COCA Call Information

- For the best quality audio, we encourage you to use your computer's audio.
- Webinar link: https://zoom.us/j/209471168
- If you cannot join through digital audio, you may join by phone in listen-only mode:
  - **US: 1(646) 876-9923 or 1(669) 900-6833**
  - **Webinar ID: 209 471 168**
- All questions must be submitted through the webinar system via the Q&A button. Please do not ask a question using the chat button.

2019-2020 Influenza Season
Update and Recommendations for Clinicians

Clinician Outreach and Communication Activity (COCA) Webinar

Tuesday, January 28, 2020

Continuing Education

All continuing education for COCA Calls are issued online through the CDC Training & Continuing Education Online system at https://tceols.cdc.gov/

Those who participated in today's COCA Call and who wish to receive continuing education should complete the online evaluation by **March 2, 2020,** with the course code **WC2922**. The access code is **COCA012820.** Those who will participate in the on demand activity and wish to receive continuing education should complete the online evaluation between **March 2, 2020,** and **March 3, 2022,** and use course code **WD2922**. The access code is **COCA012820.**

Continuing education certificates can be printed immediately upon completion of your online evaluation. A cumulative transcript of all CDC/ATSDR CEs obtained through the CDC Training & Continuing Education Online System will be maintained for each user.

Continuing Education Disclaimer

- In compliance with continuing education requirements, CDC, our planners, our presenters, and their spouses/partners wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters.
- Planners have reviewed content to ensure there is no bias.
- The presentation will not include any discussion of the unlabeled use of a product or a product under investigational use, except Dr. Angela Campbell would like to disclose that she will discuss the off label use of antiviral medications for treatment of influenza.
- CDC did not accept commercial support for this continuing education activity.

To Ask a Question

- Using the Webinar System
  - Click on the **Q&A** button in the Zoom webinar system.
  - Type your question in the **Q&A** box.
  - Submit your question.
  - Please do not submit a question using the chat button.
- For media questions, please contact CDC Media Relations at 404-639-3286 or send an email to media@cdc.gov.
- If you are a patient, please refer your questions to your healthcare provider.

Objectives

- Describe the current status of influenza activity in the United States.
- Describe the circulating influenza viruses detected this season and explain the implications for clinicians.
- Describe antiviral testing and treatment recommendations for patients with suspected and confirmed influenza.

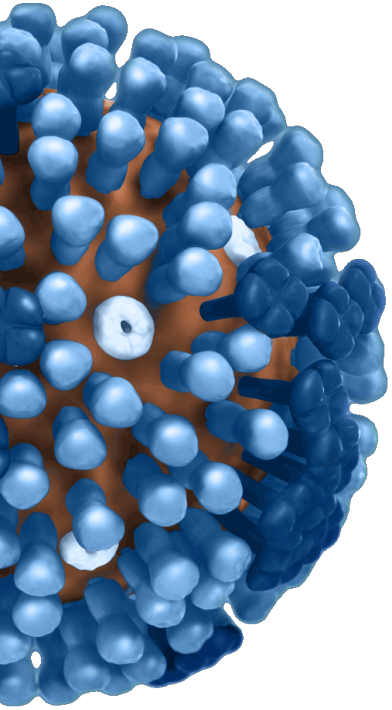
Today's First Presenter

Alicia P. Budd, MPH
Epidemiologist
Influenza Division
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention

Today's Second Presenter

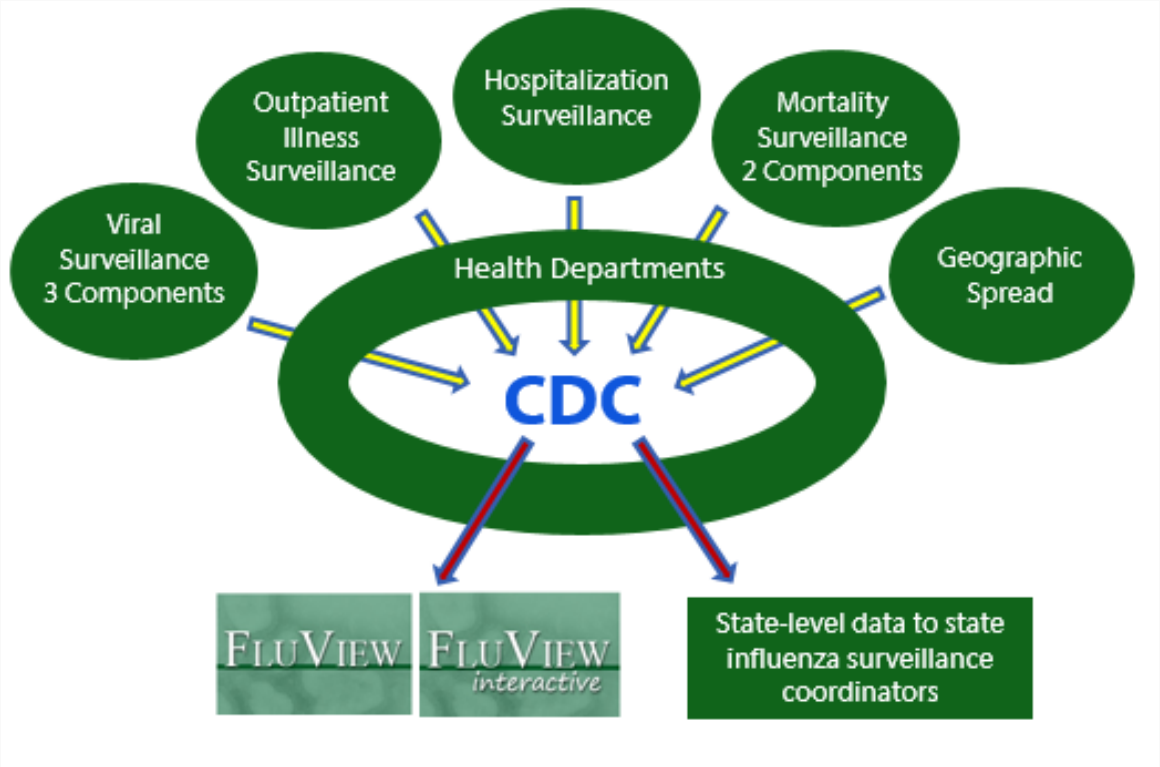
Angela J. P. Campbell, MD, MPH
Medical Officer
Influenza Division
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention

2019–2020 Influenza Season Update and Recommendations for Clinicians, United States



2019–20 Influenza Season Activity

U.S. Influenza Surveillance System

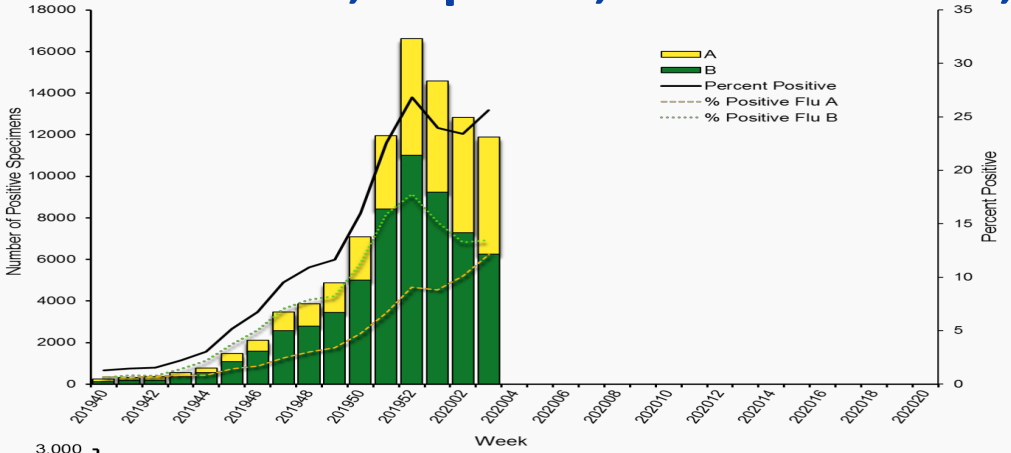


Goals of Influenza Surveillance

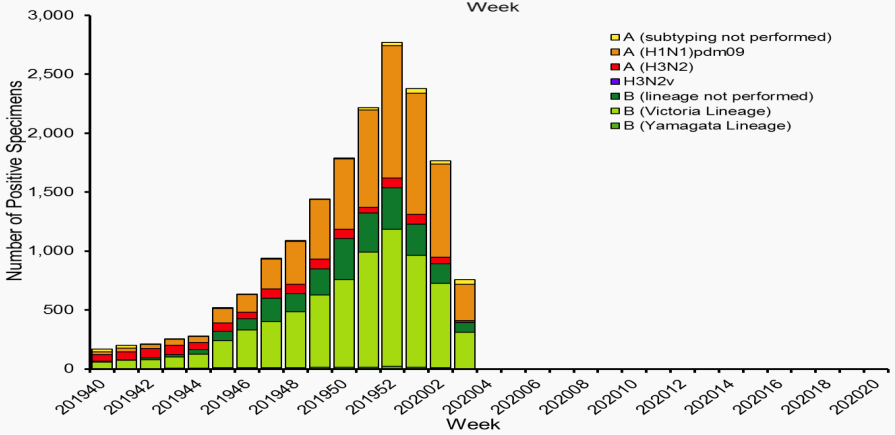
- Identify and characterize viruses/strains
- Identify viruses with pandemic potential
- Provide situational awareness
  - Describe the onset and duration of the season
  - Track geographic spread
- Monitor severity
- Describe clinical infections and those at risk
- Guide decisions for interventions

Influenza Positive Tests Reported to CDC by U.S. Clinical and Public Health Laboratories, Sept. 29, 2019 – Jan. 18, 2020

