



AIRA
AMERICAN IMMUNIZATION
REGISTRY ASSOCIATION

Discovery Session: Examining Vaccination Coverage in Specialized Care Populations!

March 23, 2026
4:00 p.m. ET



Today's Presenters

- **Hannah Forsythe, Ph.D.**, Immunization Epidemiologist, Michigan Care Improvement Registry (MCIR)
- **Sarah Kangas, MPH**, Epidemiologist, Immunization Program, Wisconsin Department of Health Services



Vaccine Uptake in Women with Systemic Lupus Erythematosus (SLE)

AIRA discovery session March 23, 2026

¹J. Patricia Dhar, MD; ²Hannah Forsythe, PhD; ¹Louis Saravolatz, MD; ¹Susan Szpunar, PhD
¹Henry Ford St. John Hospital; ²Michigan Department of Health and Human Services

What is SLE?



- A multisystem **autoimmune disease** that affects predominantly women (90%) of African American ancestry (AA).
- Treated with potent **immunosuppressive medication**.



Discoid rash



Malar rash
=butterfly rash



What is SLE?



- A multisystem **autoimmune disease** that affects predominantly women (90%) of African American ancestry (AA).
- Treated with potent **immunosuppressive medication**.
- Leads to **increased mortality** in AA, Asians, Hispanics and males.
- **Infections** are a common cause of morbidity and mortality → vaccines are critical to health care.
- These patients have a **high vaccine burden** → may result in low vaccine uptake.

How common is SLE?

Lupus Epidemiology was described by the Michigan Lupus Epidemiology and Surveillance Program (MILES; *Arthritis & Rheumatol* 2014;66(2):369-78):

Overall prevalence SLE = 72.2/100,000

10X higher in females (F:M ratio of 10:1).

2.3X higher in Blacks vs. Whites (1/537 among black female patients).

Higher renal disease in Blacks (18.8%) vs. Whites (4.5%).

Black patients with renal disease diagnosed with SLE at **younger** ages (34.4) vs. Whites (49.1).

Overall incidence SLE = 5.5/100,000

6X higher in females (F:M ratio of 6:1).

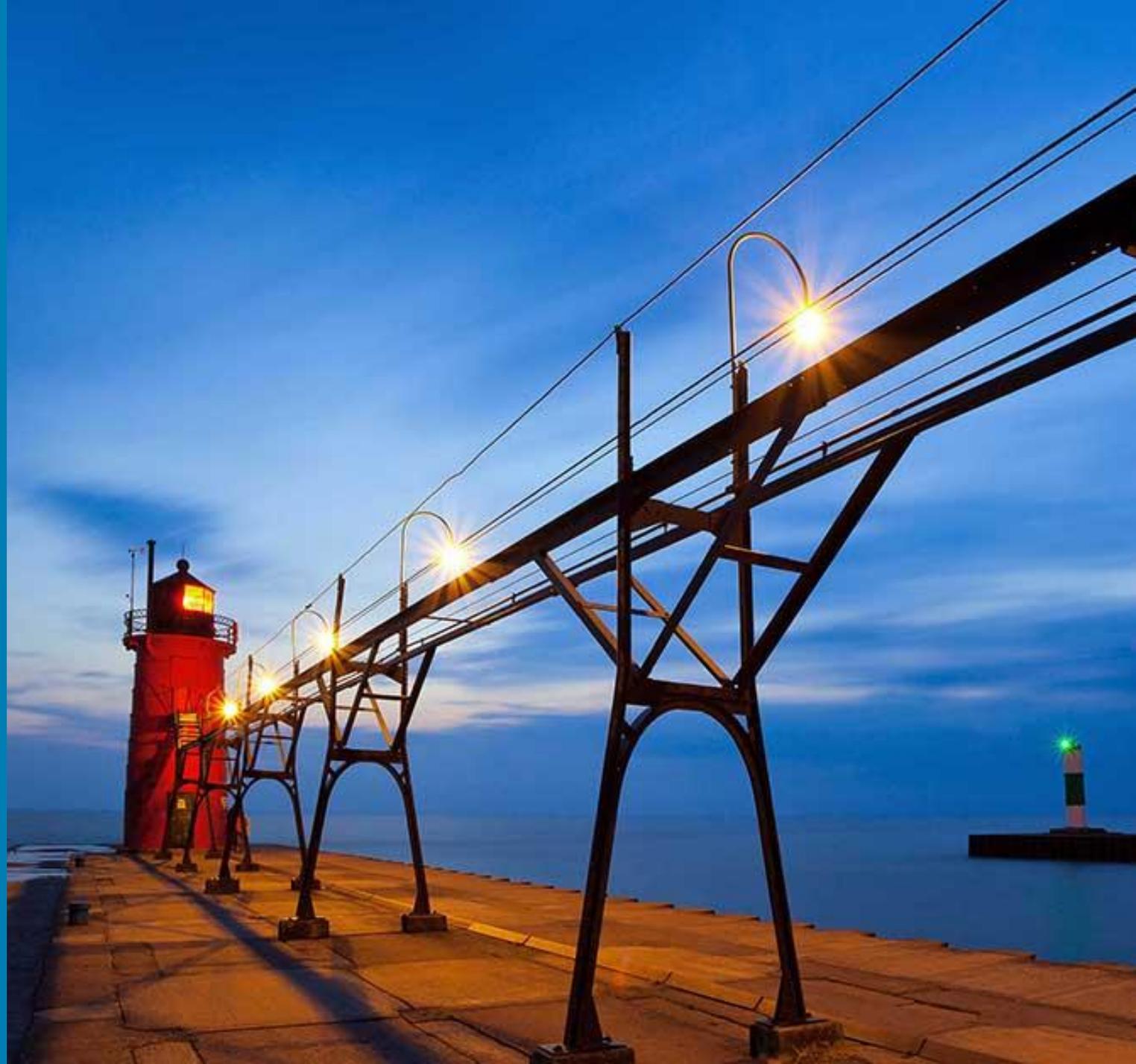
Mean age incident cases = 39.3 yrs.



Research questions

- What is the level of vaccine uptake in women with SLE?
- What does that mean in context?
 - Compared to controls → *future work*
 - Compared to general population

Methods



Methods: subjects

Age as of 12/31/2020	SLE	
18-24	9	2.0%
25-29	30	6.6%
30-34	39	8.6%
35-39	35	7.7%
40-44	35	7.7%
45-49	65	14.4%
50-54	55	12.2%
55-59	51	11.3%
60-64	43	9.5%
65-70	52	11.5%
>70	38	8.4%
Mean (SD)	51.0 (14.6)	

- N = 452 SLE women seen at Ascension St. John Hospital

Methods: subjects

Age as of 12/31/2020	SLE		MI	
18-24	9	2.0%	461,906	11.5%
25-29	30	6.6%	338,436	8.4%
30-34	39	8.6%	315,612	7.8%
35-39	35	7.7%	301,855	7.5%
40-44	35	7.7%	292,452	7.3%
45-49	65	14.4%	302,231	7.5%
50-54	55	12.2%	322,098	8.0%
55-59	51	11.3%	352,803	8.7%
60-64	43	9.5%	355,788	8.8%
65-70	52	11.5%	366,902	9.1%
>70	38	8.4%	622,214	15.4%
Mean (SD)	51.0 (14.6)		49.3 (18.9)	

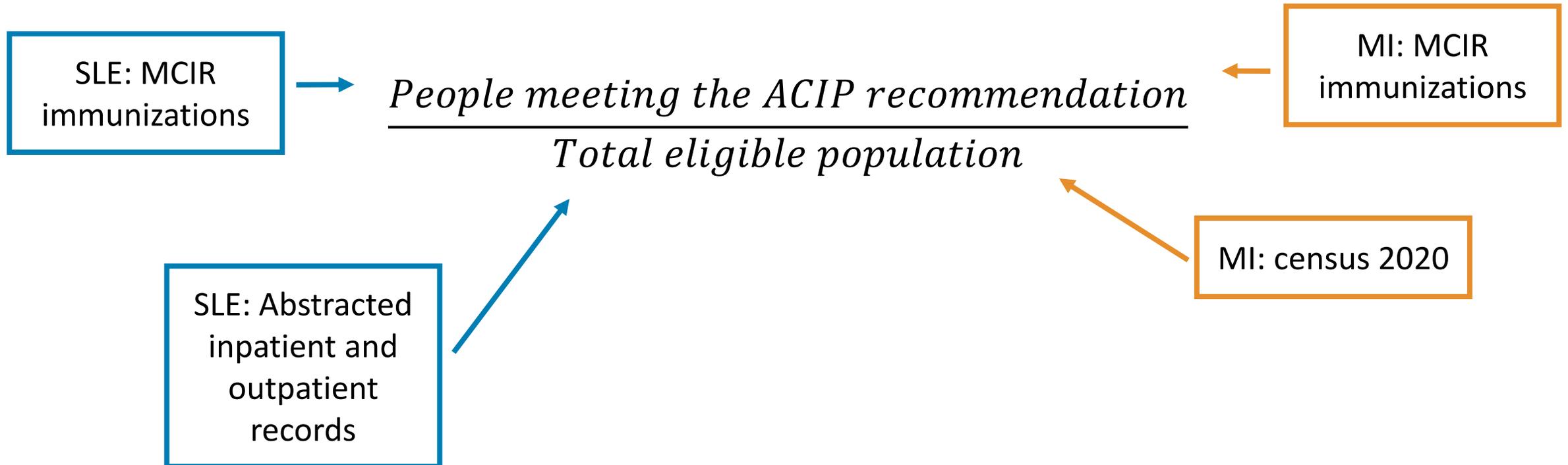
- N = 452 SLE women seen at Ascension St. John Hospital
- MI adult female population age 18-85, per 2020 census

Methods: subjects

Race	SLE		MI	
NH Black	242	53.5%	539,110	13.4%
NH White	190	42.0%	3,000,912	74.4%
Other	17	3.8%	492,576	12.2%
Unknown	3	0.7%	NA	

- N = 452 SLE women seen at Ascension St. John Hospital
- MI adult female population age 18-85, per 2020 census

Methods: measuring uptake



Methods: measuring uptake

SLE patients have a high vaccine burden

More doses may
be recommended



$$\frac{\textit{People meeting the ACIP recommendation}}{\textit{Total eligible population}}$$



