NDSU | CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Science to Practice: Protecting Children from Respiratory Viruses in 2025-2026

Tracie Newman, MD, MPH, FAAP
Pediatrician, CIRE Medical Director,
& Associate Professor of Practice
North Dakota State University

Disclosure:
It is the policy of the Minnesota Medical Association (MMA) to ensure balance, independence, objectivity, and scientific rigor in its CME activities. To comply with the Standards for Integrity and Independence of the Accreditation Council for Continuing Medical Education (ACCME), the MMA requires planning committee members and faculty to disclose all financial relationship they have with an ineligible company. The members of the faculty and planning committee for this conference have indicated that they have no financial relationships to disclose related to the content of the CME activity. Faculty members have declared that they will uphold the MMA's standards regarding CME activities and that any clinical recommendations are based on the best available evidence or are consistent with generally accepted medical practice. Please indicate in the comments section of the evaluation form whether you detect any instances of bias toward products manufactured by an ineligible company.

CME Credit:
This activity has been planned and implemented in accordance with the accreditation requirements and polices of the Accreditation Council for Continuing Medical Education through the Minnesota Medical Association and NDSU. The Minnesota Medical Association (MMA) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.
The Minnesota Medical Association designates this live activity for a maximum of 1 *AMA PRA Category 1 Credit(s)*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Financial Support:
This project was supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award totaling $143,195 with 100 percent funded by CDC/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government. Additionally, the contents do not necessarily represent the official views of, nor an endorsement, by the North Dakota Department of Health and Human Services.

NDSU CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

MINNESOTA MEDICAL ASSOCIATION

Disclosure

Dr. Tracie Newman has no relevant financial relationships with ineligible companies to disclose.

Off-label use of medications will be discussed during this presentation.

Objectives

1. Describe current and emerging trends in pediatric respiratory viruses for the 2025-2026 season, including RSV, influenza, and COVID-19.
2. Identify risk factors and populations most vulnerable to severe outcomes from pediatric respiratory infections.
3. Discuss current evidence-based prevention and treatment options and evolving clinical guidelines for managing pediatric respiratory infections.

What the heck is going on?

VACCINES IN THE NEWS

Vaccine Recommendation Process: What Usually Happens

FDA//WHO determine fall vaccine formula

Manufacturers start making the vaccine

ACIP determines who gets it

HHS Secretary/ CDC Director signs off

Insurance determines coverage

Health clinics order the vaccines

FDA license/ approval

Vaccines delivered to clinics/ pharmacies. Public access

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Figure by Your Local Epidemiologist, August 2025.

Vaccine Recommendation Process: 2025 Changes

FDA limits COVID-19 to high risk. RFK Jr doesn't include pregnant women. CDC includes pregnant women as high-risk.

VIP met in August; found no new safety risks.

FDA//WHO determine fall vaccine formula

Manufacturers start making the vaccine

ACIP determines who gets it

RFK Jr replaces entire advisory group, adds many vaccine skeptics. Doesn't vote on COVID-19.

HHS Secretary/ CDC Director signs off

Insurance determines coverage

Health clinics order the vaccines

FDA license/ approval

FDA limits COVID-19 vaccine label.

Vaccines delivered to clinics/ pharmacies. Public access

ACIP meeting for COVID-19? Professional organizations kicked out.

COVID-19 stuck here

Until this happens

Figure by Your Local Epidemiologist, August 2025.
Zettler et al, *JAMA*, 2025.

Fall and Winter Immunization Guide: 2025-26

	Influenza (Flu) Vaccine	RSV Immunization	COVID-19 Vaccine
Kids	**All children 6 months and older** Some children 6 months to 8 years may need multiple doses AAP, CDC	**All infants <8 months old and children 8-19 months with risk factors** AAP, CDC **OR**	**All children 6-23 months** **Children 2-17 years old with risk factors or if parents desire vaccination** AAP
Pregnant Women	**All** At any point in pregnancy ACOG, CDC	**32-36 weeks gestation** ACOG, CDC	**All** At any point in pregnancy ACOG, CDC
Adults	**All** High-dose inactivated, recombinant, or adjuvanted inactivated flu vaccine preferred for 65+, if available CDC	**All 75+ and adults 50-74 with risk factors** As of now, one lifetime dose CDC	**Unknown** Pending recommendations from CDC and professional organizations Forthcoming: ACP, IDSA, AAFP, CDC

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Figure adapted from Your Local Epidemiologist, 2025.

Comparing Pediatric Vaccine Recommendations

Virus	AAP Recommendation (Aug 2025)	CDC/ACIP Recommendation (mid-2025)
COVID-19	6–23 months: Universal recommendation (vaccinate all) 2–17 years: Recommend for high-risk, and for others at parental discretion	**DIFFERENT from AAP:** CDC uses a "shared clinical decision-making" model for ages 6 months–17 years, rather than having a universal endorsement; parents should consult their provider
RSV	All infants <8 months + children 8-19 months with risk factors Typically Oct-March, if no maternal RSV vaccine	**SAME as AAP:** Infants < 8 months born to unvaccinated or unknown-status mothers High-risk 8–19 month-olds entering second season
Flu	Annual influenza vaccination for all children starting at 6 months Some children 6 months to 8 years may need multiple doses	**SAME as AAP:** Routine annual influenza vaccination for everyone aged ≥6 months

AAP, 2025; CDC, 2025

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

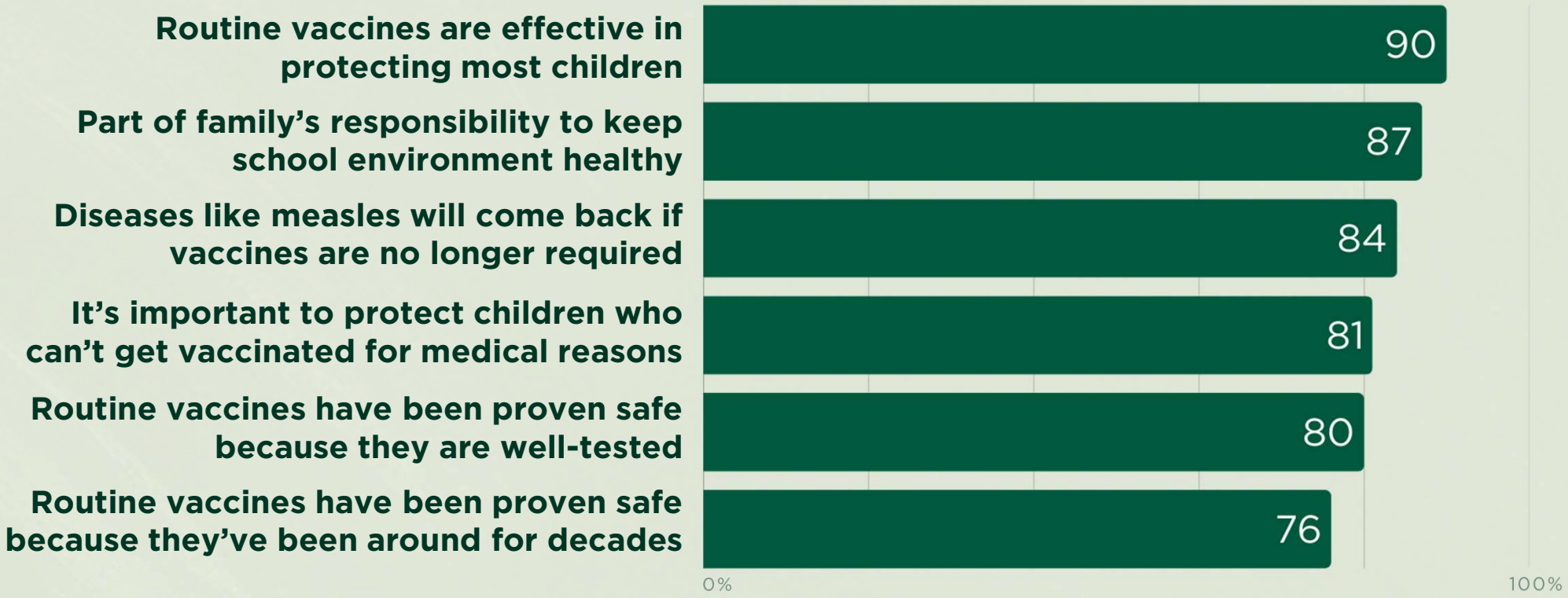
Vaccine Integrity Project

WHAT IS IT?

“CIDRAP's Vaccine Integrity Project is an initiative dedicated to safeguarding vaccine use in the U.S. so that it remains grounded in the best available science, free from external influence, and focused on optimizing protection of individuals, families, and communities against vaccine-preventable diseases.”

- Steering committee comprised of 8 members, with input from public health and vaccine experts
- Presented on safety and efficacy of respiratory virus immunizations on August 19th, 2025

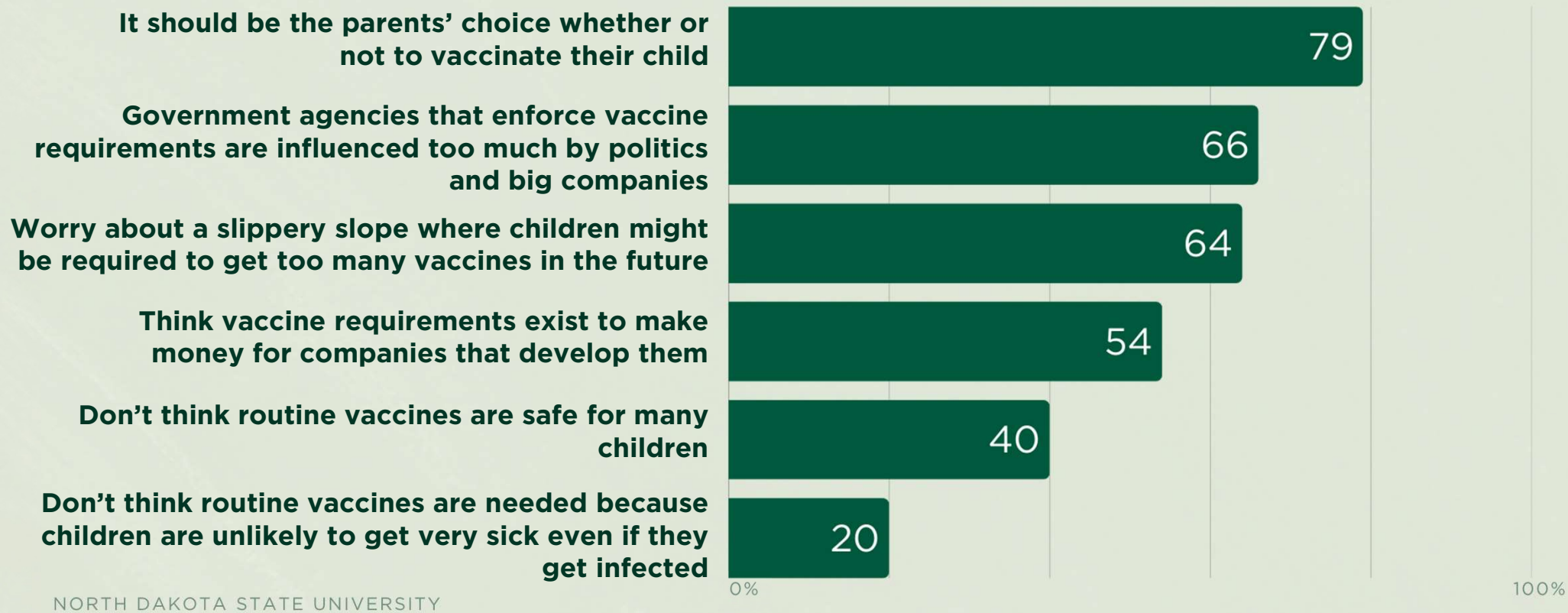
4 in 5 (79%) of Americans support childhood vaccine requirements. Here's why:



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

De Beaumont, 2025

1 in 5 (21%) of Americans oppose childhood vaccine requirements. Here's why:



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

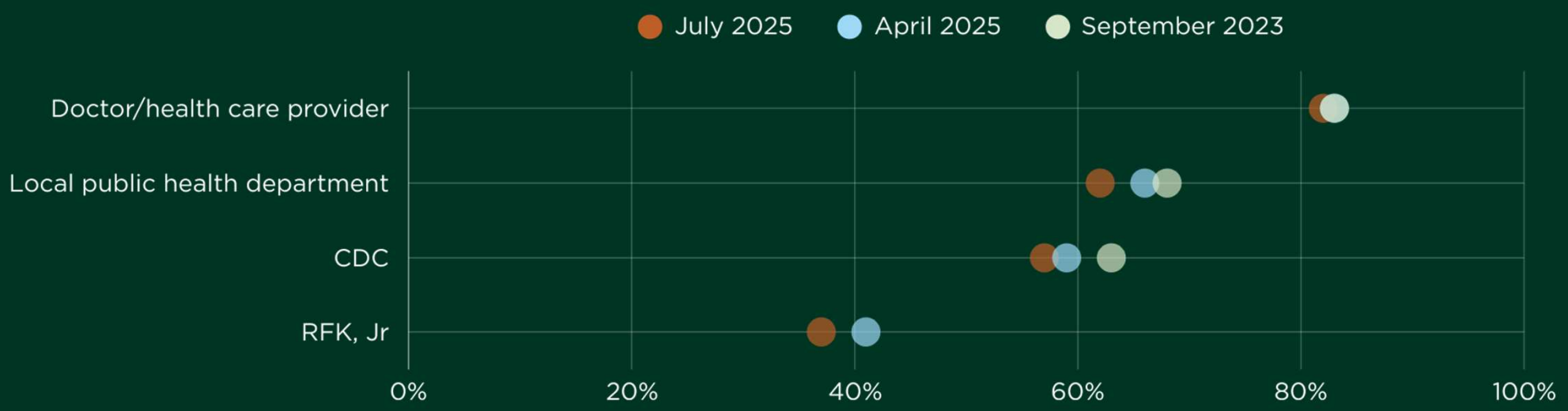
De Beaumont, 2025

As a healthcare provider, **YOU** are patients' most trusted source of vaccine information.