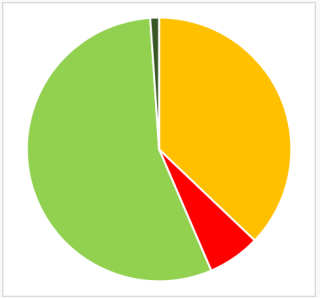
Clinical Laboratories



Public Health Laboratories



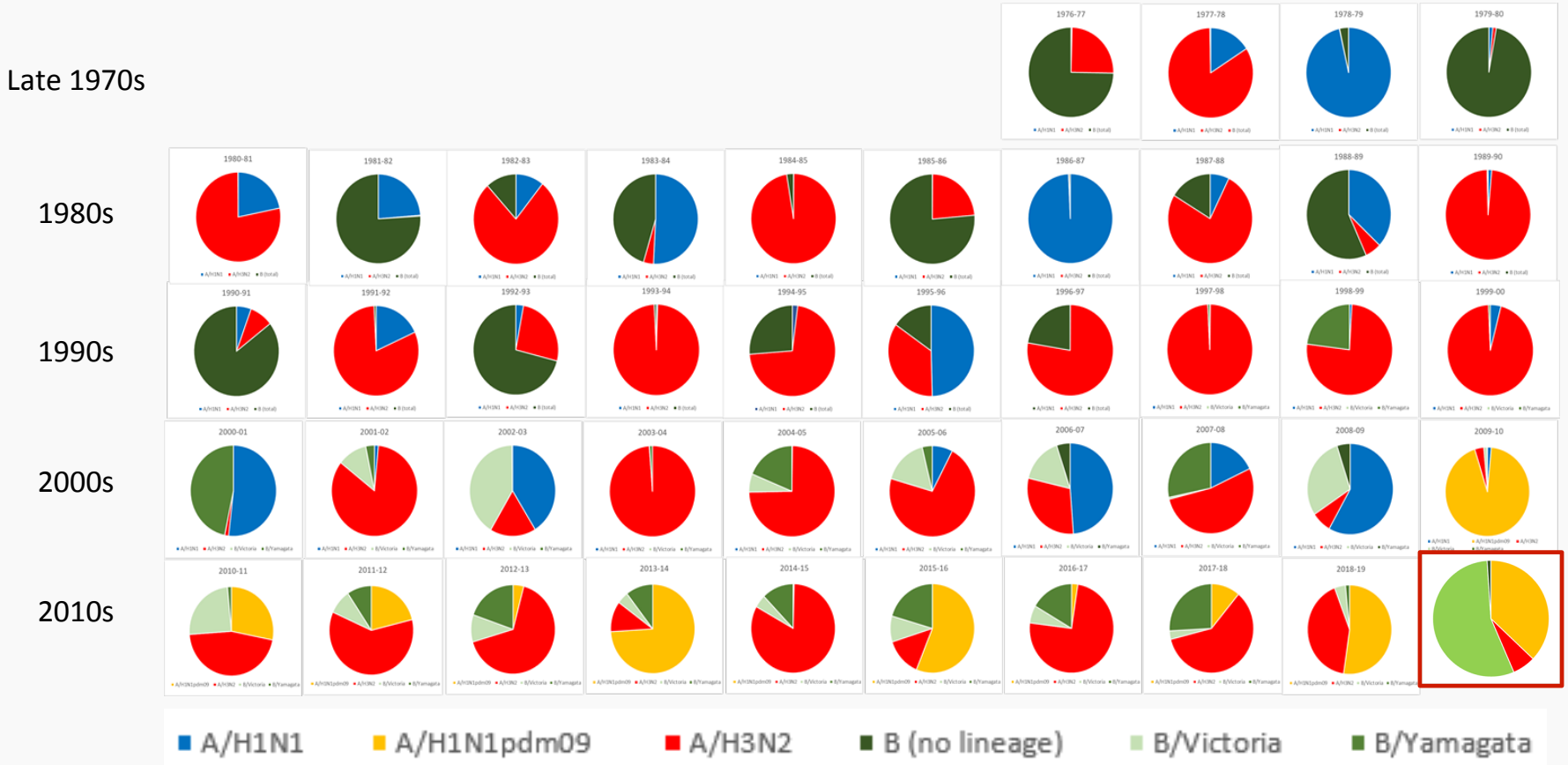
Season totals



A/H1 – 37%
A/H3 – 6%
B/Vic – 55%
B/Yam – 1%

Proportion of Circulating Viruses by Season

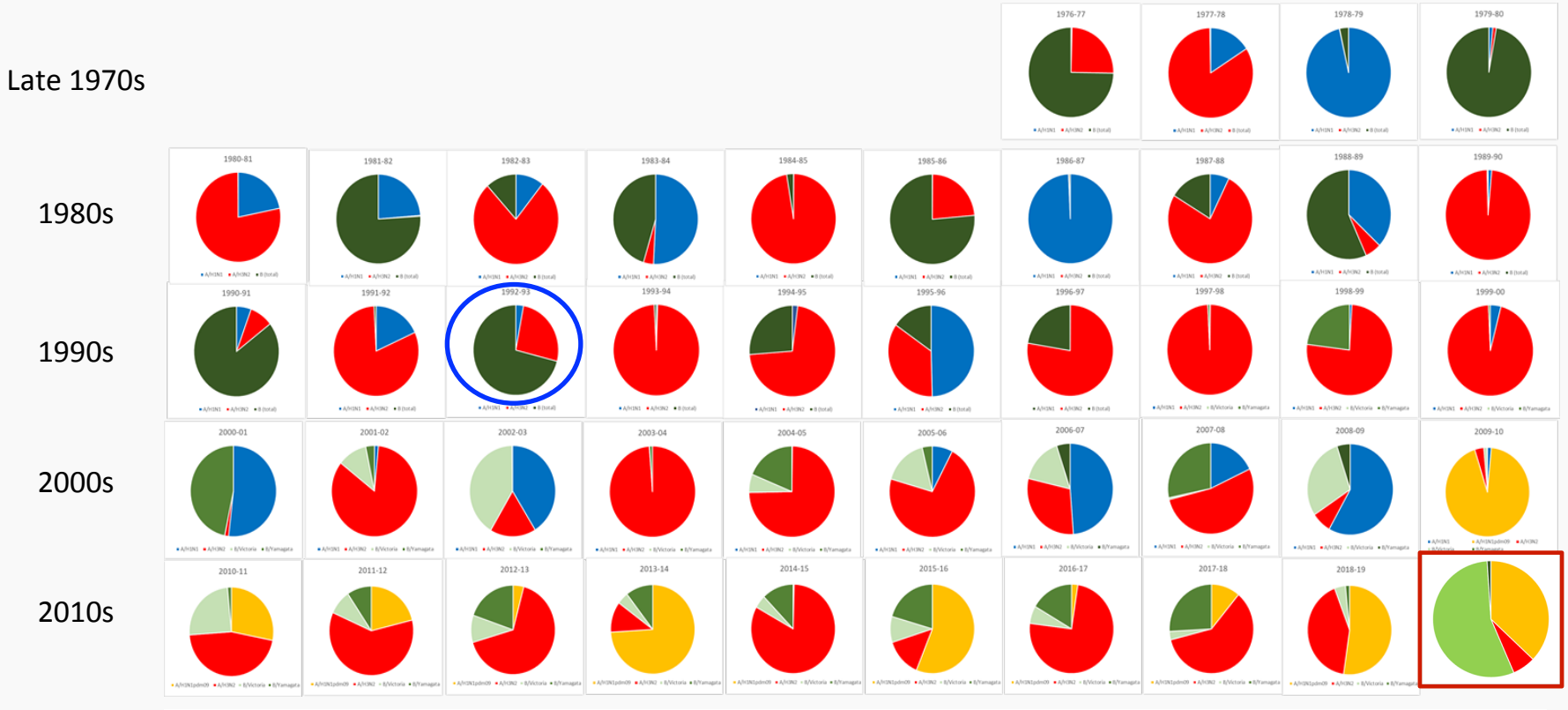
United States, 1976-1977 to 2019-2020*



* Through week 3, as of January 18, 2020

Proportion of Circulating Viruses by Season

United States, 1976-1977 to 2019-2020*



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Proportion of Circulating Viruses by Season

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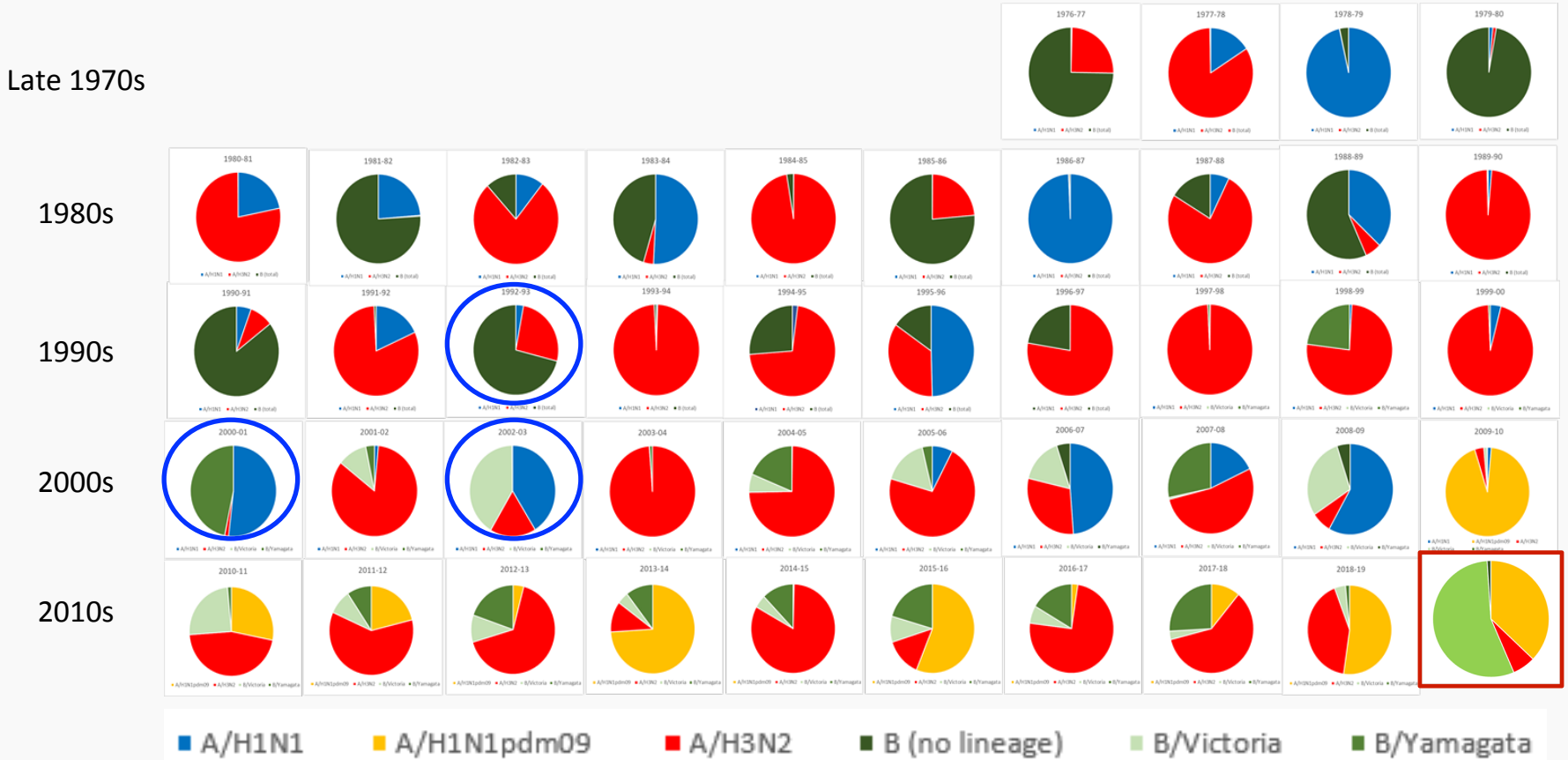
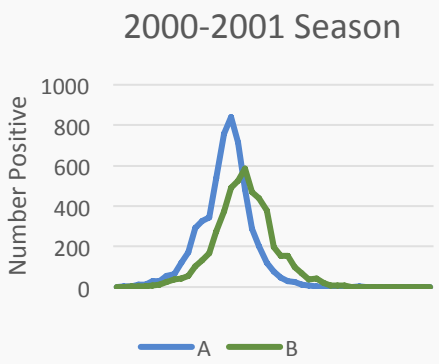


* Through week 3, as of January 18, 2020

History – B lineages

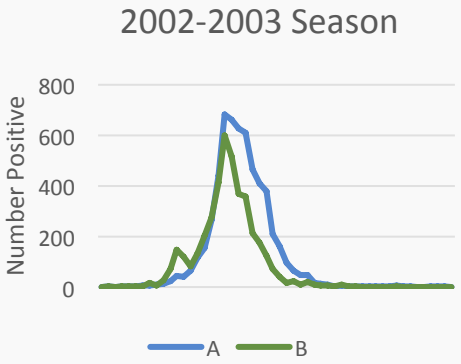
- Early/mid 1980s – separate B lineages identified
- 1988 - B/Yamagata/16/88 identified by Japan and then retrospectively (earlier in 1980s) identified from other countries in Asia
  - Sequence analysis of early Yamagata viruses showed there were related to a 1983 virus (B/USSR/100/83)
- 1988-1989 season - all US influenza B viruses were antigenically like B/Victoria/2/87
- 1990-1991 - first B/Yamagata season for the US
  - B/Yamagata dominated the Bs in circulation in US during 1990s
- 2001-2002 – B/Victoria virus circulation in US again (1st since 1988-1989)
- Since then – cocirculation of Victoria and Yamagata viruses in US

