Evidence to Recommendations Framework:
Additional Doses of 2024–2025 COVID-19 Vaccine in Older Adults and People with Moderate or Severe Immunocompromise

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Advisory Committee on Immunization Practices Meeting
October 23, 2024

ACIP recommendations for COVID-19 vaccines

- **On June 27, 2024, ACIP voted to recommend 2024–2025 COVID-19 vaccines for everyone ages 6 months and older**
- **On August 22, 2024, FDA approved and authorized 2024–2025 Pfizer-BioNTech and Moderna COVID-19 vaccines* for people ages 6 months and older**
- **On August 30, 2024, FDA authorized 2024–2025 Novavax COVID-19 vaccine** for people aged 12 years and older**

FDA: Food and Drug Administration
* Omicron JN.1 lineage, KP.2 strain
** Omicron JN.1 lineage, JN.1 strain

Evidence to Recommendations (EtR) Framework

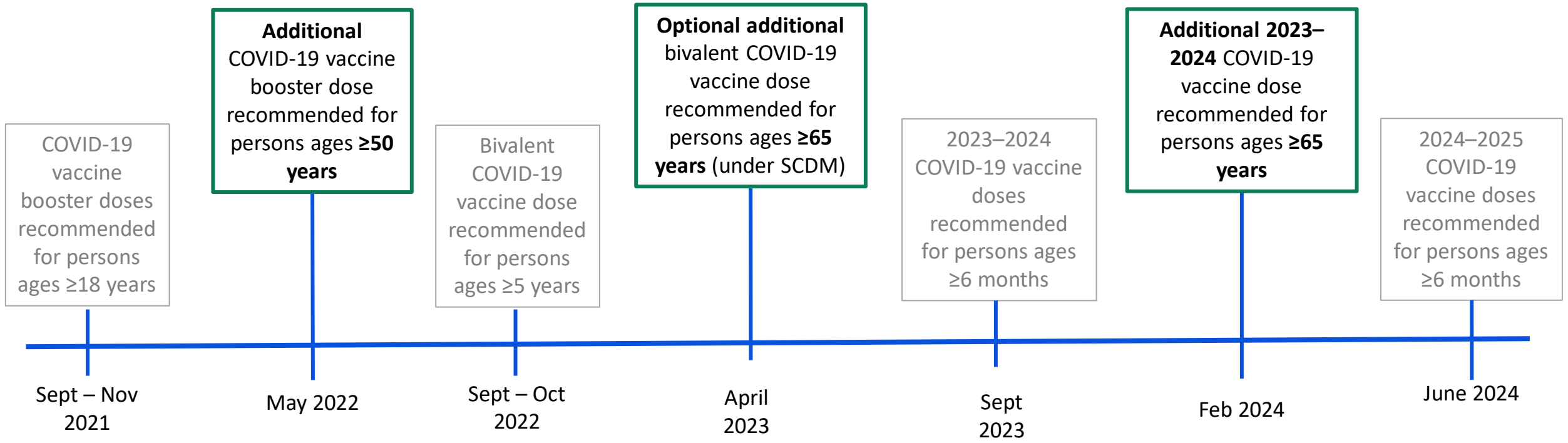
Policy Questions

In addition to previously recommended 2024–2025 vaccination:

- Should a **second dose*** of 2024–2025 COVID-19 vaccine be recommended for adults ages 65 years and older?
- Should a **second dose**** of 2024–2025 COVID-19 vaccine be recommended for people ages 6 months and older who are moderately or severely immunocompromised?
- Should **additional doses (i.e., 3 or more)** of 2024–2025 COVID-19 vaccine be recommended for people ages 6 months and older who are moderately or severely immunocompromised under ***shared clinical decision-making***?

*If previously unvaccinated and receiving Novavax, 2 doses are recommended as initial vaccination series followed by a third dose of any age-appropriate 2024-2025 COVID-19 vaccine 6 months (minimum interval 2 months) after second dose.
**If previously unvaccinated or receiving initial vaccination series, at least 2 doses of 2024–2025 vaccine are recommended, and depending on vaccination history more may be needed. This additional 2024–2025 vaccine dose is recommended 6 months (minimum interval 2 months) after completion of initial vaccination series.

Older adults: timeline of additional COVID-19 vaccine dose recommendations



SCDM: Shared clinical decision-making

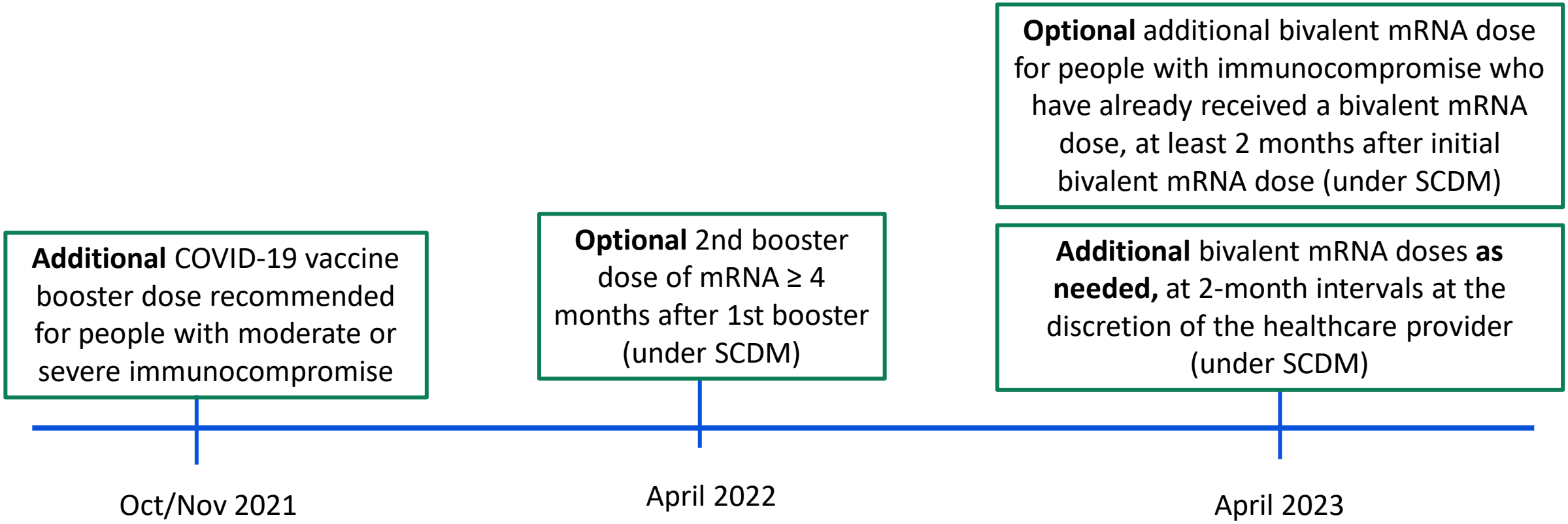
Current recommendations for people ages 5 years and older

Doses recommended:

- **1 dose of 2024–2025 COVID-19 vaccine**

- **2024–2025 COVID-19 vaccine dose is recommended at least 2 months after receipt of the last COVID-19 vaccine dose**
- **mRNA COVID-19 vaccines authorized or approved for ages 6 months and older and Novavax COVID-19 vaccine authorized for ages 12 years and older**
- **People who are previously unvaccinated for COVID-19 and are receiving Novavax should complete a 2-dose initial series**

People with moderate or severe immunocompromise: ACIP recommendations for additional COVID-19 vaccine doses



SCDM: Shared clinical decision-making

https://www.sciencedirect.com/science/article/pii/S0264410X23014664?via%3Dihub
https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2023-04-19/06-COVID-Oliver-508.pdf
https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2023-04-19/07-COVID-Twentyman-508.pdf

Current recommendations for people ages 6 months and older who are moderately or severely immunocompromised

Doses recommended:

- Initial COVID-19 vaccine series*
- **At least 1 2024–2025 COVID-19 vaccine dose**
- May receive 1 additional 2024–2025 COVID-19 vaccine dose with option for further additional doses of 2024–2025 COVID-19 vaccine**

***Series of 3 homologous mRNA COVID-19 vaccine doses or 2 Novavax COVID-19 vaccine doses (if ages 12 years and older); includes revaccination after hematopoietic cell transplant and CAR-T-cell, or B-cell-depleting therapies.**

****Further additional dose(s) may be administered, informed by the clinical judgement of a healthcare provider and personal preference and circumstances. Further additional doses should be administered at least 2 months after the last 2024-2025 COVID-19 vaccine dose.**

For more information, see https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#immunocompromised.