The Good News

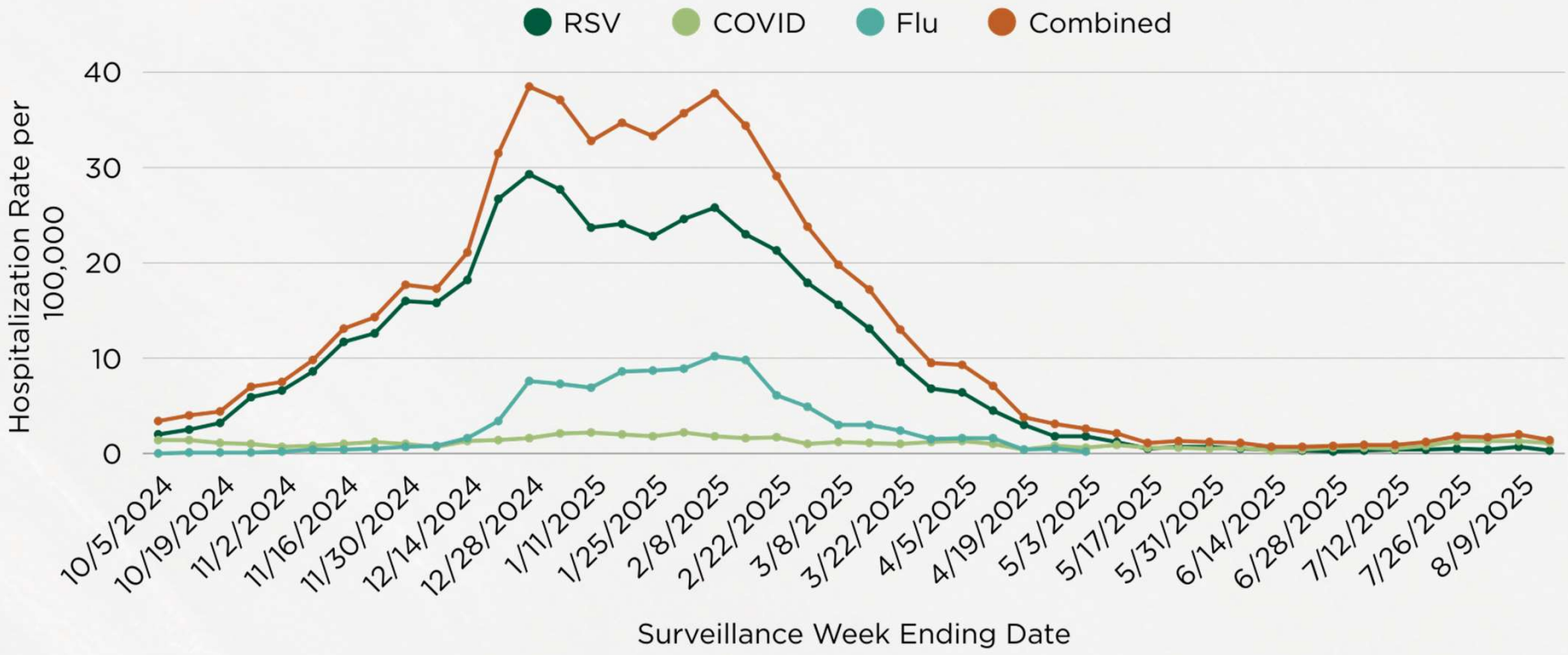
Trust in Doctors Remains High

Percent who say they have a **great deal** or a **fair amount** of trust in the following to provide reliable information about vaccines:



KFF, August 2025.

2024-25 Respiratory Virus Rates, United States, 0-4 years

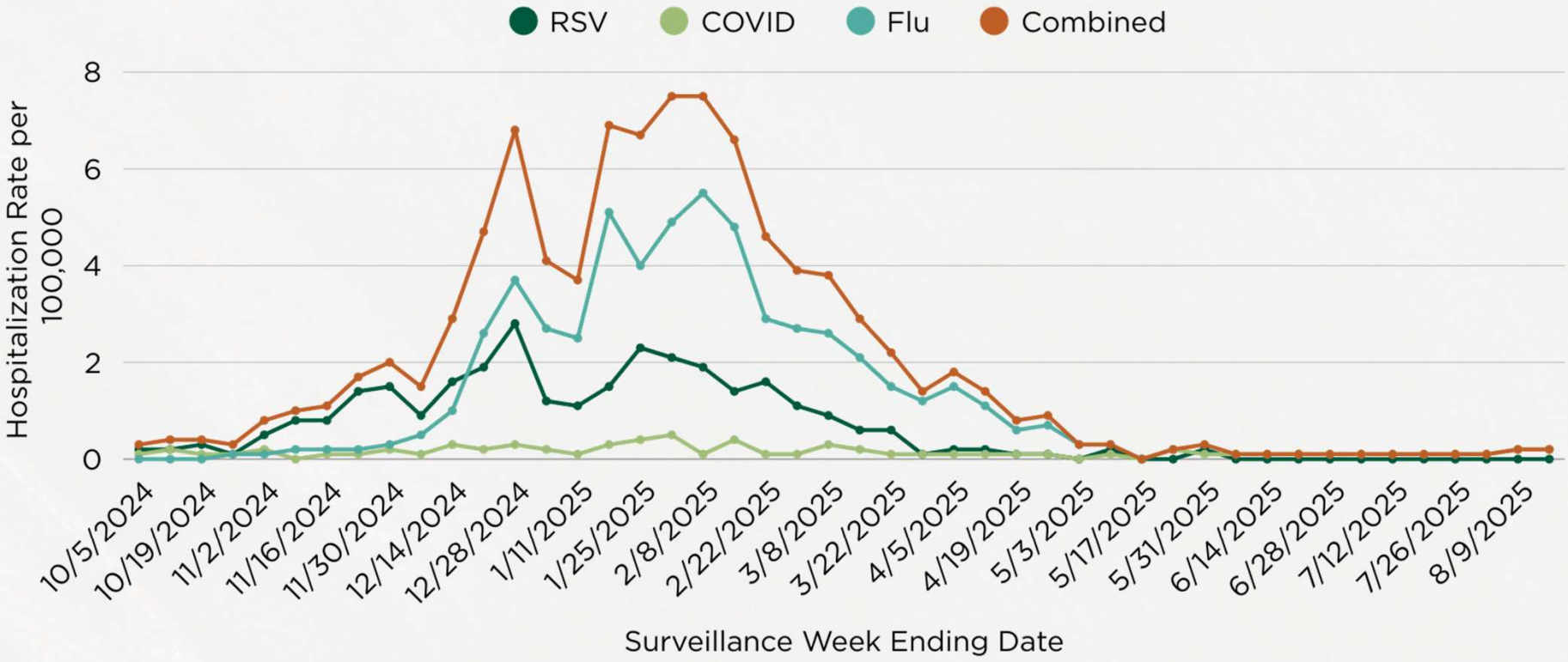


NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

CDC RESP-NET, accessed 8/27/25.

2024-25 Respiratory Virus Rates, United States, 5-11 years

*Note scale change.

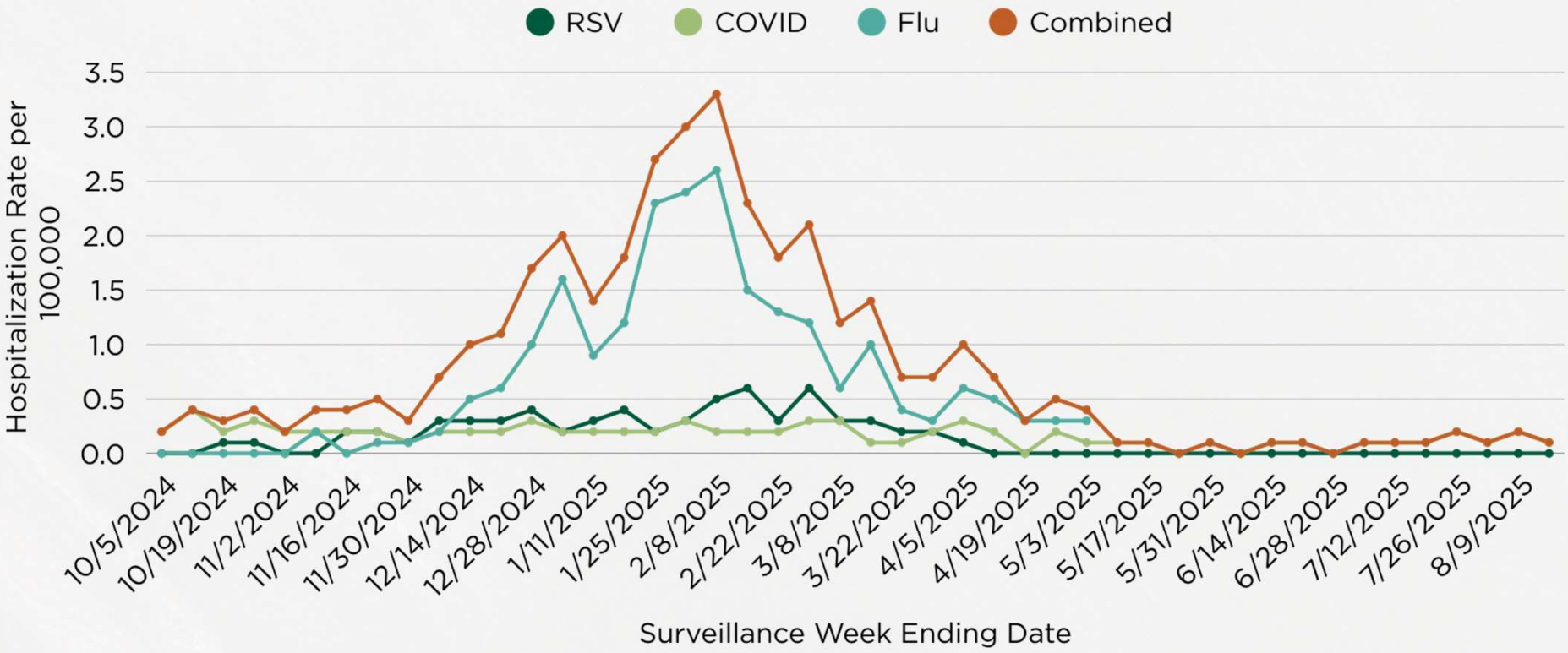


NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

CDC RESP-NET, accessed 8/27/25.

2024-25 Respiratory Virus Rates, United States, 12-17 years

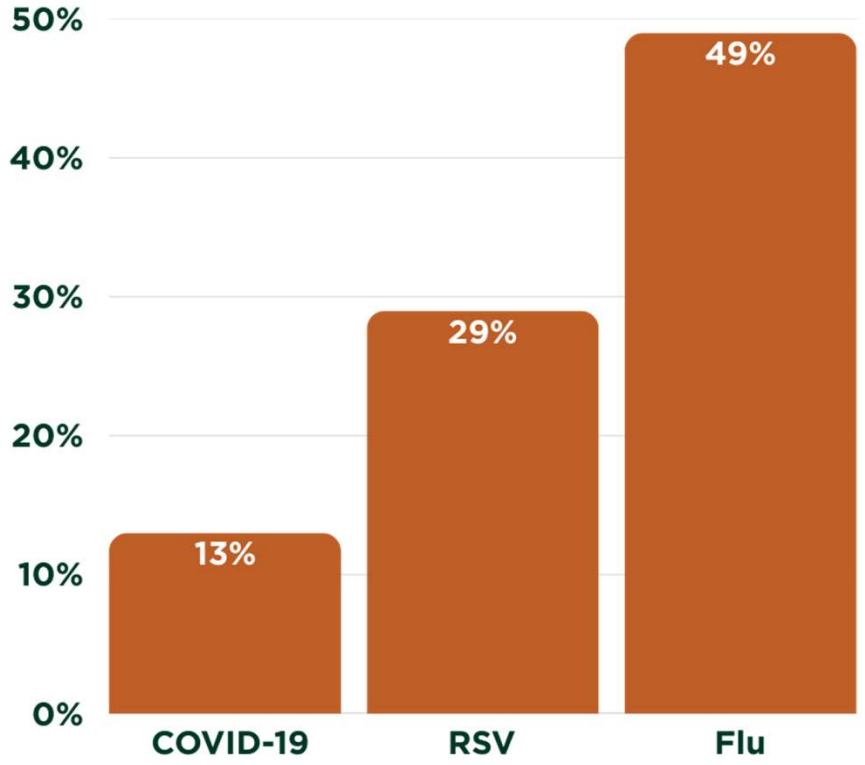
*Note scale change.



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

CDC RESP-NET, accessed 8/27/25.

How did we do last season in the U.S.?



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

CDC, 2025 - COVIDVaxView; FluVaxView
Boundy et al, MMWR, 2025

Influenza (Flu)

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Preliminary 2024-2025 U.S. Flu In-Season Disease Burden Estimates (All Ages)

BASED ON DATA FROM OCTOBER 1, 2024 - MAY 17, 2025

CDC, Preliminary Estimated Flu Disease Burden 2024-2025 Flu Season, May 2025.

47-82 MILLION FLU ILLNESSES

21-37 MILLION FLU MEDICAL VISITS

610,000 - 1.3 MILLION FLU HOSPITALIZATIONS

27,000 - 130,000 FLU DEATHS

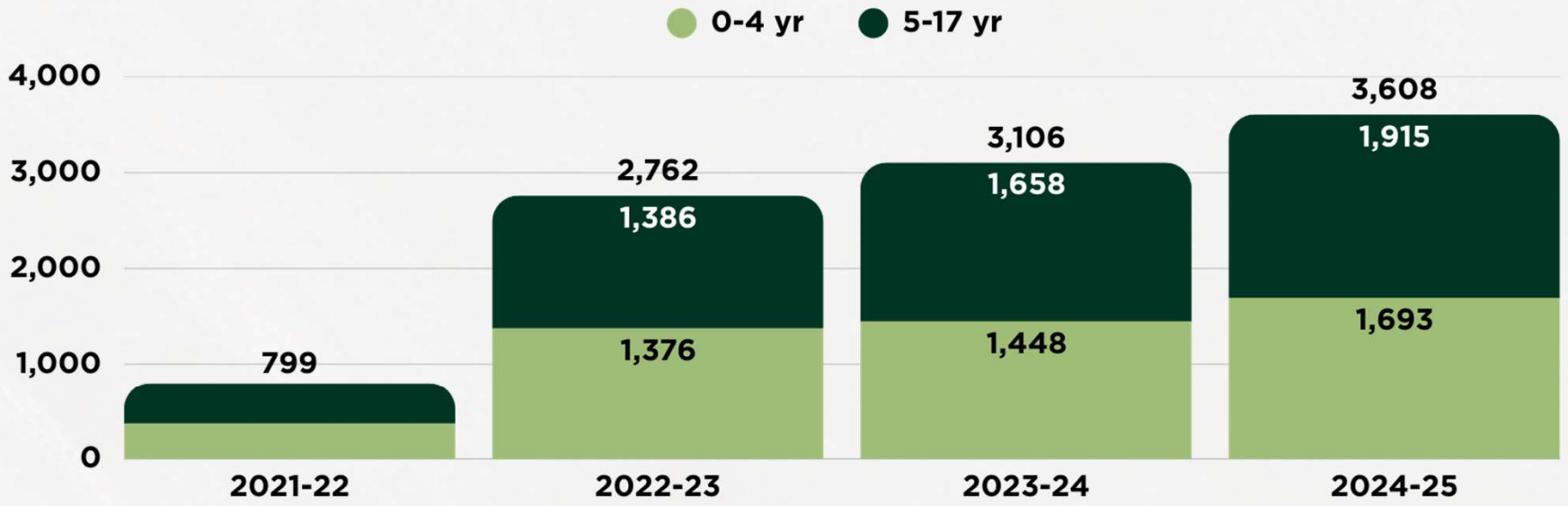
Influenza in Children

- Every year, 8-10% of U.S. children develop symptomatic influenza
- Hospitalization rates are highest in kids under 5 years of age
- Viral infections have been known to lead to invasive bacterial infections in kids, as well as acute necrotizing encephalopathy (ANE)
- 8-11% of hospitalized children experience neurologic complications (e.g., seizures, encephalopathy)

AAP Committee on Infectious Diseases, *Pediatrics*, July 2025.