Timing of A and B Circulation



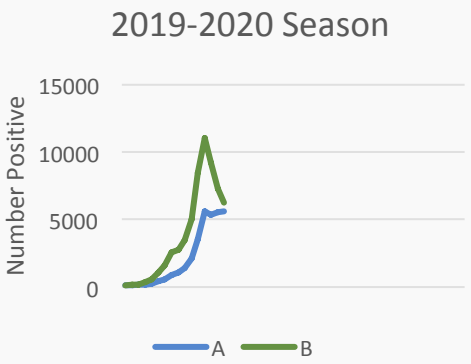
A(H1N1) & B/Vic

A first, then B



A(H1N1) & B/Yam

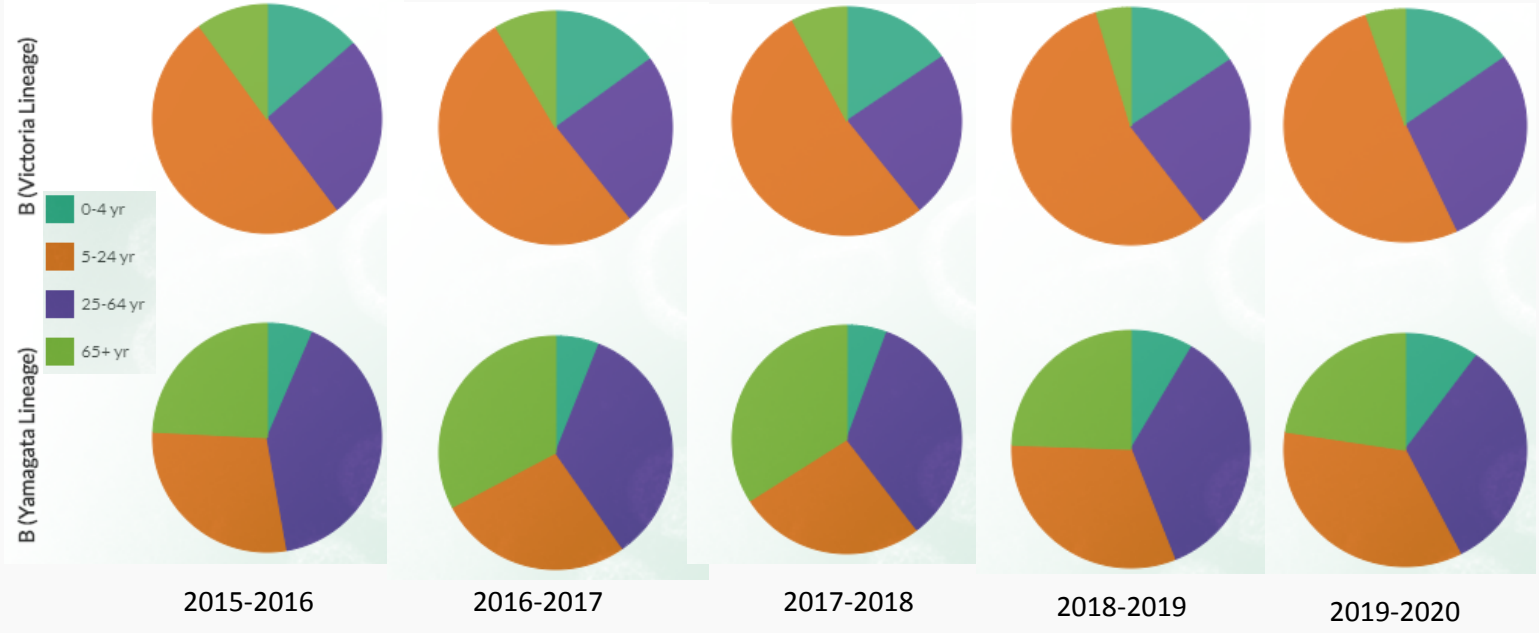
A & B Simultaneously



A(H1N1)pdm09 & B/Vic

B first, then A

Distribution of B/Victoria and B/Yamagata by Age Group, 2015-16 through 2019-20*

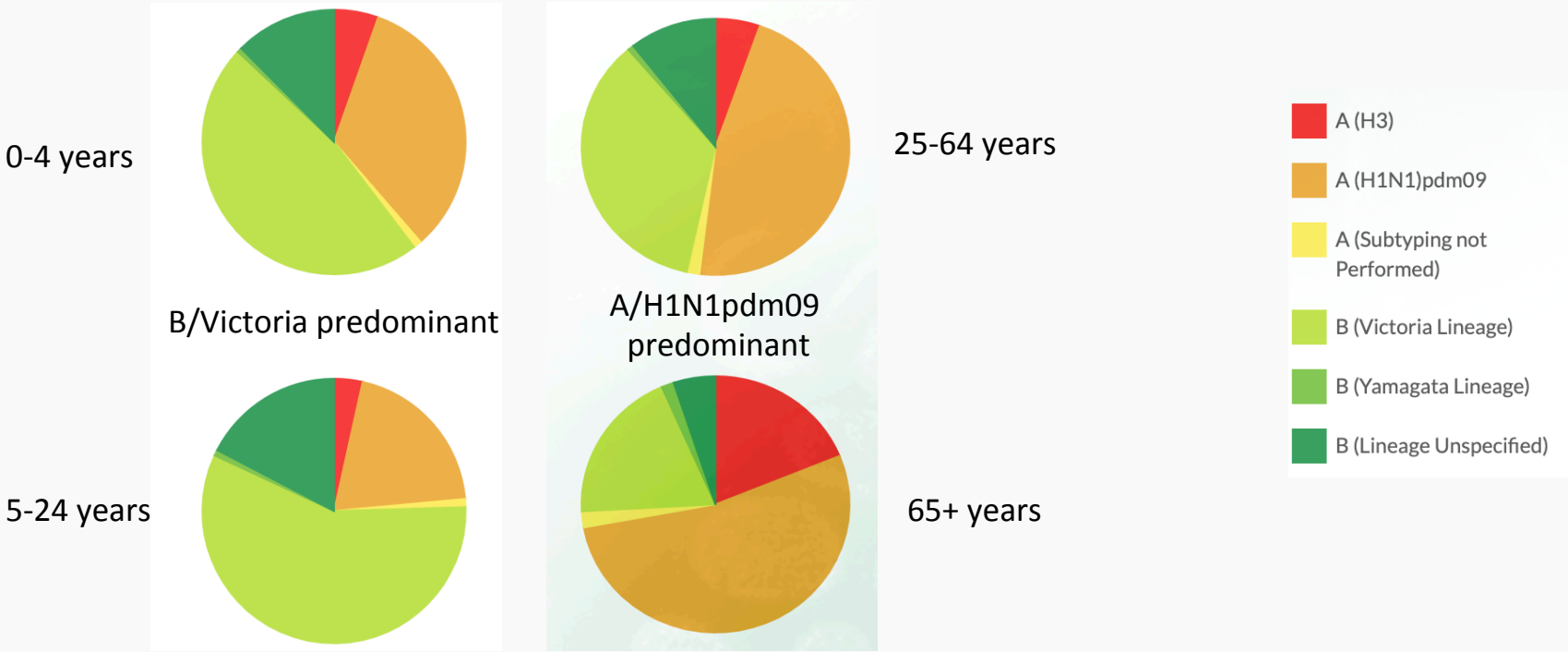


- 0-4yo: ~15%
- School age kids: ~50%
- Adults: ~25%
- 65+: ≤ 10%

- 0-4yo: ~6%
- School age kids: 25-35%
- Adults: 34-41%
- 65+: 23-34%

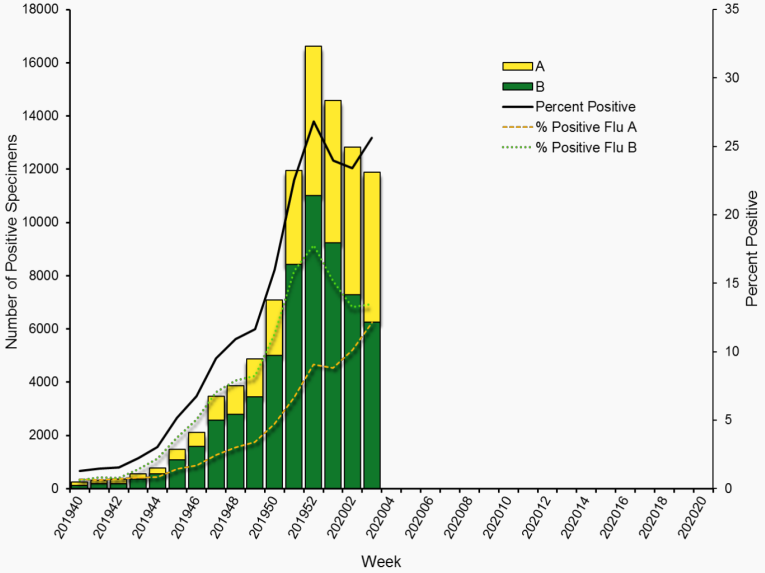
* Through week 3, as of January 18, 2020

Virus Distribution by Age Group, 2019-2020* Season

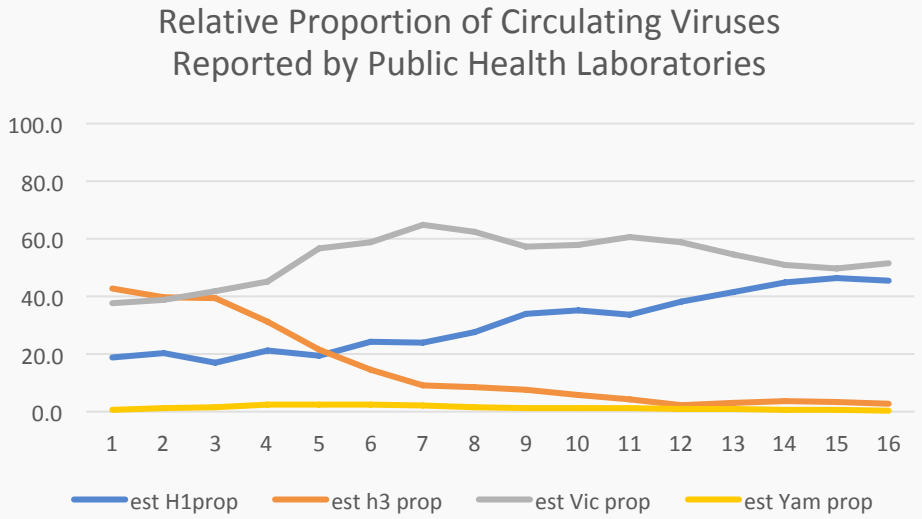


* Through week 3, as of January 18, 2020

Influenza A Activity Increasing



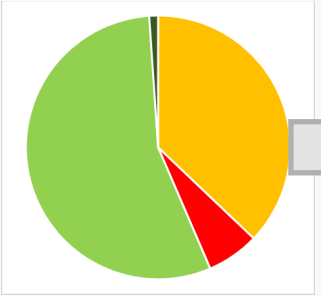
Percent A Positivity



Relative Proportion of A(H1N1)pdm09

Virus Characterization: U.S. Viruses Collected September 29, 2019 – January 18, 2020