Evidence to Recommendations (EtR) Framework

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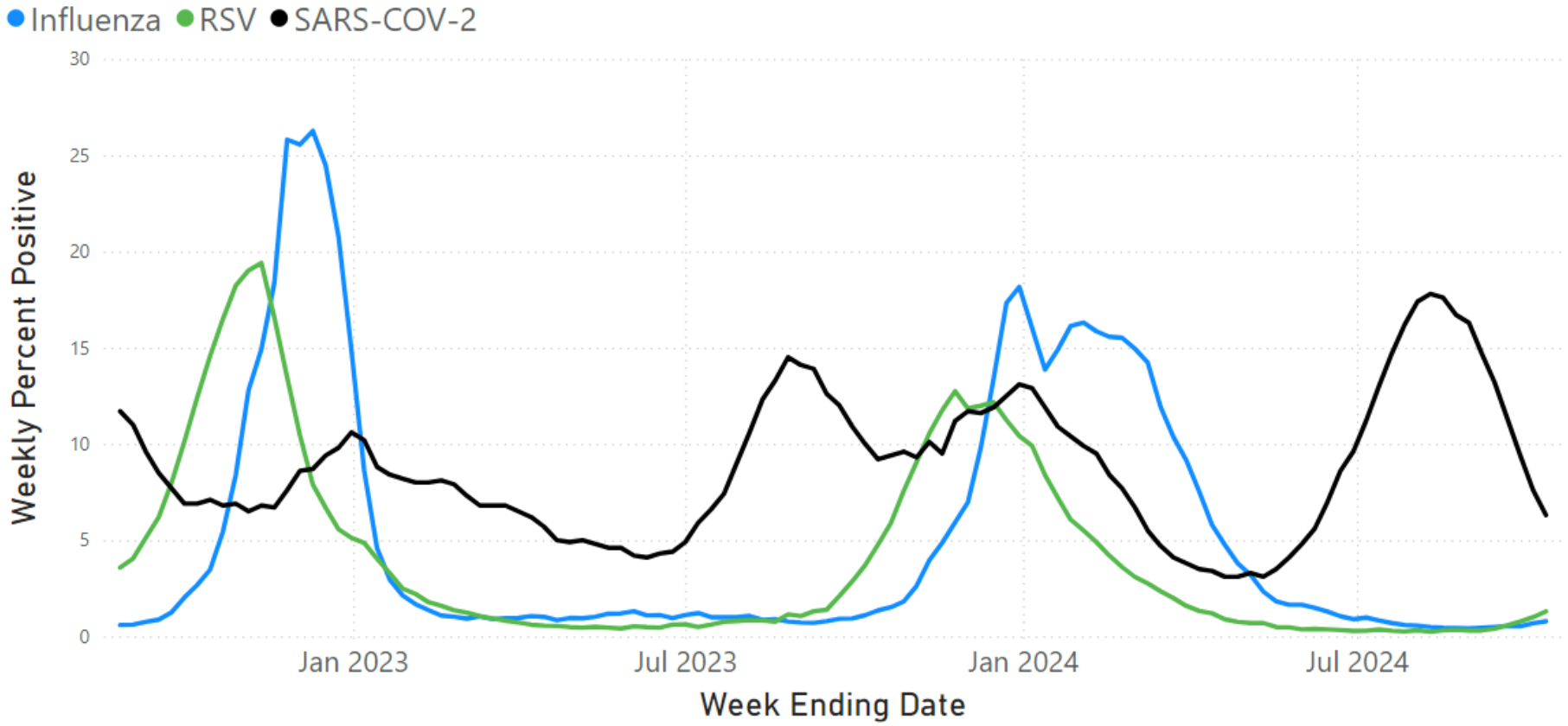
EtR Domain:

Public Health Problem

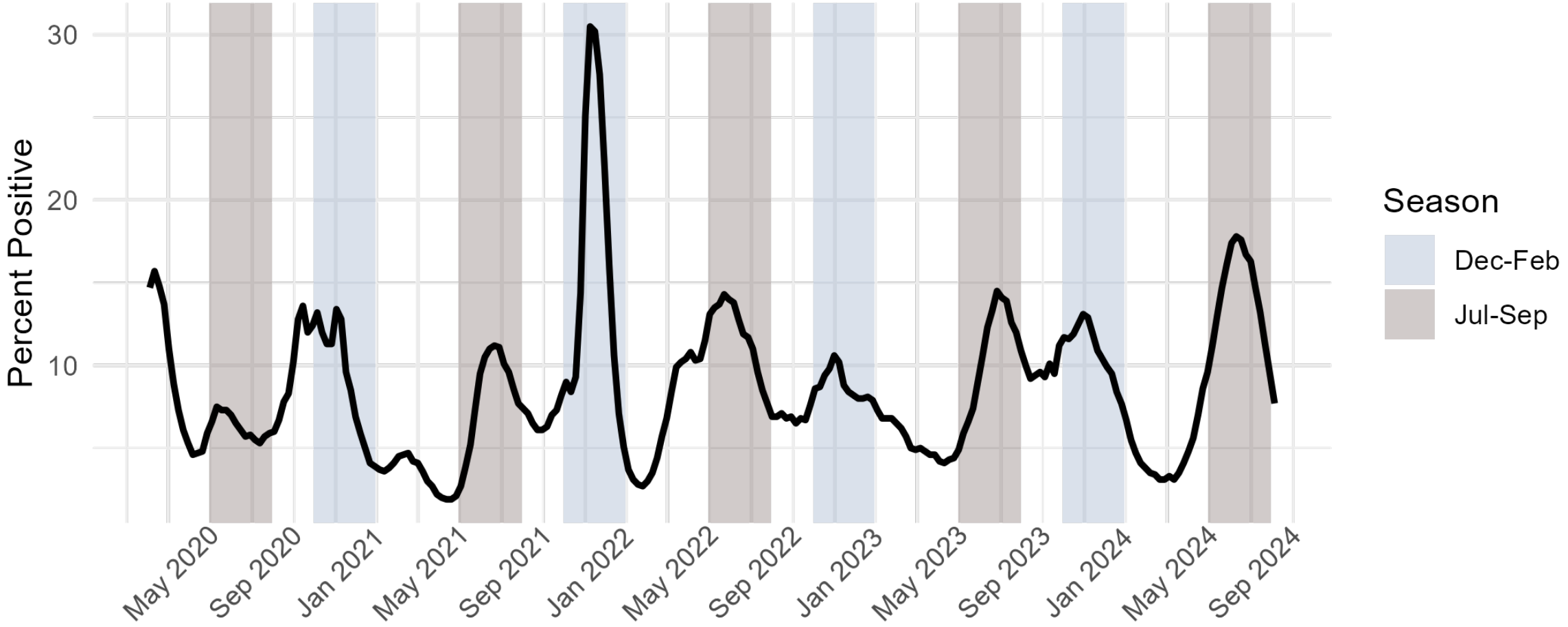
COVID-19 circulates year-round.

