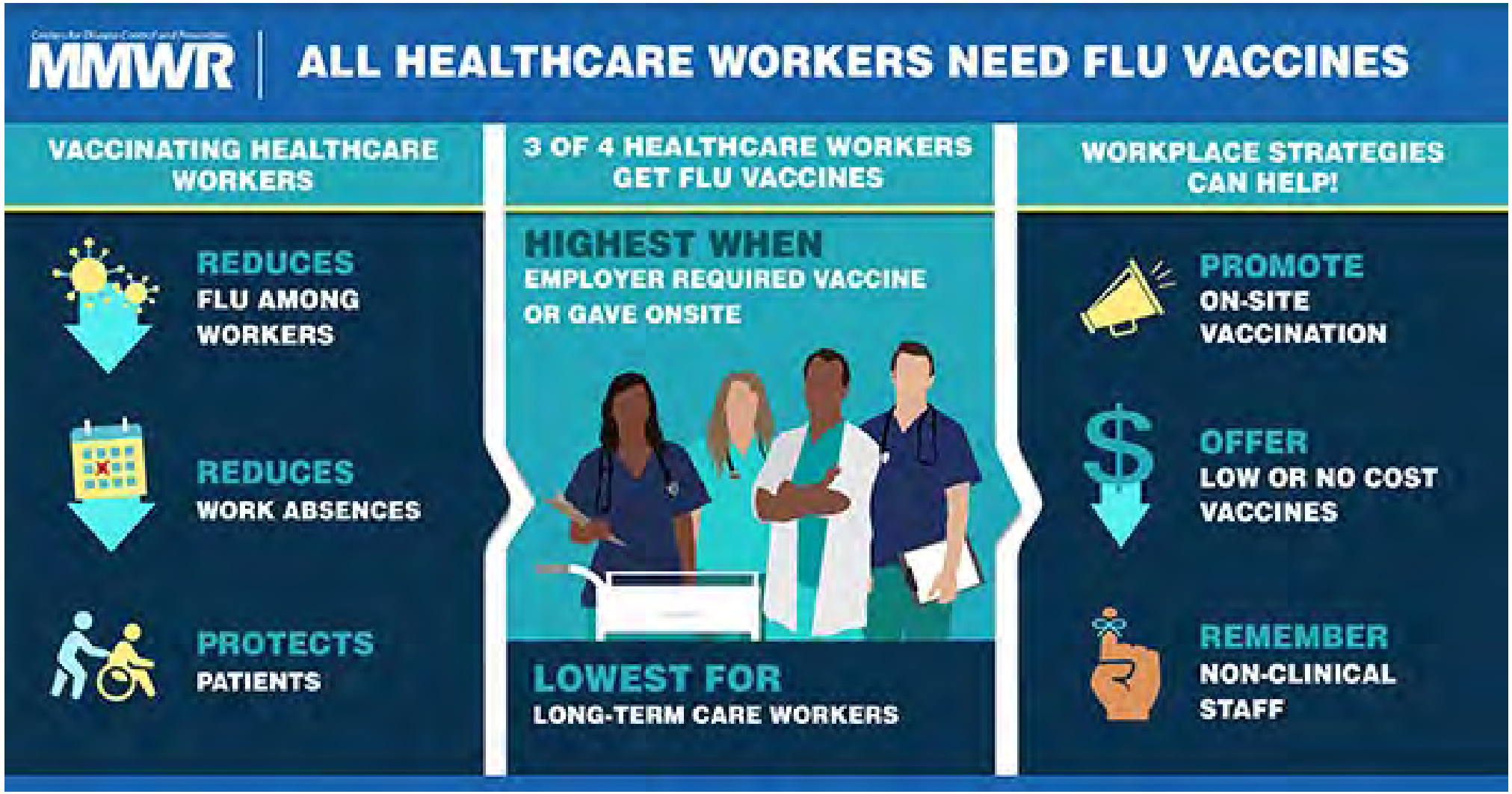
For Immediate Release October 24, 2018

Release

Español

Today, the U.S. Food and Drug Administration approved Xofluza (baloxavir marboxil) for the treatment of acute uncomplicated influenza (flu) in patients 12 years of age