Public Health Laboratories - Season totals as of 1/18/2020



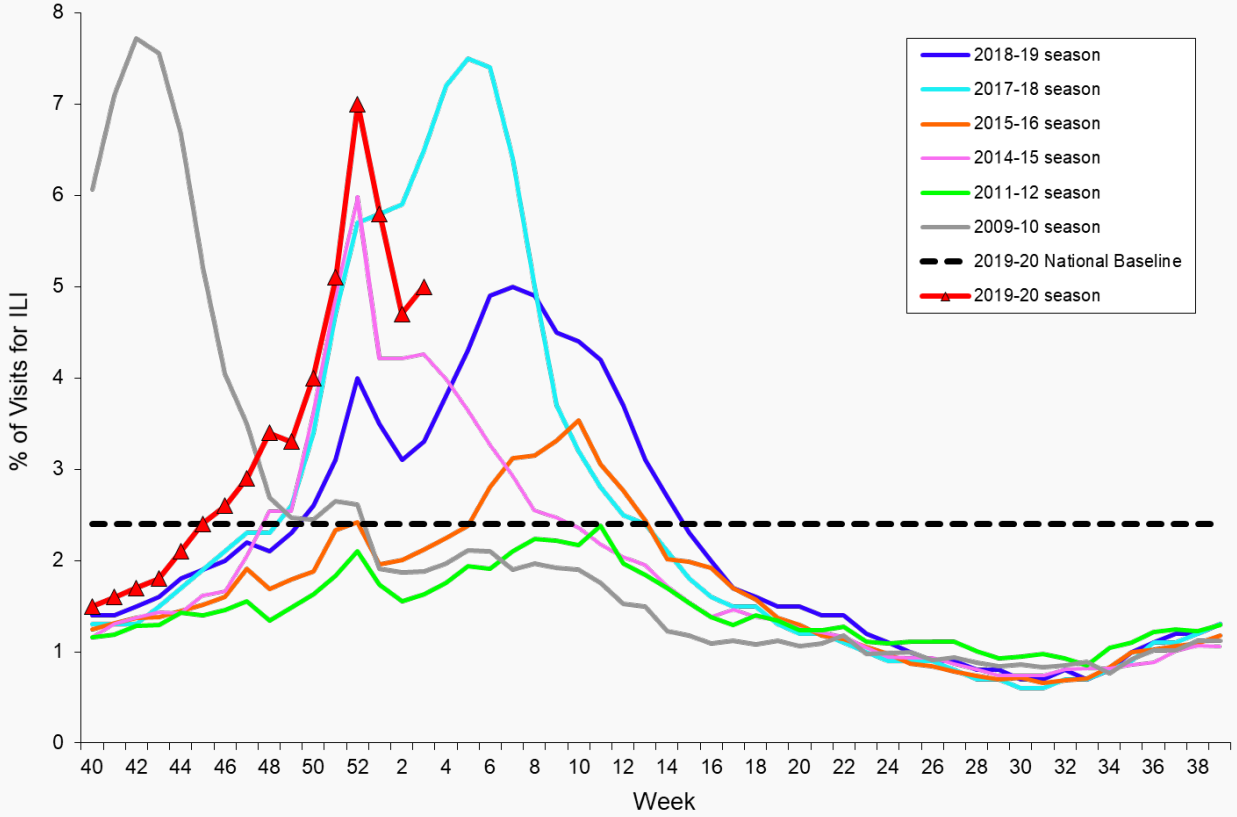
A/H1 – 37%
A/H3 – 6%
B/Vic – 55%
B/Yam – 1%

Virus Subtype or Lineage	Genetic Characterization			Antigenic Characterization
	Total No. of Subtype/Lineage Tested	Clade/Subclade	Number (% of subtype/ lineage tested)	Number (%) Similar to Cell Grown Vaccine Reference Virus*
A/H1	340			74 (100%)
		6B.1A	340 (100%)	
A/H3	268			53 (42%)
		3C.2a1	260 (97.0%)	
		3C.3a	8 (3.0%)	
B/Victoria	433			88 (60%)
		V1A.1	38 (8.8%)	
		V1A.3	395 (91.2%)	
B/Yamagata	46			10 (100%)
		Y3	46 (100%)	

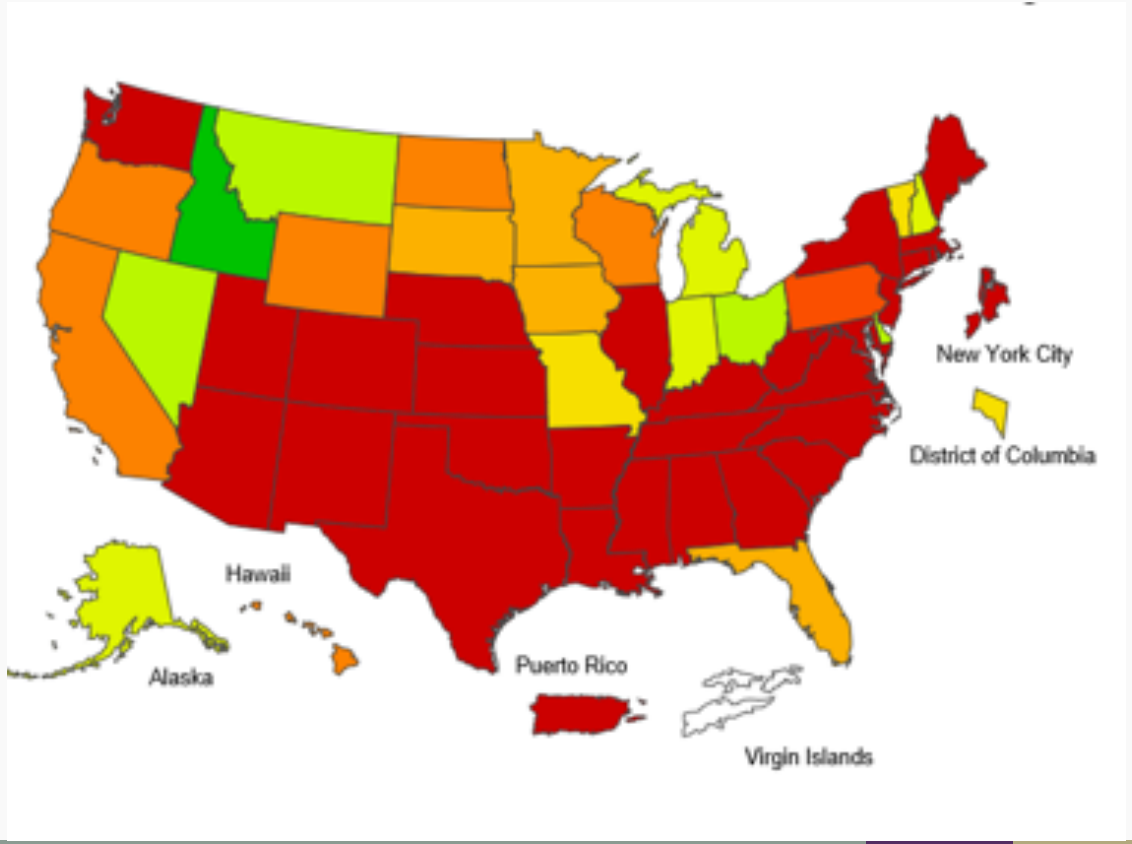
- >99% of virus tested are susceptible to 4 licensed antiviral medications.

* Trivalent vaccines will contain an A/Brisbane/02/2018 (H1N1)pdm09–like virus, an A/Kansas/14/2017 (H3N2)–like virus, and a B/Colorado/06/2017–like virus (Victoria lineage). Quadrivalent vaccines will contain the same three HA antigens as trivalent vaccines, plus a B/Phuket/3073/2013–like virus (Yamagata lineage).

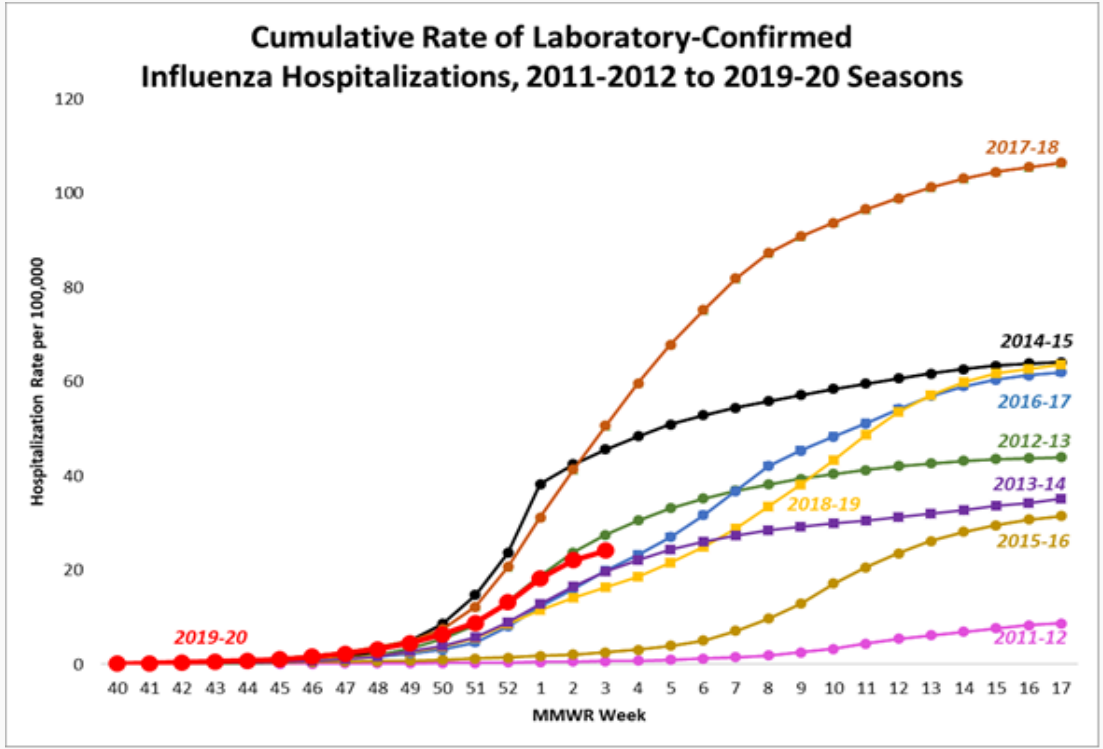
Percentage of Visits for Influenza-like Illness (ILI), 2019-2020 and Selected Previous Seasons



ILI Activity Level Indicator Determined by Data Reported to ILINet, Week 3 ending Jan. 18, 2020



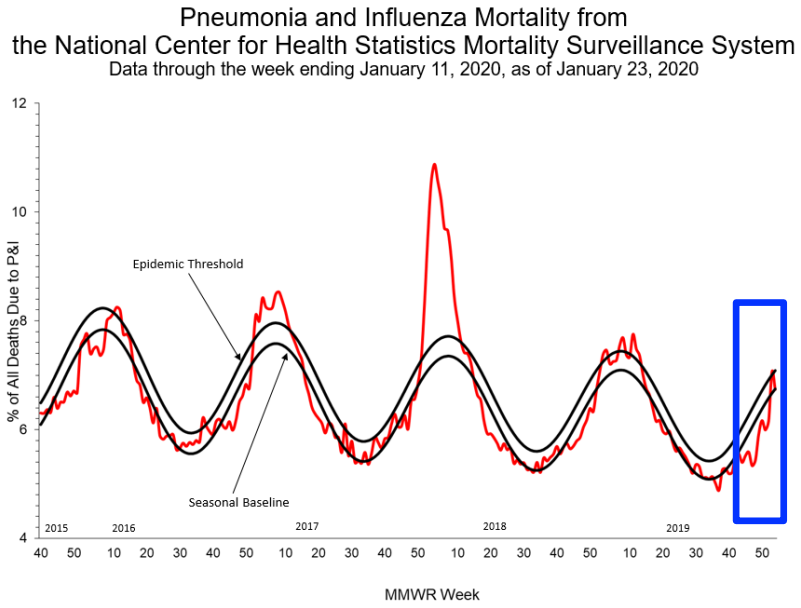
Laboratory Confirmed Influenza Associated Hospitalizations, Cumulative Rate per 100,000; 2011-2012 to 2019-20 Seasons