National weekly percent positive for SARS-COV-2, RSV and influenza reported to NREVSS, August 27, 2022 through October 12, 2024



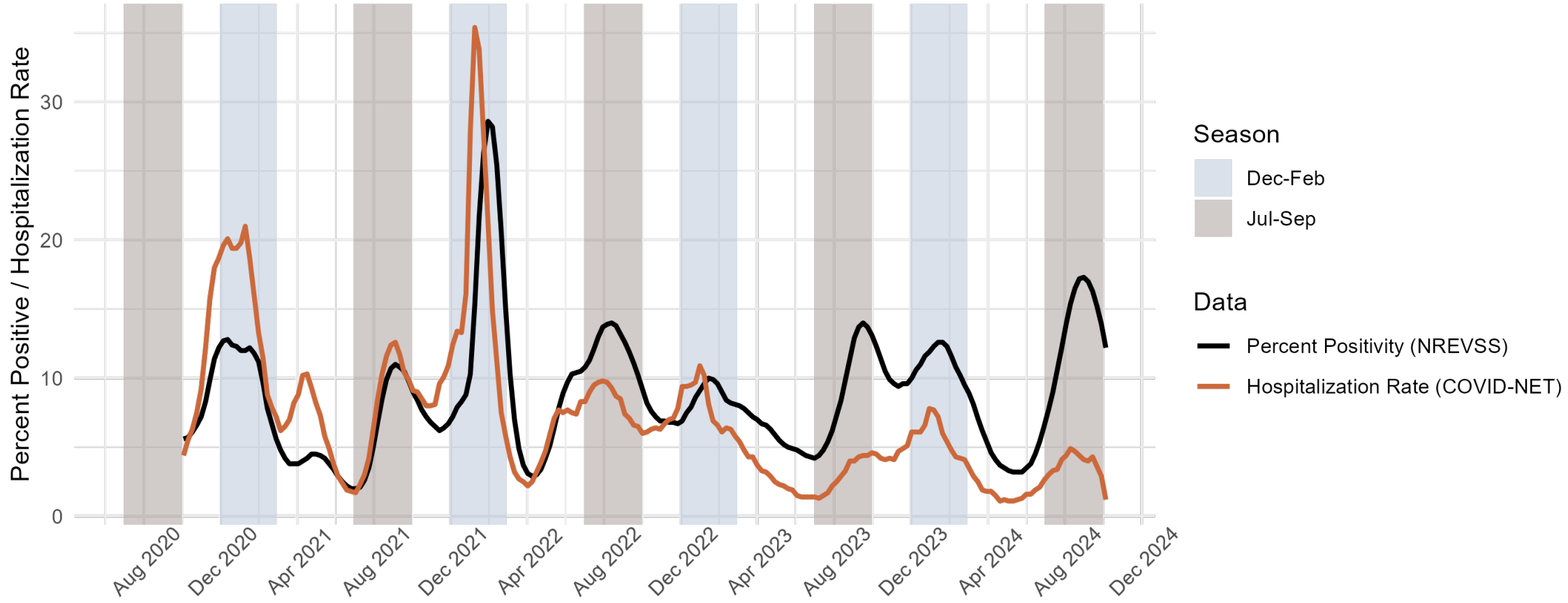
Reported was last updated on October 16, 2024.
All results presented from nucleic acid amplification tests which represent >90% of the diagnostic tests reported to NREVSS. The last three weeks of data may be less complete. NREVSS is an abbreviation for the National Respiratory and Enteric Virus Surveillance System. For more information on NREVSS, please visit www.cdc.gov/surveillance/nrevss.
SARS-COV-2: Severe acute respiratory syndromic coronavirus type 2
Flu: Influenza viruses types are combined but reported by type and subtype depending on the testing capabilities of each contributing laboratory.
RSV: Respiratory Syncytial Virus. Types A and B are reported but not shown separately in this report.
https://www.cdc.gov/nrevss/php/dashboard/index.html

COVID-19 has consistently peaked in winter and late-summer.



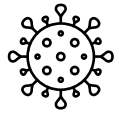
National Respiratory and Enteric Virus Surveillance System (NREVSS)

COVID-19–associated hospitalizations also peaked in winter and late-summer.



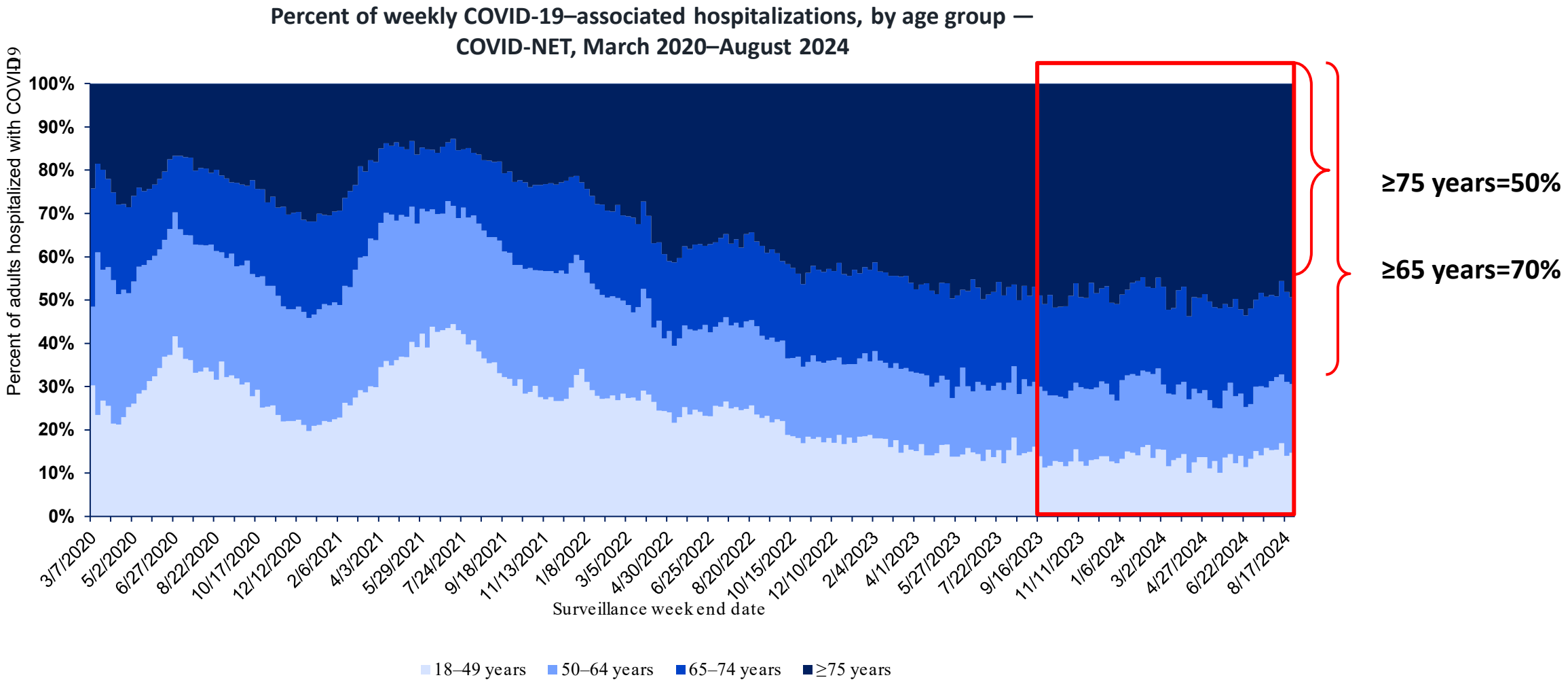
NREVSS: National Respiratory and Enteric Virus Surveillance System

Factors that could impact COVID-19 periodicity

Factor	Potential contributors
Host 	• Natural infection (reinfection) • Timing of vaccination • Waning immunity
Virus 	• Variant emergence and displacement • Variant characteristics (e.g., immune escape, transmissibility)
Environment 	• Temperature • Relative humidity • UV radiation
Behavior 	• Travel and mobility • Time spent indoors • School and daycare schedules • Holidays and large gatherings