Prevention



(CDC)

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Chemo Prophylaxis

- Recommended duration – 7 days after last known exposure
- Outbreak control
  - Minimum of 2 weeks
  - Continue up to 1 week after last known case is identified
  - Recommended for all residents including those who have been vaccinated

http://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm

(CDC)

Prevention of Influenza

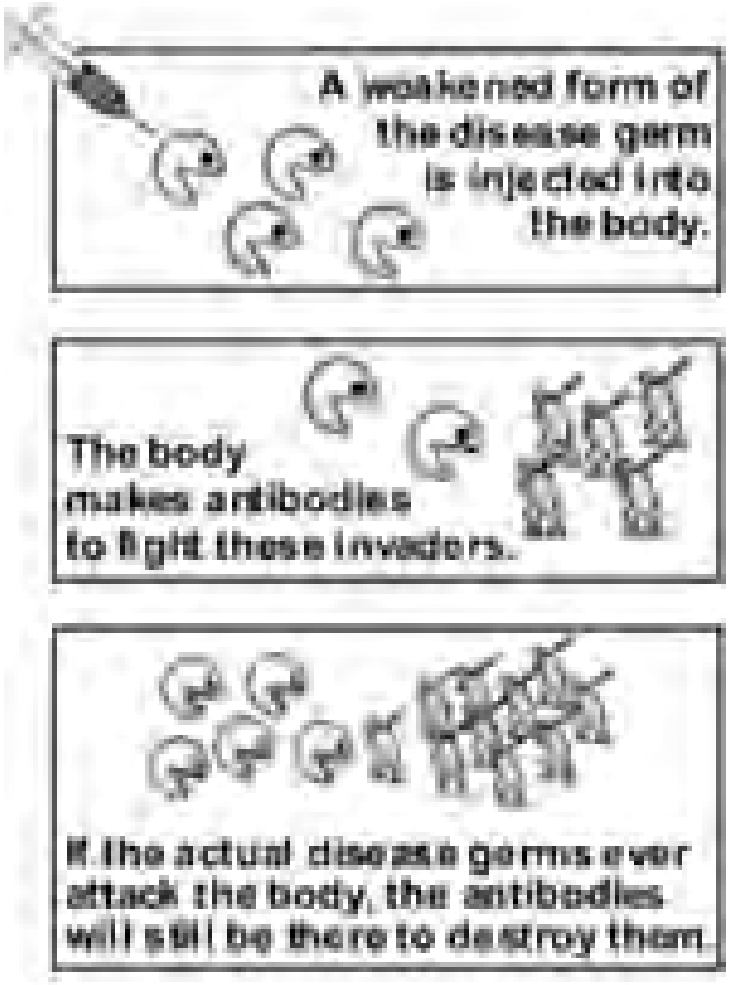
- Annual vaccination is the MOST important measure to prevent seasonal influenza infection
- Vaccination should be provided as soon as the vaccine is available and be offered throughout the influenza season
- CDC recommends vaccination by the end of October

(CDC)

Vaccines

- Inactivated vaccine (dead virus) is injected
- Takes approximately 2 weeks to develop immunity after vaccination
- Because it is dead virus it cannot cause the “flu”

(CDC)



(CDC)