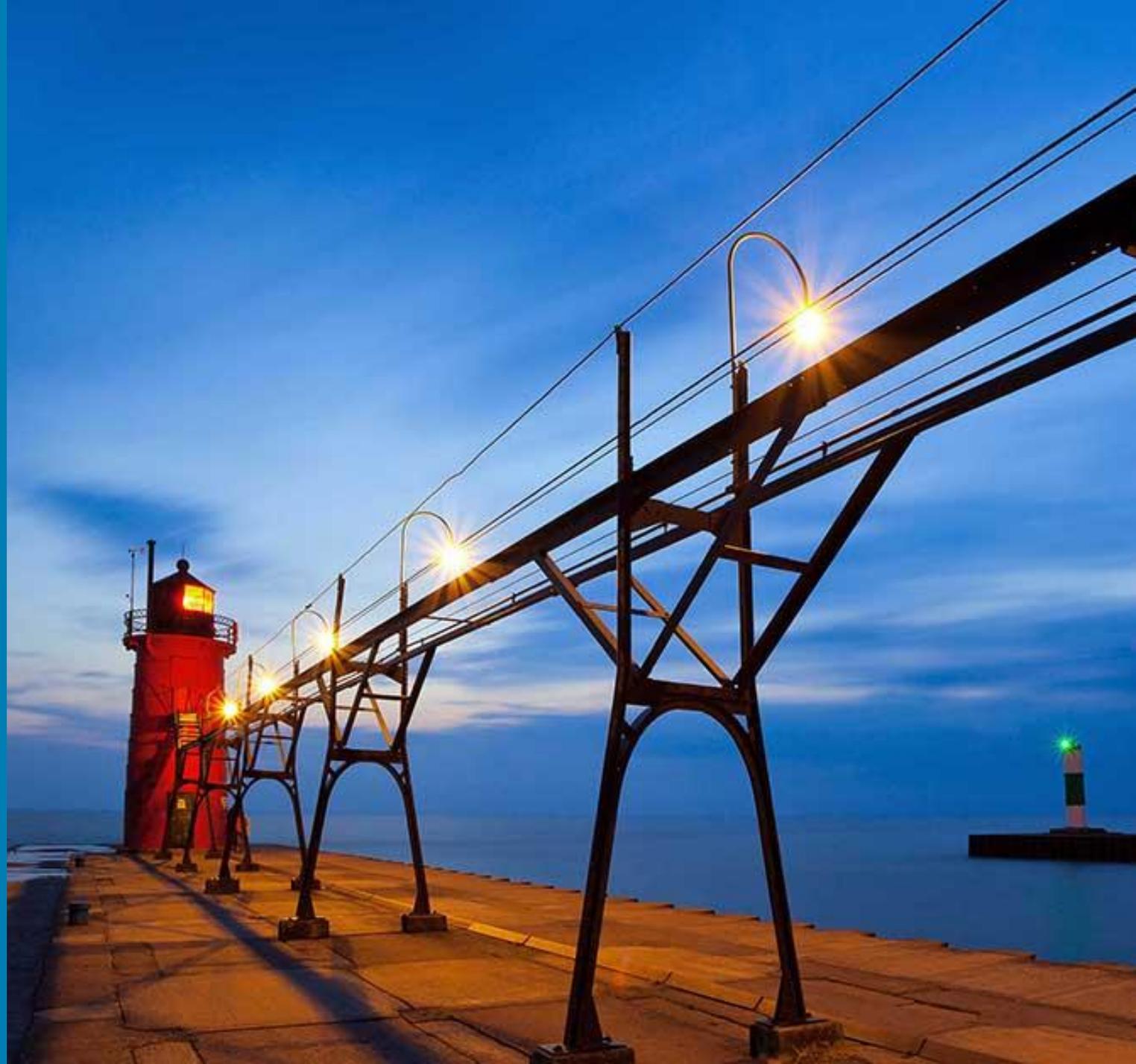
uptake may be
lower for SLE
group (two-
proportion z test)

Lower eligibility threshold
for some vaccines (ex.
earlier in life)



Results

data as of June, 2024



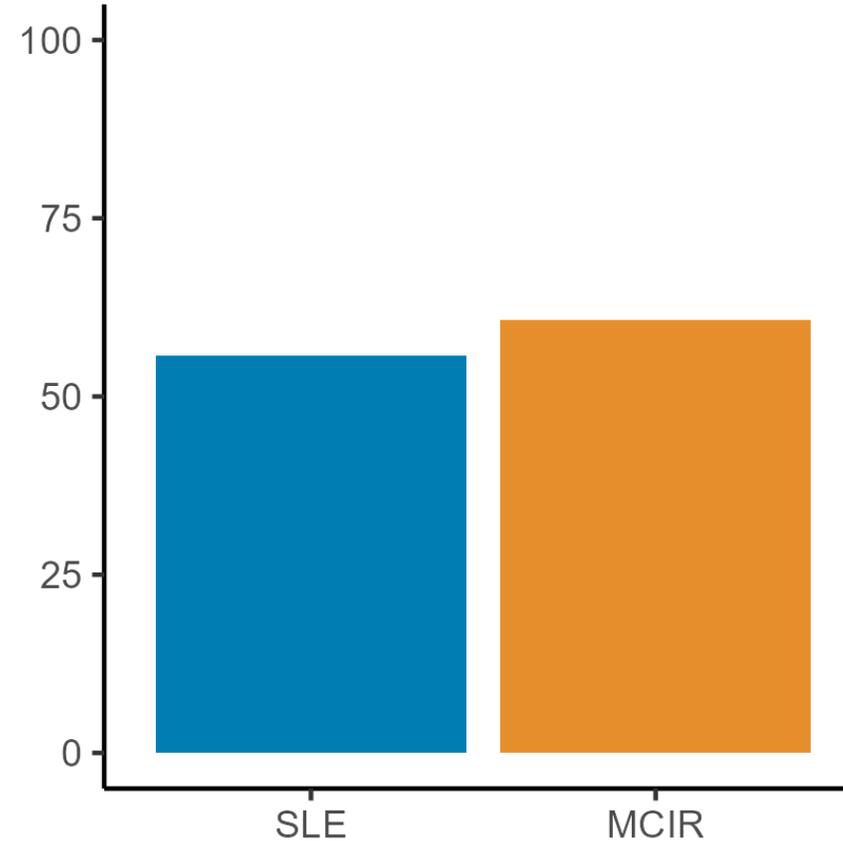
SLE characteristics

Disease level and treatment history	Percent or Mean (+/- SD)
Mean ACR criteria count	4.2 (\pm 2.1)
Mean SLICC criteria count	5.5 (\pm 2.7)
Mean 2019 EULAR/ACR score	19.1 (\pm 9.7)
Lupus Nephritis history	26.6% (93/349)
Lupus Cerebritis history	3.6% (12/336)
Smoking history	43.1% (185/429)
Immunosuppressive use	
Corticosteroids	73.8% (304/412)
Hydroxychloroquine	83.3% (350/420)
Other	54.6% (220/403)

Reproductive history	Percent or Mean (+/- SD)
Sexually transmitted disease	38.3% (100/261)
Gravidity	2.7 \pm 2.0
Mean Parity	1.8 \pm 1.5
Median No. Stillbirths (range)	0 (0-3)
Median No. Miscarriages (range)	0 (0-7)
Median No. voluntary terminations (range)	0 (0-5)
Mean yr to last pap smear	6.8 \pm 4.4
Hist. of abnormal pap smear	30.7% (100/326)
Hist. of abnormal cervical biopsy	71.8% (28/39)
+HPV test documented	32.2% (55/171)

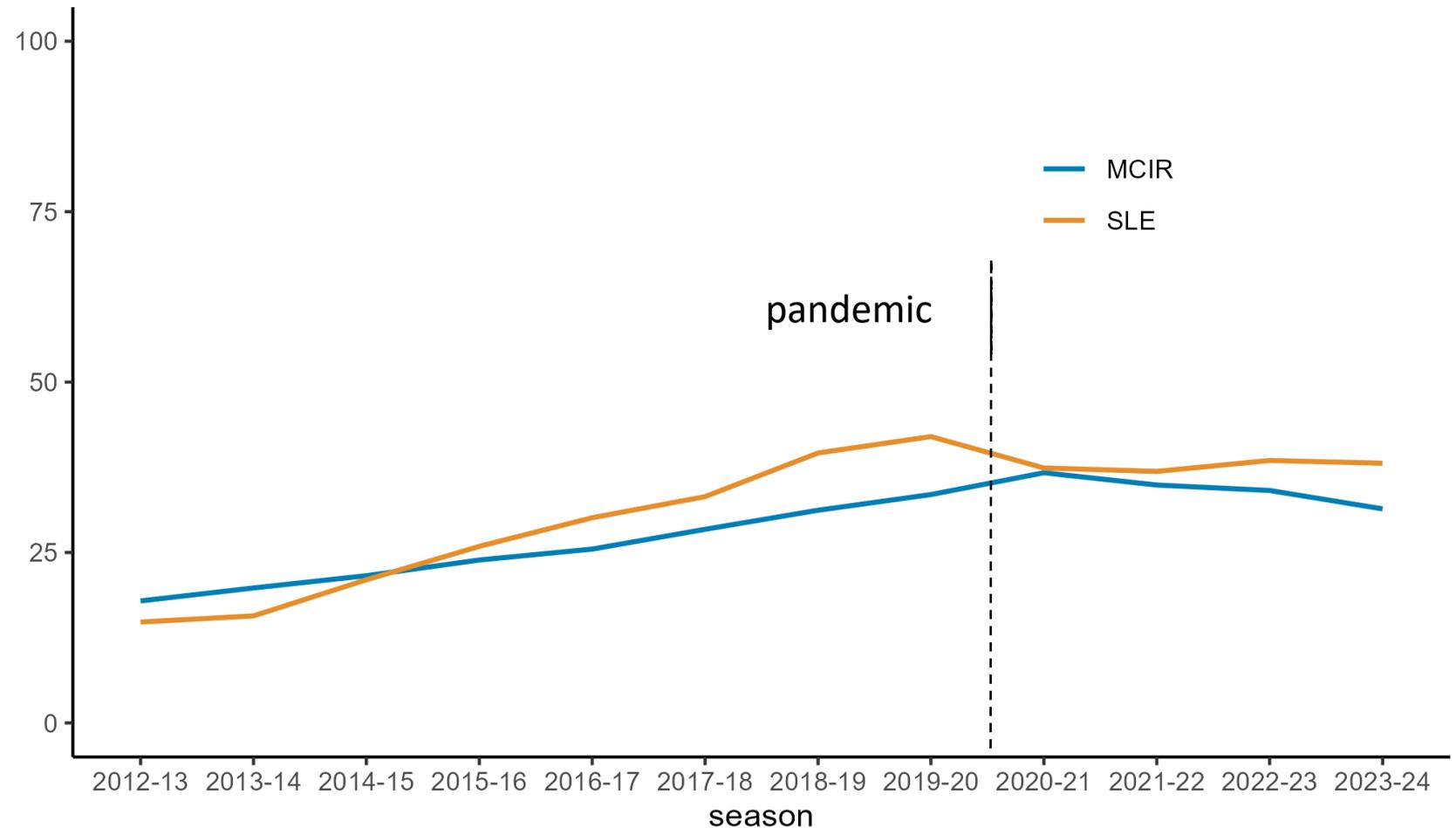
Results: Tdap

- SLE group had significantly **lower uptake** of 1 dose on or after age 19 ($p = 0.03$).