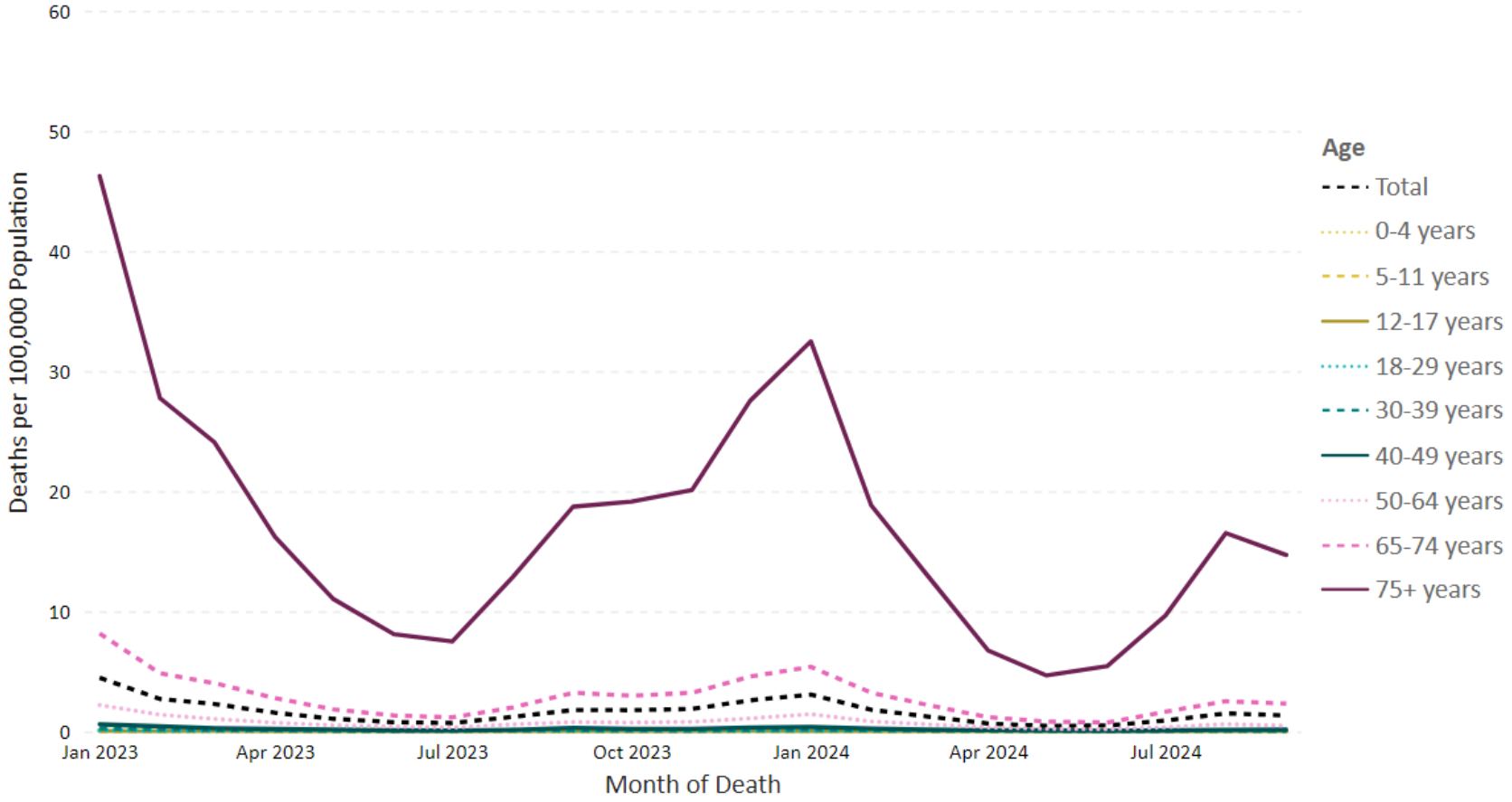
Public Health Problem: older adults

Adults ages ≥65 years comprise 2/3 of all COVID-19–associated hospitalizations among adults.



during this same period of October 2023 through August 2024, children and adolescents ages 17 years and younger comprised 4% of all COVID-19-associated hospitalizations.

COVID-19–associated deaths per 100,000 population by age group, United States, January 1, 2023 – September 30, 2024

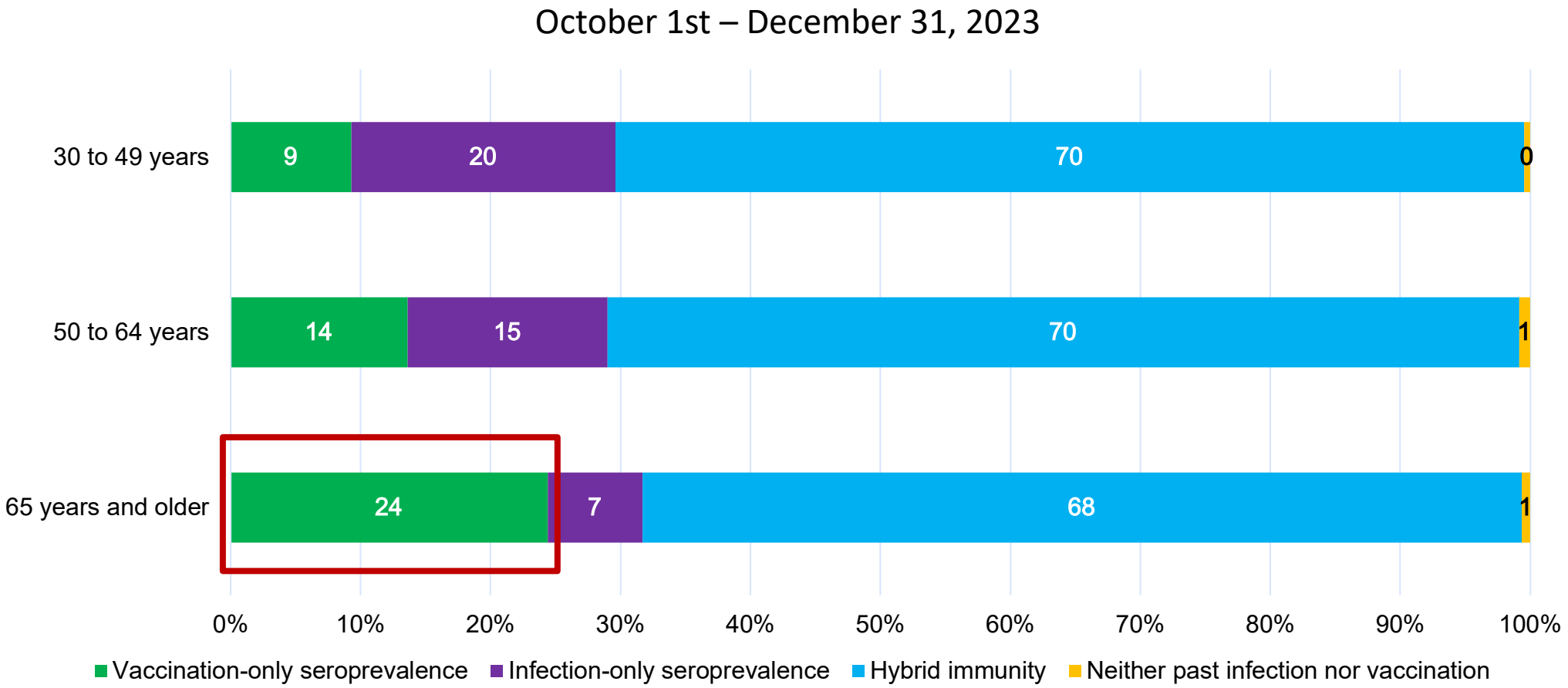


Source: Provisional death data from CDC's National Center for Health Statistics (NCHS), National Vital Statistics System (NVSS).

Provisional data are non-final counts of deaths based on reported mortality data in NVSS. Deaths include those with COVID-19, coded as ICD–10 code U07.1, as an underlying or contributing cause of death on the death certificate. Death data are displayed by date of death (event).

https://covid.cdc.gov/covid-data-tracker/#demographicsovertime Accessed October 22, 2024.