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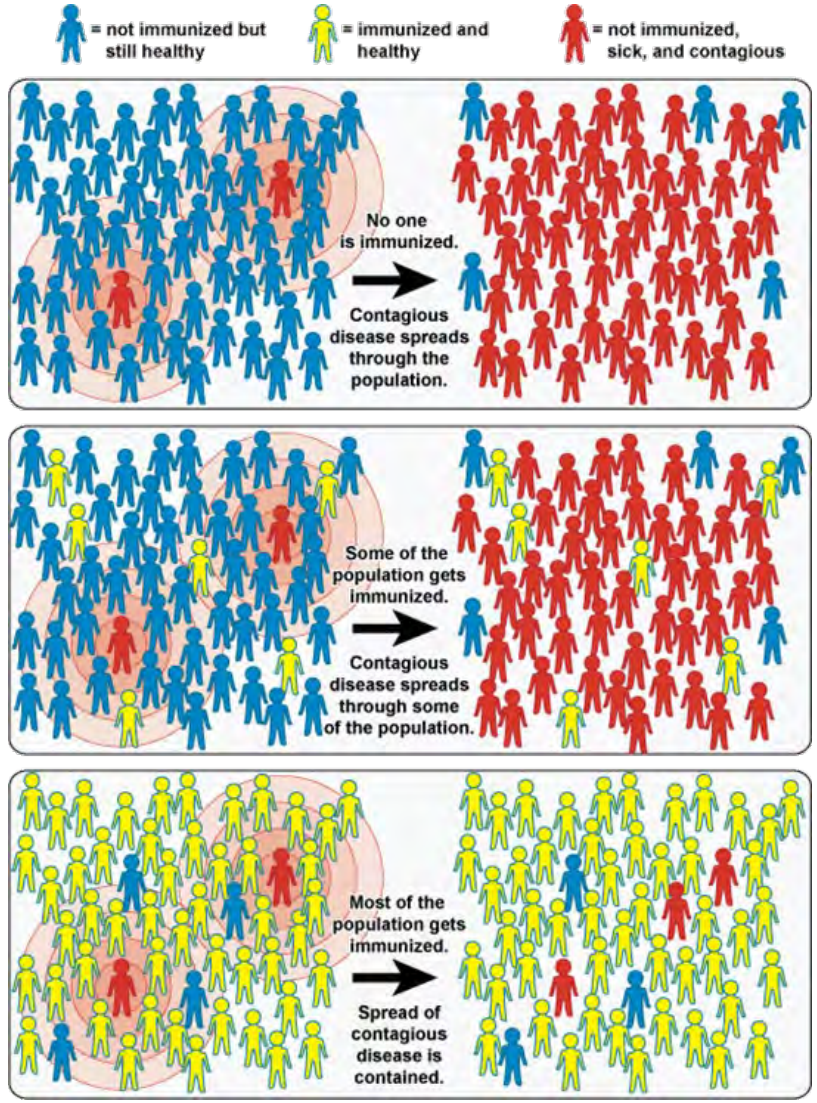
Community Immunity

- Vaccines can prevent the outbreak of disease and save lives
- If a critical portion of the community is immunized against a contagious disease there is little chance of an outbreak
- People unable to be vaccinated are protected because the spread is contained
- This is called “Community Immunity” or “Herd Immunity”

(CDC)



(PBS)

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Types of Vaccine

- Seasonal influenza vaccine
  - Inactivated influenza vaccines [IIV]
  - Recombinant influenza vaccine [RIV]
  - Live attenuated influenza vaccine [LAIV]
- CDC recommends that people get a flu vaccine by the end of October
- Takes about two weeks after vaccination for antibodies that protect against flu to develop in the body

(CDC)

Inactivated Influenza Vaccine (IIV)

- Manufactured using virus grown in eggs
- Inactivated (dead) virus
- Given with a needle for ages 6 months and older or jet injector for ages 18 through 64 only

(CDC)

Recombinant Influenza Vaccine (RIV)

- Produced using a method does not require an egg-grown vaccine virus and does not use chicken eggs in the production process
- Only egg-free vaccine available in the US
- Flublok Quadrivalent for use in adults 18 years and older.
- Flucelvax Quadrivalent (cell-based vaccine) is approved for people 4 years and older

(CDC)

Live Attenuated Influenza Vaccine (LAIV)

- Nasal spray
- Approved for ages 2 through 49
- Contraindicated for:
  - Immunosuppressed individuals
  - Pregnant women
  - Children receiving aspirin or salicylate containing medications
  - People who have taken influenza antiviral drugs within the past 48 hours
  - People who care for severely immunocompromised individuals

(CDC)