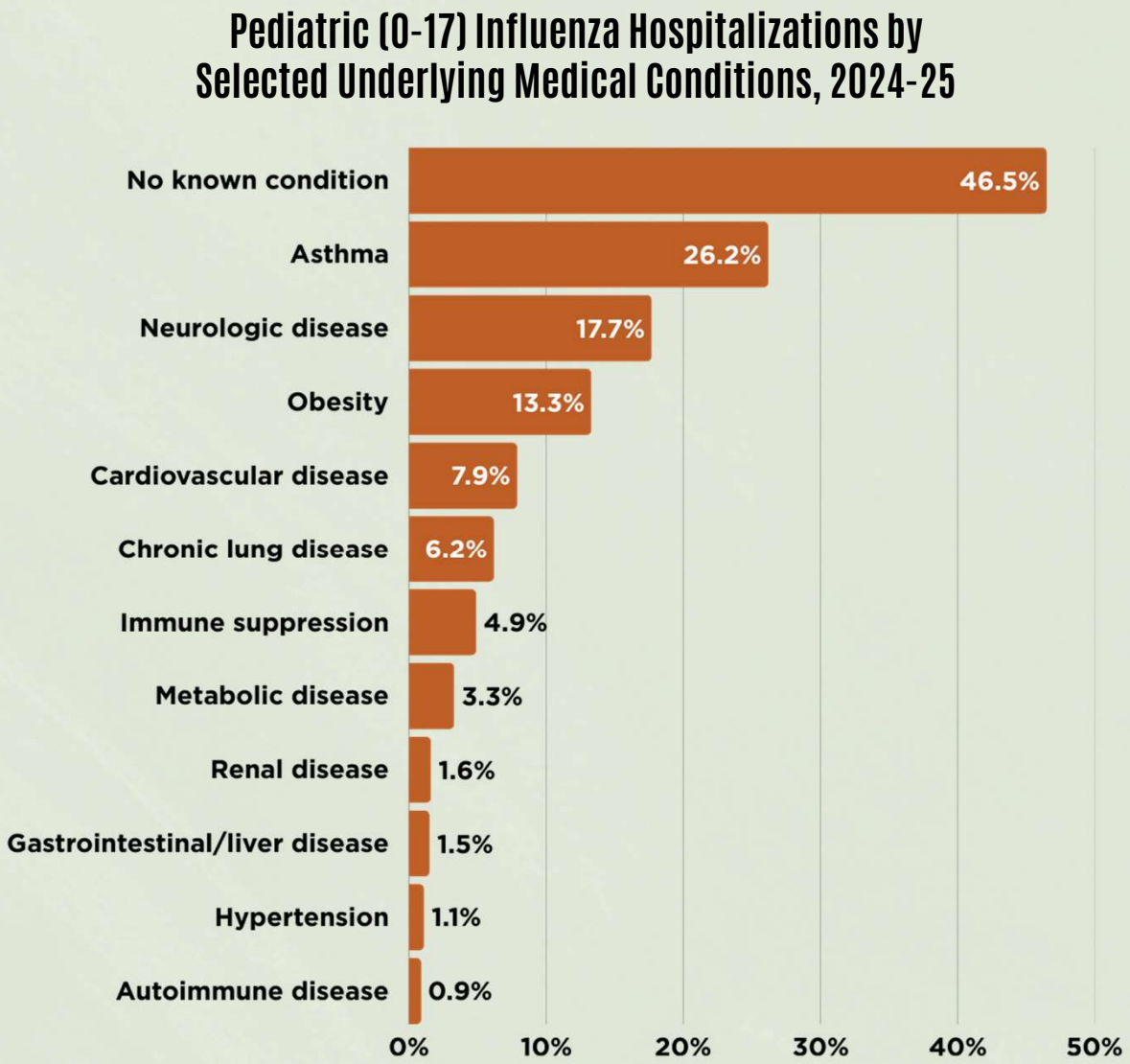
Influenza-Associated Hospitalizations by Age Group and Flu Season

As of August 16, 2025



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

CDC, FluView Interactive, Accessed 8/27/2025.



Underlying Conditions Among Children Hospitalized with Influenza

- Almost half of kids hospitalized with influenza **did not have any known health conditions**
- Among kids hospitalized with influenza, the following conditions were the most common:
  - Asthma (26.2%)
  - Neurologic disease (17.7%)
  - Obesity (13.3%)

CDC FluView, accessed 9/2/2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION
RESEARCH AND EDUCATION

Acute Necrotizing Encephalopathy (ANE) & Influenza

A CASE SERIES

"We might see one case every couple years.
It's just not common to see a cluster of cases."

-Keith Van Haren, MD
Pediatric Neurologist, Stanford University

41

CASES OF ANE IN KIDS DURING PAST 2 RESPIRATORY VIRUS SEASONS

Appears to be higher than usual based on perceptions from senior pediatric neurologists.

76%

OCCURRED IN KIDS WITH NO UNDERLYING MEDICAL CONDITIONS

63% of survivors left with moderate to severe disability after 90-day follow-up.

27%

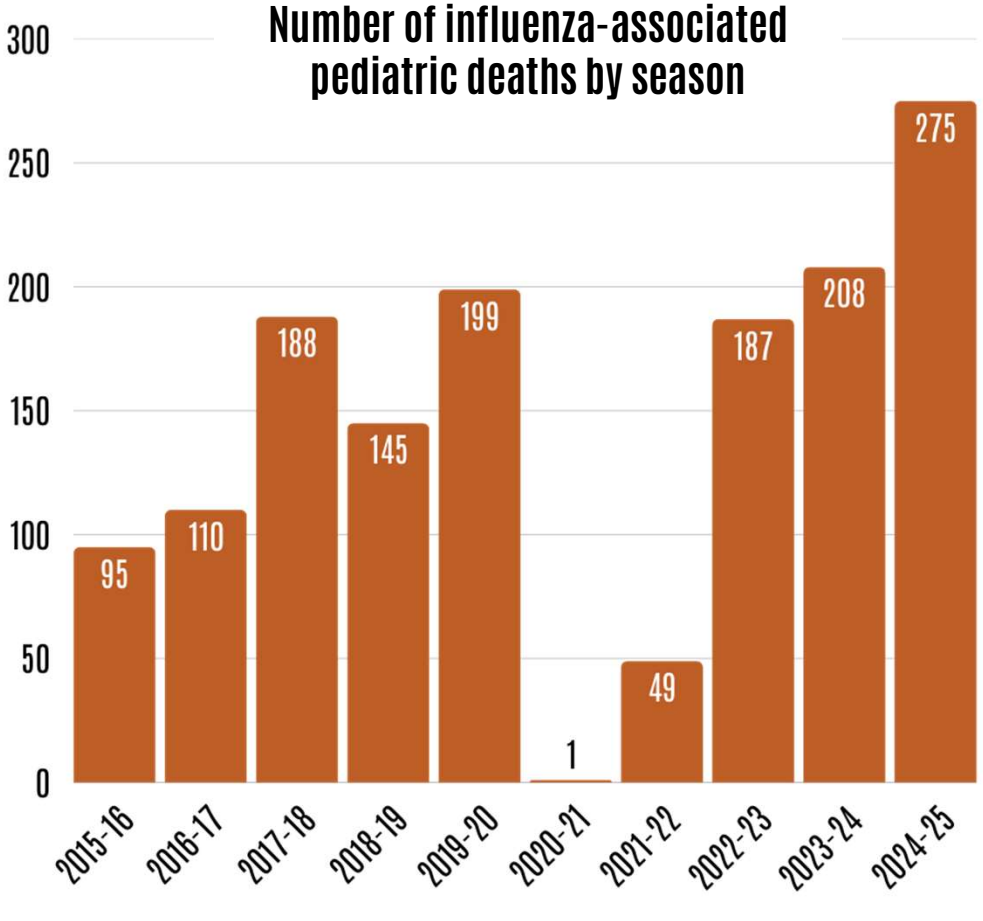
MORTALITY RATE

All but one of the deaths occurred in unvaccinated children.

Influenza-Associated Acute Necrotizing Encephalopathy (IA-ANE) Working Group, *JAMA*, July 2025; Fiore, *MedPage Today*, July 2025; AAP Committee on Infectious Diseases, *Pediatrics*, July 2025.

Pediatric Infuenza Deaths on the Rise

The 2024-25 season saw the highest number of pediatric flu deaths in 15 years.



CDC FluView Interactive, accessed 8/25/2025; CDC Influenza-Associated Pediatric Mortality Surveillance System, accessed 8/13/2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION
RESEARCH AND EDUCATION

275

INFLUENZA-RELATED PEDIATRIC DEATHS IN THE 2024-2025 INFLUENZA SEASON, AS OF 8/25/25

occurred in children who **weren't fully vaccinated**.

AAP, Influenza Vaccine Recommendations for 2025-26 Season, 2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION
RESEARCH AND EDUCATION

275

INFLUENZA-RELATED PEDIATRIC DEATHS IN THE 2024-2025 INFLUENZA SEASON, AS OF 8/25/25

Any number of influenza-related deaths is ***too many.***

AAP, Influenza Vaccine Recommendations for 2025-26 Season, 2025.

Influenza Vaccines for Kids

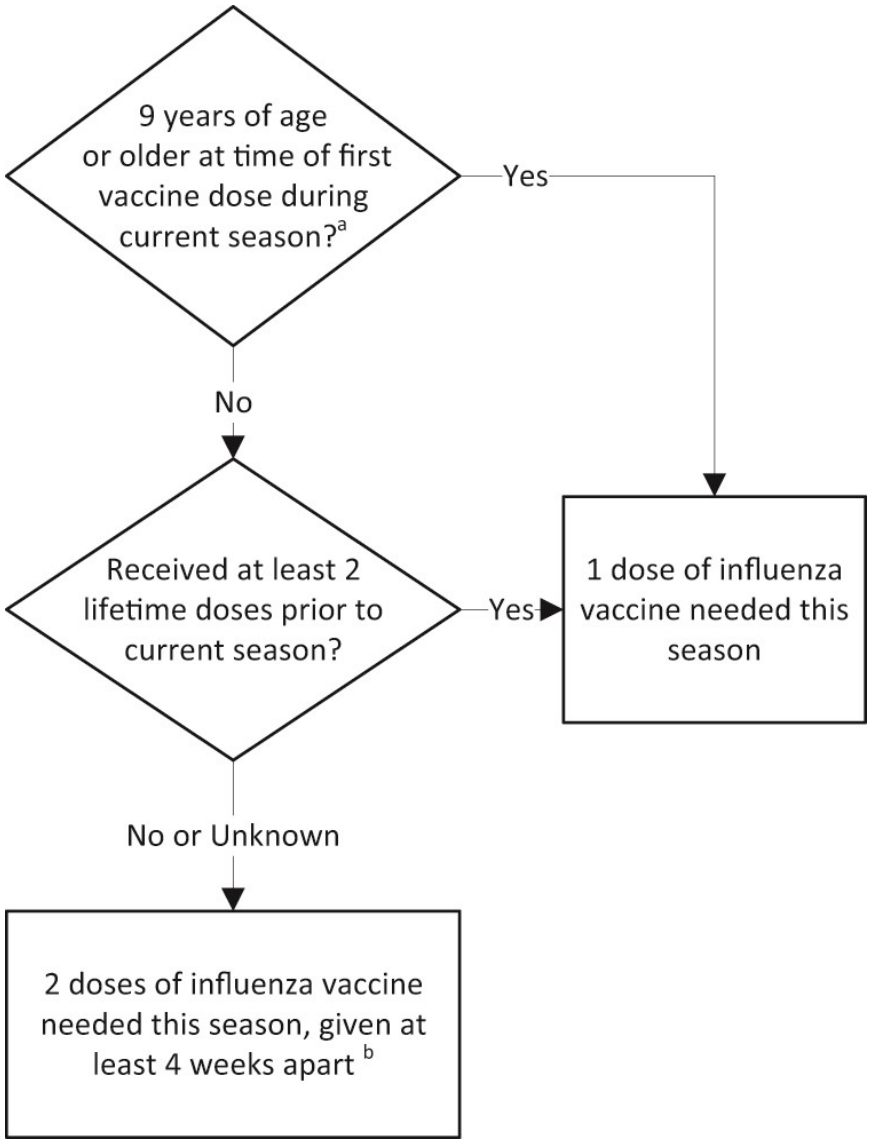
2025-2026
RECOMMENDATIONS & UPDATES

Influenza Vaccine

- Annual flu vaccine is recommended for **everyone 6 months and older**
- Recommended dose(s) ideally received by the end of October
- Pregnant/postpartum individuals should receive the flu vaccine
- Can be coadministered with other vaccines
- New option: At-home nasal spray flu vaccine available for patients 2 - 49 years of age

AAP Policy Statement, *Pediatrics*, July 2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION



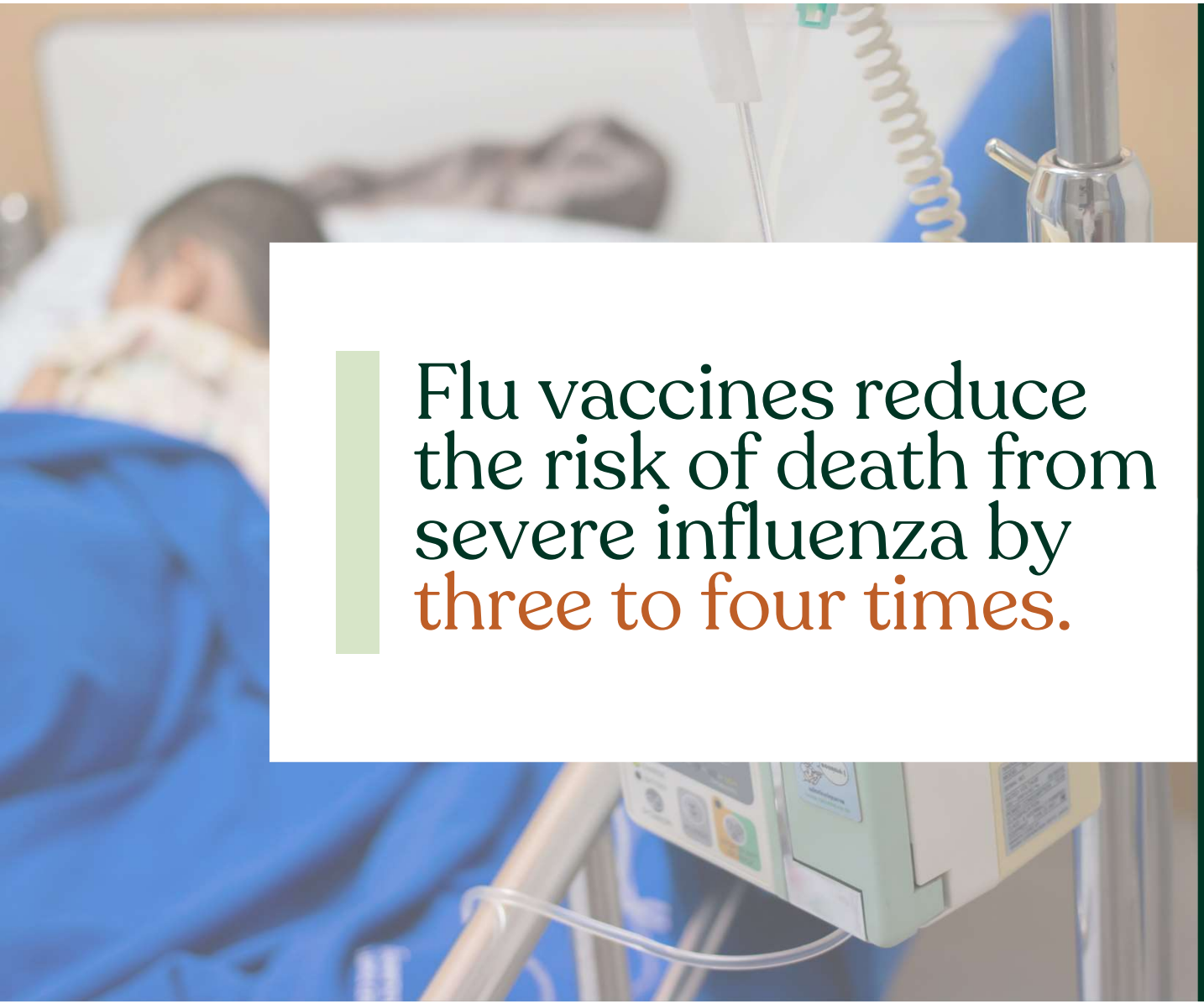
THIMEROSAL & FLU VACCINES

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

AAP Recommendation:

"The AAP continues to support the current WHO recommendations for use of thimerosal as a preservative in multiuse vials in the global vaccine supply. **Thimerosal-containing vaccines are not associated with an increased risk of autism spectrum disorder in children.** Thimerosal from vaccines has not been linked to any neurologic condition. Despite the lack of evidence of harm, some states have legislation restricting the use of vaccines that contain even trace amounts of thimerosal and in June 2025, the Advisory Committee on Immunization Practices recommended that children and adults only receive influenza vaccine in single-dose formulations that are free of thimerosal as a preservative. The benefits of protecting children against the known risks of influenza are clear. Therefore, to the extent permitted by state law, **children should receive any available formulation of IIV rather than delaying vaccination while waiting for reduced-thimerosal content or thimerosal-free vaccines."**

AAP Committee on Infectious Diseases, *Pediatrics*, July 2025.
Emphasis added.



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION
RESEARCH AND EDUCATION

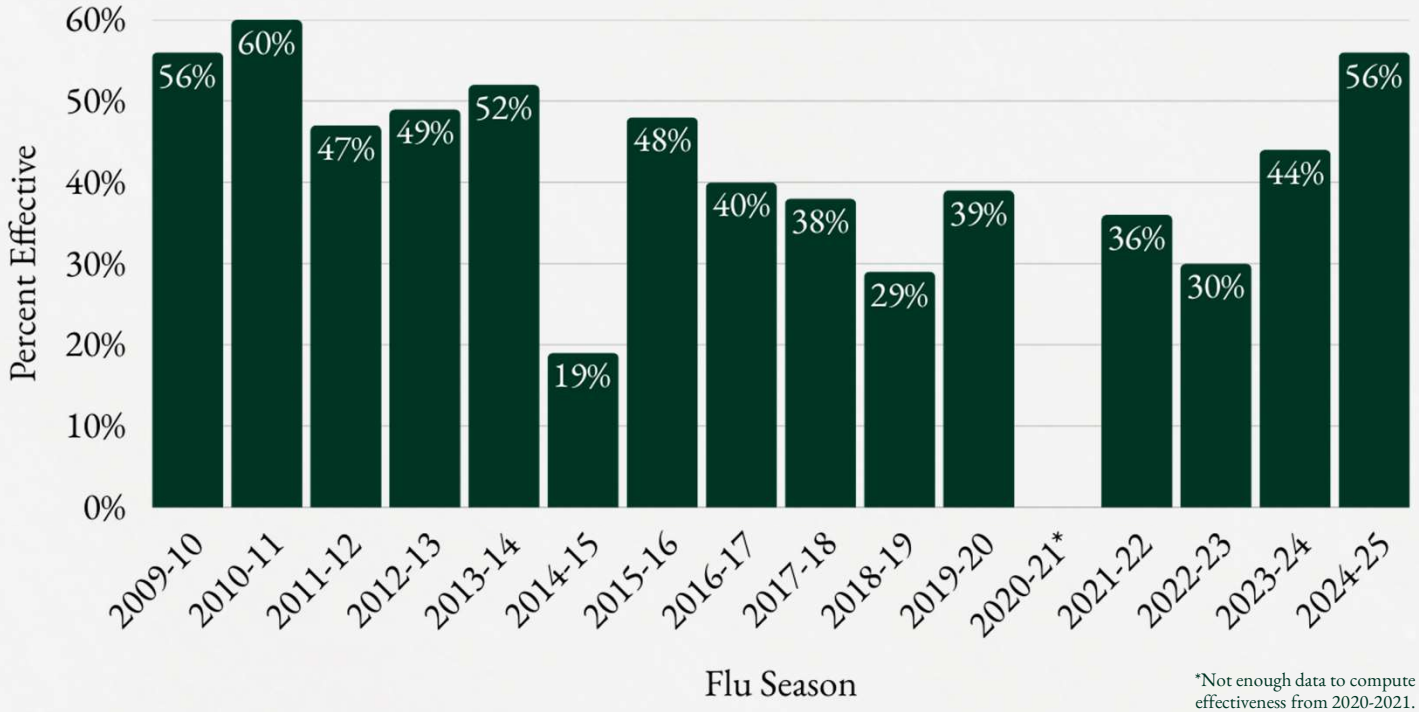
Flu vaccines reduce the risk of death from severe influenza by three to four times.

- Spanish study analyzing data from 38+ countries and 6.5 million patients.
- Patient data from 2003 - 2023 found flu vaccination to be effective at reducing infection rates and flu-related complications in all age groups.

Presa et al., *European Respiratory Review*, January 2025;
Castro, *Medscape*, February 2025.

Flu Vaccine Effectiveness Over the Years (All Ages)

Flu vaccine effectiveness varies based on many factors – including the type of influenza circulating each year and the age of the child vaccinated.



*Not enough data to compute effectiveness from 2020-2021.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

AAP Committee on Infectious Diseases, *Pediatrics*, July 2025; CDC
CDC Seasonal Flu Vaccine Effectiveness Studies, May 2025.

Pediatric Influenza Vaccine Effectiveness

ALL CHILDREN <18 YEARS

46-78%

effective against flu hospitalization and ICU admission

(Data based on 7 studies)

32-92%

effective against medically-attended flu

(Data based on 15 studies)

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Marwah H, Vaccine Integrity Project, Presented 8/19/2025.

Hundreds of millions of Americans have safely received flu vaccines for more than 50 years.

The body of scientific evidence from vaccine safety monitoring systems and scientific studies overwhelmingly supports their safety.

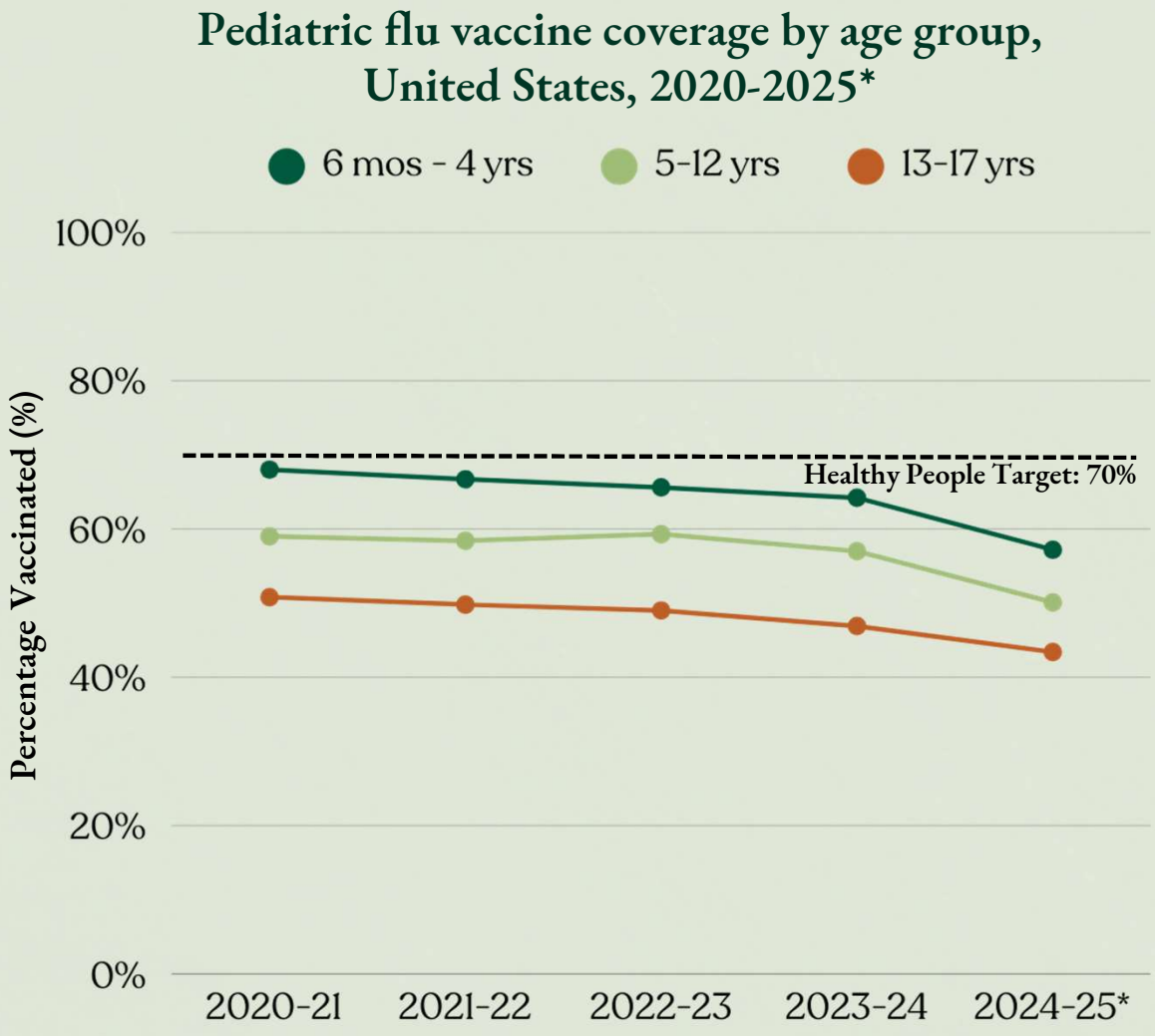
CDC Influenza Vaccine Safety, 2024.
Photo: WHO History of the Influenza Vaccine, 2022.
Image depicts people waiting for a flu vaccine in New Jersey in 1976.

United States 2024-2025 Pediatric Flu Vaccine Coverage

6 months - 4 years	57.2%
5-12 years	50.1%
13-17 years	43.4%

National pediatric flu vaccine rates are well below the Healthy People 2030 target of 70% vaccination coverage.

CDC FluVaxView, accessed 8/27/25.



*2024-25 seasonal data through April 26, 2025.
Previous seasonal data through end of May of that year.

North Dakota 2024-2025 Pediatric Flu Vaccine Coverage

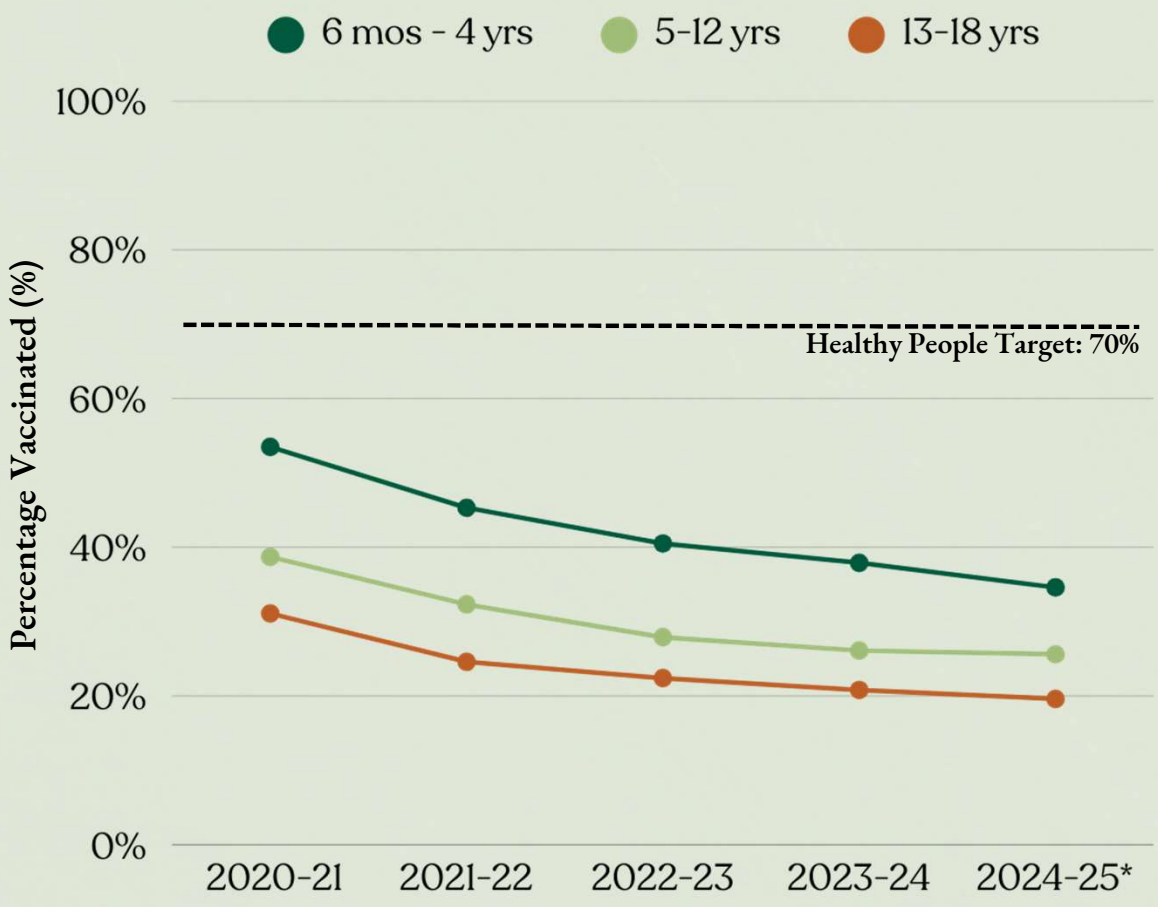
6 months - 4 years	34.6%
5-12 years	25.6%
13-18 years	19.6%

#39

ND ranked 39/50 in pediatric flu vaccine coverage.