Weighted U.S. SARS-CoV-2 seroprevalence by vaccine and infection history and age, based on blood donations

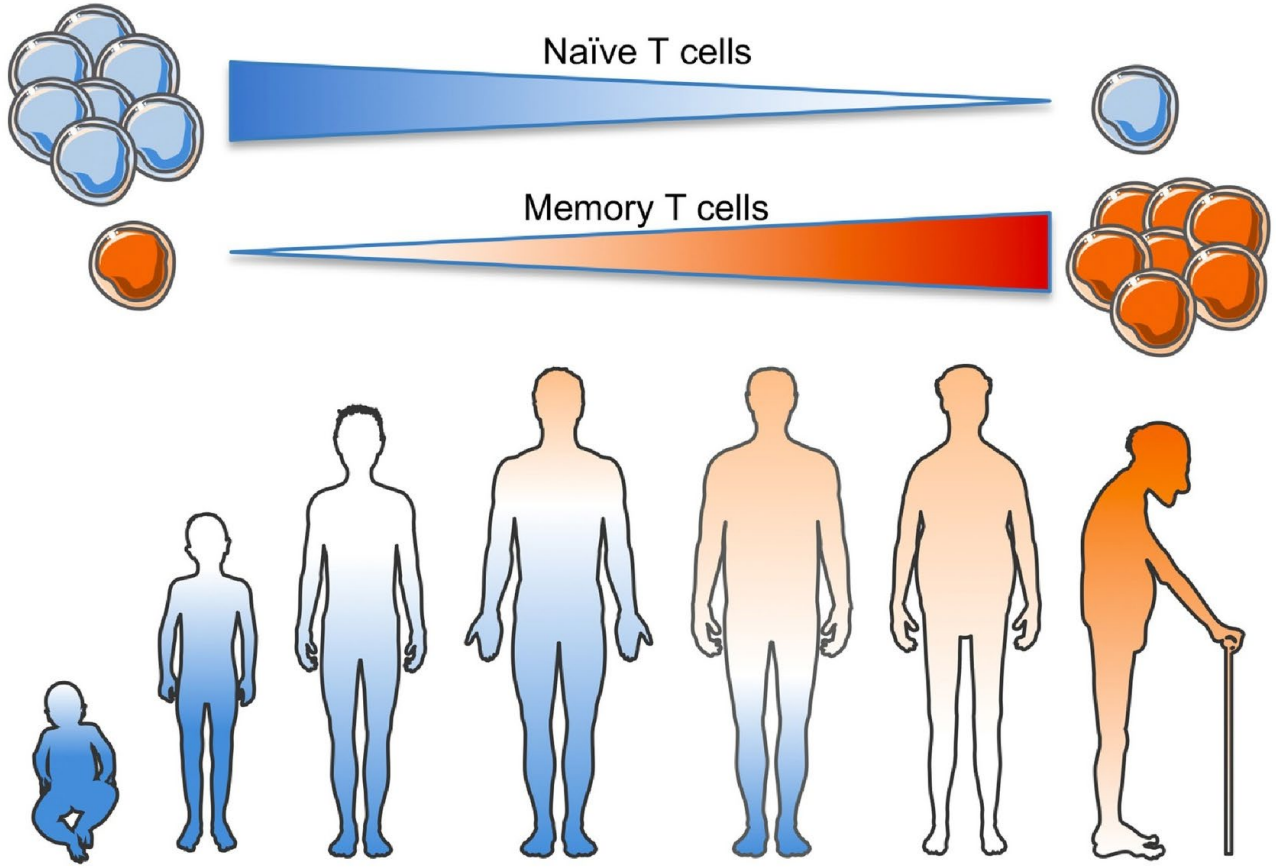


Seroprevalence definition: The percentage of people with antibodies against a virus in their blood is known as seroprevalence.

Methodology available at https://covid.cdc.gov/covid-data-tracker/#nationwide-blood-donor-seroprevalence-2022

https://www.cdc.gov/mmwr/volumes/72/wr/mm7222a3.htm

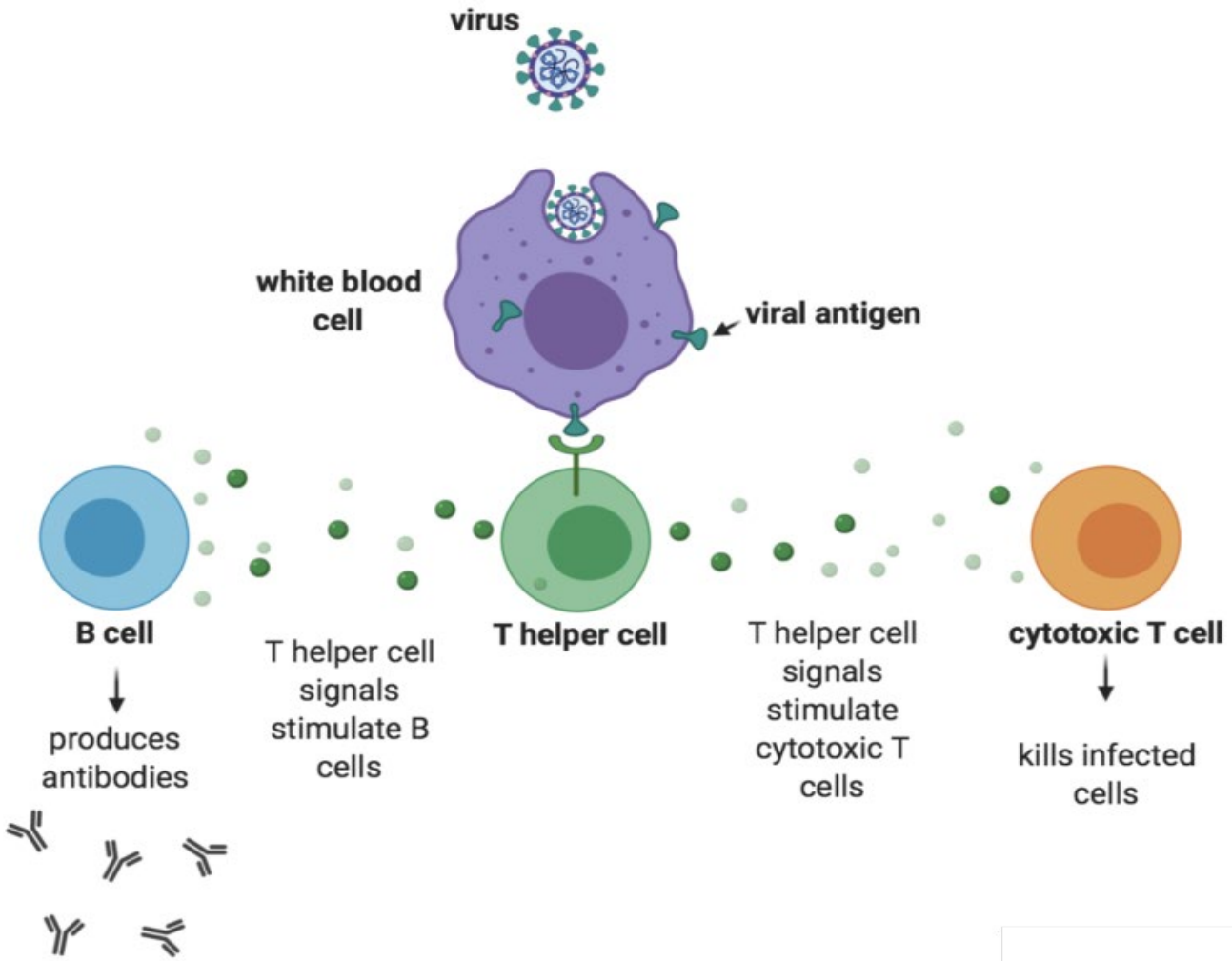
Pool of naïve T cells diminishes with age



Immunosenescence refers to age-associated immune decline that may result in an inefficient immune response to novel antigens and an inability to develop proper immunity against infections and upon vaccination.

de Candia P, Prattichizzo F, Garavelli S, Matarese G. T Cells: Warriors of SARS-CoV-2 Infection. Trends Immunol. 2021 Jan;42(1):18-30. doi: 10.1016/j.it.2020.11.002. Epub 2020 Nov 13. PMID: 33277181; PMCID: PMC7664351