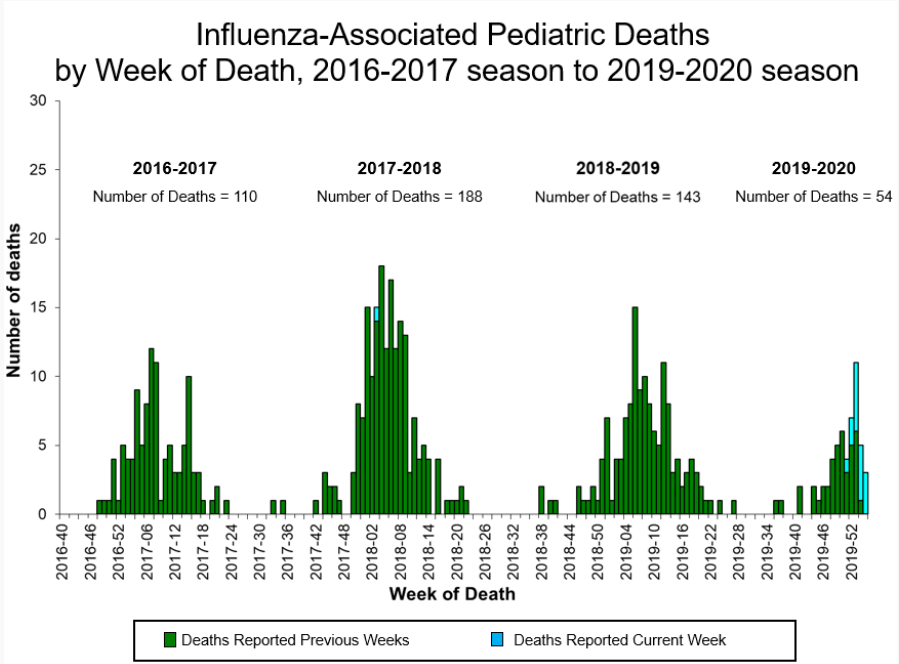
Age Group	2019-2020 Season Cumulative Rate per 100,000 Population
Overall	24.1
0-4 years	40.6
5-17 years	10.8
18-49 years	13.9
50-64 years	28.9
65+ years	58.1

Mortality Surveillance: 2019-2020 and Previous Seasons

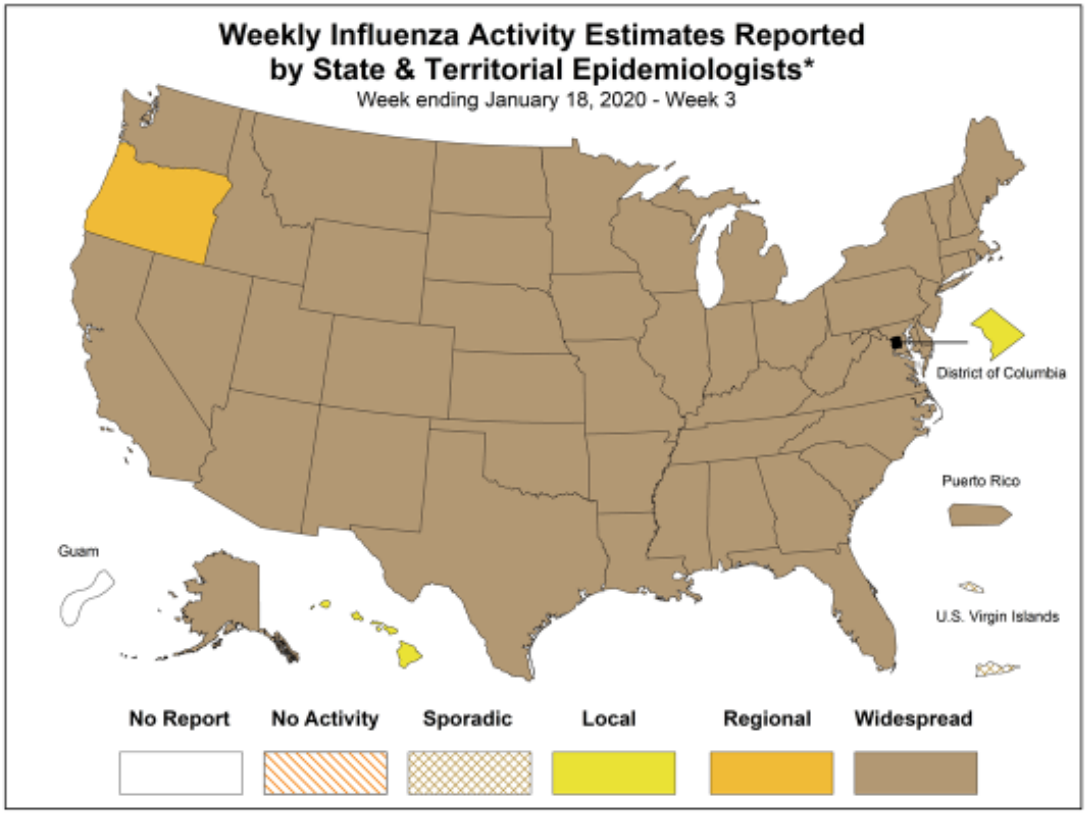
- **Pneumonia and Influenza Mortality, National Center for Health Statistics**



- **Deaths in Children with Laboratory Confirmed Influenza, as of 1/18/2020**



Weekly Influenza Activity Estimates

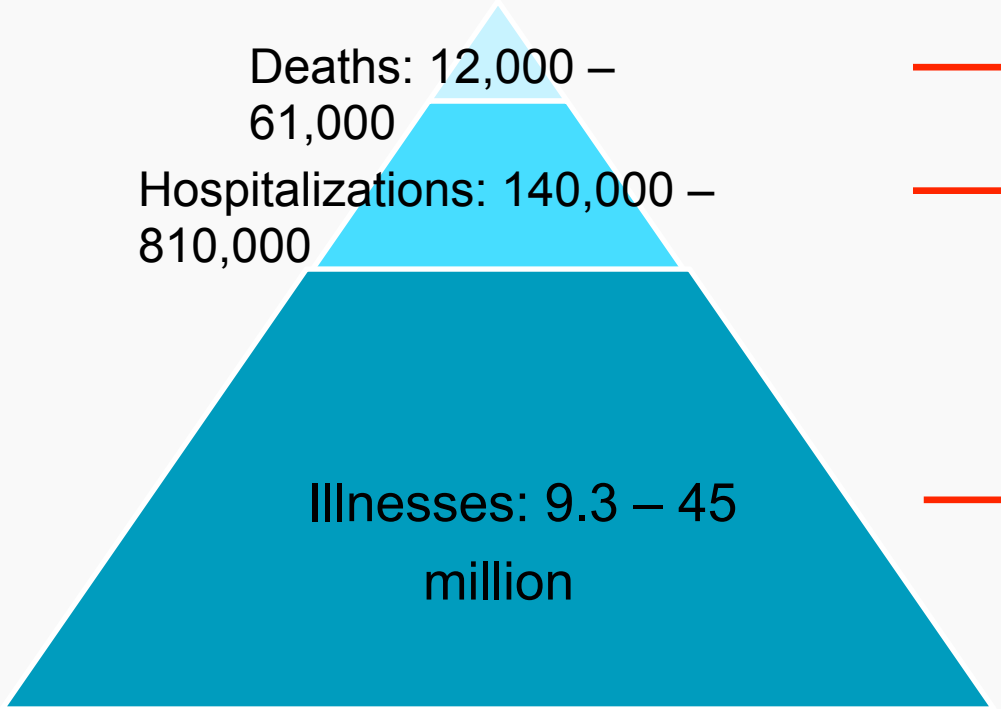


* This map indicates geographic spread & does not measure the severity of influenza activity

Burden of Influenza in the United States

2010-11 through 2017-18

2019-20 as Jan.18, 2020



8,200 – 20,000 deaths

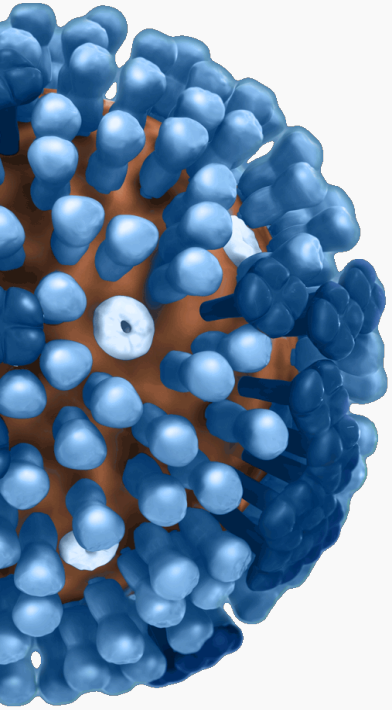
140,000 – 250,000 hospitalizations

15 – 21 million illnesses

Summary: 2019-2020 Influenza Season Activity*

- Indicators that track influenza activity are high.
  - Estimate is at least 15 million illnesses so far.
- Indicators that track severity (hospitalizations & deaths) are not high at this point.
  - Even so, estimates are at least 140,000 hospitalizations and 8,200 deaths so far.
- Influenza activity is expected to remain elevated for many more weeks.
- Nationally, B/Victoria viruses are predominant this season but during recent weeks approximately equal numbers of A/H1N1pdm09 viruses have been reported.
  - Predominant virus varies by region and age group.

* As of 1/18/2020

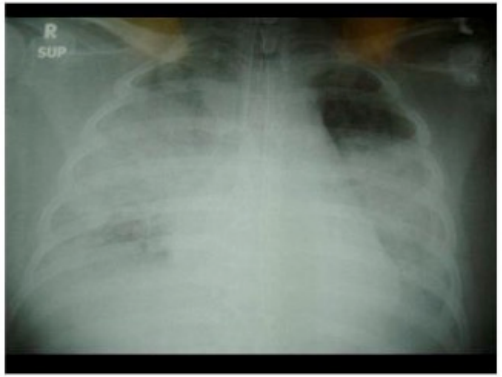


Clinical Manifestations of Influenza Virus Infection

Spectrum of Influenza Virus Infection

- Disease severity and clinical manifestations vary by age, host factors, immunity, virus type/subtype
  - Asymptomatic infection
  - Upper respiratory tract illness
    - Typical: abrupt onset of fever, cough, chills, muscle aches, fatigue, headache, sore throat, runny nose
    - GI symptoms (more common in children)
    - Infants can have fever alone, irritability, may not have respiratory symptoms
    - Elderly and immunosuppressed may not have fever
  - Complicated illness

Influenza Complications



- Otitis media common in children, sinusitis
- Worsening of underlying chronic disease
- Dehydration
- Pneumonia (primary viral or secondary bacterial) or other respiratory (croup, bronchiolitis, respiratory failure, acute respiratory distress syndrome)
- Extra-pulmonary: renal failure, myocarditis, pericarditis, myositis/ rhabdomyolysis, encephalopathy and encephalitis, Guillain-Barre syndrome, acute disseminated encephalomyelitis, sepsis, multi-organ failure
  - Sepsis is listed as a complication in up to 30% of pediatric death reports
- Invasive bacterial co-infection can cause severe and fulminant disease
  - *S. pneumoniae*, *S. aureus* (MSSA and MRSA), and *S. pyogenes*

Elevated Influenza Activity: Influenza B/Victoria and A(H1N1)pdm09 Viruses are the Predominant Viruses

HAN HEALTH ALERT NETWORK

This is an official CDC HEALTH ADVISORY

Distributed via the CDC Health Alert Network
January 10, 2020, 1140 ET (11:40 AM ET)
CDCHAN-00425

The Centers for Disease Control and Prevention reminds clinicians that influenza B viruses can cause severe illness in people of all ages, including children. CDC continues to recommend influenza vaccination and prompt antiviral treatment of high-risk outpatients and hospitalized patients with suspected influenza.