Trivalent Influenza Vaccines

- Standard dose (Afluria)
  - Virus is grown in eggs
  - Approved for people age 5 or older
  - Administered with needle (5 or older) or jet injector (age 18 or older)
- High-dose (Fluzone)
  - Approved for people 65 years and older
- Trivalent with adjuvant (Fluad)
  - Approved for people 65 years and older

(CDC)

Quadrivalent Influenza Vaccines

- Standard-dose (Afluria Quadrivalent, Fluarix Quadrivalent, FluLaval Quadrivalent, and Fluzone Quadrivalent)
  - Different flu shots are approved for different age groups
  - Some are approved for children as young as 6 months of age
- Cell-based (Flucelvax Quadrivalent)
  - Egg free
  - Virus grown in cell culture
  - Approved for people 4 years and older
- Recombinant (Flublok Quadrivalent)
  - Approved for people 18 years and older
  - Egg free

(CDC)

2018-2019 Vaccine Components

- Trivalent (three-component) vaccines contain:
  - A/Michigan/45/2015 (H1N1)pdm09-like virus
  - A/Singapore/INFIMH-16-0019/2016 A(H3N2)-like virus (updated)
  - B/Colorado/06/2017-like (Victoria lineage) virus (updated)
- Quadrivalent (four-component) vaccines contain:
  - The three recommended viruses above, plus B/Phuket/3073/2013-like (Yamagata lineage) virus

(CDC)

Vaccine Safety

- People with a severe egg allergy should receive egg free vaccine
- Communicate with the medical staff. Inform them if a person has ever had:
  - A severe allergic reaction after a dose of influenza vaccine
  - Guillain Barre Syndrome
  - If a person is moderately or severely ill, it may be advisable to wait until they recover before receiving vaccine.

(CDC)

CDC Vaccination Recommendations for Egg Allergy

- Hives only after exposure to egg may receive any licensed and recommended flu vaccine (i.e., any form of IIV or RIV)
- Egg reactions with symptoms such as angioedema, respiratory distress, lightheadedness, or recurrent emesis, or who required epinephrine or other emergency medical intervention, may receive any licensed and recommended flu vaccine (i.e., any form of IIV or RIV)
  - Should be administered in an inpatient or outpatient medical setting and be supervised by a health care provider who is able to recognize and manage severe allergic conditions
- Previous severe allergic reaction to flu vaccine, regardless of the component suspected of being responsible for the reaction, is a contraindication to vaccination

(CDC)

Vaccine Side Effects

- Mild Reactions
  - Soreness, redness, tenderness or swelling at injection site
  - Fainting (mainly adolescents)
  - Headache and muscle aches
  - Fever
  - Nausea
- If these symptoms occur, they usually begin soon after the injection and last 1 – 2 days

(CDC)

Vaccine Side Effects

- Severe Reactions - Life-threatening allergic reactions to vaccines are very rare.
- Signs of a severe allergic reaction
  - Difficulty breathing
  - Hoarseness or wheezing
  - Hives
  - Paleness
  - Weakness
  - High Fever
  - Rapid heart rate
  - Behavior changes
  - Dizziness

(CDC)

Vaccination and Healthcare Workers

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Vaccine Misconceptions

- “My flu shot gave me the flu!”
- “It is better to get the flu than the flu vaccine.”
- “I don’t need a flu shot every year.”
- “Getting a flu shot makes it easier for me to get colds and bronchitis.”
- “I am going to wait until later to get my flu shot so it lasts longer.”
- “It is after Thanksgiving so it’s too late for me to get a flu shot.”
- “I had the stomach flu so I don’t need a shot.”

Healthcare Worker Definition

- All persons, paid and unpaid, working in healthcare settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.

(CDC)

Healthcare Worker Vaccination

- Influenza vaccination is the single most effective way of preventing influenza infection
- Even among those who are not entirely protected, vaccination reduces the complications of influenza
- Universal vaccination of HCW is necessary to maximize the protective impact of this intervention
- The average seasonal influenza vaccination rate was 78.4% among HCW in the US (Hospital 91.9%, ASC 75.1%, LTC 67.4%)
- Facilities with an employer requirement for vaccination had an average rate of 98.1%
- The use of masking for unvaccinated individuals will help prevent the spread of influenza

(CDC)

Why Vaccinate?