Adaptive immunity includes cellular and humoral responses



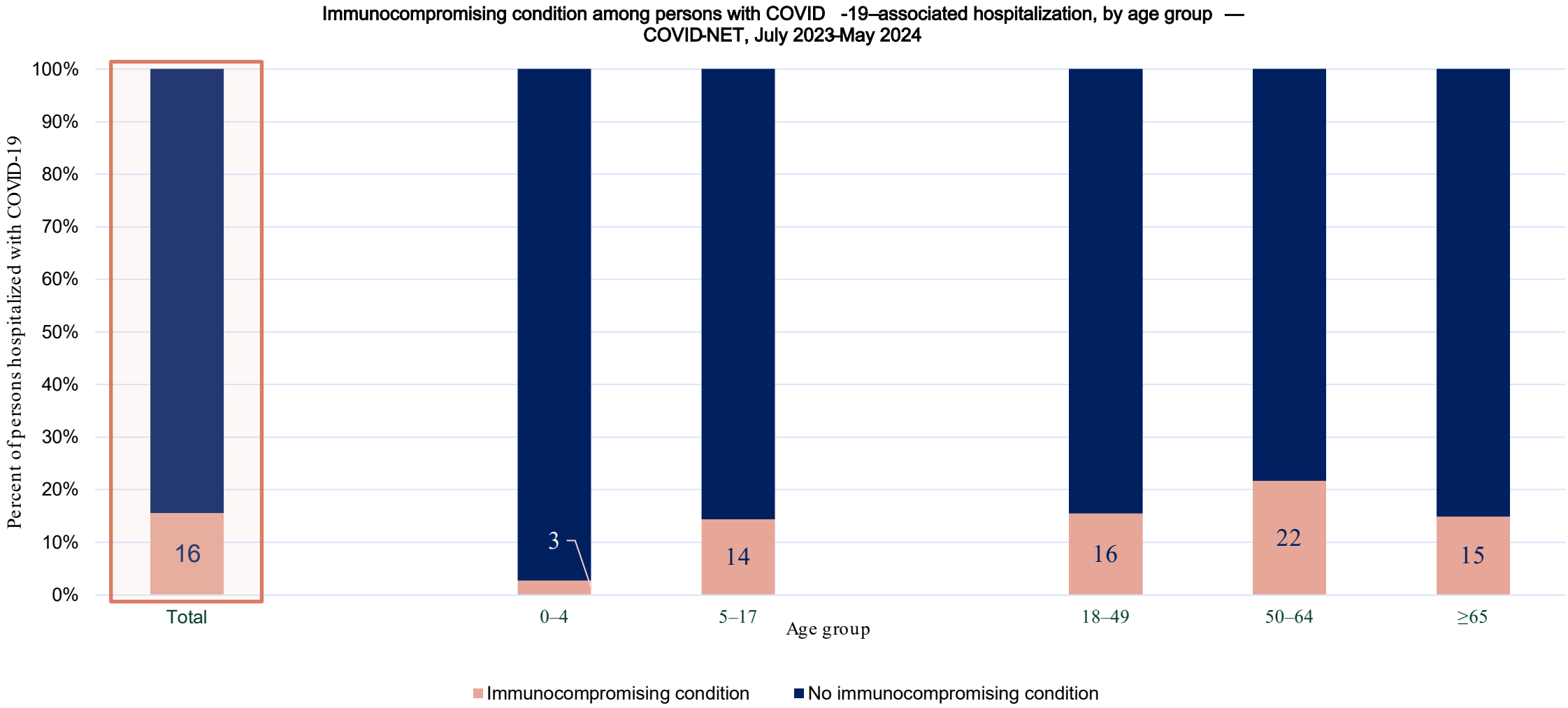
Insufficient pools of naïve T cells impacts ability to generate:

- **Neutralizing antibody responses**
- **Cytotoxic T cells**

Rey, Gertrud. T Cell Responses to Coronavirus Infection are Complicated. https://www.virology.ws/2020/11/05/t-cell-responses-to-coronavirus-infection-are-complicated/

Public health problem: People with moderate or severe immunocompromise

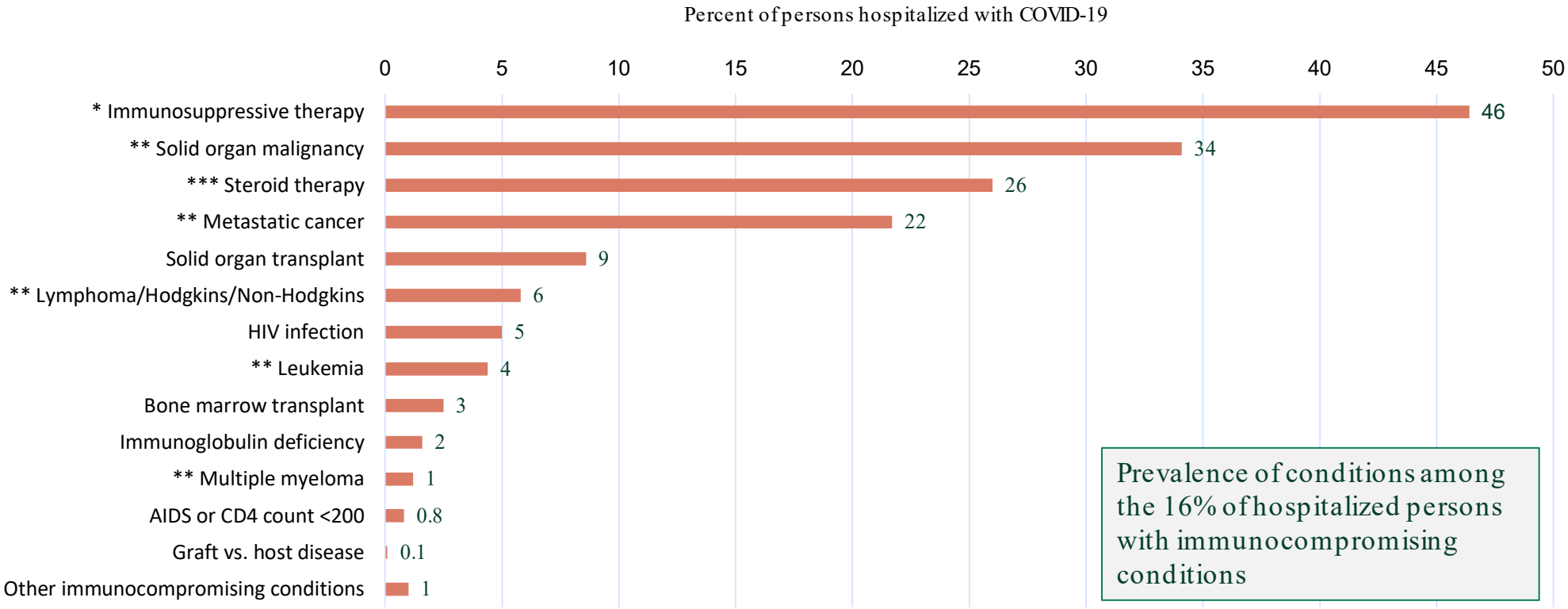
About 1 in 6 (15.6%) persons hospitalized with COVID-19 have an immunocompromising condition.



Data are limited to hospitalizations where COVID-19 is a likely primary reason for admission.

