



2022–2023 Recommendations for Influenza Prevention and Treatment in Children: An Update for Pediatric Providers

Clinician Outreach and Communication Activity (COCA) Call
Thursday, September 15, 2022

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- All of the relevant financial relationships listed for these individuals have been mitigated.
- Content will not include any discussion of the unlabeled use of a product or a product under investigational use, with the exception of Dr. Fatimah Dawood's discussion of neuraminidase inhibitor medications (antivirals) that are FDA approved only for the treatment of uncomplicated influenza but will discuss off-label use such as for hospitalized patients or for unapproved age groups such as young neonates.
- CDC did not accept financial or in-kind support from ineligible companies for this continuing education activity.

Objectives

At the conclusion of today's session, the participant will be able to accomplish the following:

1. Highlight key recommendations in the AAP influenza policy statement, “Recommendations for Prevention and Control of Influenza in Children, 2022–23” and in the CDC Advisory Committee on Immunization Practices’ document, “Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2022-23 Influenza Season.”
2. Discuss the importance of influenza vaccination and treatment during the COVID-19 pandemic.
3. Describe strategies to increase vaccination rates and highlight important health disparities.
4. Review considerations for the coadministration of influenza vaccines and other immunizations, including the COVID-19 vaccine.

To Ask a Question

- Using the Zoom Webinar System
 - Click on the “Q&A” button
 - Type your question in the “Q&A” box
 - Submit your question
- If you are a patient, please refer your question to your healthcare provider.
- If you are a member of the media, please direct your questions to CDC Media Relations at 404-639-3286 or email media@cdc.gov

Today's Presenters

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2022-2023 Recommendations for Influenza Prevention and Treatment in Children: An Update for Pediatric Providers

Fatimah S. Dawood, MD
Influenza Division, CDC

Clinician Outreach and Communication Activity (COCA) Call

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Influenza (Flu) in Children

- Millions of children in the US get sick with seasonal flu during typical seasons
 - 7,000 to 26,000 estimated flu-related hospitalizations per season in children aged <5 years during 2010-2011 to 2019-2020
 - 37 to 199 reported flu-related deaths in children per season during 2004-2005 to 2019-2020
- Flu vaccination is the **best** way to prevent flu in children
 - Studies show that getting vaccinated reduces flu illnesses, doctor's visits, flu-related hospitalizations, life-threatening flu episodes, and death*



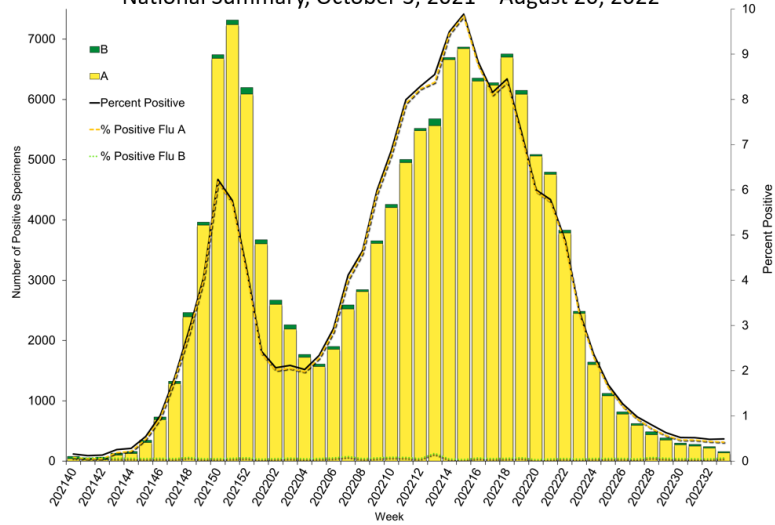
*[Key Facts About Seasonal Flu Vaccine | CDC](#)

A Review of Last Season

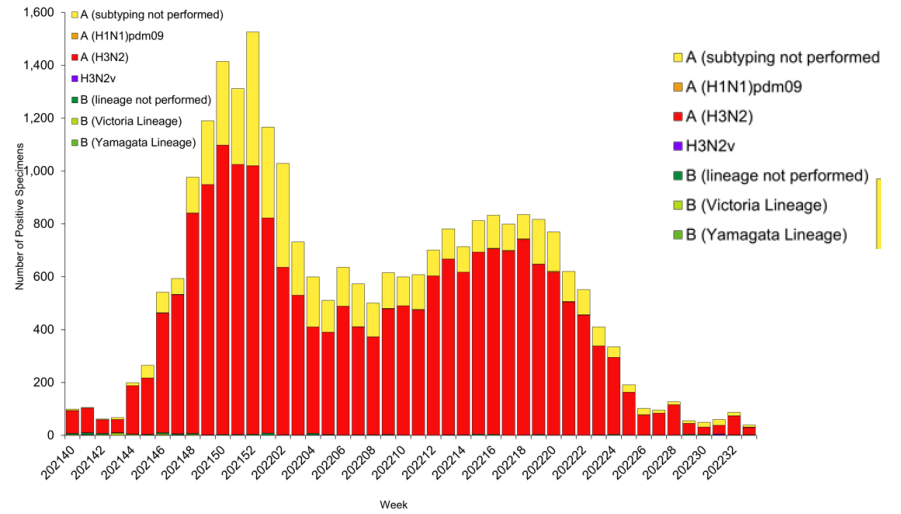
- Almost all A(H3N2) virus in all age groups and regions
- Long and late season
 - Two waves of circulation
 - Activity began to increase in November, remained elevated and even increased in some areas in May and early June
 - Activity levels higher in May and June than ever before
- Low levels of activity overall
 - Lowest ever compared to pre-pandemic seasons by most metrics
 - But higher than the 2020-2021 season

US Clinical Laboratory and Public Health Laboratory Surveillance, October 2021–August 2022

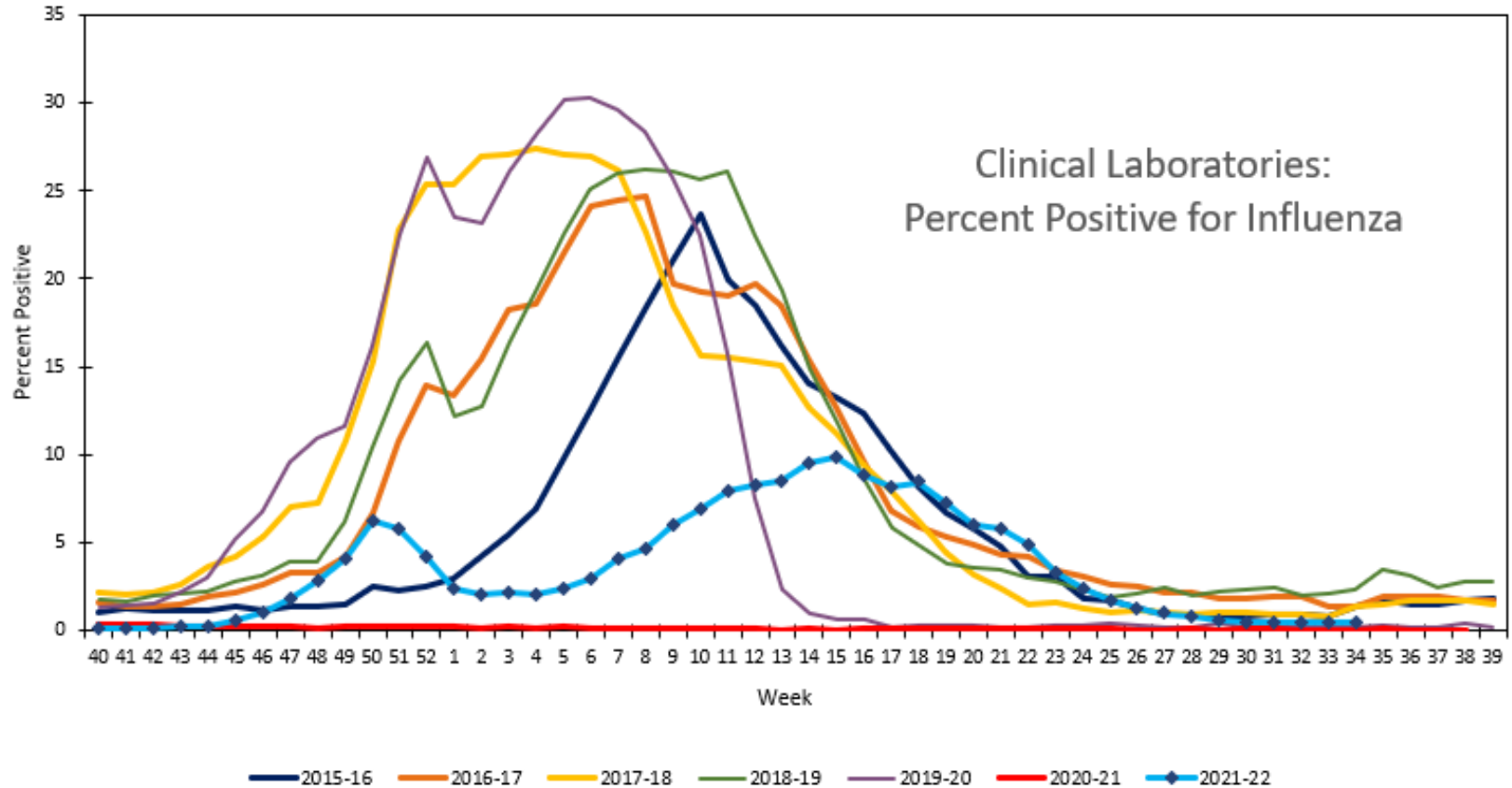
Influenza Positive Tests Reported to CDC by U.S. Clinical Laboratories, National Summary, October 3, 2021 – August 20, 2022



Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, October 3, 2021 – August 20, 2022

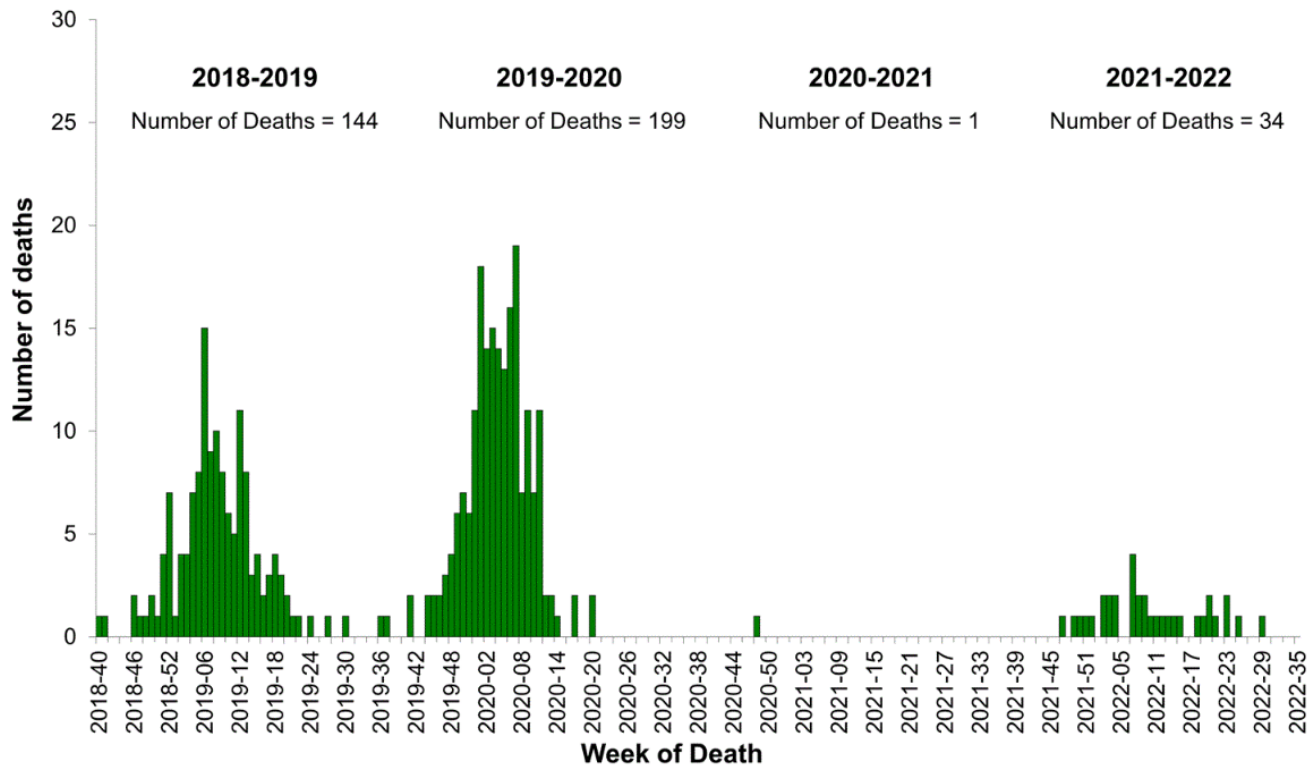


US Clinical Laboratory Surveillance during the 2021-2022 Season and the Preceding Six Seasons



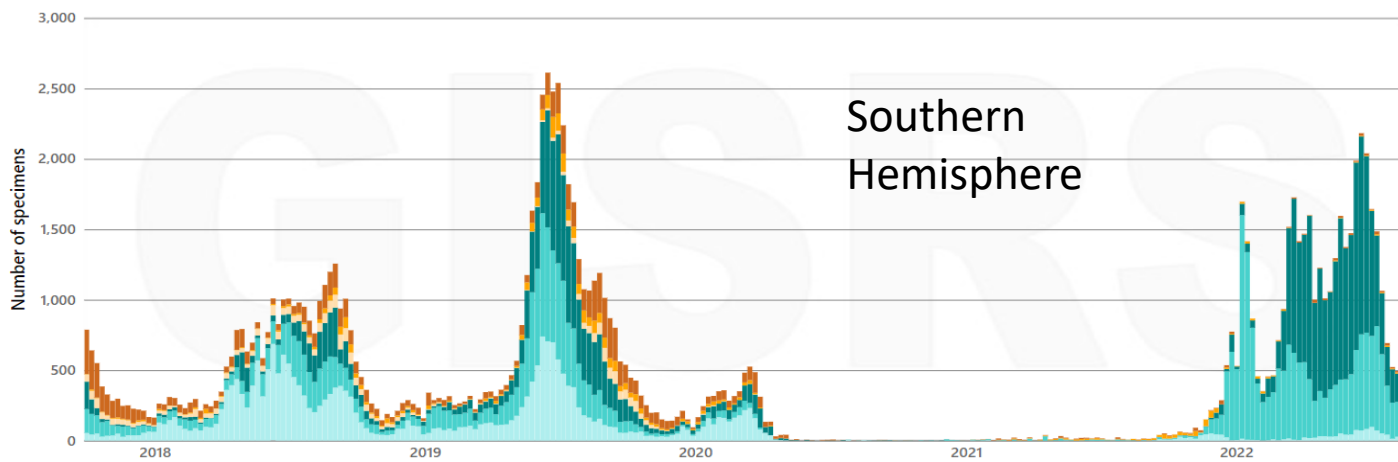
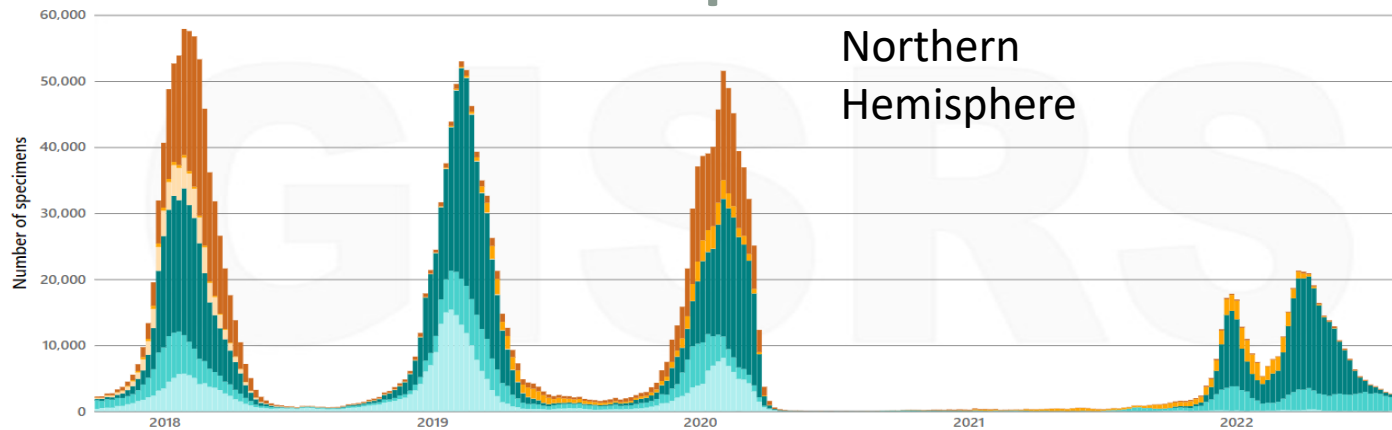
Influenza-Associated Pediatric Deaths* Reported to CDC

	No. of Pediatric Deaths*
2004-05	47
2005-06	46
2006-07	77
2007-08	88
2008-09	137
2009-10	288
2010-11	124
2011-12	37
2012-13	171
2013-14	111
2014-15	148
2015-16	95
2016-17	110
2017-18	188
2018-19	144
2019-20	198
2020-21	1
2021-22	33



* Data through August 20, 2022; reported to CDC as of August 24, 2022.