- 4 Values of Medical Ethics
  - Autonomy
  - Beneficence
  - Nonmaleficence
  - Justice
- Harm Principle
- Professional Code of Ethics
  - "Do No Harm"

(McCormick)

Infectious Disease Experts Vaccination Position

- APIC – Influenza vaccination should be a condition of employment for healthcare personnel, unless medically contraindicated.
- CDC, the Advisory Committee on Immunization Practices (ACIP), and the Healthcare Infection Control Practices Advisory Committee (HICPAC) - Recommend that all U.S. HCW get vaccinated annually against influenza.
- SHEA - Endorses a policy in which influenza vaccination is an ongoing condition of employment, unpaid service, or receipt of professional privileges.

(APIC, CDC, SHEA)

American Nurses Association Vaccination Position

- ANA strongly recommends that nurses and other HCW be vaccinated against the influenza virus. ANA further maintains that nurses involved in direct patient care – and particularly nurses working with persons who have HIV/AIDS, are immunocompromised or in other high-risk groups – get vaccinated against the influenza in order to prevent outbreaks of the virus.

(ANA)

Vaccination Takeaways

- Prevent transmission of influenza
- Protect people unable to be vaccinated
- Benefit to employees and employer
- Fewer missed days of work due to influenza (average of 7 days off work for influenza)
- More stable workforce

(CDC)

In Summary

- Influenza vaccination is the single most effective way of preventing influenza infection.
- Even among those who are not entirely protected, vaccination reduces the complications of influenza.
- Universal vaccination of HCW is necessary to maximize the protective impact of this intervention.
- The average seasonal influenza vaccination rate was 67.4% among long-term care HCW in the US.
- Vaccination rates when an employer requirement had an average rate of 98.1% versus 45.8% when not required or promoted.
- The use of masking for unvaccinated individuals will prevent the spread of influenza.

(CDC)

Influenza Affects More Than Just You.....

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Remember, it's not just about you...it's about them, too.

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Annual Resource - MMWR

https://www.cdc.gov/mmwr/volumes/67/rr/rr6703a1.htm

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Resources

Influenza posters

- http://patientsafety.pa.gov/pst/Pages/Influenza/influenza_providers.aspx
- http://patientsafety.pa.gov/pst/Pages/Influenza/influenza_patients.aspx

Resources for patient/visitor education

- www.flu.gov
- http://www.cdc.gov/flu/freeresources/print.htm

Influenza Toolkit for Long Term Care Facilities

- http://www.cdc.gov/flu/toolkit/long-term-care/index.htm

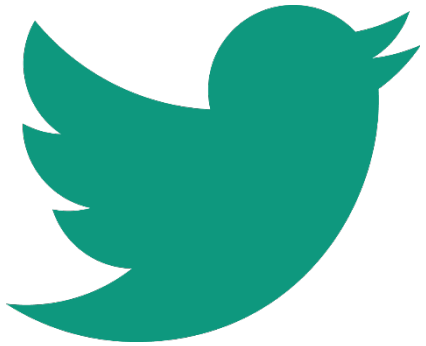
Interim Guidance for Influenza Outbreak Management in Long-Term Care Facilities

- http://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm

What questions do you have?

Thank You!

@PennsylvaniaPatientSafetyAuthority



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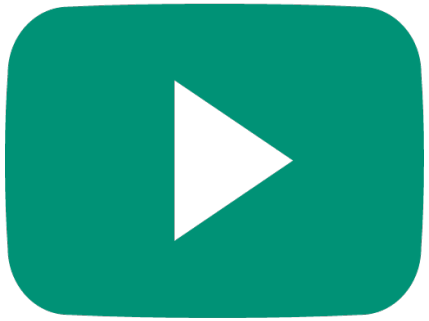

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