Summary

This health advisory notifies clinicians that influenza activity remains high in the United States. Ongoing elevated activity is due to influenza B/Victoria viruses, increasing circulation of influenza A(H1N1)pdm09 viruses, and low levels of influenza B/Yamagata and influenza A(H3N2) viruses. CDC's influenza forecasts suggest that national influenza activity will remain

Influenza B Viruses

- Among hospitalized adults with confirmed influenza in the United States over 8 seasons
  - No difference in ICU admission, length of stay, or mortality between influenza A and B infections
- Among children in the United States
  - The proportion of influenza-related pediatric deaths associated with influenza B viruses has generally been higher than the proportion of influenza B among circulating viruses

Su, et al. Clin Infect Dis 2014;59:252-5; Shang, et al. Pediatrics 2018;141(4); Doyle & Campbell. Curr Opin Pediatr 2019;31:119-126; Tran et al. Pediatrics 2016;138(3)

Influenza B Viruses

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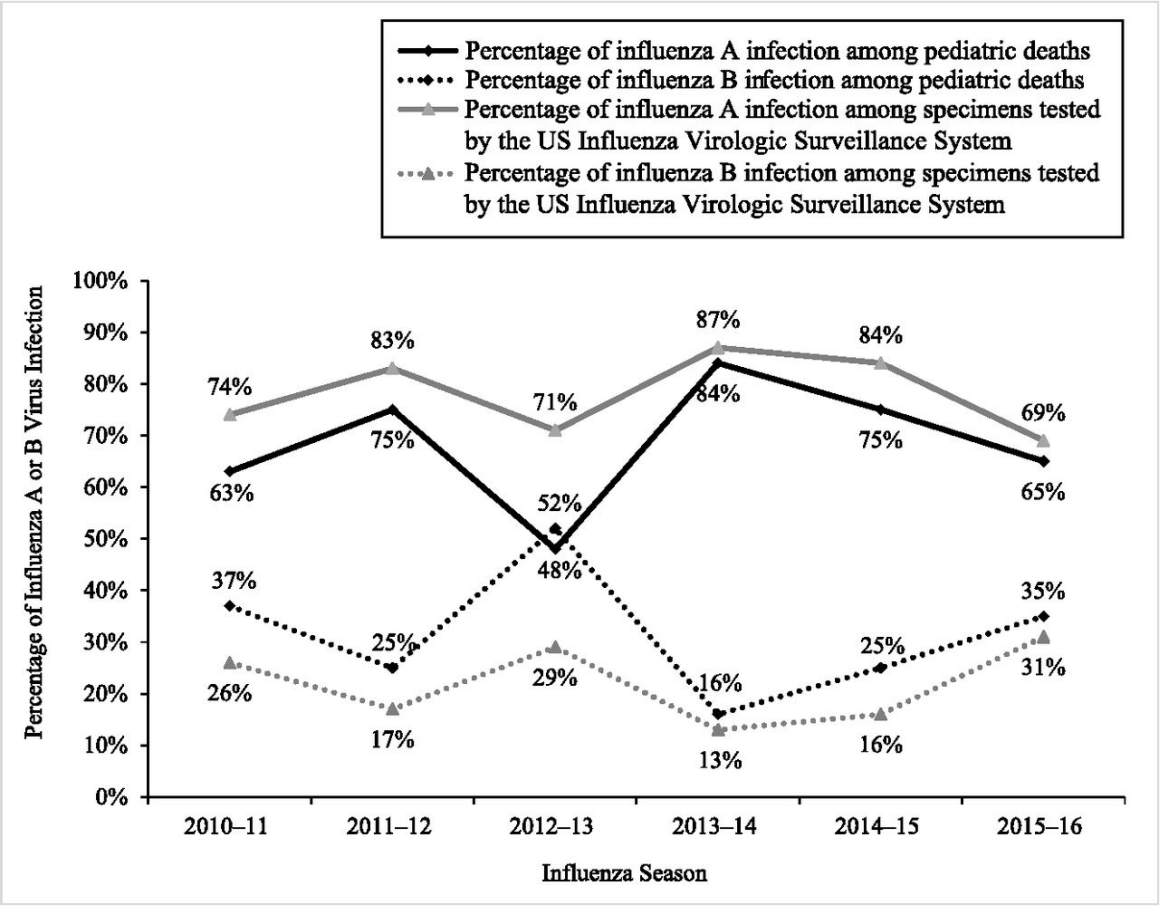

Shang, et al. Pediatrics 2018;141(4)

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Influenza B Viruses

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- Among children in the United States
  - The proportion of influenza-related pediatric deaths associated with influenza B viruses has generally been higher than the proportion of influenza B among circulating viruses
  - Mortality from influenza B–associated hospitalizations has been reported to be higher than with influenza A–associated hospitalizations

Su, et al. Clin Infect Dis 2014;59:252-5; Shang, et al. Pediatrics 2018;141(4); Doyle & Campbell. Curr Opin Pediatr 2019;31:119-126; Tran et al. Pediatrics 2016;138(3)

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A-Z Index
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Morbidity and Mortality Weekly Report (*MMWR*)

CDC

Early Season Pediatric Influenza B/Victoria Virus Infections Associated with a Recently Emerged Virus Subclade — Louisiana, 2019

Weekly / January 17, 2020 / 69(2);40–43

On January 10, 2020, this report was posted online as an MMWR *Early Release.*

Daniel Owusu, DrPH[1,2]; Julie Hand, MSPH[3]; Mark W. Tenforde, MD, PhD[1,2]; Leora R. Feldstein, PhD[2]; Juliana DaSilva, MA[2]; John Barnes, PhD[2]; Grace Lee, MD[4]; Juliet Tran, MD[4]; Theresa Sokol, MPH[3]; Alicia M. Fry, MD[2]; Lynnette Brammer, MPH[2]; Melissa A. Rolfes, PhD[2] (View author affiliations)

Summary

What is already known about this topic?

Influenza B viruses have not predominated in the United States for 27 years. Influenza B virus infection is more common among children and can cause complications, resulting in hospitalization or death.

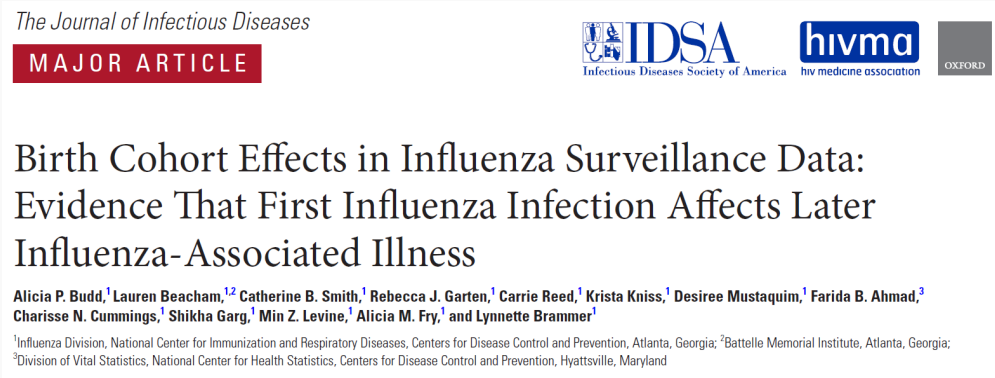
What is added by this report?

Early influenza B/Victoria virus activity in Louisiana resulted in illnesses in children that were similar to typical seasonal influenza; however, some illnesses were severe, and one death was reported.

Owusu, et al. MMWR 10 Jan 2019

Influenza A(H1N1)pdm09 Viruses

- 2018 systematic review found weak evidence that A(H1N1)pdm09 viruses were more often associated with secondary bacterial pneumonia, ICU admission, and death in the post-2009 pandemic period
- Subsequent analysis suggests that since the pandemic, more severe disease and death occurred during H1 predominant seasons than H3, particularly in adults not originally exposed to currently circulating A(H1N1)pdm09 viruses



The Journal of Infectious Diseases

MAJOR ARTICLE

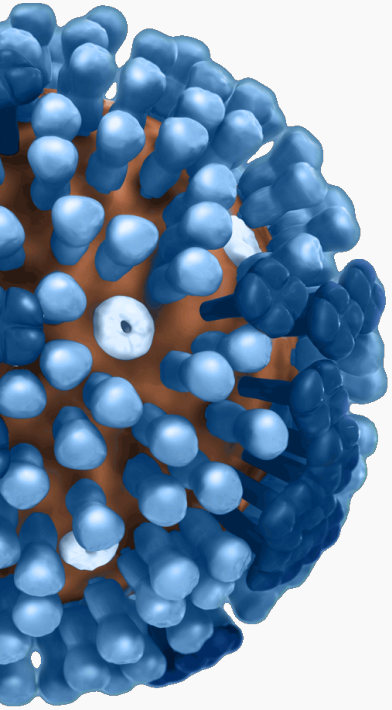
IDSA Infectious Diseases Society of America · hivma hiv medicine association · OXFORD

Birth Cohort Effects in Influenza Surveillance Data: Evidence That First Influenza Infection Affects Later Influenza-Associated Illness

Alicia P. Budd,[1] Lauren Beacham,[1,2] Catherine B. Smith,[1] Rebecca J. Garten,[1] Carrie Reed,[1] Krista Kniss,[1] Desiree Mustaquim,[1] Farida B. Ahmad,[3] Charisse N. Cummings,[1] Shikha Garg,[1] Min Z. Levine,[1] Alicia M. Fry,[1] and Lynnette Brammer[1]

[1]Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia; [2]Battelle Memorial Institute, Atlanta, Georgia; [3]Division of Vital Statistics, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland

Caini, et al. Influenza Other Respir Viruses 2018;12:780-92
Budd, et al. J Infect Dis 2019;220:820-29



Influenza Vaccination and Vaccine Effectiveness

Influenza Vaccination

- Influenza vaccination is the best way to protect against influenza
- The Advisory Committee on Immunization Practices/CDC recommend annual vaccination for everyone 6 months of age and older who do not have contraindications
- Recommended to be received by the end of October
  - As long as influenza viruses are circulating, vaccination should continue throughout influenza season, even into January or later

Grohskopf, et al. MMWR 2019; 68(No. RR-3): 1-21

2019-20 Influenza Vaccine Composition

- Trivalent vaccines:
  - A/Brisbane/02/2018 (H1N1)pdm09–like virus--*updated*
  - A/Kansas/14/2017 (H3N2)–like virus--*updated*
  - B/Colorado/06/2017-like virus (Victoria lineage)
- Quadrivalent vaccines:
  - The above three viruses, and
  - a B/Phuket/3073/2013-like virus (Yamagata lineage)