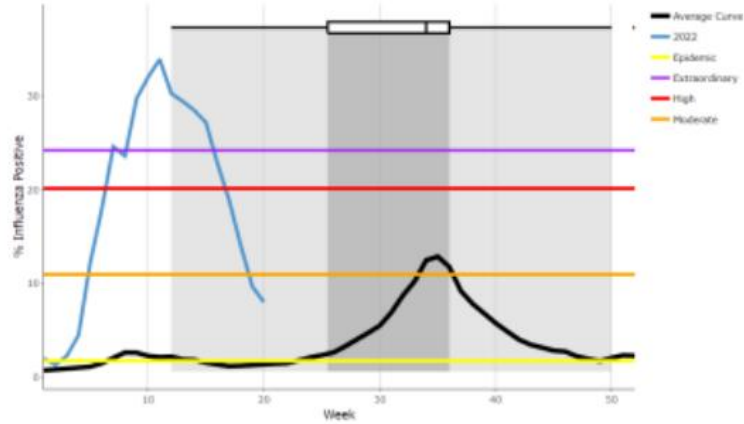
Global Influenza Surveillance in Northern and Southern Hemisphere Locations



Influenza subtype

- Select all
- Influenza B (lineage not determined)
- Influenza B (Victoria)
- Influenza B (Yamagata)
- Influenza A not subtyped
- Influenza A(H3)
- Influenza A(H1N1)pdm09
- Influenza A(H1)
- Influenza A(H5)

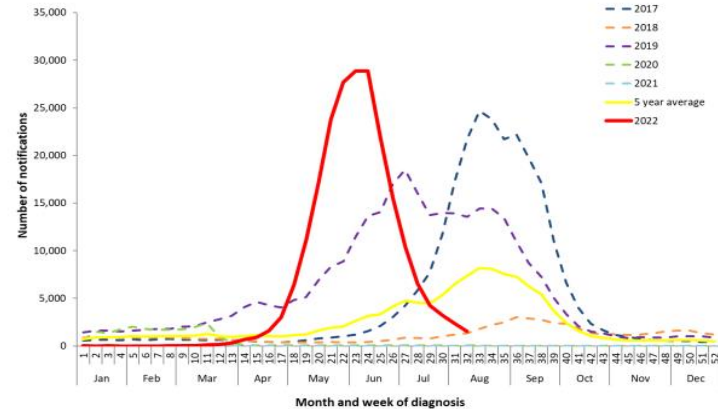
Argentina



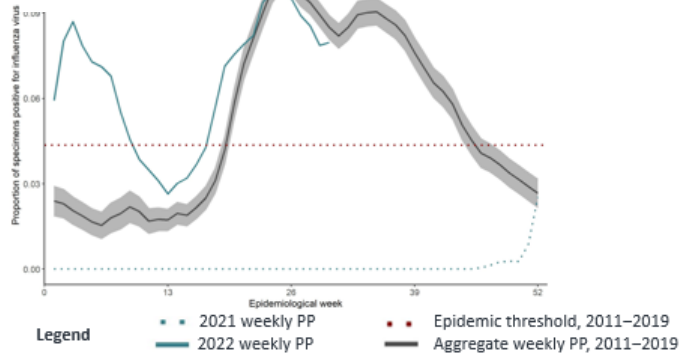
Timing of Influenza Activity in 2022 is Unusual in Many Southern Hemisphere Countries

Australia

Figure 4. Notifications of laboratory-confirmed influenza, Australia, 01 January 2017 to 14 August 2022, by month and week of diagnosis*



Chile



Legend
 ••• 2021 weekly PP
 — 2022 weekly PP
 ••• Epidemic threshold, 2011–2019
 — Aggregate weekly PP, 2011–2019

Sources of 2020-2021 Influenza Season Data

- Updated surveillance information is available each Friday
 - FluView, static report: <https://www.cdc.gov/flu/weekly/>
 - FluView Interactive, online application: <https://www.cdc.gov/flu/weekly/fluviewinteractive.htm>
- Vaccine effectiveness estimates
 - Morbidity and Mortality Week Report (MMWR) updates: <https://www.cdc.gov/mmwr/index.html>
 - Advisory Committee on Immunization Practices (ACIP) meetings: <https://www.cdc.gov/vaccines/acip/meetings/index.html>

2022-2023 CDC Antiviral Treatment Recommendations

CDC Antiviral Treatment Recommendations

- Antiviral treatment is recommended as early as possible for any patient with confirmed or suspected influenza who is:
 - Hospitalized
 - Has severe, complicated, or progressive illness
 - Is at high risk for influenza complications
- Antiviral treatment can be considered for previously healthy, symptomatic outpatient not at high risk with confirmed or suspected influenza, if treatment can be initiated within 48 hours of illness onset
- Clinical benefit is greatest when antiviral treatment is given early



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 persons
- Children <18 years old receiving long-term aspirin therapy
- American Indians/Alaska Natives
- People with underlying medical conditions (e.g., pulmonary, cardiac, immunosuppression, neurologic and neurodevelopment conditions)
- Residents of nursing homes/chronic care facilities

Influenza Antiviral Medication Treatment, Route and Age Indications

Drug	Route	Age Indication for Treatment
Oseltamivir*	Oral	Any age
Zanamivir	Inhaled	≥7 years
Peramivir**	Intravenous	≥6 months
Baloxavir***	Oral	≥5 years

* Oral oseltamivir phosphate is approved by the FDA for treatment of acute uncomplicated influenza within 2 days of illness onset in people 14 days and older. Although not part of the FDA-approved indications, use of oral oseltamivir for treatment of influenza in infants less than 14 days old is recommended by the CDC and the American Academy of Pediatrics.

** Intravenous peramivir is approved by the FDA for treatment of acute uncomplicated influenza within 2 days of illness onset in people 6 months and older.

*** Oral baloxavir marboxil is approved by the FDA for treatment of acute uncomplicated influenza within 2 days of illness onset in people aged ≥5 years who are otherwise healthy, or in people aged ≥12 years who are high risk of developing influenza-related complications.

Self-knowledge Check

Which of the following influenza antiviral medications is licensed for treatment of uncomplicated influenza in infants 14 days of age and older:

- A. Zanamivir
- B. Peramivir
- C. Oseltamivir
- D. Baloxavir
- E. B and C

Self-knowledge Check

The correct answer is C.

Oral oseltamivir phosphate is approved by the FDA for treatment of acute uncomplicated influenza within 2 days of illness onset in people 14 days and older. Although not part of the FDA-approved indications, use of oral oseltamivir for treatment of influenza in infants less than 14 days old is recommended by the CDC and the American Academy of Pediatrics.

2022-2023 ACIP Influenza Vaccination Recommendations Update

Groups Recommended for Vaccination

- Routine annual influenza vaccination is recommended for **all persons ≥ 6 months of age** who do not have contraindications
- Vaccination is recommended for all— if supply is limited, vaccinate those at highest risk for influenza complications
 - People aged ≥ 6 months who are at increased risk of influenza complications and severe illness
 - Contacts and caregivers of persons
 - < 5 years of age
 - ≥ 50 years of age
 - with medical conditions that put them at higher risk for severe complications from influenza

Groups at Increased Risk for Influenza Complications and Severe Illness

- **Children aged 6 through 59 months and adults aged ≥ 50 years** (children under 6 months of age are also at high risk, but cannot be vaccinated)
- **Persons with chronic medical conditions**, including pulmonary (including asthma) or cardiovascular (excluding isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus)
- **Persons who are immunocompromised**
- Persons who are or will be **pregnant** during the influenza season
- **Children and adolescents** (aged 6 months–18 years) who are **receiving aspirin- or salicylate-containing medications** (who might be at risk for Reye syndrome after influenza virus infection)
- **Residents of nursing homes and other long-term care facilities**
- **American Indians/Alaska Natives**
- **Persons with extreme obesity (BMI ≥ 40)**

2022-2023 ACIP Influenza Statement – Updates to Pediatric Vaccination

- Influenza vaccine composition for 2022-2023
- Labelling change from last season to Flucelvax Quadrivalent (cell-culture based inactivated influenza vaccine or cclIV4)
- Influenza vaccines expected to be available for children during the 2022-2023 season

2022-2023 Influenza Vaccine Composition

- Egg-based IIVs and LAIV4:
 - An A/Victoria/2570/2019 (H1N1)pdm09-like virus
 - An A/Darwin/9/2021 (H3N2)-like virus (*updated*)
 - A B/Austria/1359417/2021 (Victoria lineage)-like virus (*updated*)
 - A influenza B/Phuket/3073/2013 (Yamagata lineage)-like virus.
- Cell-culture-based IIV4 and RIV4:
 - An A/Wisconsin/588/2019 (H1N1)pdm09-like virus
 - An A/Darwin/6/2021 (H3N2)-like virus (*updated*)
 - A B/Austria/1359417/2021 (Victoria lineage)-like virus (*updated*)
 - A B/Phuket/3073/2013 (Yamagata lineage)-like virus.