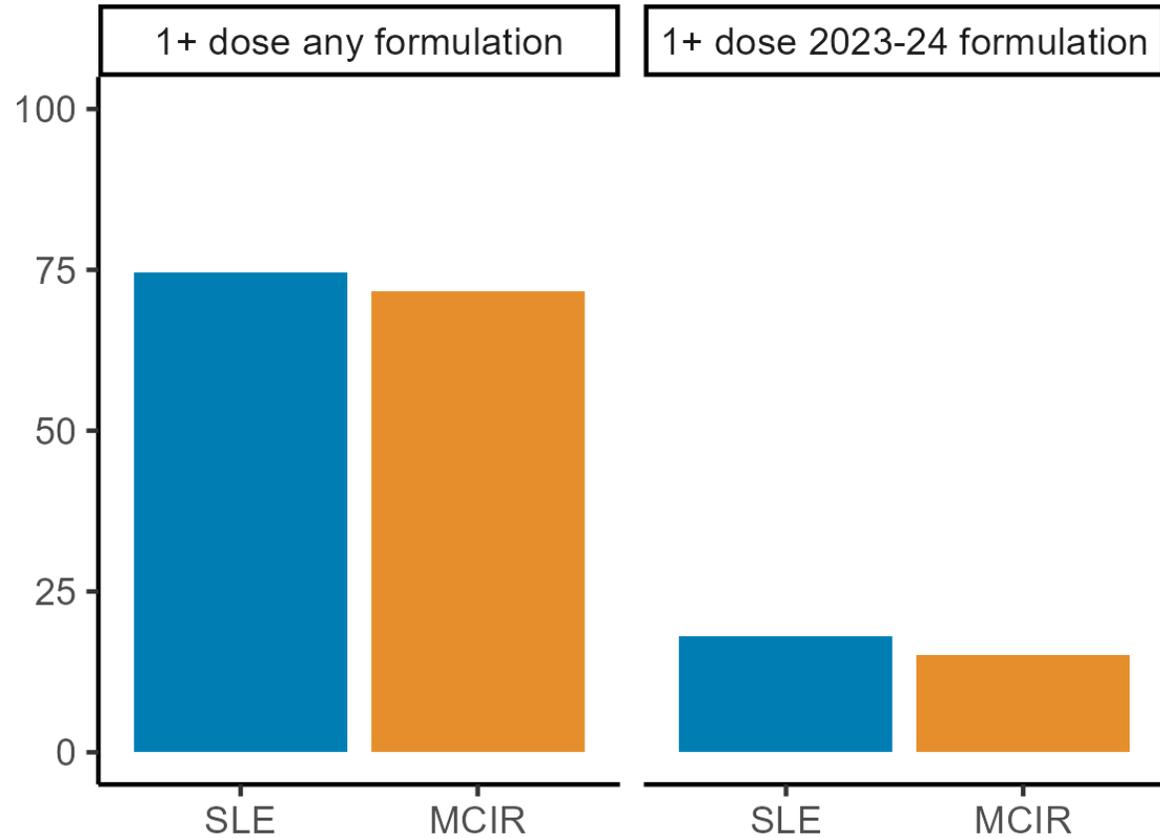
Results: flu

- SLE group had significantly **lower** uptake of 1 dose in 2013-14 ($p = 0.03$).
- **higher** uptake in 2016 thru 20 and 2023-24 (all $p \leq 0.02$).
- Note the upward trend until 2020.



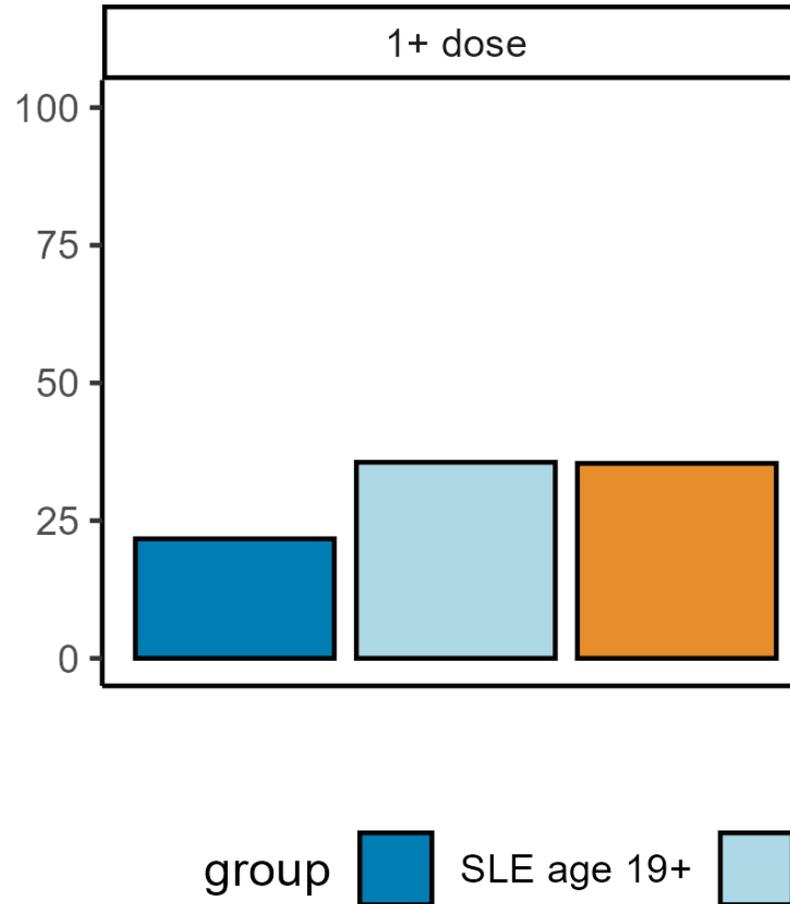
Results: COVID

- **no difference** in COVID uptake.



Results: Shingles

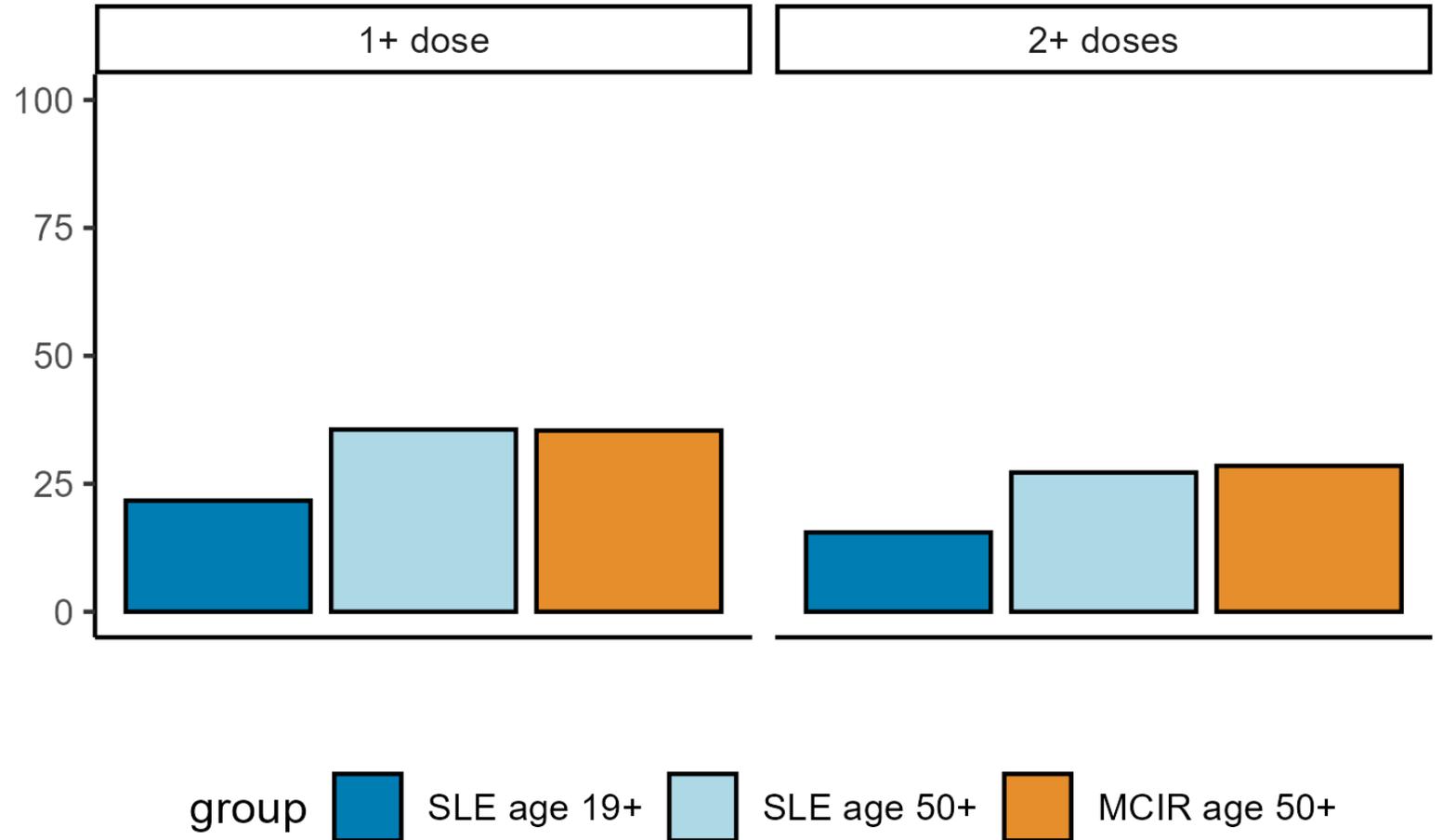
- **Eligible** SLE group age 19+ had significantly **lower** uptake of 1 dose Shingrix© ($p < 0.001$).
- **Age-matched** SLE group had **no difference** (but see note*).



*NOTE: Immunocompetent adults could also receive live Zostavax© until discontinued in Nov. 2020.

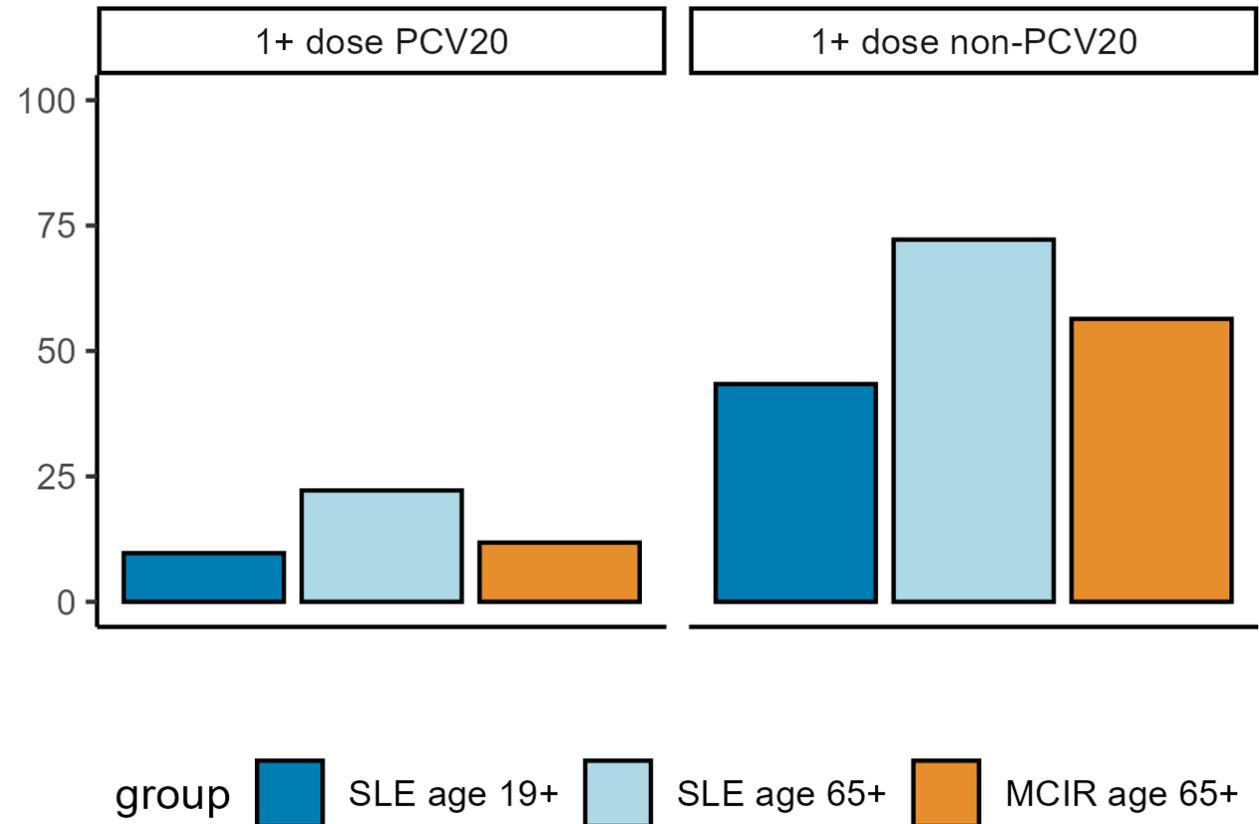
Results: Shingles

- **Eligible** SLE group age 19+ had significantly **lower** uptake of 1 dose Shingrix© ($p < 0.001$).
- **Age-matched** SLE group had **no difference**.
- Same pattern for 2-dose uptake.