The most common immunocompromising conditions among persons hospitalized with COVID-19 include:

Prevalence of immunocompromising conditions among adults hospitalized with COVID-19 with immunocompromised status — COVID-NET, July 2023–May 2024



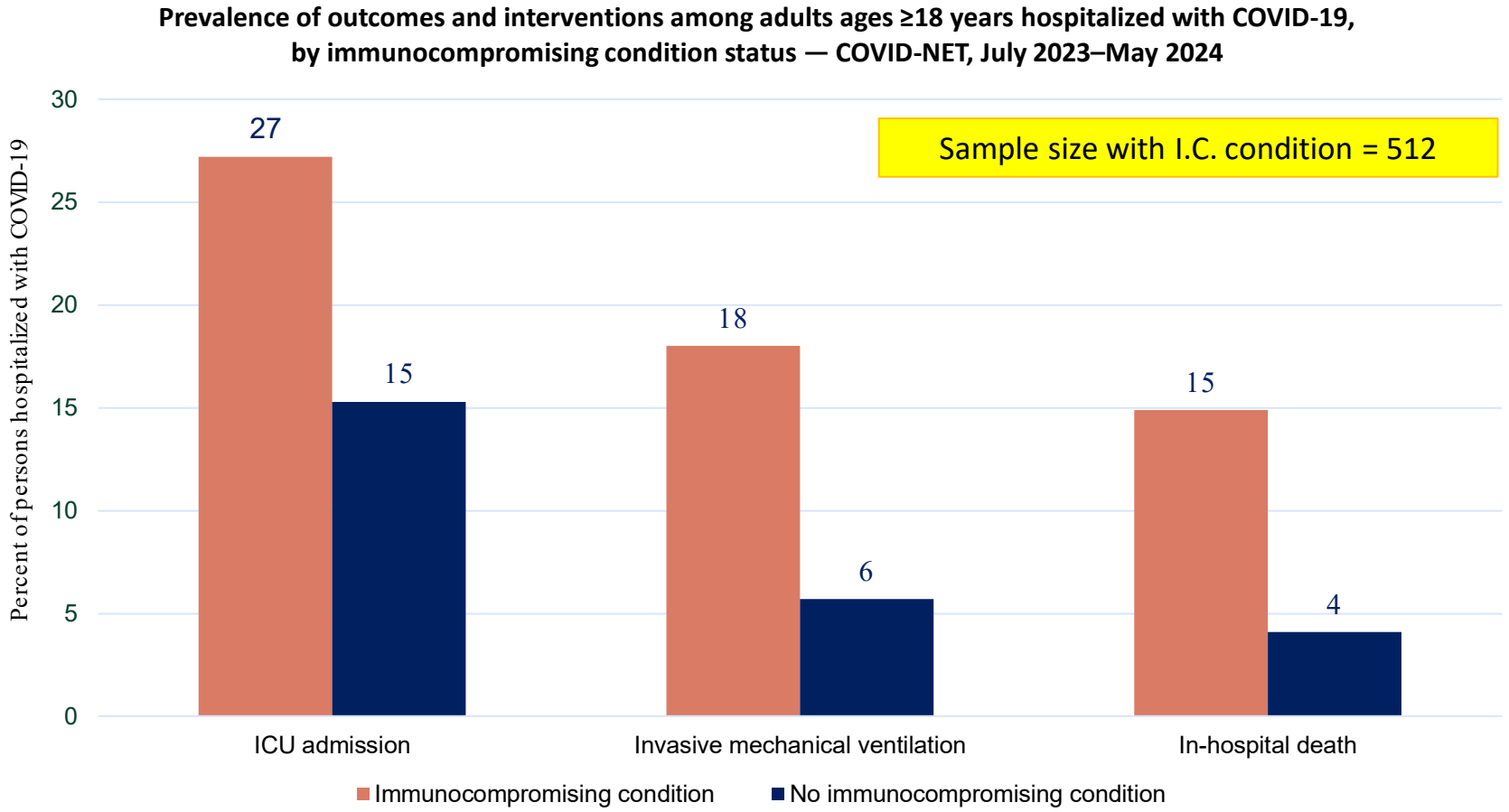
* Within the 12 months before admission

** Current/in treatment or diagnosed in the 12 months before admission

*** Within 2 weeks before admission. Does not include inhaled, intranasal steroids or intramuscular or intra-articular injection of steroids.

Data are limited to hospitalizations where COVID-19 is a likely primary reason for admission.

Risk for severe outcomes during COVID-19–associated hospitalization among adults varies by immunocompromising condition status.

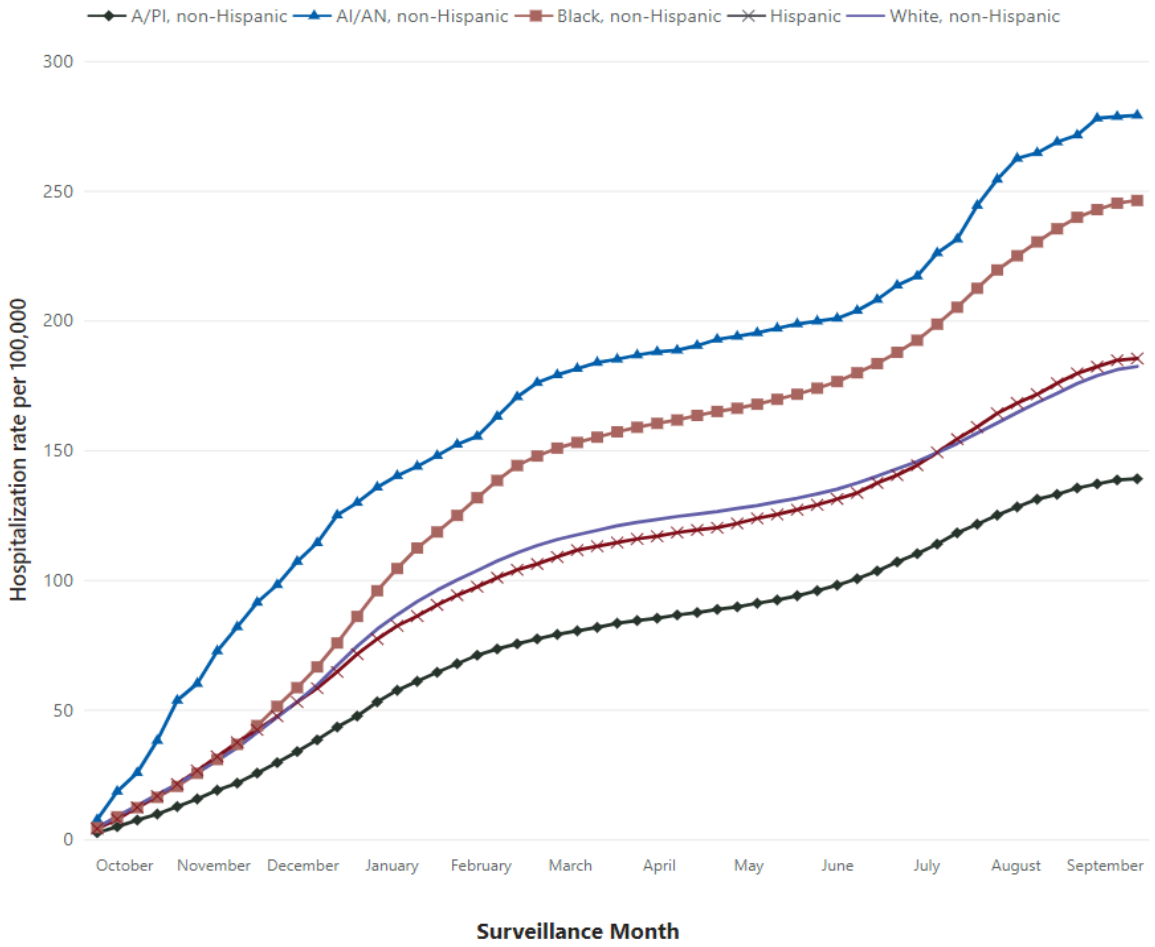


Data are limited to hospitalizations where COVID-19 is a likely primary reason for admission.

Domain Equity Question:

Does the problem impact all populations equally?