Labelling Change to Flucelvax Quadrivalent (ccIV4)

- In March 2021, FDA approved use of Flucelvax Quadrivalent for children aged 2 through <4 years (previously approved for persons aged ≥ 4)
- In October 2021, FDA approval for Flucelvax Quadrivalent was further expanded to include children aged ≥ 6 months
 - Approval was based on a randomized immunogenicity and safety study among 2,402 children aged 6-47 months (including 894 children 6-23 months)

Influenza Vaccines for Children 6 through 35 months

- Five IIVs licensed for this age group
- Licensed dose volumes for this age group differ
 - *FluLaval Quadrivalent* (IIV4, GSK) 0.5 mL
 - *Fluarix Quadrivalent* (IIV4, GSK) 0.5 mL
 - *Flucelvax Quadrivalent* (ccIIV4, Seqirus) 0.5 mL
 - *Afluria Quadrivalent* (IIV4, Seqirus) 0.25 mL
 - *Fluzone Quadrivalent* (IIV4, Sanofi Pasteur) 0.25 mL **or** 0.5 mL
- Afluria Quadrivalent and Fluzone Quadrivalent 0.25 mL prefilled syringes will not be available for 2022–23; for children 6-35 months of age, the 0.25 mL dose must be obtained from a multidose vial

Influenza Vaccination during the COVID-19 Pandemic

- Important to counsel patients about the risk of self-limited side effects after influenza vaccination which normally resolve within 72 hours after vaccination
 - Local reactions - redness, pain, swelling at injection site
 - Systemic reactions - fever, chills, headache, body aches

- Because of concerns for COVID-19, vaccine recipients who develop fever after influenza vaccination should stay home until fever-free for 24 hours without fever-reducing medications



Coadministration of Influenza and COVID-19 Vaccines in Children

- ***Routine administration of all age-appropriate doses of vaccines simultaneously is recommended for persons for whom no specific contraindications exist***
- COVID-19 vaccines may be administered regardless of timing of influenza vaccines, including simultaneous administration of COVID-19 and influenza vaccines on the same day
- Administer each vaccine in a different injection site (at least 1 inch apart)

Upcoming 2022-2023 U.S. Influenza Season

- It is unclear what impact the ongoing COVID-19 pandemic will have on the upcoming influenza season in the U.S.
 - Influenza viruses and SARS-CoV-2 may co-circulate.
 - People may be co-infected with influenza and SARS-CoV-2.
 - There *may* be more influenza than the last two seasons because of reduced population immunity from fewer recent infections and relaxation of measures to reduce COVID-19.
- **Annual influenza vaccination is the most effective way to prevent influenza**



Additional CDC Resources

- CDC Influenza homepage: <https://www.cdc.gov/flu/>
- Influenza surveillance: <https://www.cdc.gov/flu/weekly/fluactivitysurv.htm>
- Influenza vaccination coverage: <https://www.cdc.gov/flu/fluview/index.htm>
- For Professionals: <https://www.cdc.gov/flu/professionals/index.htm>
 - Vaccination homepage: <https://www.cdc.gov/flu/professionals/vaccination/index.htm>
 - 2020-21 ACIP Influenza Recommendations: <https://www.cdc.gov/mmwr/volumes/68/rr/rr6803a1.htm>
 - Antiviral homepage: <https://www.cdc.gov/flu/professionals/antivirals/index.htm>
- For Children (created by CDC and endorsed by the AAP): activity book
 - https://www.cdc.gov/phpr/readywrigley/documents/ready_wrigley_flu.pdf



Thank You

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



2022-2023 Recommendations for Influenza Prevention and Treatment in Children: An Update for Pediatric Providers

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Committee on Infectious Diseases
American Academy of Pediatrics

September 15, 2022

American Academy of Pediatrics
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LEARNING OBJECTIVES

- Share AAP recommendations for influenza immunization and treatment during the 2022-2023 season
- Review strategies to increase immunization rates
- Highlight important health disparities

AAP RECOMMENDATIONS FOR INFLUENZA SEASON 2022-2023

POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Recommendations for Prevention and Control of Influenza in Children, 2022–2023

(A01)
COMMITTEE ON INFECTIOUS DISEASES

This statement updates the recommendations of the American Academy of Pediatrics for the routine use of influenza vaccine and antiviral medications for the prevention and treatment of influenza in children during the 2022–2023 influenza season. A detailed review of the evidence supporting these recommendations is published in the accompanying technical report (to be linked when published). The American Academy of Pediatrics recommends annual influenza vaccination of all children without medical contraindications starting at 6 months of age. Influenza vaccination is an important strategy for protecting children and the broader community, as well as reducing the overall burden of respiratory illnesses when other viruses, including severe acute respiratory syndrome-coronavirus 2, are cocirculating. Any licensed influenza vaccine appropriate for age and health status can be administered, ideally as soon as possible in the season, without preference for one product or formulation over another.

Antiviral treatment of influenza with any US Food and Drug Administration-approved, age-appropriate influenza antiviral medication is recommended for children with suspected or confirmed influenza who are hospitalized, have severe or progressive disease, or have underlying conditions that increase their risk of complications of influenza, regardless of duration of illness. Antiviral treatment should be initiated as soon as possible. Antiviral treatment may be considered in the outpatient setting for symptomatic children with suspected or confirmed influenza disease who are not at high risk for influenza complications, if treatment can be initiated within 48 hours of illness onset, and for children with suspected or confirmed influenza disease whose siblings or household contacts either are younger than 6 months or have a high-risk condition that predisposes them to complications of influenza. Antiviral chemoprophylaxis is recommended for the prevention of influenza virus infection as an adjunct to vaccination in certain individuals, especially exposed children who are at high risk for influenza complications but have not yet been immunized.

abstract

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Policy statements from the American Academy of Pediatrics benefit from expertise and resources of liaisons and internal and external reviewers. However, policy statements from the American Academy of Pediatrics may not reflect the views of the liaisons or the organizations or government agencies that they represent.

The guidance in this statement does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or reissued at or before that time.

DOI: <https://doi.org/10.1542/peds.2022-09274>

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COMPANION PAPER: A companion to this article can be found online at: www.pediatrics.org/cgi/doi/10.1542/peds.2022-09275.

To cite: AAP Committee on Infectious Diseases.

Policy Statement and Technical Report

Publication:
Early release September 6th
October issue of *Pediatrics*

WHAT'S NEW FOR 2022-2023?

- Vaccine composition updated
- Age-indication for Flucelvax Quadrivalent lowered to 6 months
- Age indication for peramivir lowered to 6 months (treatment)
- Age indication for baloxavir lowered to 5 years of age (treatment and prophylaxis)
- Elimination of race-based recommendations
- Focus on evidence-based strategies to increase immunization

WHAT'S NOT NEW FOR 2022-2023?

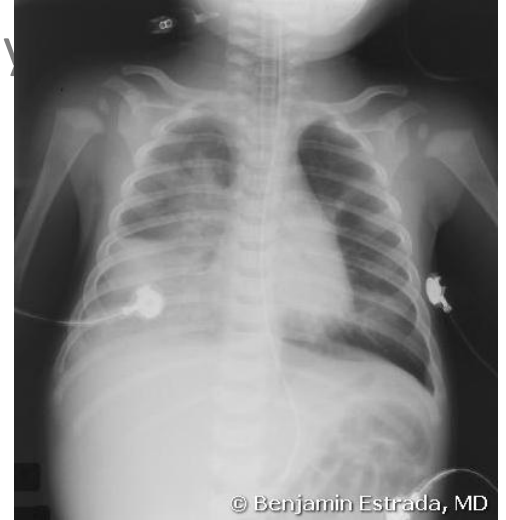
- Influenza continues to cause morbidity and mortality in children.
- Annual influenza vaccination is recommended for all persons 6 months and older.
- Any vaccine appropriate for age and health status can be used.
- Influenza vaccine can be administered at the same time as other vaccines, including the COVID-19 vaccine.
- Antiviral treatment recommended for certain children with influenza.