NDHHS Flu Vaccine Dashboard, 2025; CDC NIS-Flu, 2025.

Pediatric flu vaccine coverage by age group, North Dakota, 2020-2025*



*2024-25 seasonal data through April 5, 2025.
Previous seasonal data through June 30 of that year.

Knowledge Check

During the 2024–2025 flu season in the U.S.:

A

Pediatric flu deaths decreased compared to the previous year.

B

Over 200 children died of influenza, marking the highest toll in over a decade.

C

Pediatric deaths were minimal and only occurred in children with chronic medical conditions.

D

Nearly all of the pediatric flu deaths occurred in children who had been fully vaccinated.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Knowledge Check

During the 2024–2025 flu season in the U.S.:

A

Pediatric flu deaths decreased compared to the previous year.

B

Over 200 children died of influenza, marking the highest toll in over a decade.

C

Pediatric deaths were minimal and only occurred in children with chronic medical conditions.

D

Nearly all of the pediatric flu deaths occurred in children who had been fully vaccinated.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Respiratory Syncytial Virus

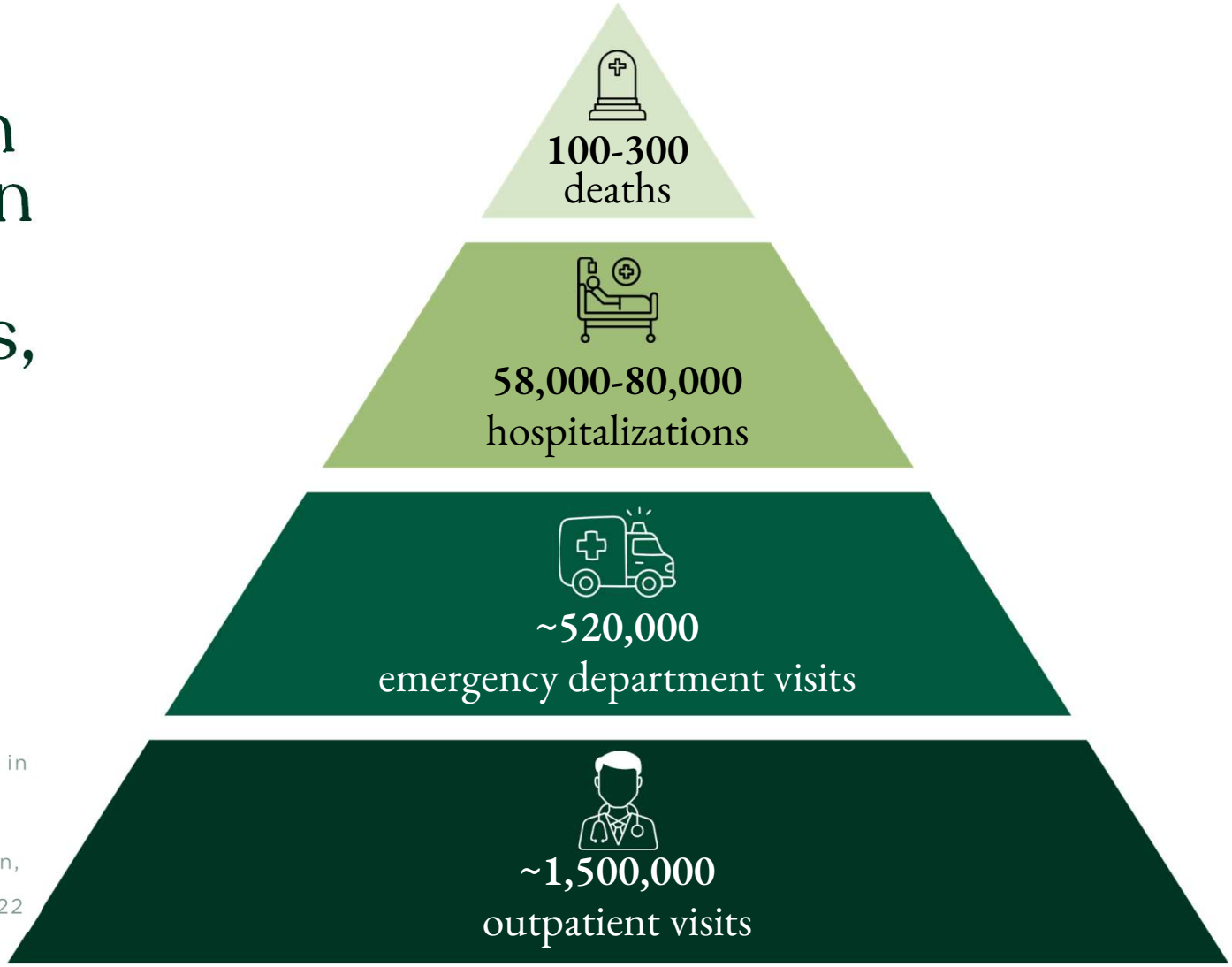
NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

RSV Epidemiology

- Most infants (68%) infected during the 1st year of life; nearly all (97%) by age 2
- **Most common cause of hospitalization in U.S. infants** (2-3% of young infants)
  - Prematurity/chronic disease increases risk, but most (79%) are in healthy, term infants
  - Risk of hospitalization higher in younger infants

Mazur et al, *The Lancet*, 2024.

Each year in U.S. children aged less than 5 years, RSV is associated with...



*Estimate 80,000 hospitalization in infants <1 yrs

Thompson et al, JAMA, 2003; Hansen et al, JAMA Network Open, 2022; Hall et al, NEJM, 2009; McLaughlin et al, J Infect Dis, 2022

RSV Prevention for Kids

2025-2026
RECOMMENDATIONS & UPDATES

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Three Options for Infant Protection

MATERNAL VACCINATION: ABRYSVO

Recommended for pregnant individuals 32 -36 weeks gestation from September - January who have not received the RSV vaccine in a previous pregnancy.

INFANT ANTIBODIES: NIRSEVIMAB

Recommended for infants <8 months born during or entering their first RSV season, and some children 8 - 19 months at increased risk of severe RSV entering their second RSV season.

INFANT ANTIBODIES: CLESROVIMAB

Recommended for infants <8 months born during or entering their first RSV season.

American Academy of Pediatrics, 2025.

Seasonal Recommendations

It is important that babies have protection before RSV season peaks, typically between December and February.

RSV vaccine (Abrysvo) recommended during weeks 32-36 of pregnancy.

Nirsevimab or clesrovimab recommended for infant.

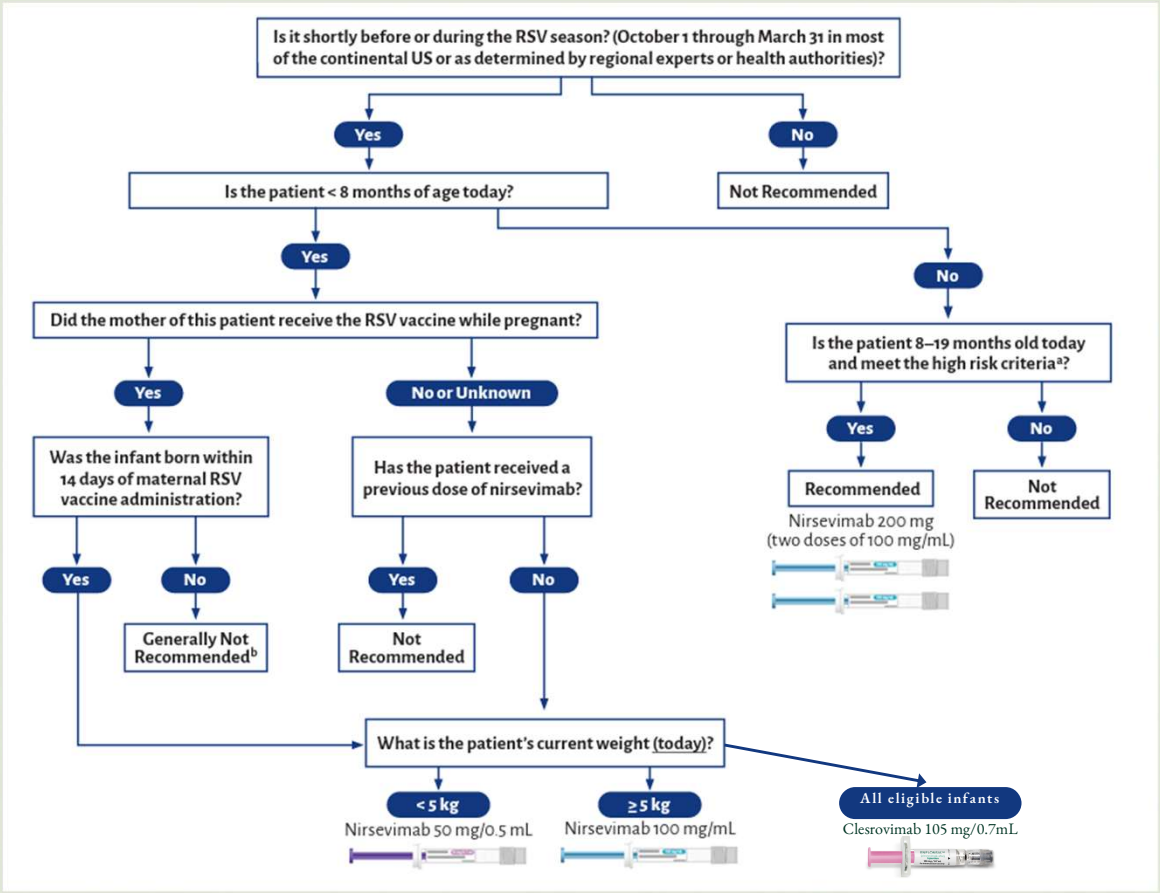
Immunizations are not recommended to protect infants outside of RSV season. Infants born in these months should receive **nirsevimab or clesrovimab** in October.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

AAP Committee on Infectious Diseases, *Pediatrics*, August 2025;
Moulia et al., MMWR, August 2025.

RSV Antibody Administration

- If the mother did not receive the maternal RSV vaccine, nirsevimab or clesrovimab should ideally be administered to babies born during October through March during their birth hospitalization, or within 1 week of birth.



American Academy of Pediatrics, 2025.
Image adapted from AAP 2024 Visual Guide.

77%

of pediatricians had ever offered nirsevimab (N=200)

- Most pediatricians agreed that nirsevimab is safe (97%) and effective (96%) for infants.
- The top challenges pediatricians reported with offering nirsevimab were:
  - parent/caregiver concerns around safety (44%)
  - challenges knowing maternal RSV vaccination status to determine infant eligibility (34%)
  - financial burden associated with purchasing nirsevimab (31%)

63%

of OB/GYNs offered RSV vaccine to pregnant women (N=200)

- Most OB/GYNs agreed that maternal RSV vaccination is safe (92%) and effective (94%).
- The top challenges OB/GYNs reported with offering maternal RSV vaccination were:
  - patient concerns around safety (65.5%)
  - cost and reimbursement issues (46%)
  - patient concerns around effectiveness (28%)

CDC Pediatrician and OB/GYN Survey on RSV Immunization, published 11/14/2024. Survey conducted October 2-10, 2024.

Pediatric Nirsevimab Effectiveness

CHILDREN <24 MONTHS

64-93%

effective against RSV hospitalization
(Data based on 13 studies)

51-91%

effective against RSV ICU admission
(Data based on 6 studies)

17-89%

effective against medically-attended RSV
(Data based on 5 studies)

Marwah H, Vaccine Integrity Project, Presented 8/19/2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Pediatric Clesrovimab Efficacy

CHILDREN <12 MONTHS

90.9%

effective against RSV hospitalization

60.4%

effective against medically-attended RSV

Moulia et al., *MMWR*, August 2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Maternal RSV Vaccine Efficacy

DATA FROM PHASE 3 CLINICAL TRIALS

81.8%

Reduced risk of severe LRTD within 90 days of birth
(91.1% reduced risk among pregnant individuals 32-36 weeks gestation)

69.4%

Reduced risk of severe LRTD within 180 days of birth
(57.3% reduced risk among pregnant individuals 32-36 weeks gestation)

LRTD: lower respiratory tract disease

ACOG, Updated August 2025;
Kampmann et al., *NEJM*, April 2023.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Maternal RSV Vaccine Safety

ACOG, Practice Advisory, Updated August 2025.

Most common side effects: pain at injection site, headache, myalgia, nausea

Preterm birth

- A small numerical increase in preterm births was observed in clinical trials among Abrysvo recipients (5.7%) vs. placebo (4.7%).
- **No definitive causal link:** the balance of evidence makes a vaccine-caused increase in preterm birth less likely, but it cannot be ruled out yet.

Guillain-Barré syndrome (GBS)

- Updated Abrysvo's label for those 65+ to include possible increased risk of GBS (based on observational study)
- **Does NOT apply to pregnant people,** no current established causal link in this population.

Hypertensive disorder

- Some data suggests a possible, small increased risk of hypertensive pregnancy disorder among vaccinated individuals. But findings may relate to residual confounding and require further research.

	Advantages	Disadvantages
Maternal RSV Vaccine 	◦ Immediate protection for baby after birth ◦ Reduces number of vaccines for infant at birth ◦ Can be given with other vaccines in pregnancy	◦ Potentially reduced protection in some situations (e.g., pregnant person is immunocompromised or infant born soon after vaccination) ◦ Potential risk of hypertensive disorders of pregnancy
Infant RSV Antibody Nirsevimab & Clesrovimab 	◦ Protection may wane more slowly than from maternal RSV vaccine ◦ Direct receipt of antibodies rather than relying on transplacental transfer ◦ No risk for adverse pregnancy outcomes	◦ Requires infant injection ◦ Delay in administration could leave the infant unprotected

Should a pregnant person receive the maternal RSV vaccine during pregnancy this season if they received the maternal RSV vaccine during pregnancy in a previous season?

No.

Rather, the infant should receive nirsevimab or clesrovimab.

RSV-associated hospitalization rates decreased during 2024-25 compared to RSV seasons before prevention products were available

Greatest reductions among infants aged 0-2 months born just before or during RSV season.

These trends underscore the **importance of early protection** through maternal vaccination during pregnancy or infant immunization in their first week of life.