Results: Pneumococcal

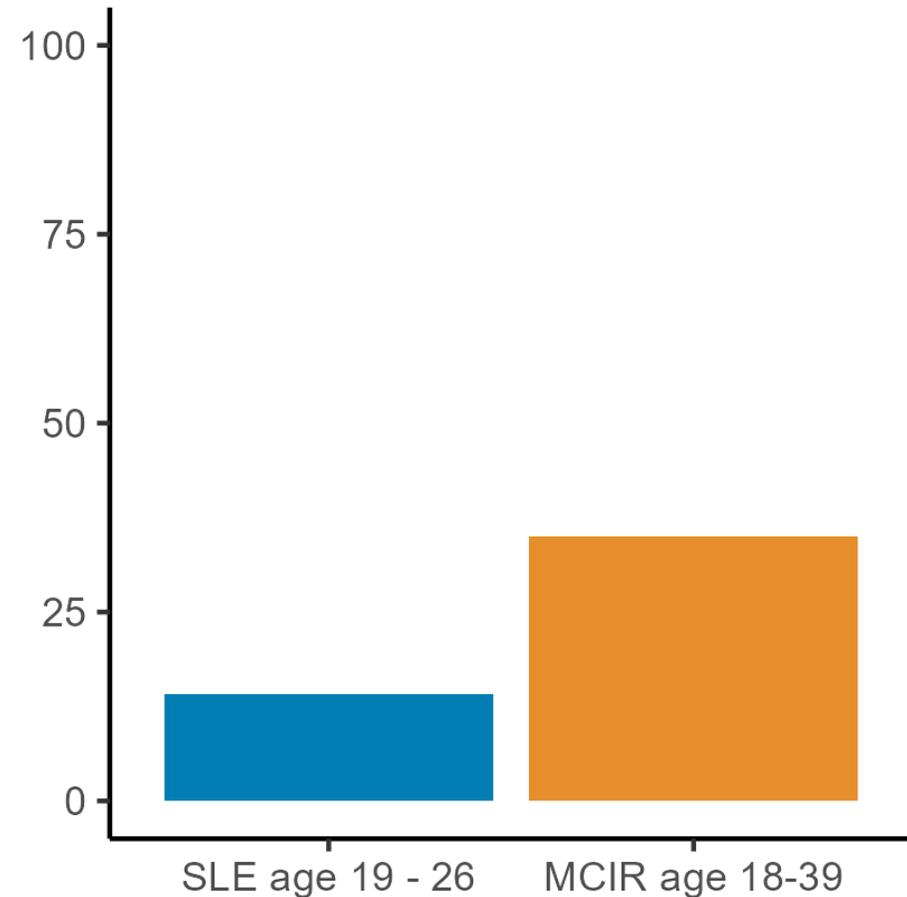
- **Eligible** SLE group age 19+ had **similar or lower** uptake, depending on the metric. *
- **Age-matched** SLE group had **higher** uptake on all metrics (all $p < 0.01$).



*NOTE: PCV20 was recommended in 2022 as an alternative to a combined PPSV23 & PCV13/15 series. Figure excludes additional products and eligibility recommendations introduced in 2024-25.

Results: HPV

- Only 14% of SLE patients age 19-26 received **3 doses**.
- Only 35% of MI women age 18-39 received **2 or 3 doses** (depending on series starting age).
- SLE uptake is significantly lower ($p < 0.0001$) and **both rates are extremely low**.





Summary

- Where eligibility and recommendations are the same, SLE patients may have lower (Tdap), higher (flu 2016-20, 2023-24) or similar (COVID) uptake relative to the overall adult female population.
- Where eligibility differs, age makes a big difference in whether SLE patients can match (shingles) or even exceed (pneumo) uptake rates in the general population.
- Where recommendations are stricter (HPV) SLE uptake rates are lower.
- Comparisons aside, some vaccines have shockingly low uptake (updated COVID, updated pneumo, HPV).

Normalized results

Remember! SLE group skews...

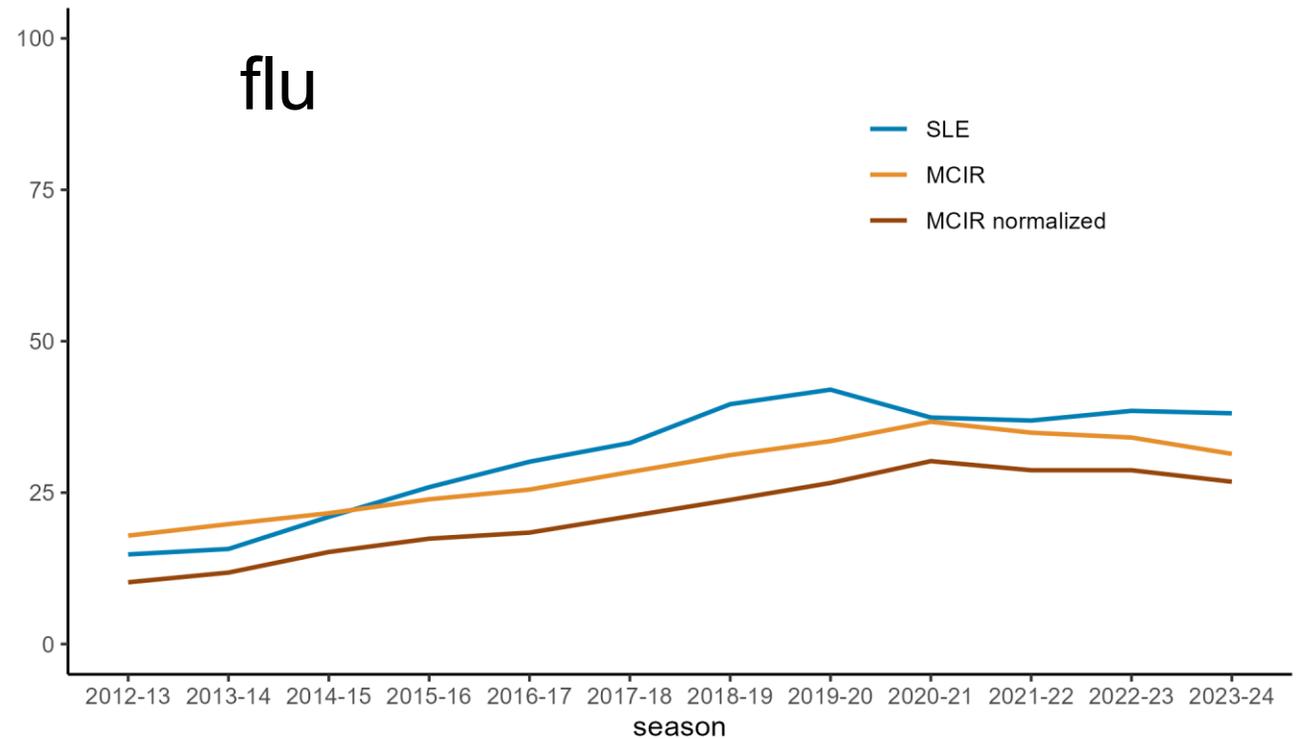
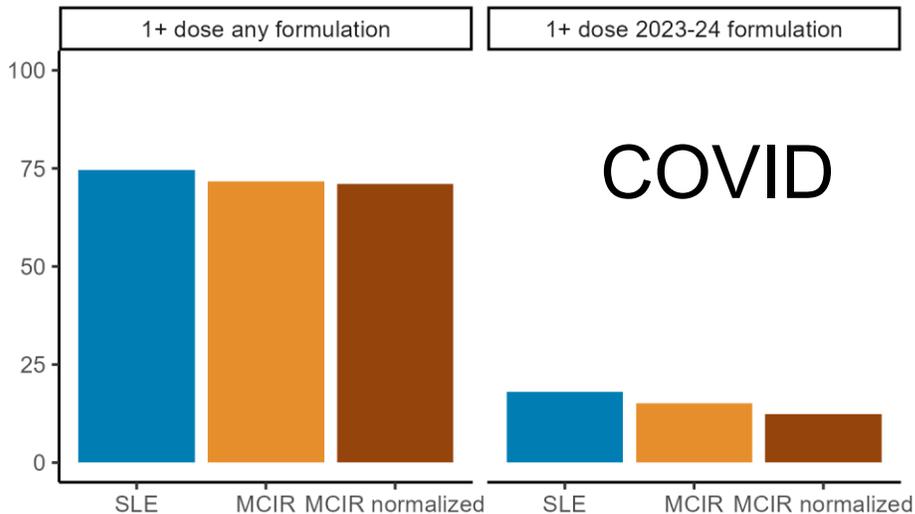
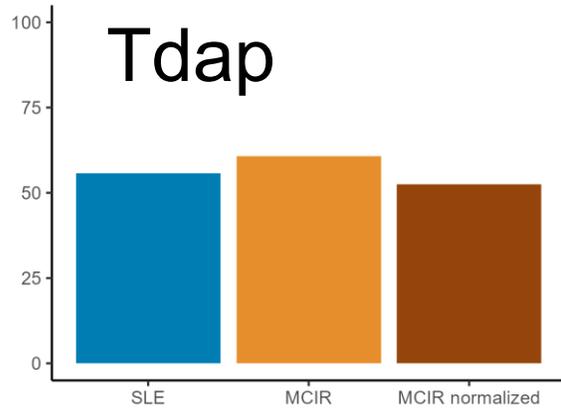
- slightly older
- African American
- close to Ascension (SE Michigan)

Let's normalize by...