RECENT INFLUENZA SEASONS: IMPACT ON CHILDREN

	2019-2020	2020-2021	2021-2022
Severity	Moderate	Low	***
Predominant viruses	Influenza B/Victoria – early Influenza A(H1N1)pdm09 – late	Influenza A (H3N2) Influenza B (Victoria)	Influenza A (H3N2)
Hospitalization Rate	92.3/100,000 (0–4 y) 23.5/100,00 (5–17 y)	0.8/100,000 overall rate	21.6/100,000 (0–4 y) 9/100,00 (5–17 y)
Characteristics of Hospitalized Children	42.9% with ≥ 1 underlying condition asthma/RAD 22.1%	Not available because of low case numbers	65.6% with ≥ 1 underlying condition Asthma 22.1%
Deaths	199	1	33

IMPACT OF INFLUENZA ON CHILDREN

- About 9% develop symptomatic infection annually
- Significant morbidity in hospitalized children
 - 20% require ICU care
 - 17% with pneumonia
 - 5% require mechanical ventilation
 - 8-10% experience neurologic complication



Red Book Online
Influenza A with *Staphylococcus aureus* pneumonia with empyema in a preschool-aged child

IMPACT OF INFLUENZA: INFLUENZA ASSOCIATED COMPLICATIONS

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Influenza-Associated Neurologic Complications in Hospitalized Children

Sarah Frankl, BA¹, Susan E. Coffin, MD, MPH^{2,4}, Jacqueline B. Harrison, BA¹, Sanjeev K. Swami, MD^{2,4}, and Jennifer L. McGuire, MD, MSCE^{1,3,4}

Objectives To define the incidence and characteristics of influenza-associated neurologic complications in a cohort of children hospitalized at a tertiary care pediatric hospital with laboratory-confirmed influenza and to identify associated clinical, epidemiologic, and virologic factors.

Study design This was an historical cohort study of children aged 0.5–18.0 years old hospitalized between 2010 and 2017 with laboratory-confirmed influenza. Children with immune compromise or a positive test due to recent receipt of live virus vaccine or recently resolved illness were excluded. Influenza-associated neurologic complications were defined as new-onset neurologic signs/symptoms during acute influenza illness without another clear etiology.

Results At least 1 influenza-associated neurologic complication was identified in 10.8% (95% CI 9.1–12.6%, n = 131 of 1217) of hospitalizations with laboratory-confirmed influenza. Seizures (n = 97) and encephalopathy (n = 44) were the most commonly identified influenza-associated neurologic complications, although an additional 20 hospitalizations had other influenza-associated neurologic complications. Hospitalizations with influenza-associated neurologic complications were similar in age and influenza type (A/B) to those without. Children with a pre-existing neurologic diagnosis (n = 326) had a greater proportion of influenza-associated neurologic complications compared with those without (22.7% vs 6.4%, $P < .001$). Presence of a pre-existing neurologic diagnosis (aOR 4.6, $P < .001$), lack of seasonal influenza vaccination (aOR 1.6, $P = .020$), and age ≤ 5 years (aOR 1.6, $P = .017$) were independently associated with influenza-associated neurologic complications.

Conclusions Influenza-associated neurologic complications are common in children hospitalized with influenza, particularly those with pre-existing neurologic diagnoses. A better understanding of the epidemiology and factors associated with influenza-associated neurologic complications will direct future investigation into potential neuro-pathologic mechanisms and mitigating strategies. Vaccination is recommended and may help prevent influenza-associated neurologic complications in children. (*J Pediatr* 2021;239:24–31).

Frankl S, Coffin SE, Harrison JB, Swami SK, McGuire JL. Influenza-Associated Neurologic Complications in Hospitalized Children. *J Pediatr*. 2021;239:24–31.e1. doi:10.1016/j.jpeds.2021.07.039

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Prevalence, Risk Factors, and Outcomes of Influenza-Associated Neurologic Complications in Children

James W. Antoon, MD, PhD^{1,2}, Matt Hall, PhD³, Alison Herndon, MD, MPH^{1,2}, David P. Johnson, MD^{1,2}, Charlotte M. Brown, MD^{1,2}, Whitney L. Browning, MD^{1,2}, Todd A. Florin, MD, MSCE¹, Leigh M. Howard, MD, MPH², Carlos G. Grijalva, MD, MPH⁵, and Derek J. Williams, MD, MPH^{1,2}

Objective To determine the frequency of neurologic complications associated with influenza in hospitalized children.

Stud design We performed a cross-sectional study of children (2 months through 17 years of age) with influenza discharged from 49 children's hospitals in the Pediatric Health Information System during the influenza seasons of 2015–2020. Neurologic complications were defined as encephalopathy, encephalitis, aseptic meningitis, febrile seizure, nonfebrile seizure, brain abscess and bacterial meningitis, Reye syndrome, and cerebral infarction. We assessed length of stay (LOS), intensive care unit (ICU) admission, ICU LOS, 30-day hospital readmissions, deaths, and hospital costs associated with these events. Patient-level risk factors associated with neurologic complications were identified using multivariable logistic regression.

Results Of 29 676 children hospitalized with influenza, 2246 (7.6%) had a concurrent diagnosis of a neurologic complication; the most frequent were febrile seizures (5.0%), encephalopathy (1.7%), and nonfebrile seizures (1.2%). Hospital LOS, ICU admission, ICU LOS, deaths, and hospital costs were greater in children with neurologic complications compared with those without complications. Risk factors associated with neurologic complications included male sex (aOR 1.1, 95% CI 1.02–1.21), Asian race/ethnicity (aOR 1.7, 95% CI 1.4–2.1) (compared with non-Hispanic White), and the presence of a chronic neurologic condition (aOR 3.7, 95% CI 3.1–4.2).

Conclusions Neurologic complications are common in children hospitalized with influenza, especially among those with chronic neurologic conditions, and are associated with worse outcomes compared with children without neurologic complications. These findings emphasize the strategic importance of influenza immunization and treatment, especially in high-risk populations. (*J Pediatr* 2021;239:32–8).

Antoon JW, Hall M, Herndon A, et al. Prevalence, Risk Factors, and Outcomes of Influenza-Associated Neurologic Complications in Children. *J Pediatr*. 2021;239:32–38.e5. doi:10.1016/j.jpeds.2021.06.075

IMPACT OF INFLUENZA ON CHILDREN

- 9% develop symptomatic infection annually
- Significant morbidity in hospitalized children
 - 20% require ICU care
 - 17% with pneumonia
 - 5% require mechanical ventilation
 - 8-10% experience neurologic complication
 - **0.5% die**

HEALTH DISPARITIES AND INFLUENZA

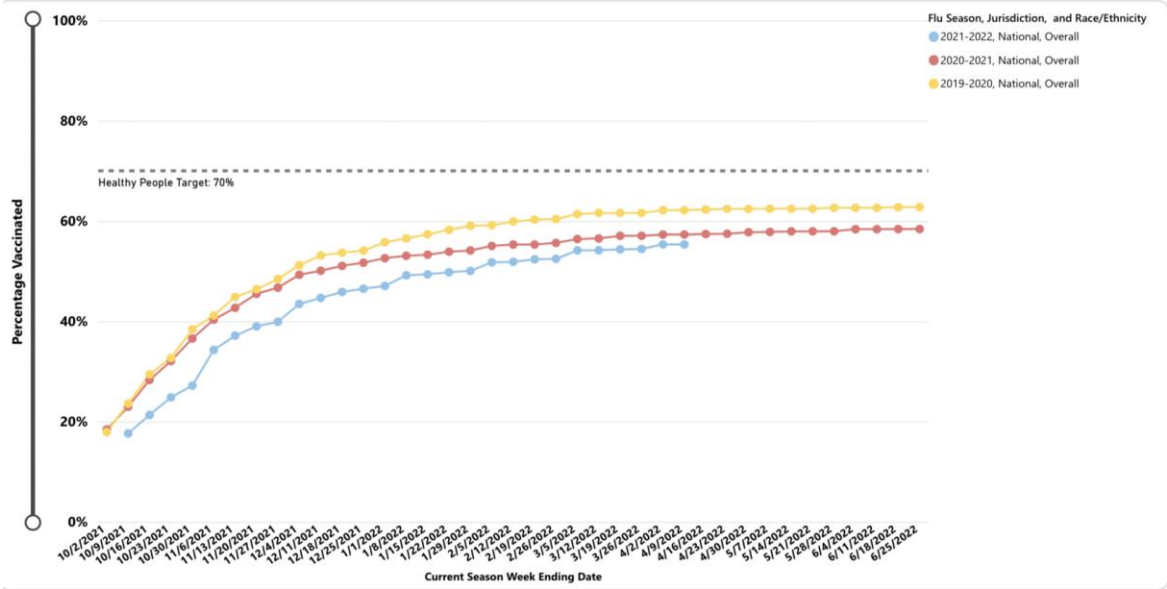
Table 2. Age-Specific Rate Ratios of Hospitalization, ICU Admission, and In-Hospital Death by Race and Ethnicity