Percent Hospitalization Reductions in 2024-2025

	0-2 months	0-7 months
RSV-NET	47% ↓	38% ↓
NVSN	46% ↓	31% ↓

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

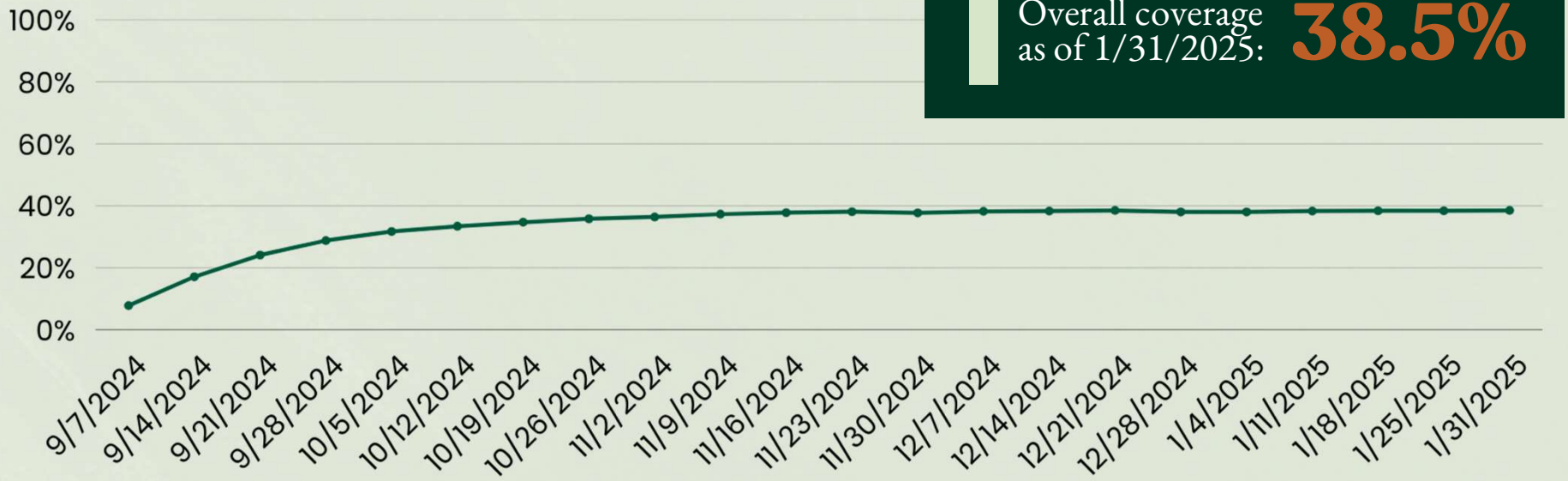
CDC Coronavirus and Other Respiratory Viruses Division, presented at ACIP on 6/25/2025.

Maternal RSV Vaccine Uptake Increased from 2023-2024 Season

Percent of pregnant women ages 18-49 years vaccinated with RSV vaccine, United States, 2024-2025

Overall coverage as of 1/31/2024: **17.9%**

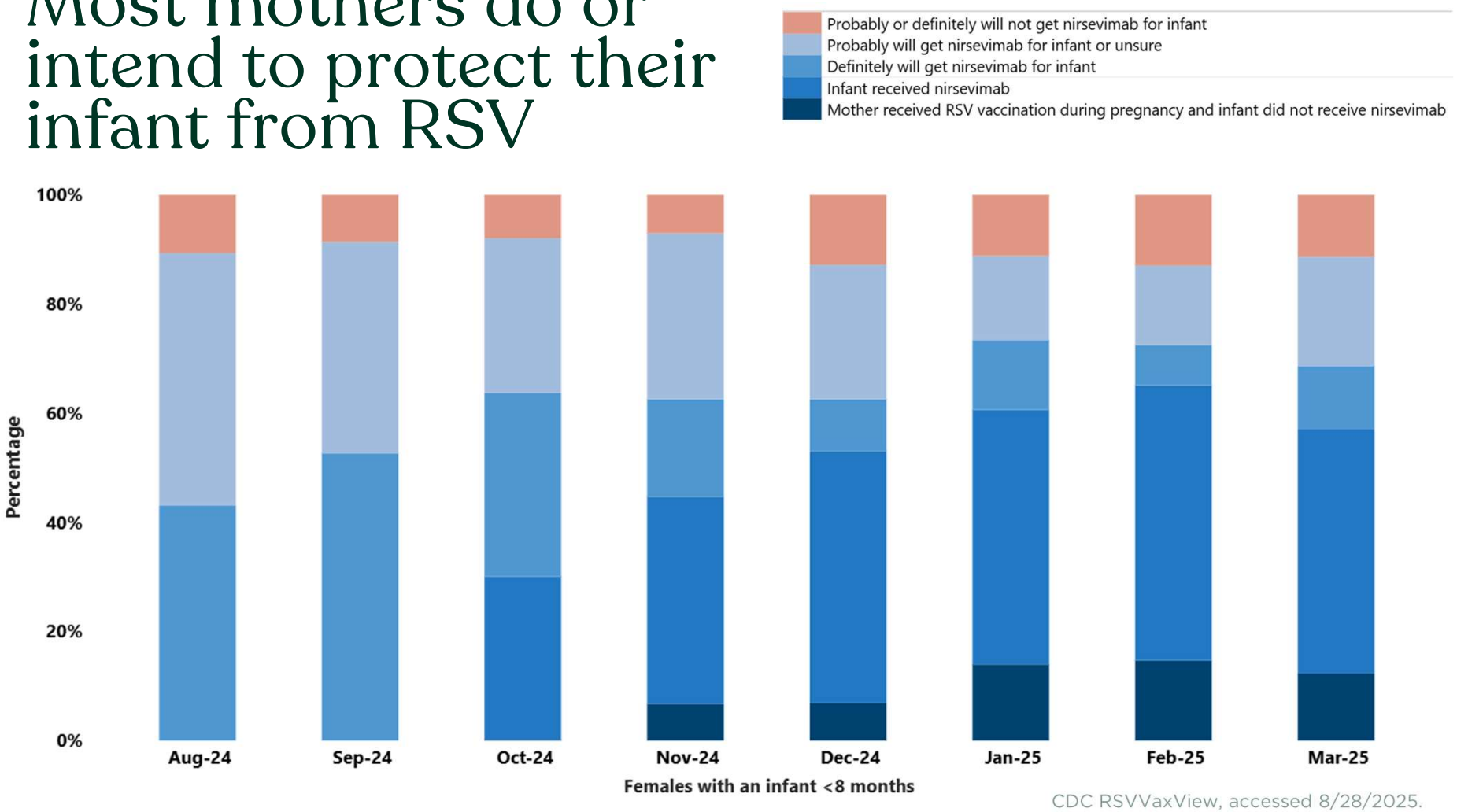
Overall coverage as of 1/31/2025: **38.5%**



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

CDC RSVVaxView, accessed 8/28/2025.

Most mothers do or intend to protect their infant from RSV



CDC RSVVaxView, accessed 8/28/2025.

Knowledge Check

Which of the following infants is eligible to receive a single dose of clesrovimab for protection against RSV during their first RSV season, according to current U.S. public health guidance?

A

A 10-month-old infant who received maternal RSV vaccination during pregnancy and is entering their second RSV season.

B

A 12-month-old infant entering their first RSV season.

C

A 6-month-old infant born during the RSV season whose mother did not receive RSV vaccination during pregnancy.

D

A 4-month-old infant born to a mother who received RSV maternal vaccination 20 days before birth.

Knowledge Check

Which of the following infants is eligible to receive a single dose of clesrovimab for protection against RSV during their first RSV season, according to current U.S. public health guidance?

A

A 10-month-old infant who received maternal RSV vaccination during pregnancy and is entering their second RSV season.

B

A 12-month-old infant entering their first RSV season.

C

A 6-month-old infant born during the RSV season whose mother did not receive RSV vaccination during pregnancy.

D

A 4-month-old infant born to a mother who received RSV maternal vaccination 20 days before birth.

COVID-19

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Who is being hospitalized?

1 in 4 children hospitalized with COVID required ICU care.

9 in 10 children hospitalized were NOT up to date with COVID-19 vaccination.

COVID-19 impacts infants most:

- >50% of pediatric hospitalizations are in children <2 years
- Most hospitalized children <2 years had no underlying conditions
- Even in ICU, over half (53%) had no underlying conditions

MacNeil, Current Epidemiology of COVID-19, ACIP Meeting June 25, 2025; Free et al., Pediatrics, August 2025.

Clinical characteristics significantly associated with severe COVID-19 in children

(A) Children aged 6 to 23 months:

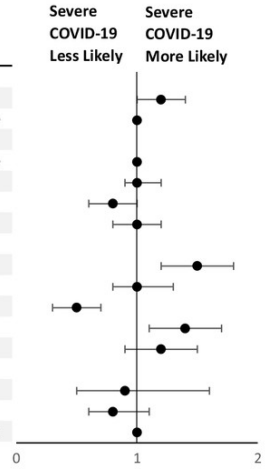
- Chronic lung disease (excluding asthma)
- Cardiovascular disease

(B) Children aged 2 to 17 years:

- Chronic lung disease (excluding asthma)
- Diabetes mellitus
- Neurologic disorders

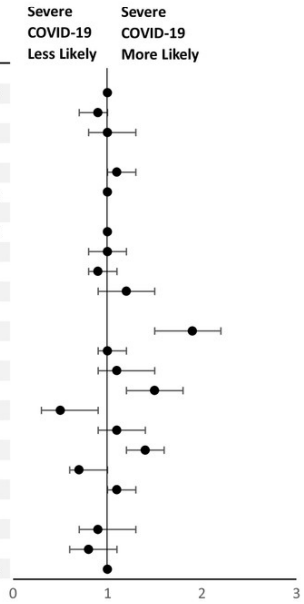
(A)

Characteristic	Severe COVID-19 (n = 443) n	Row %	No Severe COVID-19 (n = 671) n	Row %	Bivariate Model RR	95% CI	Multivariable Model aRR	95% CI
Sex								
Male	263	41.6	367	58.4	1.2	(1.0-1.3)	1.2	(1.0-1.4)
Female	180	36.3	304	63.7	1.0	Reference	1.0	Reference
Race and ethnicity[a]								
Non-Hispanic white[b]	161	41.0	223	59.0	1.0	Reference	1.0	Reference
Non-Hispanic Black	108	44.5	139	55.5	1.0	(0.9-1.2)	1.0	(0.9-1.2)
Hispanic	99	31.4	207	68.6	0.8	(0.6-1.0)	0.8	(0.6-1.0)
Other (multiracial/AIAN/API)	56	41.1	75	58.9	1.0	(0.8-1.2)	1.0	(0.8-1.2)
Underlying condition[c]								
Chronic lung disease[d]	63	59.4	44	40.6	1.6	(1.2-2.0)	1.5	(1.2-1.8)
Chronic lung disease of prematurity[e]	33	53.0	29	47.0	1.4	(1.1-1.7)	1.0	(0.8-1.3)
Blood disorder	13	20.3	47	79.7	0.5	(0.3-0.7)	0.5	(0.3-0.7)
Cardiovascular disease[f]	63	55.6	50	44.4	1.5	(1.2-1.7)	1.4	(1.1-1.7)
Neurologic disorders[g]	43	54.8	36	45.2	1.4	(1.1-1.9)	1.2	(0.9-1.5)
Vaccination status								
Up-to-date	9	32.8	18	67.2	0.8	(0.4-1.5)	0.9	(0.5-1.6)
Vaccination w/in 12 mos but not UTD	34	33.1	64	66.9	0.8	(0.6-1.1)	0.8	(0.6-1.1)
No vaccination w/in 12 mos	398	40.1	581	59.9	1.0	Reference	1.0	Reference



(B)

Characteristic	Severe COVID-19 (n = 484) n	Row %	No Severe COVID-19 (n = 892) n	Row %	Bivariate Model RR	95% CI	Multivariable Model aRR	95% CI
Age group								
2-4 years	169	35.6	298	64.4	1.0	Reference	1.0	Reference
5-11 years	156	31.1	333	68.9	0.9	(0.8-1.0)	0.9	(0.7-1.0)
12-17 years	159	36.7	261	63.3	1.0	(0.9-1.3)	1.0	(0.8-1.3)
Sex								
Male	268	35.7	460	64.3	1.1	(0.9-1.3)	1.1	(1.0-1.3)
Female	216	32.8	432	67.2	1.0	Reference	1.0	Reference
Race and ethnicity[a]								
Non-Hispanic white[b]	167	34.7	311	65.3	1.0	Reference	1.0	Reference
Non-Hispanic Black	115	35.2	207	64.8	1.0	(0.8-1.2)	1.0	(0.8-1.2)
Hispanic	134	32.3	262	67.7	0.9	(0.8-1.1)	0.9	(0.8-1.1)
Other (multiracial/AIAN/API)	60	40.6	83	59.4	1.1	(0.9-1.4)	1.2	(0.9-1.5)
Underlying condition[c]								
Chronic lung disease[h]	147	63.0	82	37.0	2.2	(1.9-2.7)	1.9	(1.5-2.3)
Asthma/RAD	147	36.1	239	63.9	1.1	(0.9-1.4)	1.0	(0.9-1.2)
Chronic metabolic disease[i]	35	48.4	34	51.6	1.4	(1.1-1.8)	1.1	(0.9-1.5)
Diabetes mellitus	36	47.3	40	52.7	1.4	(1.2-1.7)	1.5	(1.2-1.8)
Blood disorder	22	18.6	95	81.4	0.5	(0.3-0.8)	0.5	(0.3-0.9)
Cardiovascular disease[f]	46	50.4	47	49.6	1.5	(1.3-1.8)	1.1	(0.9-1.4)
Neurologic disorder[g]	148	55.6	124	44.4	1.9	(1.6-2.3)	1.4	(1.2-1.6)
Immunosuppressive condition	44	24.1	133	75.9	0.7	(0.5-0.9)	0.7	(0.6-1.0)
Obesity	104	40.1	150	59.9	1.2	(1.1-1.4)	1.1	(1.0-1.3)
Vaccination status								
Up-to-date	26	34.7	47	65.3	1.0	(0.7-1.4)	0.9	(0.7-1.3)
Vaccination w/in 12 mos but not UTD	51	29.6	108	70.4	0.8	(0.5-1.2)	0.8	(0.6-1.1)
No vaccination w/in past 12 mos	405	35.6	717	64.4	1.0	Reference	1.0	Reference

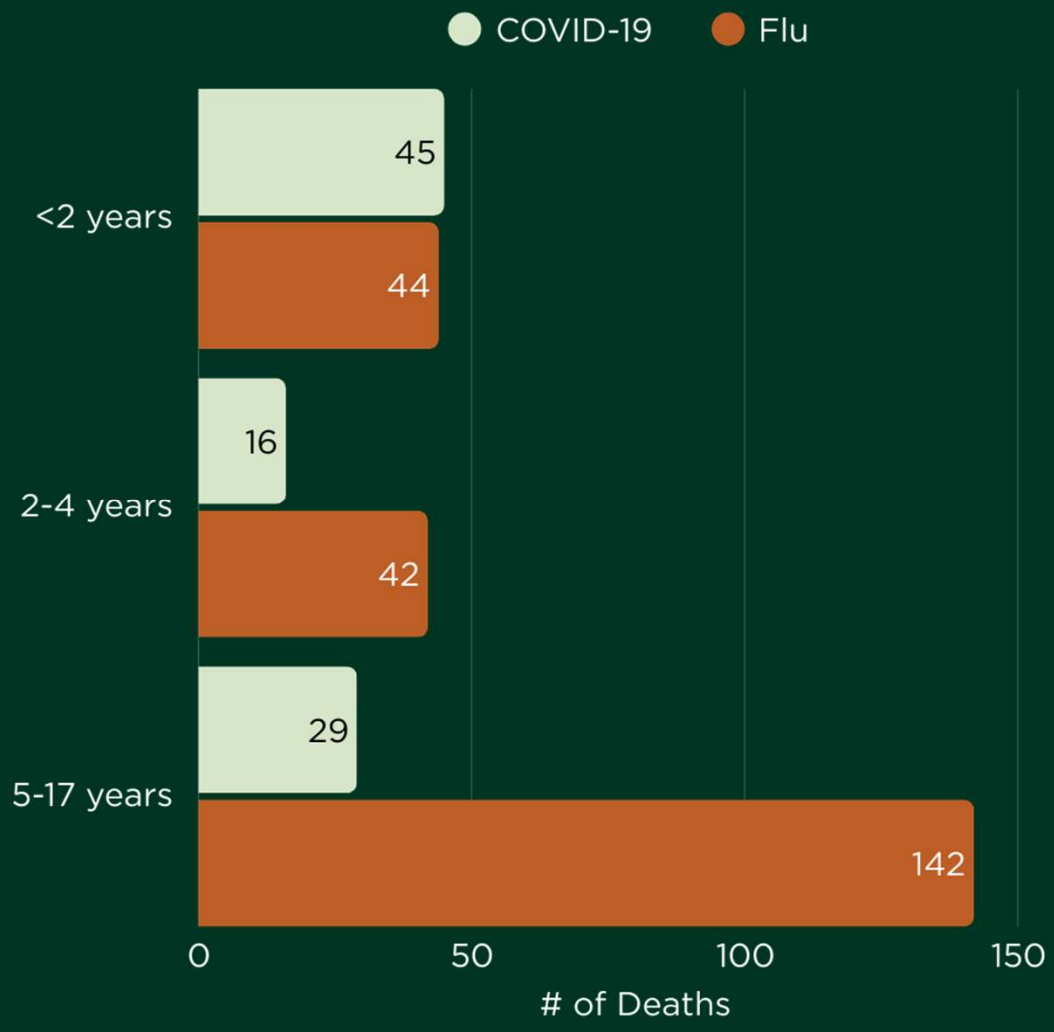


Free et al., Pediatrics, August 2025.