- age
- *n/a* (too much “unk” race)
- county of residence

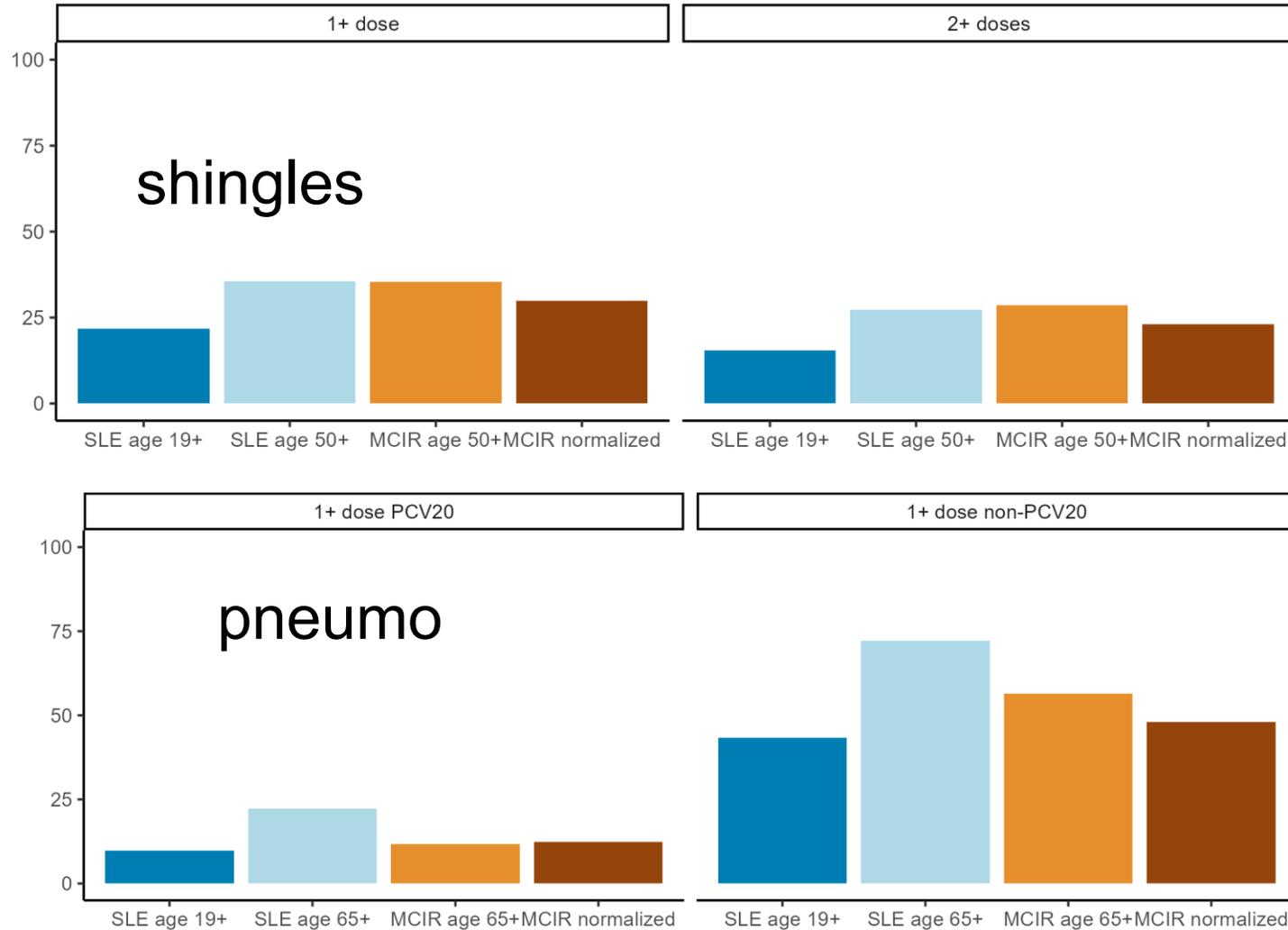
Normalized results

Normalized rates are lower than **raw** rates among MI female pop, making **SLE** group look better by comparison.

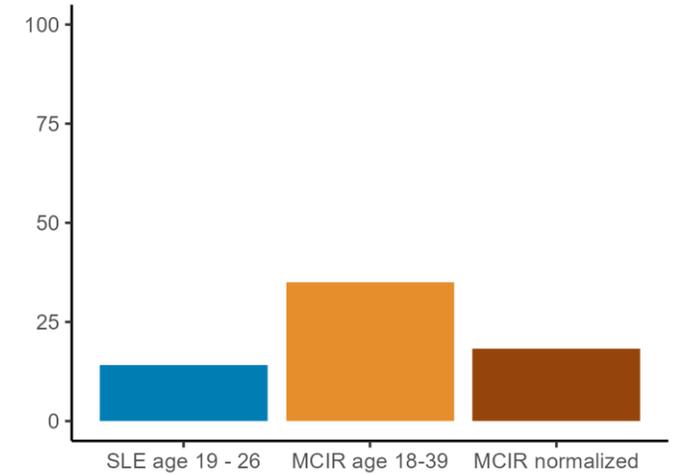


Normalized results

Normalized rates are lower than **raw** rates among MI female pop → **SLE** group still doesn't fully catch up.



HPV





Summary

- When we normalize the general population to look more like the SLE group, uptake estimates fall.
- Suggests that SLE patients' age and/or geography play a role in vaccination barriers.
- This is even before taking race and ethnicity into account.

Limitations



Limitations

- SLE population: N = xxx deceased excluded from SLE group.
- General population:
 - MI female population is different in many ways (race, age, location...).
 - Not everyone in MI is immunocompetent, as assumed here.
 - Denominator inflation → underestimates true uptake rate.
- Bottom line: these are INTERIM results until we have a proper control group.

Takeaways





What we learned

- What is the level of vaccine uptake in women with SLE?
Sadly low for some vaccines.
 - What does that mean in context?
 - Compared to controls → *future work*
 - Compared to general population
- It's a mixed bag. Flu is a bright spot. HPV is a big challenge.



Implications

- IIS that offer **immunosuppressed-specific forecasts** can support physicians caring for these patients.
- SLE patients may face access issues, over and above the challenge of the disease.
- Remember: Similar uptake doesn't equal similar protection!

Thank you!



Tdap, Influenza, COVID-19, and RSV Vaccines During Pregnancy in Wisconsin

Sarah Kangas, MPH
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Immunization Program
Bureau of Communicable Diseases
Division of Public Health

Agenda

- Background
- Methods
- Results
- Discussion

Is vaccination during the prenatal period linked to uptake of the infant hepatitis B birth dose?

The following vaccines are recommended by the American College of Obstetricians & Gynecologists (ACOG) during pregnancy:



- Tdap
- Influenza
- COVID-19
- RSV*

When can pregnant people receive the recommended vaccines?

- Tdap – 27 through 36 weeks of gestation.
- Influenza – recommended by end of October.
- COVID-19 – any time before, during, or after pregnancy.
- RSV – 32 through 36 weeks of gestation during September through January.

Hepatitis B (HepB) Birth Dose



- All infants should receive the hepB vaccine series, starting at birth.
- Administered within three days of birth.
- In 2023, 78.6% of infants in Wisconsin received the birth dose.

Methods – Cohort Selection

Birth record data

- Wisconsin address
- Gave birth in 2023 or 2025*
- Singleton birth
- Gestation age \geq 27 weeks

standardize names

Wisconsin Immunization Registry (WIR) data

- Wisconsin address
- Excluded dormant, locked, and deceased records

standardize names

*Birth data from 2025 is provisional

Methods

- Vaccination coverage assessment
 - Tdap, influenza, COVID-19 uptake among pregnant people
 - HepB birth dose in infants
- Descriptive statistics
 - Demographics, urbanicity, insurance, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) status, Adequacy of Prenatal Care Utilization (APNCU) index, educational attainment

Results of Cohort Selection

	2023	2025
Births analyzed	57,672	56,382
Infants with vaccination data in WIR	50,067	45,214
Infants with no recorded vaccinations in WIR at time of analysis	7,645	11,168



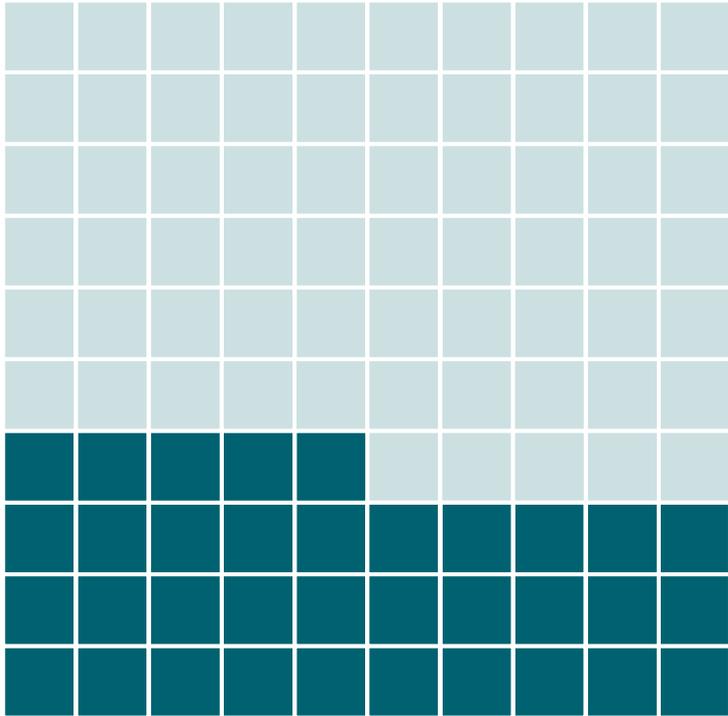
74%

**pregnant people
received at least one
vaccine during their
prenatal period**

What was the hepB vaccination coverage rate in 2025?