Outcome	Rate ratio (95% CI)				
	Non-Hispanic				
	White	Black	American Indian or Alaska Native	Asian or Pacific Islander	Hispanic
Hospitalization, age group, y					
≤4	1 [Reference]	2.21 (2.10-2.33)	3.00 (2.55-3.53)	1.26 (1.16-1.38)	1.87 (1.77-1.97)
5-17	1 [Reference]	1.99 (1.88-2.11)	1.48 (1.16-1.90)	0.81 (0.72-0.91)	1.28 (1.19-1.36)
18-49	1 [Reference]	2.52 (2.44-2.59)	1.72 (1.51-1.96)	0.61 (0.57-0.65)	1.29 (1.24-1.34)
50-64	1 [Reference]	2.50 (2.43-2.57)	1.54 (1.34-1.76)	0.63 (0.59-0.67)	1.25 (1.20-1.31)
65-74	1 [Reference]	1.74 (1.68-1.81)	0.96 (0.79-1.17)	0.84 (0.78-0.89)	1.18 (1.12-1.25)
≥75	1 [Reference]	1.05 (1.02-1.09)	0.79 (0.66-0.94)	1.02 (0.98-1.06)	0.93 (0.89-0.98)
ICU admission, age group, y					
≤4	1 [Reference]	2.74 (2.43-3.09)	3.51 (2.45-5.05)	1.31 (1.06-1.61)	1.96 (1.73-2.23)
5-17	1 [Reference]	2.00 (1.77-2.26)	1.88 (1.18-3.00)	0.97 (0.78-1.22)	1.16 (1.00-1.34)
18-49	1 [Reference]	1.85 (1.72-1.99)	1.84 (1.40-2.42)	0.57 (0.49-0.66)	1.14 (1.04-1.24)
50-64	1 [Reference]	2.09 (1.96-2.23)	1.17 (0.84-1.63)	0.61 (0.53-0.71)	1.04 (0.93-1.15)
65-74	1 [Reference]	1.50 (1.37-1.64)	1.34 (0.91-1.98)	0.87 (0.75-1.00)	1.11 (0.98-1.27)
≥75	1 [Reference]	1.26 (1.15-1.37)	0.72 (0.42-1.21)	1.21 (1.08-1.34)	0.88 (0.77-1.00)
In-hospital death, age group, y					
≤4	1 [Reference]	3.39 (1.40-8.18)	6.71 (0.85-52.97)	4.35 (1.55-12.22)	2.98 (1.23-7.19)
5-17	1 [Reference]	1.19 (0.62-2.28)	4.17 (1.00-17.41)	1.55 (0.68-3.51)	0.80 (0.38-1.69)
18-49	1 [Reference]	1.22 (0.94-1.57)	2.20 (1.04-4.67)	0.55 (0.35-0.87)	1.07 (0.81-1.41)
50-64	1 [Reference]	1.53 (1.28-1.83)	1.24 (0.55-2.77)	0.46 (0.31-0.70)	1.08 (0.83-1.40)
65-74	1 [Reference]	1.19 (0.94-1.51)	0.60 (0.15-2.42)	1.00 (0.72-1.39)	1.07 (0.77-1.48)
≥75	1 [Reference]	0.93 (0.79-1.10)	0.44 (0.14-1.35)	1.22 (1.02-1.46)	0.71 (0.56-0.91)

Abbreviation: ICU, intensive care unit.

The rate of in-hospital death was 3- to 4-fold higher in Black, Hispanic, and Asian/Pacific Islander children compared with white children.

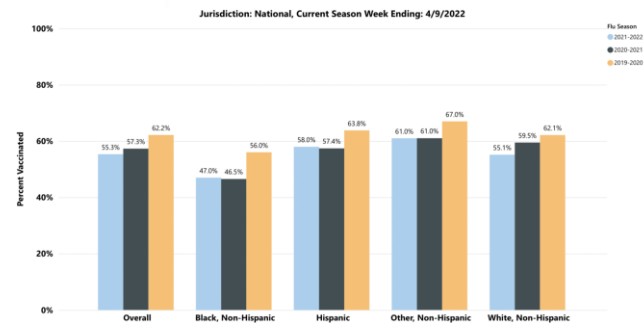
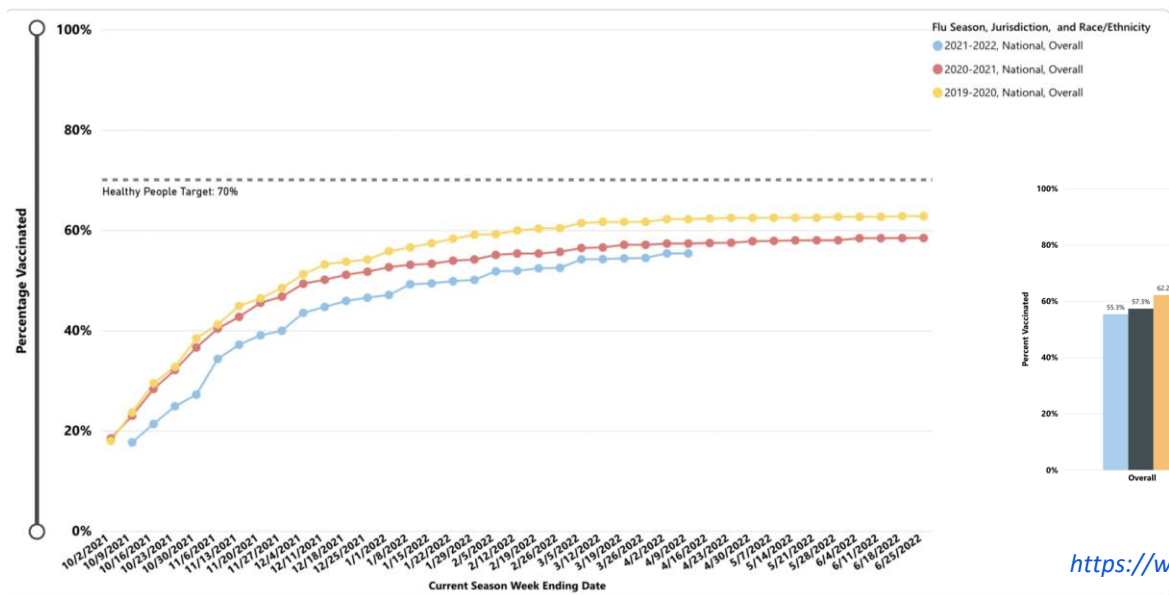
INFLUENZA IMMUNIZATION RATES FALLING



Influenza vaccination coverage in children 6 months to 17 years of age in the United States, 2019–2020 to 2021 -2022. Data source: NIS-Flu.

INFLUENZA IMMUNIZATION RATES FALLING

AND HEALTH DISPARITIES PERSIST



<https://www.cdc.gov/flu/fluview/dashboard/vaccination-coverage-race.html>

Influenza vaccination coverage in children 6 months to 17 years of age in the United States, 2019–2020 to 2021–2022. Data source: NIS-Flu.