(A) Demographic and clinical characteristics associated with severe COVID-19 among children aged 6 to 23 months. (B) Demographic and clinical characteristics associated with severe COVID-19 among children aged 2 to 17 years.

Pediatric Mortality from COVID-19 vs. Influenza (Jul 2024–Jun 2025, Ages 0–17)

The chart compares total number of pediatric deaths due to COVID-19 (green bars) and influenza (copper bars) across three age groups in the United States.



MacNeil, Current Epidemiology of COVID-19, ACIP Meeting June 25, 2025

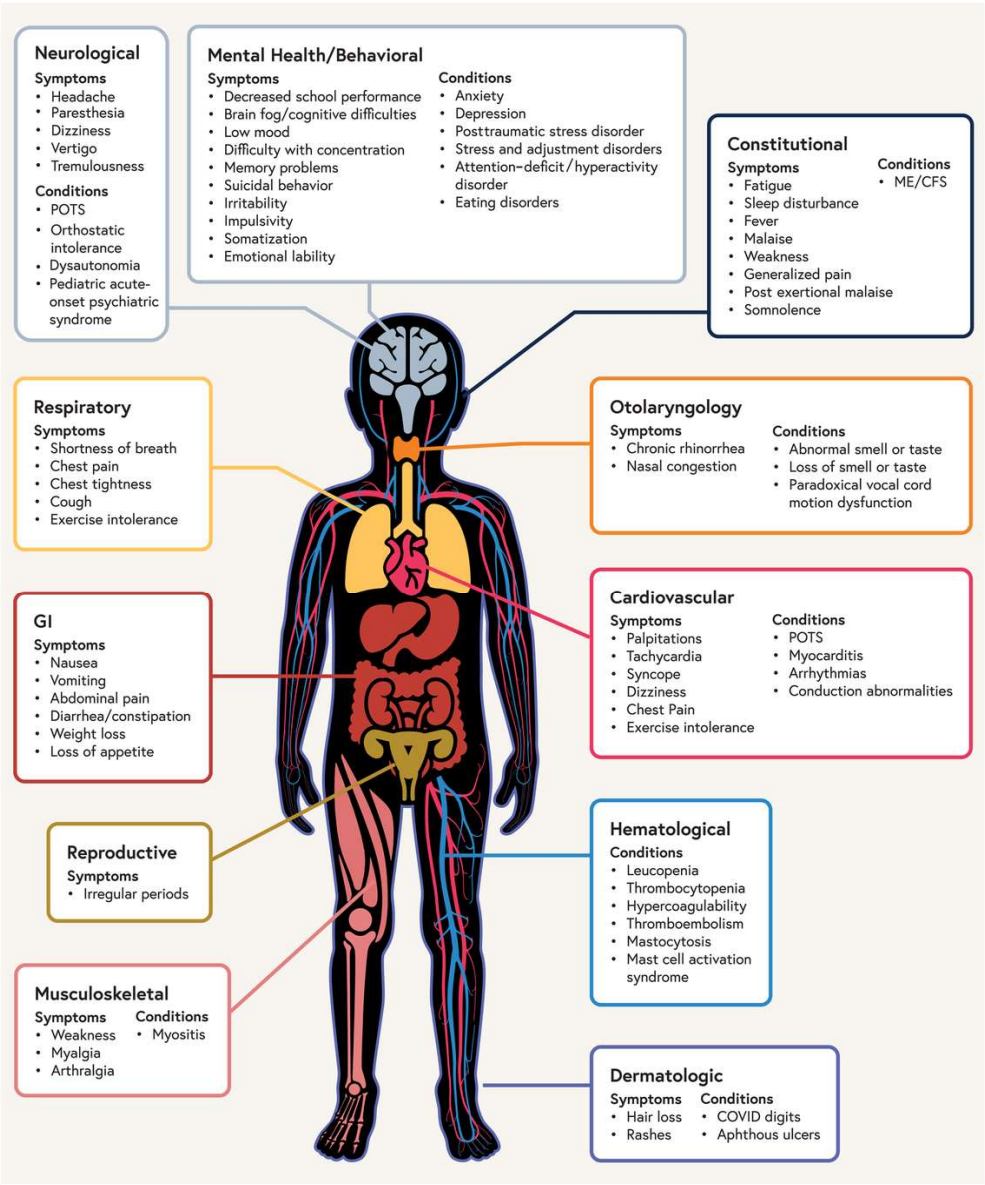
Long Term Effects of COVID-19 Infection

IN KIDS

Long COVID in Kids

- Difficult to define
- Inconsistent symptom manifestation
- Absence of diagnostic testing
- Kids unable to verbalize
- Minimal quality studies
- Lack of control group
- Small sample size

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION



Prevalence of Long COVID in kids varies based on study design and definitions

Source	Study Design	N	Outcome
Israel Ministry of Health, 2021	Prevalence Survey	13,834	11.2% children with Long COVID
Borch L, Eur J Pediatrics 2022	Retrospective Cohort	37,522	0.8% SARS-CoV-2 + children had symptoms >4 weeks (Long COVID)
Stephenson T, Nature, 2024	National Prospective Cohort	12,632	7.2% met Long COVID definition consistently across 3, 6, 12, and 24 months
Camporesi A, EClinicalMedicine, 2024	Prospective Cohort	1,296	23% at 3 months; 7% at 24 months
Esposito S, Front Immunol, 2025	Multicenter Prospective Cohort	1,129	16.2% experience long covid
Mandel H, Clin Infect Dis, 2025	EHR-based Retrospective Cohort	727,994	4% developed long COVID

Across the strongest studies, estimates of pediatric Long COVID range from about 1% to 16%, with higher rates seen in prospective cohorts than in large retrospective datasets.

A retrospective cohort study looking at new diabetes diagnoses among 613,000 kids found an increase of:

55%
(AT 1 MONTH)

48%
(AT 3 MONTHS)

58%
(AT 6 MONTHS)

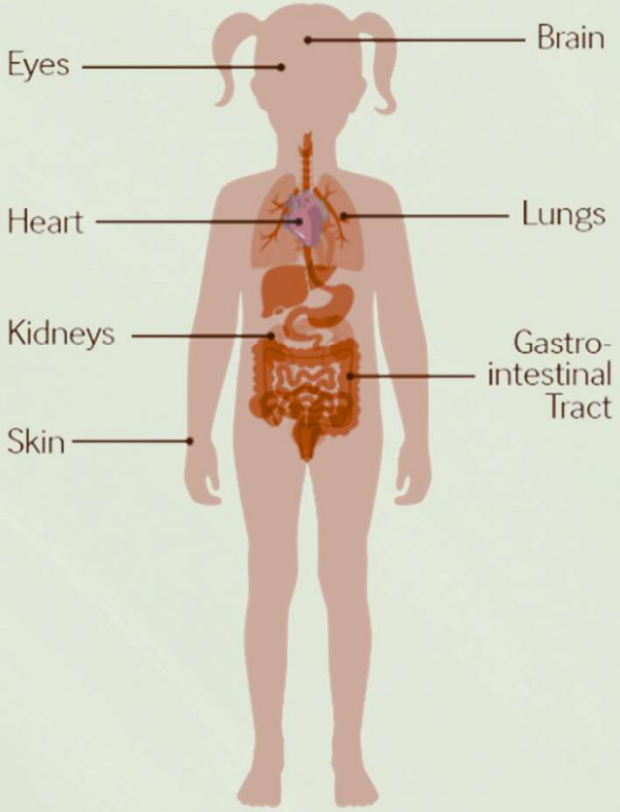
in kids who had COVID vs those diagnosed with ORIs

The risk was elevated in kids that were:

Overweight/ Obese
(2X higher)

Hospitalized
(3x higher)

Miller, et al. JAMA Open, 2024



Multisystem Inflammatory Syndrome in Children (MIS-C)

WHERE ARE WE NOW?

MIS-C has become less prevalent since the start of the pandemic:

- Decreased from 2020 to 2023
- <1% of children with confirmed COVID-19 developing MIS-C
- Vast majority of recent MIS-C cases occurred in unvaccinated children

MIS-C is now very rare, much less common than at the height of COVID, and largely preventable with vaccination.

Yousaf et al, MMWR, 2024; Carzaniga et al, Eur J Pediatr, 2025; Khoury, JAMA, 2025; CDC, 2025

COVID-19 Vaccines for Kids

2025-2026
RECOMMENDATIONS & UPDATES

2025-26 COVID-19 vaccines will:

Target JN.1 lineage of the Omicron variant, specifically the LP.8.1. strain.

Be "monovalent," meaning it is designed to protect against only one type of viral strain.

Continue to be monitored to assure their safety and effectiveness, along with the evolution of the SARS-CoV-2 virus.

FDA, 2025

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

FDA Approved* COVID-19 Vaccines

2025-2026

PFIZER (COMIRNATY)

- 65 years of age and older, or
- 5-64 years of age with 1+ underlying condition that puts them at high risk for severe outcomes from COVID-19

MODERNA (SPIKEVAX)

- 65 years of age and older, or
- 6 months - 64 years of age with 1+ underlying condition that puts them at high risk for severe outcomes from COVID-19

NOVAVAX (NUVAXOVID) & MODERNA (MNEXSPIKE)

- 65 years of age and older, or
- 12-64 years of age with 1+ underlying condition that puts them at high risk for severe outcomes from COVID-19

EUA PULLED FOR PFIZER'S USE IN YOUNGEST

FDA did not renew the emergency use authorization (EUA) for Pfizer's COVID-19 vaccine for children ages 6 months to 4 years old for the upcoming respiratory virus season

*Data as of 9/2/2025. The next ACIP meeting is scheduled for September 18-19, 2025, and recommendations MAY not align with FDA licensure.

FDA, Comirnaty, 2025; FDA, Spikevax, 2025; FDA, Nuvaxovid, 2025;FDA, Mnexspike, 2025; Common Health Coalition, 2025

Comparing COVID-19 Vaccine Recommendations

Group	AAP/ACOG/AAFP Guidance	FDA Label	CDC Current Guidance*	Insurance Coverage (likely)
Kids	**AAP (American Academy of Pediatrics) recommends vaccination for all children under 2, plus high-risk kids and those living with high-risk individuals; also "permissive" for others if parents desire protection.**	6 mos -17 years old with 1+ high-risk condition (Approval ages vary by product)	CDC has **removed routine recommendations for healthy children,** including under 2; now uses shared clinical decision-making — i.e., offer based on physician-parent discussion, not formal endorsement.	6 mos -17 years old and healthy: Off Label 6 mos -17 years old with conditions that put them at high risk for severe illness: Covered
Pregnant Women	ACOG (American College of Obstetricians and Gynecologists) recommends vaccination **at any point during pregnancy**, planning to conceive, postpartum, or while lactating.	18-64 years old with high-risk conditions; at this moment pregnancy is noted on CDC's "at risk" list	CDC **no longer recommends vaccination for pregnant women**. Recommendation has been withdrawn; pregnant people no longer on routine schedule.	Covered
Adults	AAFP (American College of Family Physicians) recommends all adults 18 years and older should receive a vaccine, especially if you are 65+, at increased risk for severe infection, or have never received a COVID-19 vaccine.	Adults 65+ years old 18-64 years old with high-risk conditions	All adults aged 18 and older are recommended to receive the 2024–2025 COVID-19 vaccine - NOT currently updated yet for 2025-26 season.	65+ years old: Covered 18-64 years old healthy: Off Label 18-64 years old with conditions that put them at high risk for severe illness: Covered

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

*Data as of 8/28/25. The next ACIP meeting is scheduled for September 18-19, 2025.
Your Local Epidemiologist, 2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

What qualifies as "high risk"?

People of all ages, including children and teens, can get very sick from COVID-19, especially those with underlying medical conditions. This includes children and teens with:

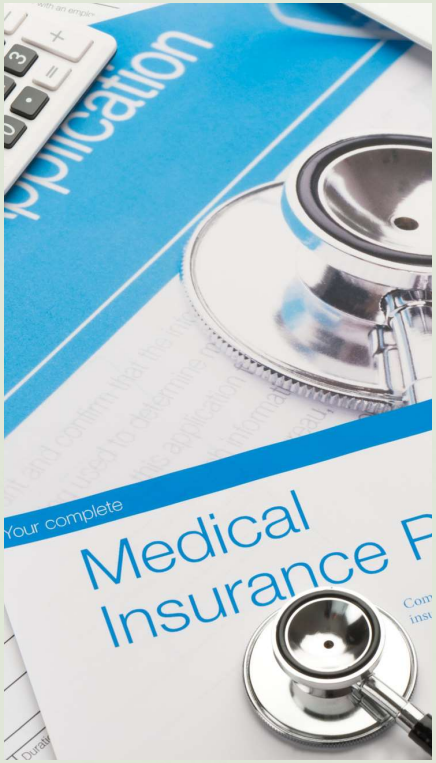
- Medical complexity
- Genetic, neurologic, or metabolic conditions
- Congenital heart disease
- Like adults, children and teens with obesity, diabetes, asthma or chronic lung disease, sickle cell disease, or who are immunocompromised can also be at increased risk for getting very sick from COVID-19.