Grohskopf, et al. MMWR 2019; 68(No. RR-3): 1-21

Communicating Influenza Vaccine Effectiveness is Challenging…

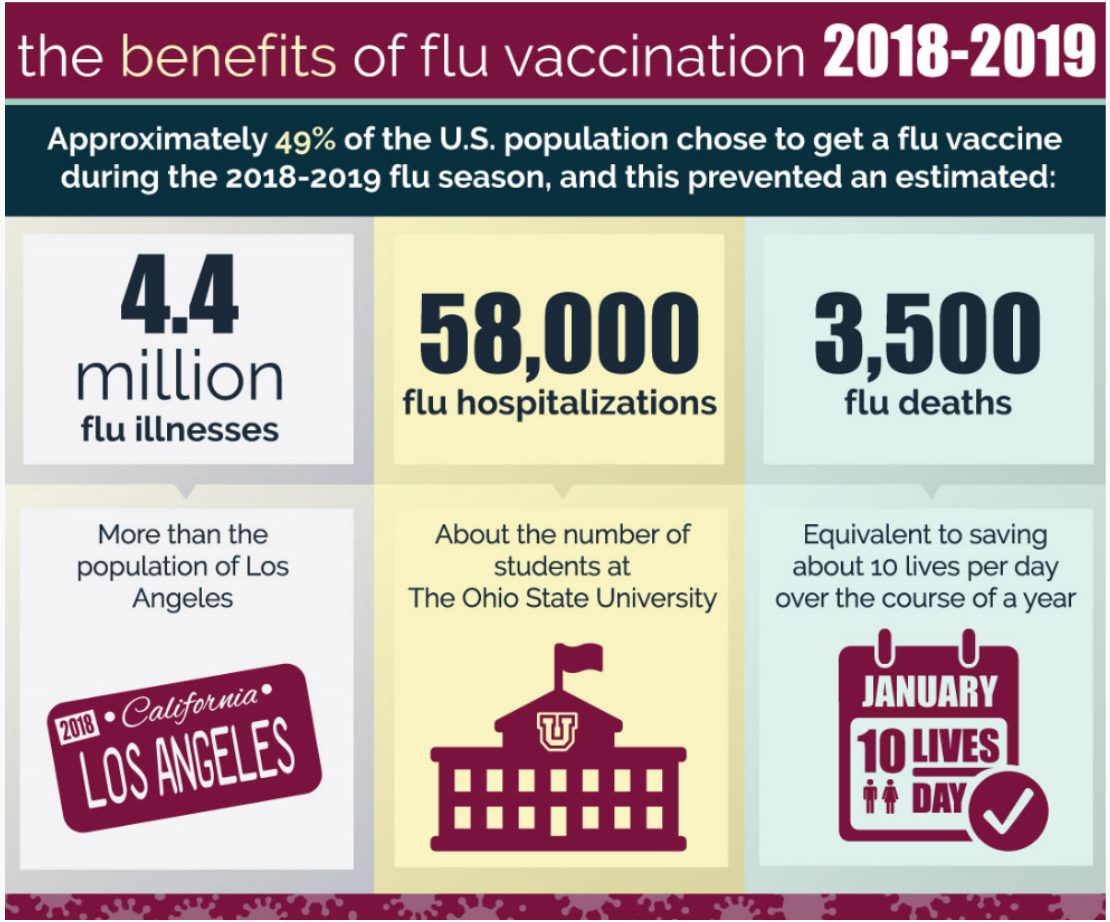
- Varies by population, circulating virus, vaccine type
- CDC developed a model to translate:

Vaccine effectiveness

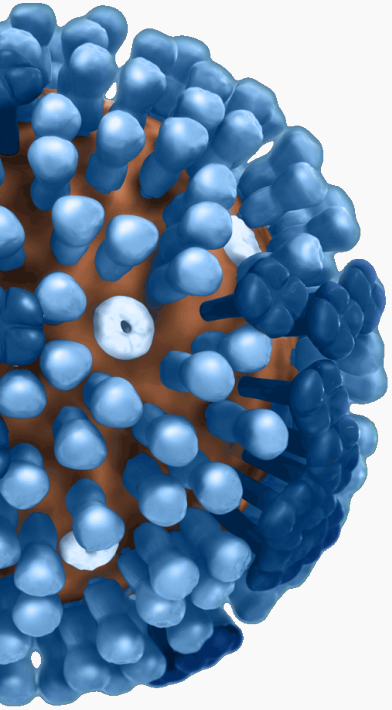
Number of influenza-related outcomes <u>prevented</u> by vaccination

Tokars et al, Vaccine 2018, 36(48): 7331-37

Season



https://www.cdc.gov/flu/vaccines-work/burden-averted.htm



Diagnosis of Influenza

2018 IDSA Clinical Practice Guidelines

Clinical Infectious Diseases

IDSA GUIDELINE

Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenza[a]

Timothy M. Uyeki,[1] Henry H. Bernstein,[2] John S. Bradley,[3,4] Janet A. Englund,[5] Thomas M. File Jr,[6] Alicia M. Fry,[1] Stefan Gravenstein,[7] Frederick G. Hayden,[8] Scott A. Harper,[9] Jon Mark Hirshon,[10] Michael G. Ison,[11] B. Lynn Johnston,[12] Shandra L. Knight,[13] Allison McGeer,[14] Laura E. Riley,[15] Cameron R. Wolfe,[16] Paul E. Alexander,[17,18] and Andrew T. Pavia[19]

Uyeki, et al. Clin Infect Dis 2019;68(6):895-902

https://www.cdc.gov/flu/professionals/diagnosis/index.htm

Seasonal Influenza (Flu)

About Flu

Who is at High Risk for Flu Complications

Flu Season

Prevent Flu

Flu Vaccines Work

Symptoms & Diagnosis

Treatment

Schools, Businesses & Travelers

Flu Activity & Surveillance

Health Professionals

Health Care Workers Need A Flu

Information for Clinicians on Influenza Virus Testing

Español

When to Test for Influenza

- Guide for considering influenza testing when influenza viruses are circulating in the community
- Influenza virus testing in investigational outbreaks in institutional or other closed settings

How to Interpret Influenza Testing Results

- Algorithm to assist in the interpretation of influenza testing results and clinical decision-making during periods when influenza viruses are circulating in the community
- Algorithm to assist in the interpretation of influenza testing results and clinical decision-making during periods when influenza viruses are NOT circulating in the community

What Influenza Virus Tests Are Available

- Overview of influenza tests
- Influenza Virus Testing Methods
- Table 1: Influenza Virus Testing Methods
- Table 2: FDA-cleared and Available Rapid Influenza Diagnostic Tests
- Table 3: FDA-cleared Nucleic Acid Detection Based Tests for Influenza Viruses
- Information on Rapid Molecular Assays, RT-PCR, and other Molecular Assays for Diagnosis of Influenza Virus Infection
- Information about Rapid Influenza Diagnostic Tests

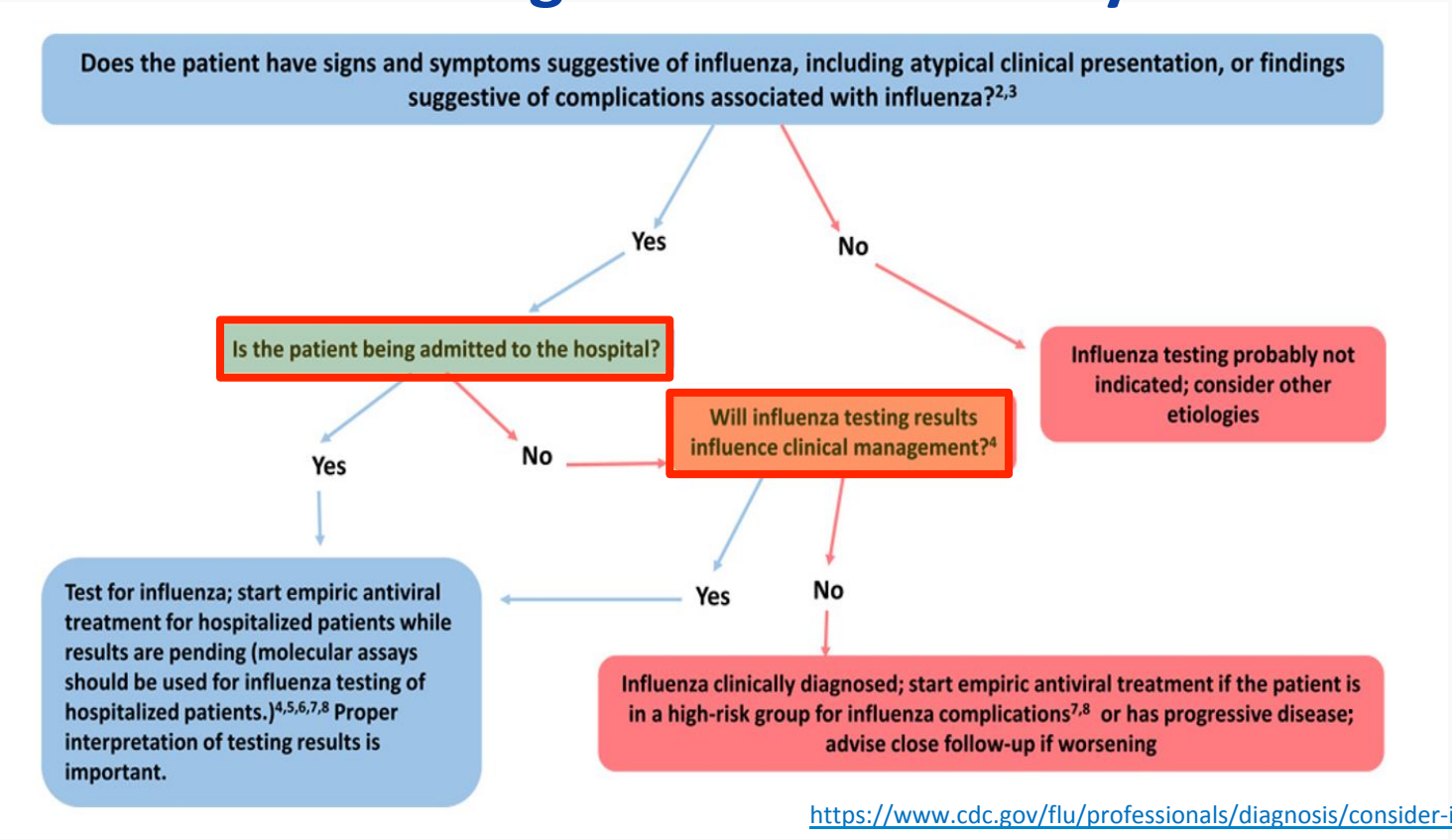
Information for Laboratory Directors and Staff

Influenza Testing Should be Performed when…

- **Results are likely to influence clinical management**
  - Decrease unnecessary laboratory testing for other etiologies
  - Decrease unnecessary use of antibiotics
  - Facilitate implementation of infection prevention and control measures
  - Increase appropriate use of influenza antiviral medications
  - Potentially decrease length of stay
- **Results will influence a public health response**
  - Outbreak identification and interventions

Uyeki, et al. Clin Infect Dis 2019;68(6):895-902

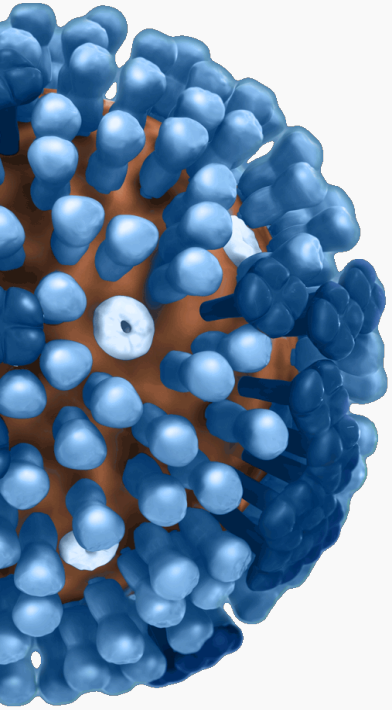
Guide for Considering Influenza Testing when Influenza Circulating in the Community



https://www.cdc.gov/flu/professionals/diagnosis/consider-influenza-testing.htm

What Tests Should be Used to Diagnose Influenza?