VACCINE VIRUS STRAINS FOR 2022-2023

Specific Strain	
Influenza A	
H1N1	A/Victoria/2570/2019 (H1N1) pdm09-like virus; (egg-based) A/Wisconsin/588/2019 (H1N1) pdm09-like virus; (cell culture-based or recombinant)
H3N2	A/Darwin/9/2021 (H3N2)-like virus; (egg-based) A/Darwin/6/2021 (H3N2)-like virus; (cell culture-based or recombinant)
Influenza B	
Victoria	B/Austria/1359417/2021-like virus; (B/Victoria lineage)
Yamagata	B/Phuket/3073/2013-like virus; (B/Yamagata lineage)

Bolded strains are new this season

PEDIATRIC VACCINES 2022-2023

Vaccine	Presentation	Indication	Antigen content
IIV4 Inactivated influenza vaccine – Egg-based			
Afluria (Seqirus)	0.5 ml PFS 5 ml MDV	≥ 36 months ≥ 6 months	15 ug/0.5 ml 15 ug/0.5 ml
Fluarix (GSK)	0.5 ml PFS	≥ 6 months	15 ug/0.5 ml
FluLaval (GSK)	0.5 ml PFS	≥ 6 months	15 ug/0.5 ml
Fluzone (Sanofi Pasteur)	0.5 ml PFS 0.5 ml SDV 5 ml MDV	≥ 6 months ≥ 6 months ≥ 6 months	15 ug/0.5 ml
ccIIV4 Cell culture-based influenza vaccine			
Flucelvax (Seqirus)	0.5 ml PFS 5 ml MDV	≥ 6 months ≥ 6 months	15 ug/0.5 ml
LAIV4 - Live attenuated influenza vaccine – Egg based			
FluMist (AztraZeneca)	0.2 ml PF Sprayer	≥ 2 yr	10 ^{6.5-7.5} fluorescent focus units

INFLUENZA VACCINE ADMINISTRATION PEARLS

- When two doses are required in a season, use of the same brand or type is **not required**.
- The maximum number of doses drawn from a multidose vial is specified in the package insert and should not be exceeded.
- Residual product must be discarded regardless of the remaining volume in the vial.
- A 0.5-mL unit dose of any IIV should not be split into 2 separate 0.25-mL doses.

INFLUENZA VACCINE ADMINISTRATION PEARLS

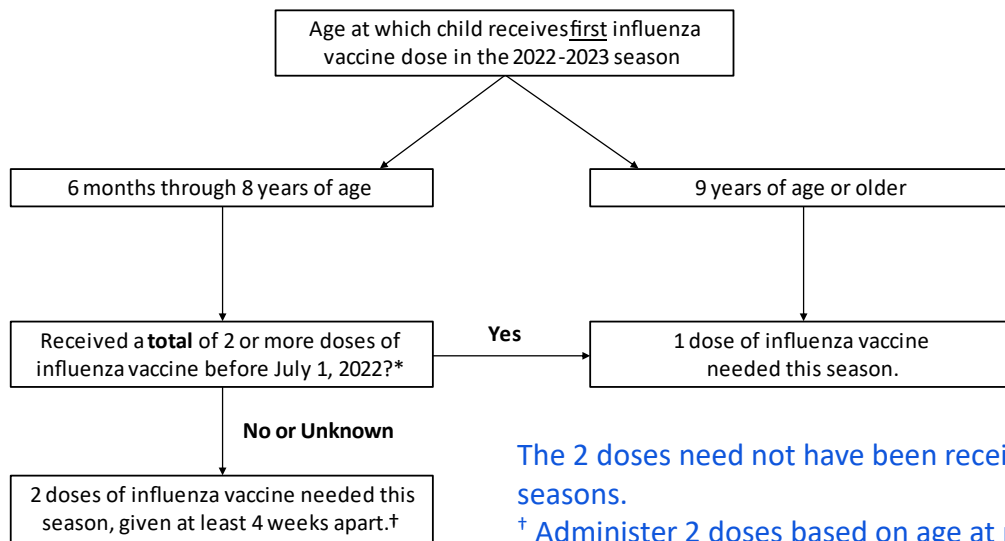
- IIV may be administered simultaneously with or at any time before or after other inactivated or live vaccines (**including COVID-19 vaccines**).
- LAIV may be administered simultaneously with other live or inactivated vaccines.
 - If not administered simultaneously, ≥ 4 weeks should pass between the administration of LAIV and other non-oral live vaccines.

INFLUENZA VACCINES AND ALLERGIES

- Children with egg allergies can receive any licensed, recommended vaccine that is age-appropriate, with **no special precautions than those recommended for other routine vaccines.**
- Egg allergy **does not increase the risk** of anaphylactic reaction to vaccination with inactivated influenza vaccines.*
- Children who have had a severe allergic reaction after influenza vaccination should be evaluated by an allergist to help identify the vaccine component responsible for the reaction and to determine whether future vaccine receipt is appropriate.
- Children who are allergic to gelatin (very rare) should receive IIV (or Recombinant Influenza Vaccine if age-appropriate) instead of LAIV.

*Based on 28 studies evaluating 4,315 egg-allergic subjects (656 with severe allergies)

2022–2023 SEASONAL INFLUENZA VACCINE FOR CHILDREN: NUMBER OF DOSES



The 2 doses need not have been received during the same season or consecutive seasons.

† Administer 2 doses based on age at receipt of the first dose of influenza vaccine during the season. Children who receive the first dose prior to their ninth birthday should receive 2 doses, even if they turn 9 years old during the same season.

2022–2023 SEASONAL INFLUENZA VACCINE FOR CHILDREN: TIMING

- Offer influenza vaccine as soon as it becomes available, especially to children who require 2 doses.
- Administer recommended dose(s) ideally by the end of October.
- Continue offering vaccine to unvaccinated children and families throughout the season.

CHILDREN AT HIGH RISK FOR INFLUENZA COMPLICATIONS

- Any child < 5 years
 - Especially < 2 years
- Residents of chronic care facility or nursing home



Underlying Condition or Treatment	
Chronic pulmonary disease	Metabolic disorders
Cardiovascular disease	Neurologic and neurodevelopmental conditions
Kidney disease	Extreme obesity ²
Hepatic disease	Immunosuppression
Hematologic disease	Pregnancy and post-partum
Receipt of aspirin or salicylate-containing therapies ¹	¹ <19 years who may be at increased risk of Reye syndrome ² Could consider BMI ≥99% for age

STRATEGIES FOR INCREASING INFLUENZA IMMUNIZATION

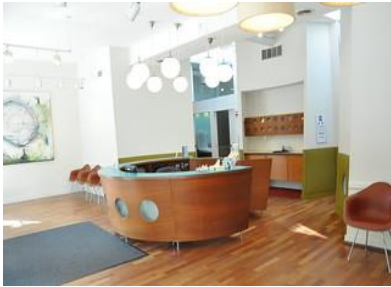
PROVIDER/CARE TEAM



- Offer a strong, presumptive recommendation
- Bundle recommendation for influenza vaccine with recommendations for other needed vaccines
- Use consistent messaging across care team members
- Identify influenza champions

STRATEGIES FOR INCREASING INFLUENZA IMMUNIZATION

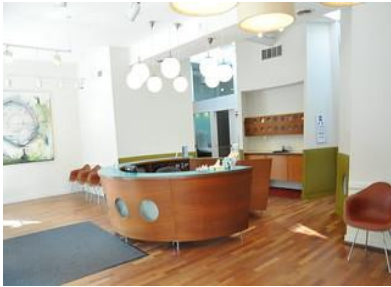
PRACTICE/HEALTH SYSTEM



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- Review influenza vaccination status at all visits
- Identify patients who need to be vaccinated for influenza, routine childhood immunizations, and COVID-19
- Vaccinate at all visit types
- Vaccinate in all healthcare settings
- Increase access to influenza vaccine (eg, expanded hours, vaccine-only clinic)
- Provide evidence-based information to patients and families (eg, office-based educational handout)

STRATEGIES FOR INCREASING INFLUENZA IMMUNIZATION PRACTICE/HEALTH SYSTEM



[This Photo](#) by Unknown Author is licensed under [CC BY-NC-ND](#)

- Send influenza vaccine reminder/recall messages
- Utilize standing orders for influenza vaccine
- Implement influenza vaccine provider prompts/clinical decision support
- Perform audits or share feedback reports
- Integrate electronic health records (EHR) with regional or state immunization systems

STRATEGIES FOR INCREASING INFLUENZA IMMUNIZATION

COMMUNITY/PUBLIC HEALTH



- Partner with stakeholders to support vaccine initiatives within the community, including school-based programs and pharmacies.
- Engage with communities affected by health disparities to develop tailored strategies that promote trust, encourage dialogue, and increase access to preventative services.