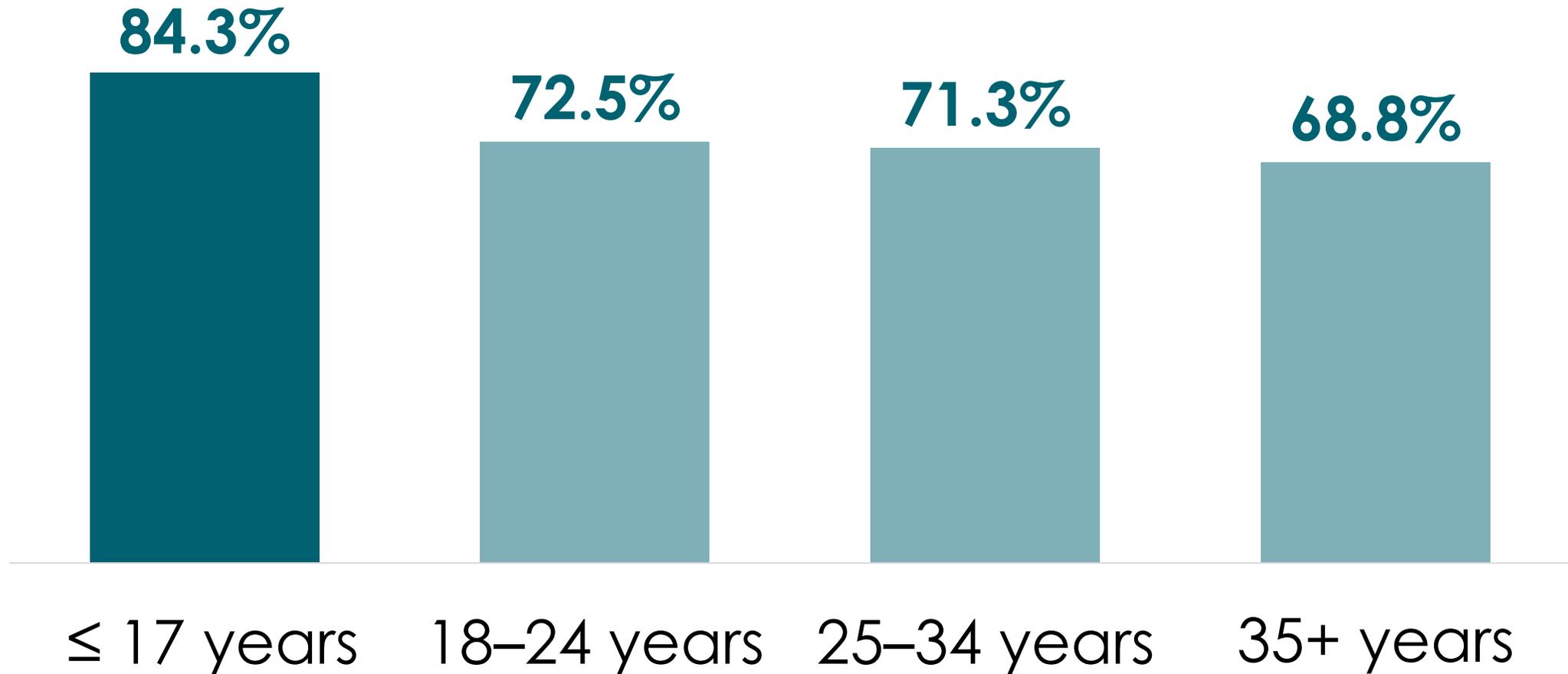


No vaccines
during pregnancy

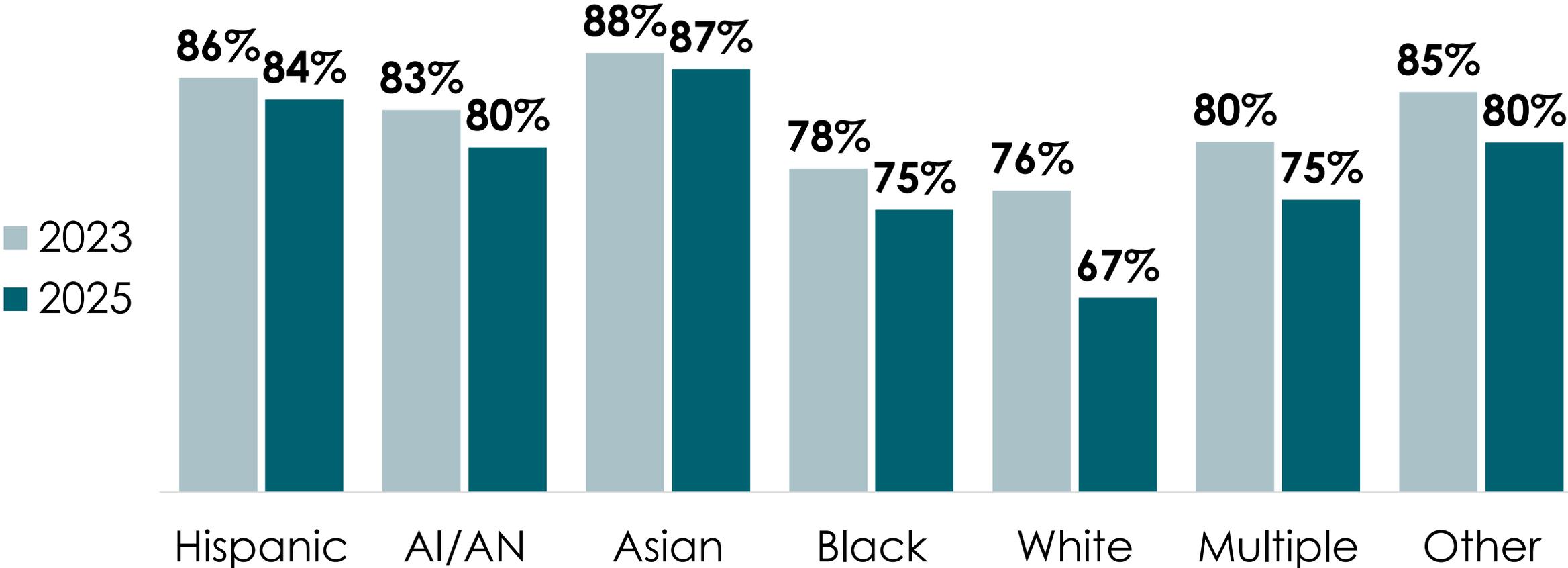


35% of infants
received hepB 
at birth

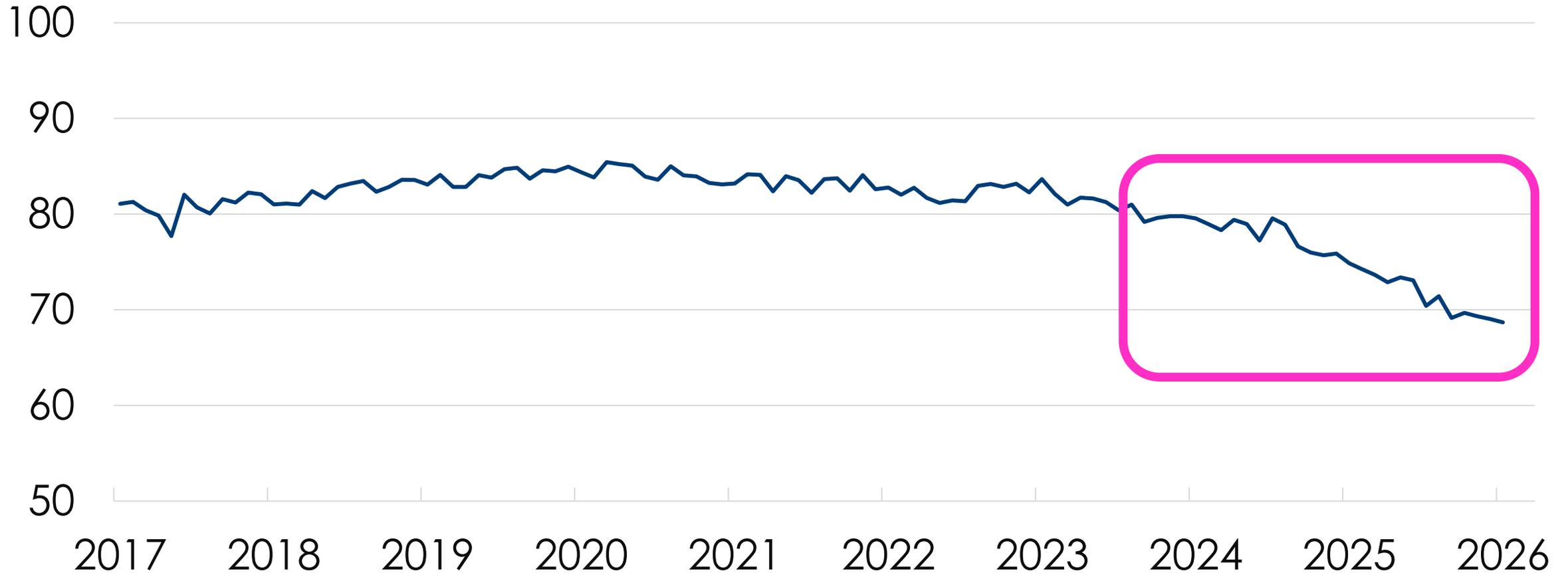
Uptake of the **hepB** birth dose is highest among infants born to people **18 years and younger**



Vaccination Coverage of HepB Birth Dose in Infants by Race and Ethnicity, 2023 & 2025



Percent of Infants Who Received a Birth Dose of the HepB Vaccine by Month, 2017–2025



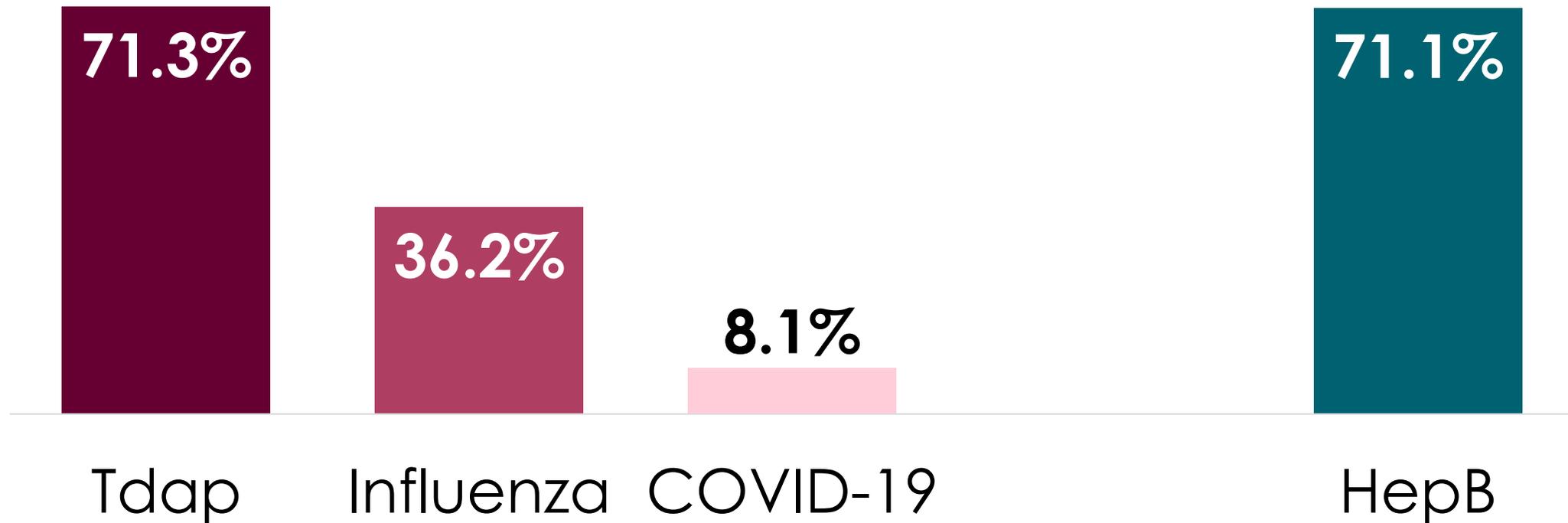
Notes: Data is only for children born in Wisconsin who were over 2,000 grams at birth according to Vital Records. A birth dose of Hepatitis B is defined as a dose given within 3 days of birth.

What are the characteristics of pregnant people who received vaccines and gave birth in 2025?