- **Outpatients**
  - Rapid molecular assays (nucleic acid amplification tests) have high sensitivity and will improve detection over rapid influenza diagnostic tests (RIDTs) that use antigen detection
- **Hospitalized Patients**
  - Molecular assays (including RT-PCR or other multiplex molecular assays) should be used to improve detection of influenza
    - Multiplex molecular panel recommended for hospitalized immunocompromised patients



Antiviral Treatment Recommendations

Influenza Antiviral Treatment

- Influenza antiviral medications are an important adjunct to vaccination
- Focus of CDC influenza treatment guidance is on *prevention of severe outcomes*
  - Treatment of those with severe disease and persons at highest risk of severe influenza complications
- Antiviral recommendations are common to IDSA, AAP, PIDS, ACOG

Uyeki, et al. Clin Infect Dis 2019;68(6):895-902
AAP COID. Pediatrics, 2019;144(4):e20192478
https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Immunization-Infectious-Disease-and-Public-Health-Preparedness-Expert-Work-Group/Assessment-and-Treatment-of-Pregnant-Women-With-Suspected-or-Confirmed-Influenza
https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Influenza Antiviral Treatment – Brief Overview of Data

- Clinical trials and observational data show that early antiviral treatment can shorten the duration of fever and flu symptoms
- Meta-analyses of randomized controlled trials have demonstrated that early treatment reduced risk of otitis media in children and lower respiratory tract complications requiring antibiotics and hospital admission in adults
- Observational studies and meta-analyses of observational data have reported:
  - Among high-risk outpatient children and adults, early antiviral treatment reduced risk of hospital admission
  - Early treatment of hospitalized adult influenza patients with oseltamivir reduced the likelihood of death and shortened hospitalization
  - In hospitalized children, early antiviral treatment with oseltamivir shortened duration of hospitalization

Muthuri, Lancet Resp Med 2014;2:395-404; Dobson, Lancet 2015; 385(9979):1728; Malosh et al. Clin Infect Diseases 2018; Venkatesan et al. Clin Infect Diseases 2017; Coffin Ped Inf Dis J 2011; Katzen, Clin Infect Diseases 2019

Antiviral Treatment Recommendations

- Antiviral treatment is recommended as early as possible for any patient with suspected or confirmed influenza who is:
  - Hospitalized
  - Has severe, complicated, or progressive illness
  - Is at high risk for influenza complications

Uyeki, et al. Clin Infect Dis, 2019;68(6):895-902
https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

People at High Risk for Influenza Complications for Whom Antiviral Treatment is Recommended

- Children <2 years old (although all children <5 years old are considered at high risk for complications, highest risk is for children <2 years old)
- Adults age 65 years and over
- Pregnant/postpartum women
- American Indians/Alaska Natives
- Children ≤18 years old receiving long-term aspirin therapy
- People with underlying medical conditions (e.g., pulmonary, cardiac, immunosuppression, neurologic and neurodevelopment conditions)
- Residents of nursing homes/chronic care facilities

https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Timing of Influenza Antiviral Treatment

- Clinical benefit is greatest when antiviral treatment is initiated as close to illness onset as possible
- Treatment should not be delayed while testing results are pending
- Antiviral treatment initiated after 48 hours can still be beneficial in some patients
  - Observational studies of hospitalized patients suggest that treatment might still be beneficial when initiated 4 or 5 days after symptom onset
  - Observational data in pregnant women has shown antiviral treatment to provide benefit when started 3-4 days after onset

https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm
Muthuri, Lancet Resp Med 2014;2:395-404; Louie, CID 2012;55:1198-204; Yu, CID 2011;52:457-65; Siston, JAMA 2010;303:1517-25

Antiviral Treatment Recommendations

- Antiviral treatment is recommended as early as possible for any patient with suspected or confirmed influenza who is:
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Uyeki, et al. Clin Infect Dis, 2019;68(6):895-902
https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Antiviral Treatment Recommendations

- Antiviral treatment is recommended as early as possible for any patient with suspected or confirmed influenza who is:
  - Hospitalized
  - Has severe, complicated, or progressive illness
  - Is at high risk for influenza complications

- Antiviral treatment can be considered for any previously healthy, symptomatic outpatient not at high risk with suspected or confirmed influenza on the basis of clinical judgment, if treatment can be initiated within 48 hours of illness onset

Uyeki, et al. Clin Infect Dis, 2019;68(6):895-902
https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Influenza Antiviral Medications

Four FDA-approved antivirals are recommended for use in the United States

Drug	Route	Treatment	Treatment Course	Chemo-prophylaxis	Adverse Events
Oseltamivir	Oral	Any age	1 dose twice daily x 5 days	≥3 months	Nausea, vomiting, headache^*
Zanamivir	Inhaled	≥7 years	1 dose twice daily x 5 days	≥5 years	Bronchospasm*
Peramivir	Intravenous	≥2 years	1 dose	N/A	Diarrhea*
Baloxavir**	Oral	≥12 years	1 dose	N/A	None more common than placebo

^Nausea and vomiting are generally transient and can be mitigated if oseltamivir is taken with food

*Post-marketing reports of serious skin reactions and sporadic, transient neuropsychiatric events

**The safety and efficacy of baloxavir for the treatment of influenza have been established in pediatric patients ≥12 years and weighing at least 40 kg.

https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Influenza Antiviral Medications: Background

- **Neuraminidase inhibitors:** oseltamivir, zanamivir, peramivir
  - FDA approved for treatment of acute, uncomplicated influenza
- **Cap-dependent endonuclease inhibitor:** baloxavir (oral)
  - Interferes with viral RNA transcription and blocks viral replication
  - FDA approved Dec 2018, for treatment of acute, uncomplicated influenza
  - In Oct 2019, FDA approved indication for baloxavir treatment of acute uncomplicated influenza in people at high risk of influenza-related complications
    - In trial of early initiation of antiviral treatment for uncomplicated influenza in high-risk adolescents and adults, baloxavir was superior to placebo and had similar overall efficacy to oseltamivir in the time to alleviation of symptoms
  - No available data for baloxavir treatment of influenza in pregnant women, immunocompromised people, those with severe disease, or hospitalized patients

https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Influenza Antiviral Treatment: Hospitalized Patients

- **Treatment with oral or enterically-administered oseltamivir is recommended as soon as possible**
  - There are insufficient data for use of inhaled zanamivir, intravenous peramivir, and oral baloxavir in patients with severe influenza disease

- For patients who cannot tolerate or absorb oral or enterically-administered oseltamivir (gastric stasis, malabsorption, or gastrointestinal bleeding), the **use of intravenous peramivir should be considered**
- The optimal duration and dosing of antiviral treatment are uncertain for severe or complicated influenza

Image by Gan Khoon Lay from the Noun Project

https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Influenza Antiviral Treatment: Pregnant Women

- **For treatment of pregnant women or women who are up to 2 weeks postpartum, oral oseltamivir is preferred** because it has the most studies available to suggest that it is safe and beneficial
- Baloxavir is not recommended for treatment of pregnant women or breastfeeding mothers
  - No available efficacy or safety data in pregnant women
  - No available data on the presence of baloxavir in human milk, the effects on the breastfed infant, or the effects on milk production

Image by Gan Khoon Lay from the Noun Project

https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

Influenza Treatment: Additional Considerations

- **Bacterial Coinfection**
  - Investigate and empirically treat in patients with suspected or confirmed influenza who present initially with severe disease (extensive pneumonia, respiratory failure, hypotension, and fever), in addition to antiviral treatment
  - Investigate and empirically treat in patients who deteriorate after initial improvement, particularly in those treated with antivirals
  - Consider investigating bacterial coinfection in patients who fail to improve after 3–5 days of antiviral treatment
- **Corticosteroids**
  - Not recommended as adjunctive therapy for suspected or confirmed influenza, influenza-associated pneumonia, respiratory failure, or ARDS, unless clinically indicated for other reasons

Uyeki, et al. Clin Infect Dis, 2019;68(6):895-902
Metlay, et al. Am J Respir Crit Care Med 2019;200(7):e45-67

Additional CDC Resources

- CDC Influenza homepage: https://www.cdc.gov/flu/
- Influenza surveillance (FluView and FluView Interactive):
  - https://www.cdc.gov/flu/weekly/fluactivitysurv.htm
  - https://www.cdc.gov/flu/weekly/fluviewinteractive.htm
- For Professionals:
  - https://www.cdc.gov/flu/professionals/index.htm
  - 2019-20 ACIP Influenza Recommendations: https://www.cdc.gov/mmwr/volumes/68/rr/rr6803a1.htm
  - Vaccination homepage: https://www.cdc.gov/flu/professionals/vaccination/index.htm
  - Antiviral homepage: https://www.cdc.gov/flu/professionals/antivirals/index.htm

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- Using the Webinar System
  - Click on the **Q&A** button in the Zoom webinar system.
  - Type your question in the **Q&A** box.
  - Submit your question.
  - Please do not submit a question using the chat button.
- For media questions, please contact CDC Media Relations at 404-639-3286 or send an email to media@cdc.gov.
- If you are a patient, please refer your questions to your healthcare provider.

Today's Webinar Will Be Available On-Demand

When: A few days after the live call

What: Video with closed captioning

Where: On the COCA Call webpage at https://emergency.cdc.gov/coca/calls/2019/callinfo_012020.asp

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All continuing education for COCA Calls are issued online through the CDC Training & Continuing Education Online system at https://tceols.cdc.gov/

Those who participated in today's COCA Call and who wish to receive continuing education should complete the online evaluation by **March 2, 2020,** with the course code **WC2922**. The access code is **COCA012820.** Those who will participate in the on demand activity and wish to receive continuing education should complete the online evaluation between **March 2, 2020,** and **March 3, 2022,** and use course code **WD2922**. The access code is **COCA012820**.

Continuing education certificates can be printed immediately upon completion of your online evaluation. A cumulative transcript of all CDC/ATSDR CEs obtained through the CDC Training & Continuing Education Online System will be maintained for each user.

Two Upcoming COCA Calls This Week

Topic: HHS Guide for Clinicians on the Appropriate Dosage Reduction or Discontinuation of Long-Term Opioid Analgesics

Date: Thursday, January 30, 2020

Time: 2:00-3:00 PM EST

*For further information, please visit: https://emergency.cdc.gov/coca/calls/2020/callinfo_013020.asp

Topic: Outbreak of 2019 Novel Coronavirus (2019-nCoV)—Interim Guidance for Clinicians

Date: Friday, January 31, 2020

Time: 2:00-3:00 PM EST

*For further information, please visit: https://emergency.cdc.gov/coca/calls/2020/callinfo_013120.asp

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CDC Clinician Outreach and Communication Activity

Informs clinicians of new CDC resources and guidance related to emergency preparedness and response. This email is sent as soon as possible after CDC publishes new content.

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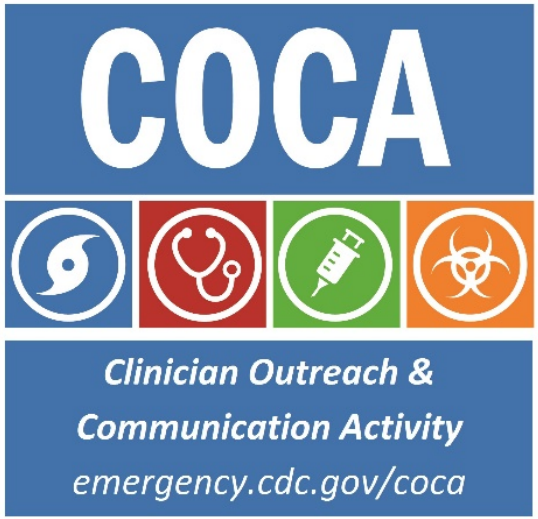

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