ANTIVIRAL TREATMENT OF INFLUENZA IN CHILDREN

***Offer* treatment as early as possible regardless of influenza vaccination status and duration of symptoms for:**

- Any child hospitalized with suspected or confirmed influenza disease
- Any child with severe, complicated, or progressive influenza disease regardless of health care setting (ie, inpatient or outpatient)
- Any child with suspected or confirmed influenza disease of any severity if they are at high risk for influenza complications, regardless of health care setting (ie, inpatient or outpatient)

ANTIVIRAL TREATMENT OF INFLUENZA IN CHILDREN

***Consider* treatment in the outpatient setting for:**

- Any child with suspected or confirmed influenza disease who is not at high risk for influenza complications, if treatment can be initiated within 48 hours of illness onset
- Any child with suspected or confirmed influenza disease whose siblings or household contacts are either younger than 6 months or at high risk for influenza complications

ANTIVIRALS FOR INFLUENZA

Drug (Trade Name)	Virus	Route	Treatment ^{a,b} (Duration)	Chemoprophylaxis ^d (Duration)	Adverse Effects
Oseltamivir (Tamiflu)	A and B	Oral	Birth or older ^c (5 days)	≥ 3 mo	Nausea, vomiting, headache, skin reactions, diarrhea**
Zanamivir (Relenza)	A and B	Inhalation	≥ 5 years (5 days)	≥ 5 y (7 days)	Bronchospasm
Peramivir (Rapivab)	A and B	IV	≥ 6 months (one dose)	NA	Diarrhea; some reports of skin reactions
Baloxavir (Zoflaxa)	A and B	Oral	≥ 5 years (one dose)	≥ 5 years (one dose)	Vomiting, diarrhea

- a. Treatment within 48 hr of onset of illness has greatest effect in reduction of symptoms and duration of illness
- b. No antiviral is specifically approved for severe influenza, but observational studies support effect on reduction of complications, and most experts support use
- c. FDA approved for children 2 wk of age and older but AAP supports use from birth in term and preterm infants
- d. Chemoprophylaxis: High risk children who cannot get vaccinated or may not respond to vaccine; within 2 weeks after vaccination if circulation of influenza, contacts of HR patients, control of outbreaks

ANTIVIRAL UNDERUTILIZED

Received: 13 September 2021 | Accepted: 15 September 2021

DOI: 10.1111/irv.12927

ORIGINAL ARTICLE

WILEY

Influenza clinical testing and oseltamivir treatment in hospitalized children with acute respiratory illness, 2015–2016

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2015-2016 influenza season

2299 hospitalized children

51% were tested for influenza

Treatment with antivirals

- 52% of tests: positive
- 6% of tests: negative or unknown

Factors associated with treatment

- Neuromuscular disease

(aOR: 1.86; 95% CI: 1.04,

3.31)

- Immunocompromised state

(aOR: 2.63; 95% CI: 1.38,

4.99)

RESOURCES

- AAP Influenza <https://www.aap.org/en/patient-care/influenza/>
- Preparing for the 2022-23 Influenza Season <https://www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/help-for-pediatricians/preparing-for-flu-season/>
- AAP *Red Book* Influenza <https://redbook.solutions.aap.org/chapter.aspx?sectionid=247326861&bookid=2591>
- AAP Immunizations <https://www.aap.org/en/patient-care/immunizations/>
- AAP Communicating with Families and Promoting Vaccine Confidence <https://www.aap.org/en/patient-care/immunizations/communicating-with-families-and-promoting-vaccine-confidence/>
- AAP Critical Updates on COVID <https://www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/>
- Healthy Children Influenza Subsite <https://healthychildren.org/English/health-issues/conditions/flu/Pages/default.aspx>

TOOLKITS

- AAP Flu Toolkit

<https://www.aap.org/en/news-room/campaigns-and-toolkits/flu-campaign-toolkit/>

- AAP Immunizations Campaign Toolkit

<https://www.aap.org/en/news-room/campaigns-and-toolkits/immunizations/>

- CDC Fight Flu Toolkit

<https://www.cdc.gov/flu/professionals/vaccination/prepare-practice-tools.htm?web=1&wdLOR=c26A0C649-03D8-45D0-A359-05F3FEFB0601>

INFLUENZA TOOLKIT RESOURCES

Social Media Graphics



Don't let the flu stop you!

You've come this far keeping everyone healthy—let's keep it going!

Schedule your child's flu vaccination today.

 [healthychildren.org](https://www.healthychildren.org)
Powered by pediatricians. Trusted by parents.
From the American Academy of Pediatrics

 American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN

The graphic features a family of four (father, mother, and two children) running happily on a grassy lawn. The text is overlaid on a green and white background.

Don't Let the Flu Stop You - Parents & Child

HealthyChildren.org Articles



The Flu

Posters and Flyers



Don't let the flu stop you!

Come to our influenza vaccination clinic!

Date & Time:

The poster features a young child in a white jacket running happily on a playground. The text is overlaid on an orange and white background.

Flu Clinic Promotional Poster 1

Edit and print this 8.5" x 11" PDF poster to include your flu clinic date, time, location and contact information.

Promote Flu Vaccination for Pediatric Patients

Resources for Clinicians in Subspecialty or Emergency Care Settings

Promote Flu Vaccination for Pediatric Patients

SELF KNOWLEDGE CHECK

If a child requires two doses of influenza vaccine in a given season, the doses must be the same brand.

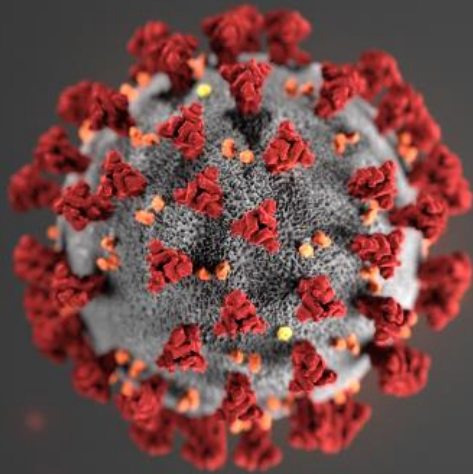
- A. True
- B. False

ANSWER

If a child requires two doses of influenza vaccine in a given season, the doses must be the same brand.

- A. True
- B. False**

Rationale: The same brand of influenza vaccine is not needed for a child requiring two doses. More than one product may be appropriate for a given patient, and there is no preference for one product over another. Influenza vaccination should not be delayed to obtain a specific product.



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



To Ask a Question

- Using the Zoom Webinar System
 - Click on the “Q&A” button
 - Type your question in the “Q&A” box
 - Submit your question
- If you are a patient, please refer your question to your healthcare provider.
- If you are a member of the media, please direct your questions to CDC Media Relations at 404-639-3286 or email media@cdc.gov

Continuing Education

- All continuing education for COCA Calls is issued online through the CDC Training & Continuing Education Online system at <https://tceols.cdc.gov/>.
- Those who participate in today's COCA Call and wish to receive continuing education please complete the online evaluation by **October 17, 2022**, with the course code **WC4520-091522**. The access code is **COCA091522**.
- Those who will participate in the on-demand activity and wish to receive continuing education should complete the online evaluation between **October 18, 2022**, and **October 18, 2024**, and use course code **WD4520-091522**. The access code is **COCA091522**.
- 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.

Today's COCA Call Will Be Available to View On-Demand

- **When:** A few hours after the live call ends*
- **What:** Video recording
- **Where:** On the COCA Call webpage
https://emergency.cdc.gov/coca/calls/2022/callinfo_091522.asp
- **Sign up to receive future COCA Call Announcements and other timely information:**
<https://emergency.cdc.gov/coca/subscribe.asp>

**A transcript and closed-captioned video will be available shortly after the original video recording posts at the above link.*

Upcoming COCA Call & Additional Resources

- **Date:** Tuesday, September 20, 2022
 - **Time:** 2:00 – 3:00 PM ET
 - **Topic:** Evaluating and Supporting Patients Presenting with Cardiovascular Symptoms Following COVID
-
- Continue to visit <https://emergency.cdc.gov/coca/> to get more details about upcoming COCA Calls.
 - Subscribe to receive notifications about upcoming COCA calls and other COCA products and services at emergency.cdc.gov/coca/subscribe.asp.

Join Us on Facebook



The screenshot shows the Facebook profile for COCA (CDC Clinician Outreach and Communication Activity). The profile picture features a diverse group of healthcare professionals. The cover photo shows a group of six people, including a woman in blue scrubs, a woman in a black blazer with a stethoscope, a man in a white lab coat, and others. The page name is "CDC Clinician Outreach and Communication Activity - COCA" with a verified badge. The handle is "@CDCClinicianOutreachAndCommunicationActivity". The page is categorized as a "Government Organization in Atlanta, Georgia". It has 21,420 likes and 21,217 followers. A recent post from October 31, 2017, at 1:18pm, announces a free CE event for a COCA Call on November 7, 2017, at 2:00PM. The location is marked on a map as "CDC Pro" near "Clifton Rd. NE" and "Houston".

<https://www.facebook.com/CDCClinicianOutreachAndCommunicationActivity>

Thank you for joining us today!



<https://emergency.cdc.gov/coca/>