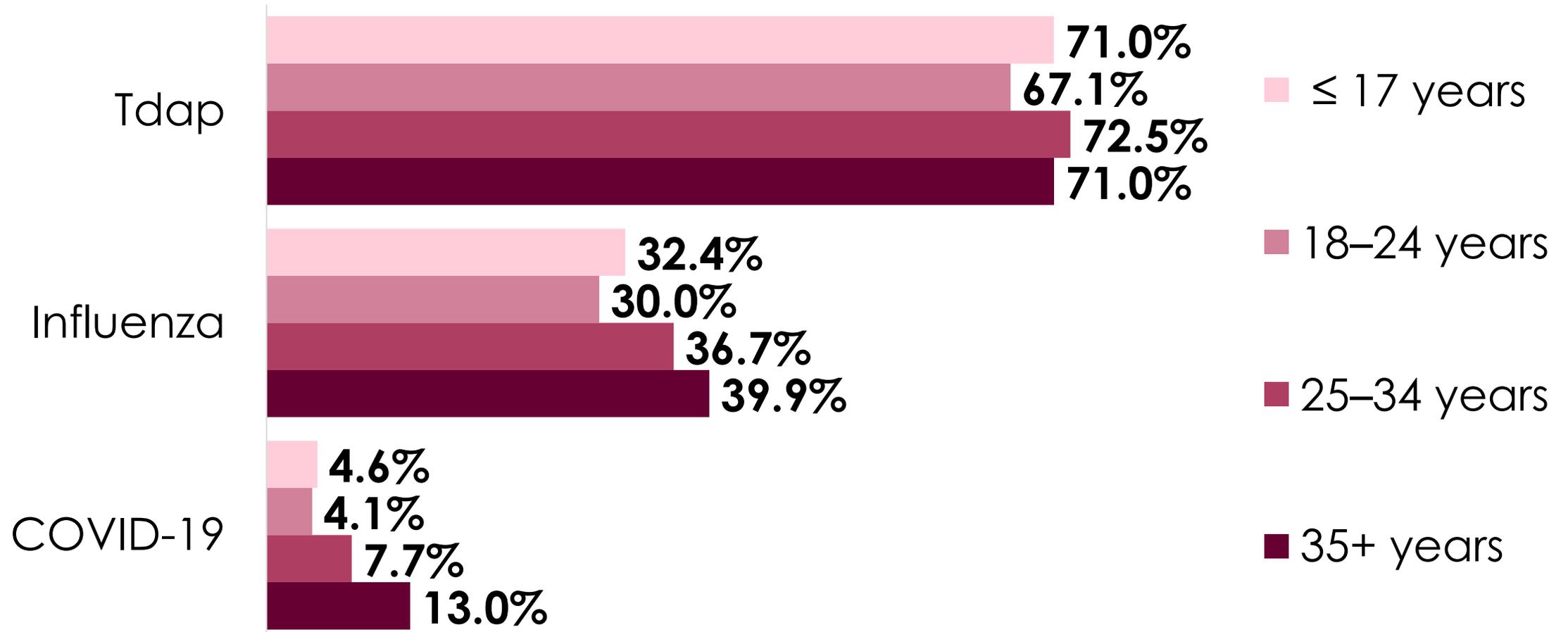
Vaccination Coverage of Pregnant People Compared to HepB Birth Dose in Infants, 2025

Vaccinations among pregnant people

Infant birth dose



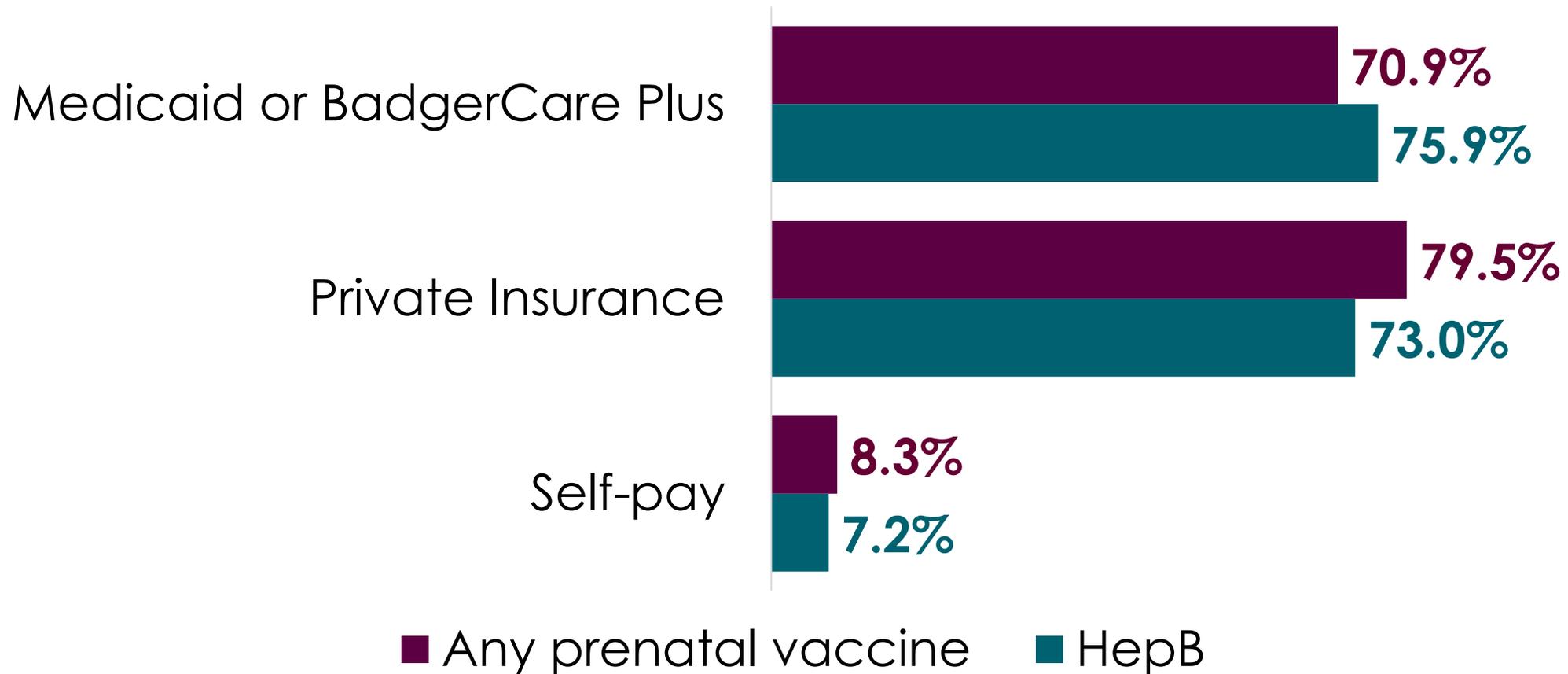
Pregnant people 18 through 24 years old had the lowest prenatal vaccination rates compared to other age groups.



Vaccination rates were higher among both infants and pregnant people in urban counties.

		HepB	Any Prenatal Vaccine
Rural		62.1%	66.4%
Urban		74.1%	75.9%

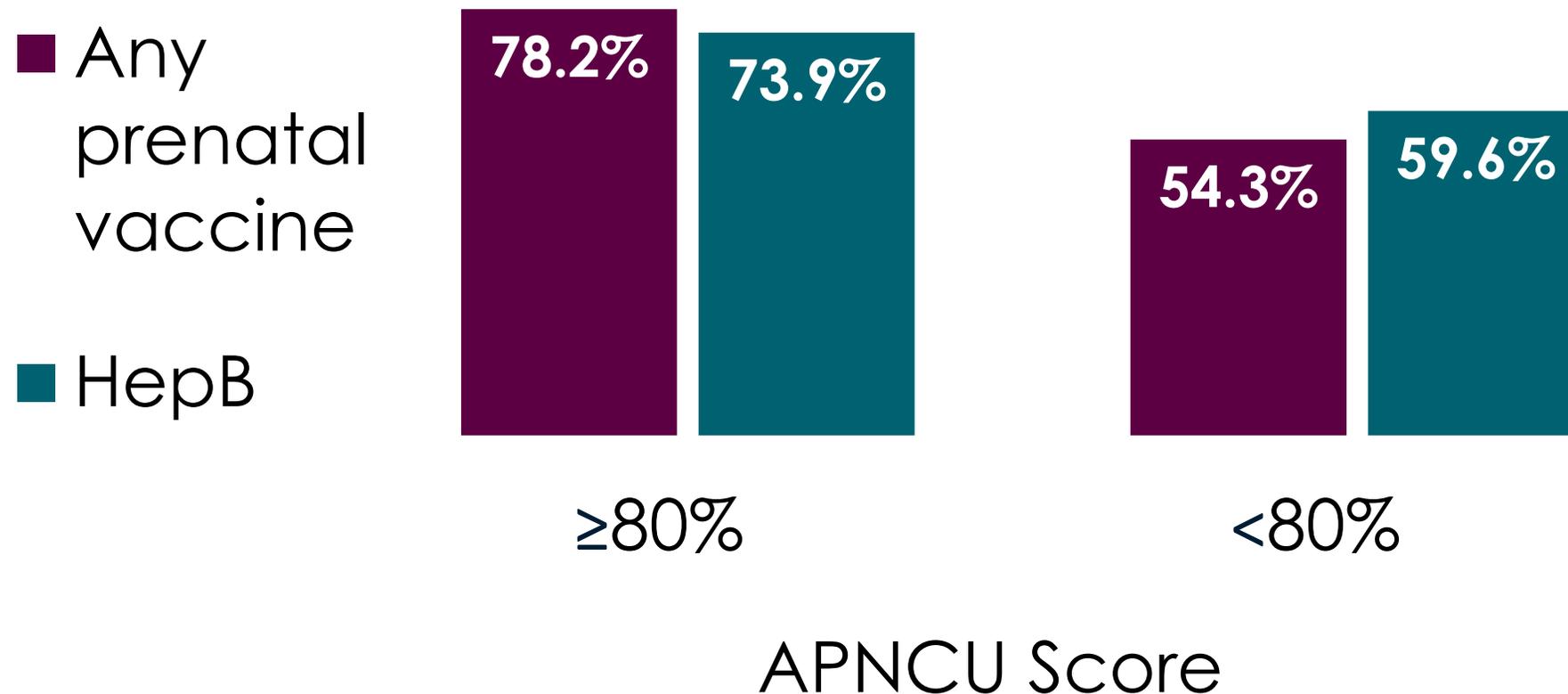
Private insured pregnant people and infants covered under Medicaid have higher vaccination rates than those who are uninsured (self-pay).



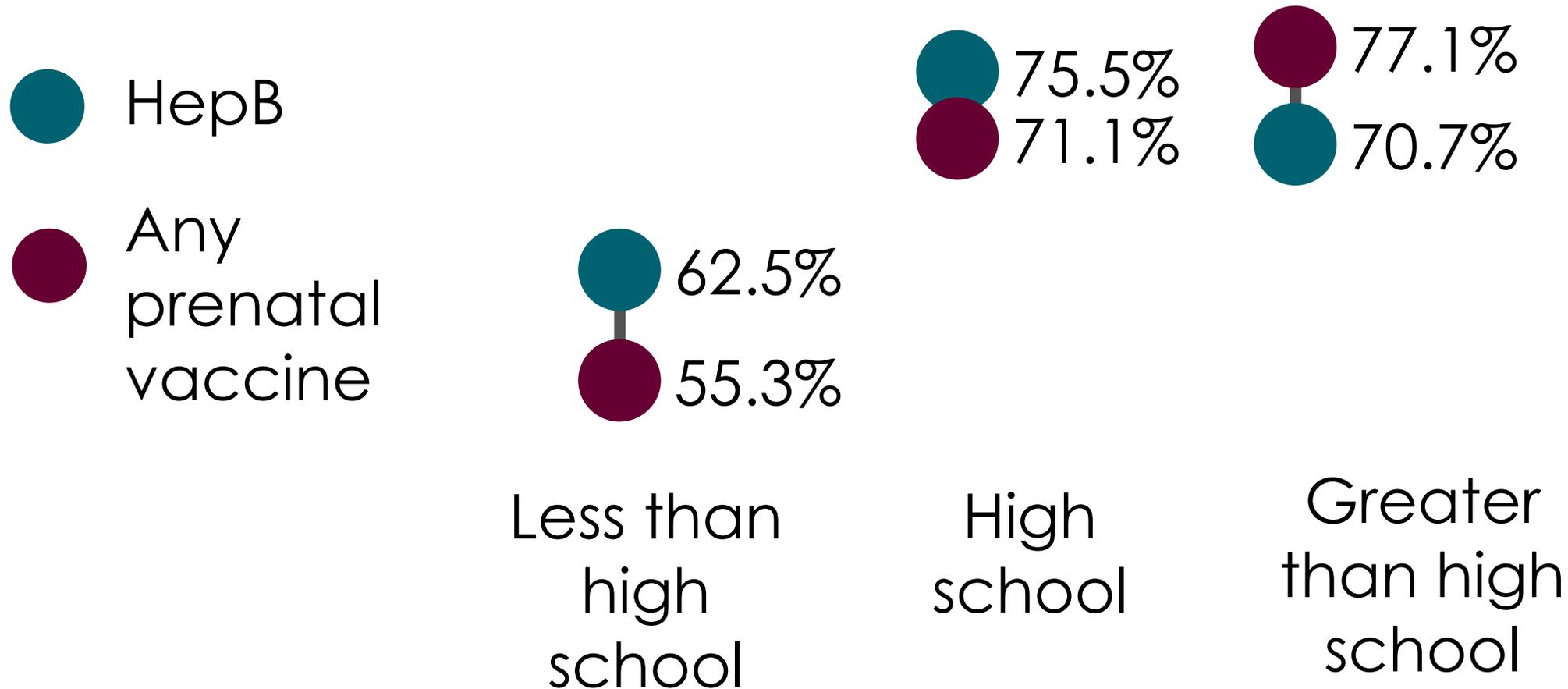
Uptake of the HepB Birth Dose is Higher Among Infants Enrolled in WIC.