NOTE:
"High risk" is NOT defined by the FDA – it defaults to CDC's list.

CDC, 2025 - definition of high risk as of 8/29/25

Individual health plans and plan sponsors will be prepared to make coverage decisions informed by science, the latest medical evidence and data. This process will be evidence-based, evaluate multiple sources of data, including but not limited to ACIP, and will be informed by customer needs.

American's Health Insurance Plans (AHIP)



AAP, 2025

Comparing COVID-19 Vaccine Recommendations

Group	U.S.	Canada	U.K.	Australia
Kids	**6 mos - 17 years:** Not routinely eligible - unless 1+ high-risk condition	**6 mos - 17 years**: Recommended/available with priority for high-risk.	**6 mos - 17 years:** Eligible only if immunosuppressed (≥6 months). No routine offer otherwise.	**6 mos - 17 years:** Recommended if medical risk
Pregnant Women	No broad U.S. routine program beyond risk-based pathways under current limits; prior CDC advice supported vaccination in pregnancy, but 2025 federal changes narrowed general eligibility.	Recommended in pregnancy (fall dose, any trimester).	Not routinely eligible unless immunosuppressed; previous seasons targeted pregnant people, but autumn 2025 is narrower.	Recommended in pregnancy (timing per clinician).
Adults	**18-64-years:** Not routinely eligible unless at high risk. **≥65 years:** Eligible (routine).	**18+ years:** (annual fall dose) Available to all adults with emphasis on priority groups (older age, medical risk, HCWs, etc.)	**18-64 years:** Not routinely offered; only if immunosuppressed. **65–74 years:** Not routinely eligible in autumn 2025 unless immunosuppressed. **≥75 years:** Eligible (routine).	**18-64 years:** Eligible if medical risk (annual dose); healthy adults without risk not routinely advised/consider based on individual factors. **≥65 years:** Recommended annual dose for 65–74; every 6 months for ≥75.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

As of 9/2/25
CDC, 2025; NACI, 2025; UK Health Security Agency 2025; ATAGI, 2025

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

What about physician liability?

- Clinicians have two protections: malpractice coverage + PREP Act immunity (though not absolute).
- Malpractice liability requires proof of deviation from standard of care; following AAP guidance is strong defense.
- Off-label prescribing is common (~1 in 5 of prescriptions).

NOTE:
Pharmacists have narrower protections, varying by state - may affect vaccine access.

AAP, 2025

Pediatric COVID-19 Vaccine Effectiveness

CHILDREN 5-17 YEARS

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Estimated BNT162b2 XBB vaccine effectiveness was:

65%

against COVID-19-associated hospitalization or ED/urgent care visits.

Marwah H, Vaccine Integrity Project, Presented 8/19/2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Vaccination and Long COVID

Post-COVID Conditions (PCC)

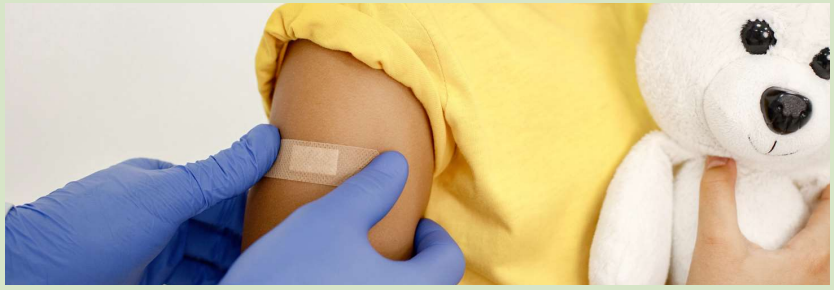
Case-control study of 622 kids 5-17 years old, mRNA COVID-19 vaccination had a:

57%

decreased odds of 1+ PCC symptoms

73%

decreased odds of 2+ PCC symptoms



Pediatric COVID-19 Vaccine Safety

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

- **Extensive safety monitoring:** Millions of doses administered to children worldwide with strong safety record
- **Most side effects are mild and short-lived** (sore arm, fever, fatigue)
- **No unexpected safety concerns identified in post-authorization monitoring**
- **Serious adverse events are rare** (e.g., anaphylaxis ~5 per million doses; Guillain-Barré syndrome not increased in children)
- **Benefits outweigh risks:** vaccines prevent hospitalization, MIS-C, and long-term complications from infection
- **Ongoing surveillance continues to reaffirm a favorable safety profile**

Marwah H, Vaccine Integrity Project, Presented 8/19/2025; AAP, Pediatrics, 2025

Pediatric COVID-19 Vaccine Safety

MYOCARDITIS

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

- Myocarditis following COVID-19 vaccination in children is very rare.
- Higher risk groups include male adolescents (especially ages 12–17) and particularly following the second dose of an mRNA vaccine.
- Booster doses appear to have an even lower incidence.
- Despite the increased risk among certain subgroups, these events remain uncommon, and most cases are mild and self-limiting.

Epidemiologic data show that myocarditis in pediatric patients is considerably **more common** and **more severe following COVID-19 infection** than after vaccination.

Marwah H, Vaccine Integrity Project, Presented 8/19/2025; Buoninfante et al, nature, 2024

Review of Recent Data on Co-Administration of COVID and Flu Vaccination

Source	Study Design	Vaccines co-administered	Outcome studied	Findings + interpretation
Walter, 2024	Randomized controlled trial	COVID mRNA vaccines + inactivated influenza vaccine (IIV4)	Reactogenicity, serious adverse events	30 children ages 5-17 years old enrolled; no serious adverse events reported in this age group in either arm
Xu, 2025	Self-controlled case series	COVID mRNA XBB1.5 vaccine + seasonal influenza vaccine	Tinnitus	No increased risk of tinnitus with influenza vaccine coadministration in any age group (includes 12-39 year olds)

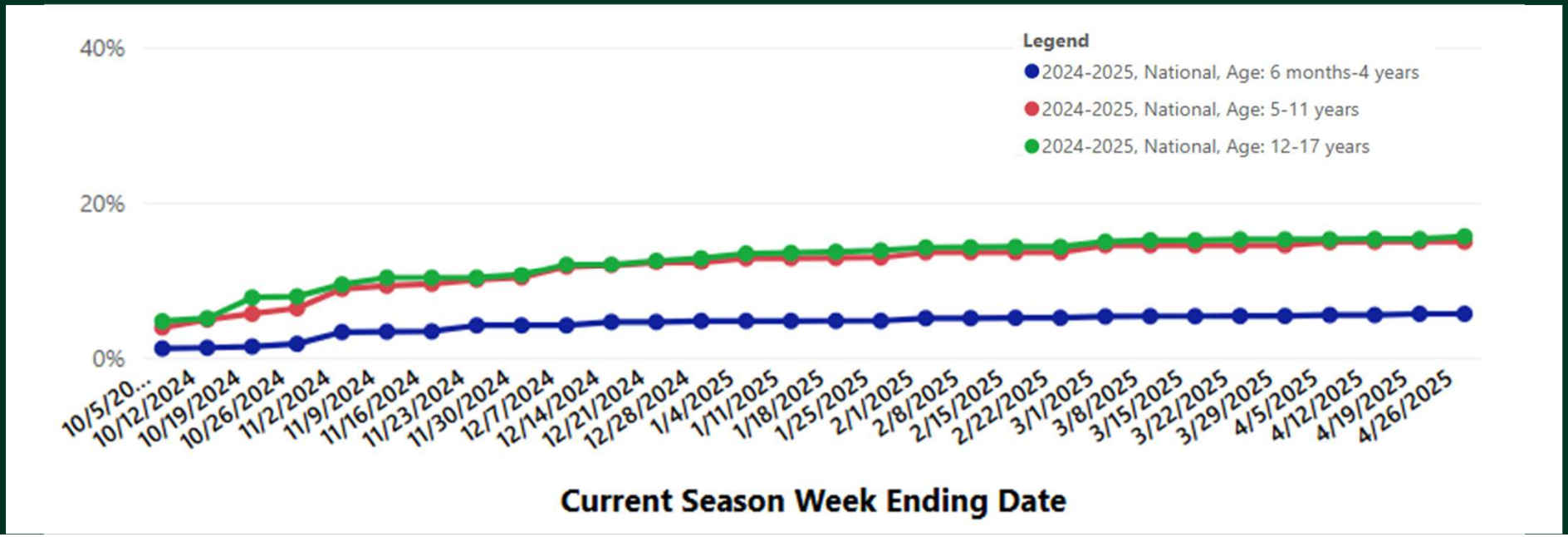
EXTENSIVE DATA SHOWS THAT CO-ADMINISTERING A COVID-19 VACCINE WITH OTHER VACCINES, PARTICULARLY THE SEASONAL FLU SHOT, IS SAFE.

Marwah H, Vaccine Integrity Project, Presented 8/19/2025.

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

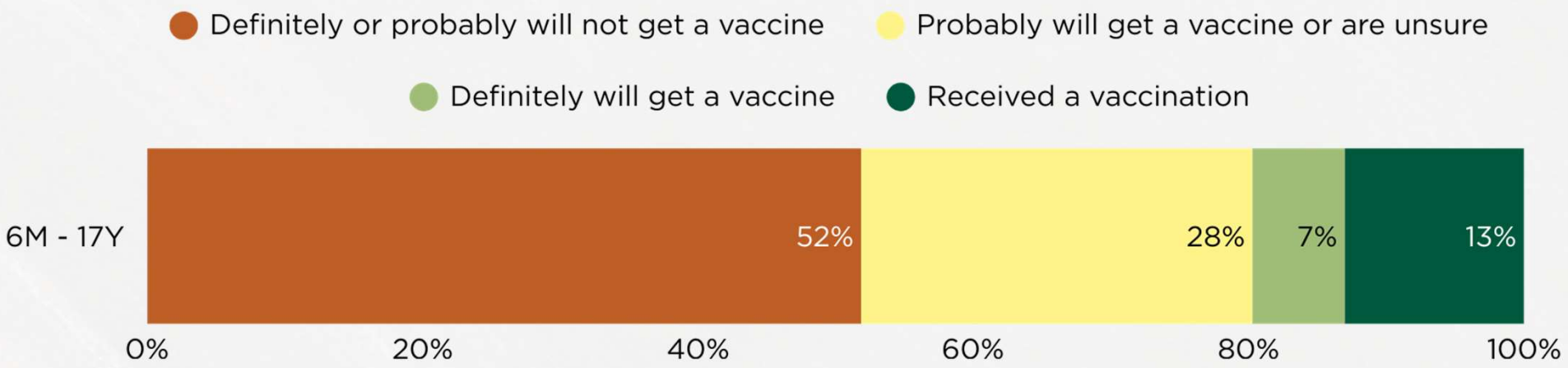
COVID-19 vaccination rates for children remain low, below 20%

RATES FOR KIDS 6M - 4Y ARE EVEN LOWER, HOVERING AROUND 6%



Half of all parents do not intend to get their child the COVID-19 vaccine, while 28% are still unsure

Focusing on the "moveable middle" may have the greatest impact at increasing pediatric COVID-19 vaccination rates.



NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Data as of 4/26/2025.
CDC National Immunization Survey, accessed 8/28/2025.

Knowledge Check

True or False? Most children hospitalized for COVID-19 were up-to-date on their COVID-19 vaccinations.

True

False

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Knowledge Check

True or False? Most children hospitalized for COVID-19 were up-to-date on their COVID-19 vaccinations.

True

False

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION
RESEARCH AND EDUCATION

Pediatric Respiratory Viruses Summary

2025-2026

INFLUENZA

- The 2024-25 flu season was particularly severe among our pediatric patients
  - Pediatric deaths have reached a new high at 275 total deaths
- Everyone 6 months and older should get an annual flu vaccine
- The 2024-25 flu vaccine reduced the risk of healthcare visits and hospitalization substantially
- Flu vaccine coverage has decreased markedly over time, with 2024-25 rates reaching the lowest they've been since 2011-2012

RSV

- RSV is the most common cause of hospitalization among infants
- Three options for prevention: monoclonal antibody for the infant (nirsevimab and clesrovimab) or maternal RSV vaccine
  - All three options are safe and effective; preference may vary based on patient situation
  - Monoclonal antibodies should ideally be administered at birth or within 1 week of birth
  - Maternal RSV vaccine should be administered during 32-36 weeks of pregnancy

COVID-19

- COVID-19 hospitalizations still disproportionately affect infants and toddlers, and most hospitalized or ICU-admitted children had no underlying conditions.
- Differing recommendations from CDC and AAP - access may be limited
- Pediatric COVID vaccines reduce the risk of hospitalization, long COVID, and death from the virus
- Vaccine coverage and intent is low

Fall and Winter Immunization Guide: 2025-26

	Influenza (Flu) Vaccine	RSV Immunization	COVID-19 Vaccine
Kids	**All children 6 months and older** Some children 6 months to 8 years may need multiple doses AAP, CDC	**All infants <8 months old and children 8-19 months with risk factors** AAP, CDC **OR**	**All children 6-23 months** **Children 2-17 years old with risk factors or if parents desire vaccination** AAP
Pregnant Women	**All** At any point in pregnancy ACOG, CDC	**32-36 weeks gestation** ACOG, CDC	**All** At any point in pregnancy ACOG, CDC
Adults	**All** High-dose inactivated, recombinant, or adjuvanted inactivated flu vaccine preferred for 65+, if available CDC	**All 75+ and adults 50-74 with risk factors** As of now, one lifetime dose CDC	**Unknown** Pending recommendations from CDC and professional organizations Forthcoming: ACP, IDSA, AAFP, CDC

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Figure adapted from Your Local Epidemiologist, 2025.

Fall and Winter Immunization Guide: 2025-26

	Influenza (Flu) Vaccine	RSV Immunization	COVID-19 Vaccine
How well do they work?	**Reduces the risk of going to the doctor by 30-60%**	**Reduces risk of severe disease by 80-96%**	**30-60% additional protection against illness and severe disease**
What is available?	**A vaccine that targets 3 strains of seasonal flu; both a nasal spray and injectable shot are available this year.**	**Children:** Monoclonal antibodies nirsevimab or clesrovimab **Pregnancy:** Pfizer (protein) vaccine **Older Adults:** GSK and Pfizer (protein) or Moderna (mRNA) vaccine	**Overall access may be limited. Vaccines are updated with Omicron sub-variants JN.1 or LP.8.1. Options: Pfizer (mRNA; 5 year olds+) Moderna (mRNA for 6 months+), Novavax (protein; 12 years+)**
When should patients get it?	**October is ideal, as vaccine protection wanes over a season**	**Infants:** Oct-March **Pregnancy:** Sept-Jan **Older Adults:** Now as protection is durable	**For protection against severe disease, get it now. Recently infected? Wait at least 6 months**

NORTH DAKOTA STATE UNIVERSITY
CENTER FOR IMMUNIZATION RESEARCH AND EDUCATION

Figure adapted from Your Local Epidemiologist, 2025.

Questions?

Please submit your questions in the Q&A function in Zoom.