 WIC	HepB	Any prenatal vaccine
WIC	80.1%	75.1%
non-WIC	68.2%	73.3%

Pregnant people who attended 80% or more of their expected prenatal visits had higher vaccination rates and higher uptake of the hepB birth dose in their infants.



Vaccination rates were lowest among pregnant people and their infants who did not have a high school degree or equivalent.



Summary



Characteristics of people with higher vaccination coverage rates during pregnancy

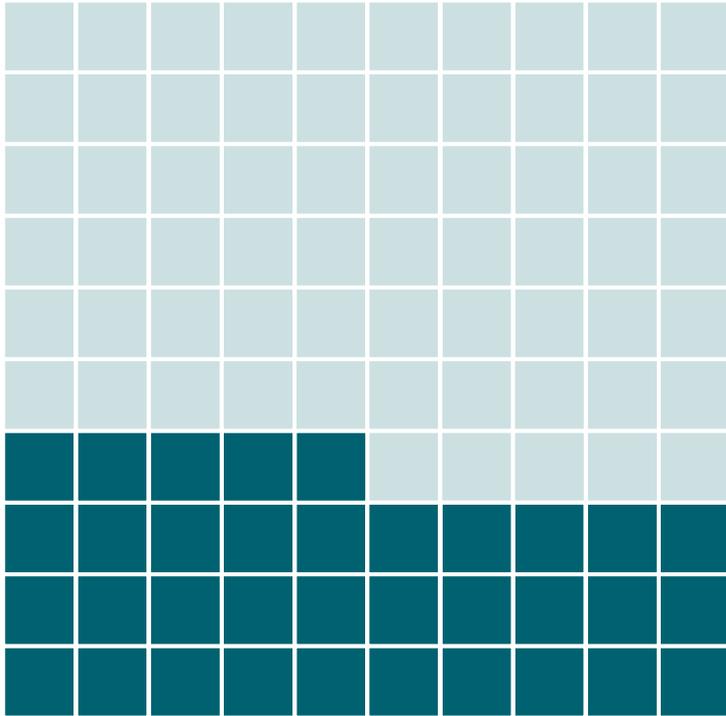
- Asian, Native Hawaiian, Pacific Islander
- 25 years or older
- Live in an urban county
- Private insurance
- Greater than high school level education
- Adequate prenatal care

Characteristics of people with higher hepB birth dose coverage rates among their infants

- Asian, Native Hawaiian, Pacific Islander
- Less than 18 years old
- Live in an urban county
- Private insurance
- High school level education or higher
- WIC participant
- Adequate prenatal care

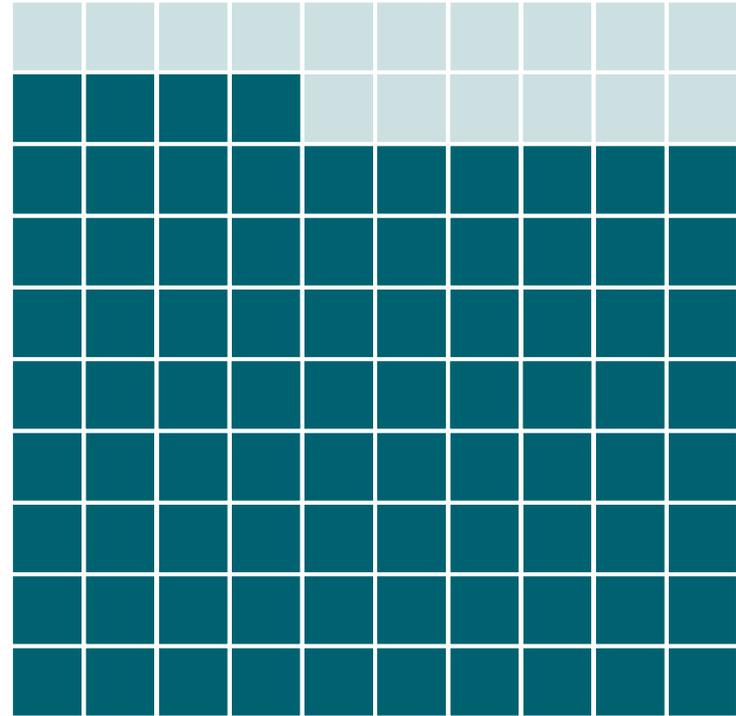


No vaccines during pregnancy



35% of infants received hepB  at birth

Any vaccine  during pregnancy



84% of infants received hepB  at birth

**Next
steps**



Making Public Health Data Actionable

- Focus on vulnerable populations
- Increase access to vaccines among uninsured people
- Make a recommendation!

Fact Sheets and Technical Report



- About DHS
- Data & Statistics
- Diseases & Conditions
- Health Care & Coverage
- Long-Term Care & Support
- Prevention & Healthy Living
- For Partners & Providers
- Certification, Licenses & Permits

Home > Prevention & Healthy Living > Immunization > Immunizations: Data

- Immunization: Home
- Adult Immunizations
- Child and Teen Immunizations
- Get the facts about vaccines
- Immunizations and Pregnancy
- Immunization Data**
- Immunization Quality Improvement-for Providers
- Local Immunization Coalitions
- RICE Grant
- School & Child Care Requirements
- Vaccine for Adults Program
- Vaccines for Children (VFC) Program - For Parents and Patients
- Vaccines for Children (VFC) Program - Information for Providers
- Vaccine Preventable Diseases
- Wisconsin Immunization Registry (WIR)-Health Care Providers
- Wisconsin Immunization Registry (WIR)-Patients or Parents
- Yellow Fever Certification
- 2024 BigShot Winners

Immunizations: Data

Vaccination rates look at the percentage of people who received recommended vaccines. This is also known as immunization rates or vaccination coverage. Vaccination rates are an important way to measure how well communities are protected from vaccine-preventable diseases. We offer reports that break down data by:

- Vaccine/vaccine series
- Demographics
- Geography
- Year

This helps us see which areas and groups have less protection. Health departments, schools, and partners can then take action to improve those vaccination rates.

The [Wisconsin Immunization Registry](#) (WIR) is our source for data on vaccine rates. We note any exceptions on the reports below.

Data pages



RSV immunization data

The Department of Health Services (DHS) reports on RSV immunization for infants ages 0-19 months and adults ages 18-49 and 60+ years.



COVID-19 vaccination data

DHS reports on updated COVID-19 vaccination for Wisconsin residents 6 months and older.

Data reports

[Close all](#) [Open all](#)

- Reports about children ages 0 – 18 years +
- Reports about adults +
- Reports about pregnant people -

[Vaccinations During Pregnancy in Wisconsin, 2023 P-03673 \(PDF\)](#) (October 2024)

Vaccinations During Pregnancy in Wisconsin, 2023^a

Health care providers play an important role in ensuring the health of their pregnant patients and newborns. A recommendation from a health care professional is the top predictor of patients getting vaccinated (1,2). To protect newborns and pregnant people against serious complications from diseases, health care providers should recommend the **Tdap**, **Influenza (flu)**, **COVID-19**, and **RSV** vaccines to their pregnant patients.

Figure 1: In 2023, three out of four patients received the Tdap vaccine, but only one in 10 received the COVID-19 vaccine, suggesting missed opportunities.³⁻⁴

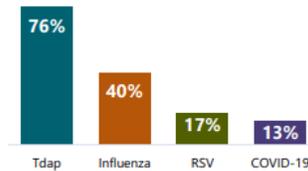


Figure 2: For Tdap, Influenza, and RSV vaccines, most pregnant people received the vaccines in traditional medical settings while most COVID-19 vaccines were administered in pharmacies.

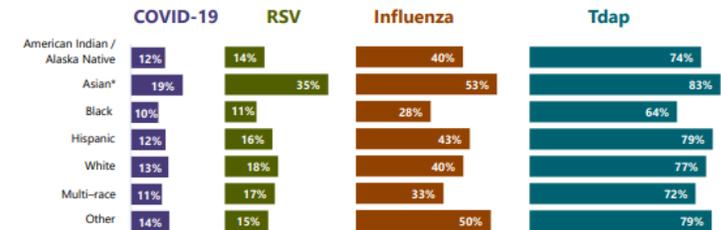
Location Vaccinated	Tdap	Influenza	RSV	COVID-19
Clinic or Medical Practice	59.2%	49.7%	57.8%	33.9%
Pharmacy	4.3%	11.5%	16.1%	49.7%
Birthing Hospital	11.8%	11.7%	11.2%	6.9%
OB/GYN	21.7%	11.8%	11.8%	0.3%
All Others	3.1%	15.3%	3.2%	9.2%

Providers may co-administer COVID-19, Influenza, and RSV (when applicable) vaccines to their patients when giving the Tdap vaccine. Co-administration ensures that individuals who may have difficulty accessing care or may experience several barriers in coming to the clinic are fully protected.

Other locations include federally qualified health centers, local and Tribal public health department clinics, occupational health centers, workplace settings, and other non-traditional settings.

Providing access to vaccines in convenient locations is one strategy that may improve vaccination coverage.

Figure 3: Black pregnant people experienced the lowest vaccination rates for COVID-19, RSV, Influenza, and Tdap vaccines while Asian pregnant people experienced the highest vaccination rates for these vaccines.



The COVID-19 pandemic highlighted racial disparities in disease burden and access to vaccines. Lack of access to health care, prior instances of discrimination from health care providers, historical mistrust of the medical field, and lower income due to systemic inequities contributed to lower vaccination rates among Black, Hispanic, and American Indian and Alaskan Natives in general (3,4,5). These disparities stress the importance for health care providers to foster patient trust, especially among pregnant patients who are at increased risk of severe illness from COVID-19, RSV, Influenza, and Pertussis. Vaccine recommendations or referrals for vaccination from health care providers remain essential for improving vaccination coverage rates among pregnant people and may help decrease vaccine hesitancy (6).



**Perform routine
vaccination
assessment among
pregnant people in
Wisconsin on a
yearly basis.**



**Contact:
Sarah Kangas
Sarah.Kangas@DHS.wisconsin.gov**

Thank you to our presenters,
and thanks to all of you for
joining us!

Please complete a brief evaluation survey.

The next Discovery Session
will be on **April 6, 2026**