Age-adjusted cumulative COVID-19 hospitalizations per 100,000 population by race and ethnicity — COVID-NET, October 2023 – September 2024

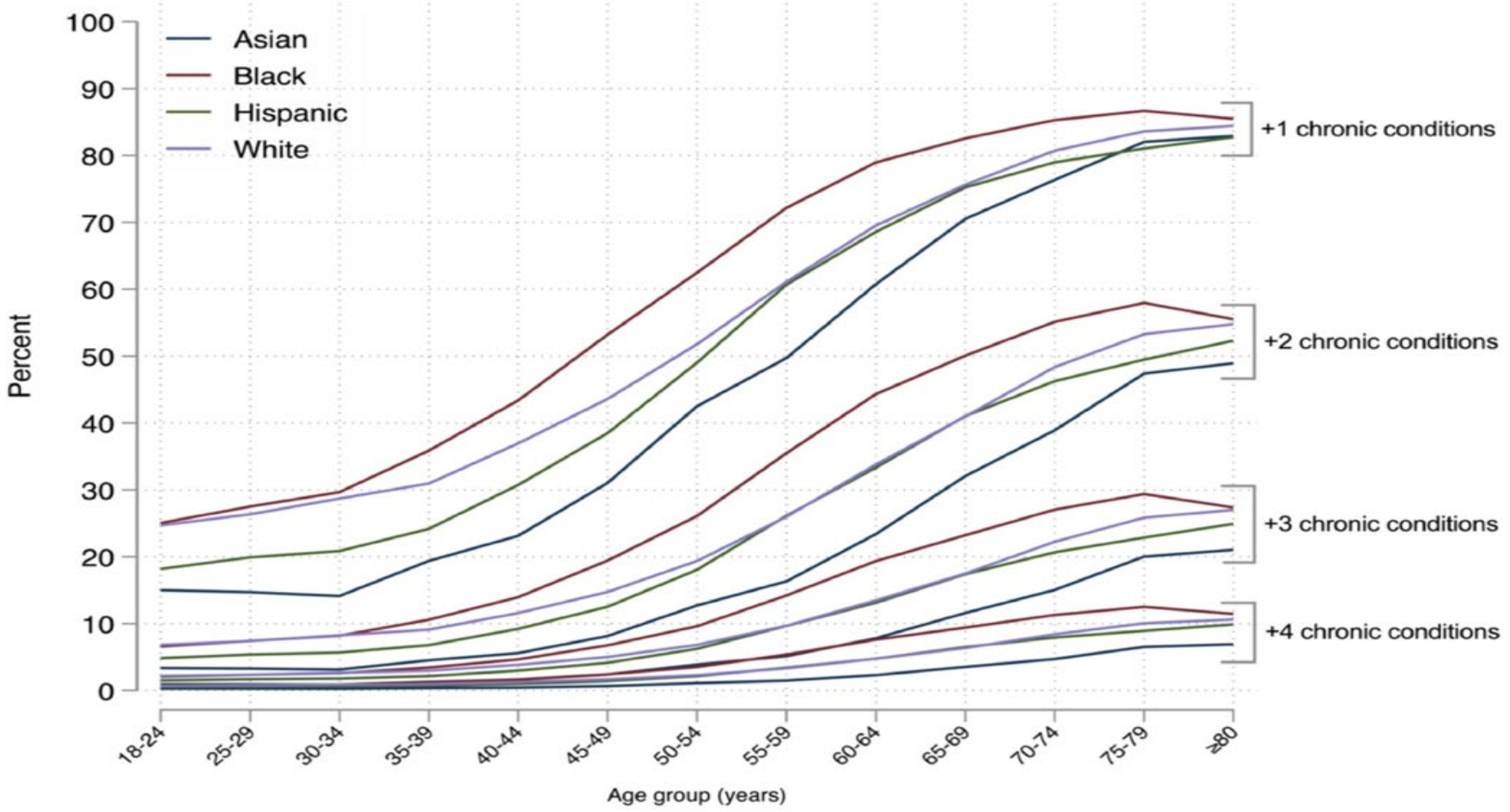


A/PI: Asian or Pacific Islander; AI/AN: American Indian or Alaska Native

CDC COVID Data Tracker. https://covid.cdc.gov/covid-data-tracker/#covidnet-hospitalization-network. Accessed October 15, 2024

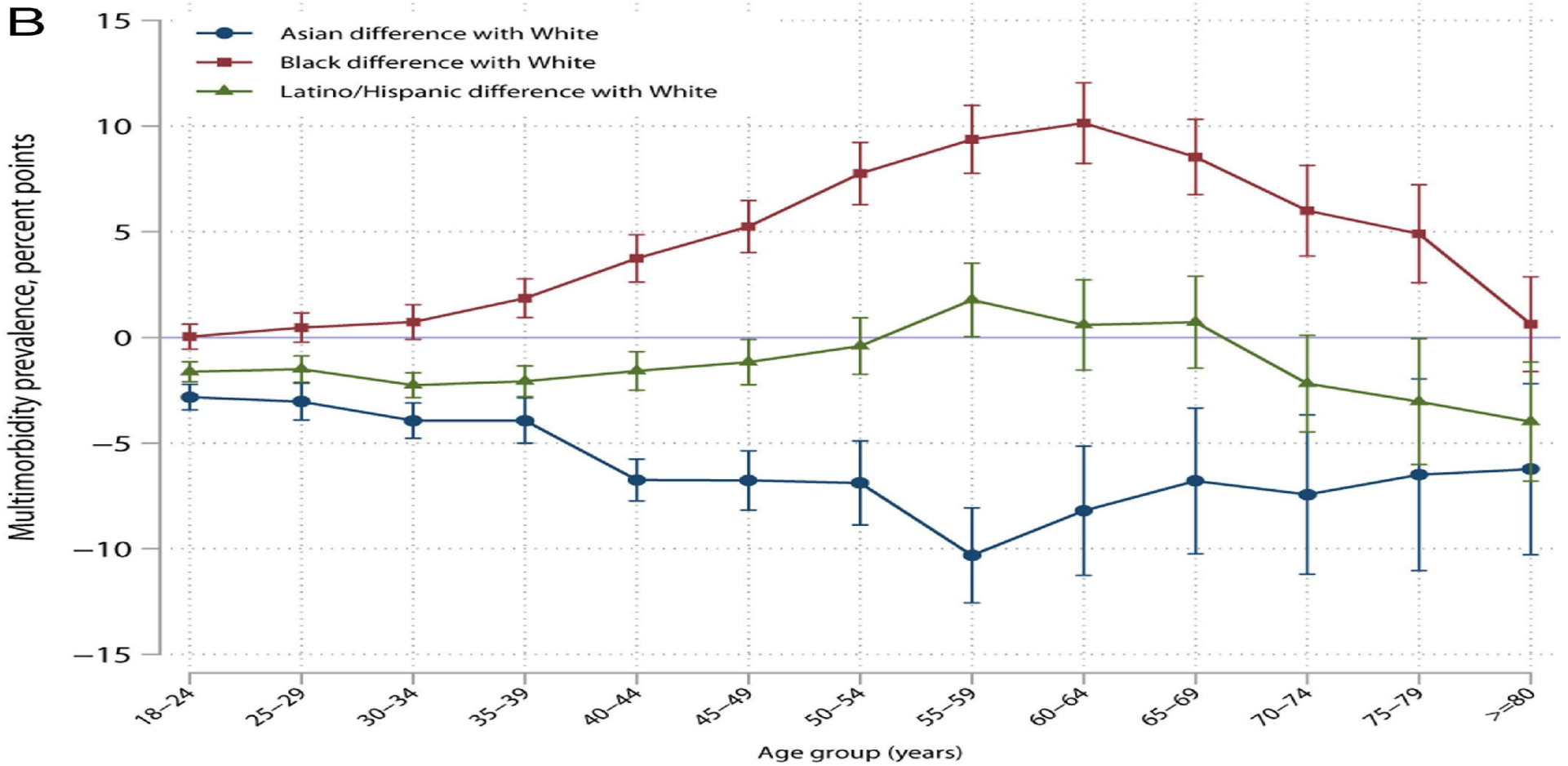
Equity

Number of chronic conditions by age among Asian, Black, Latino/Hispanic, and White adults in the National Health Interview Survey, 1999 to 2018



Caraballo C, Herrin J, Mahajan S, et al. Temporal Trends in Racial and Ethnic Disparities in Multimorbidity Prevalence in the United States, 1999-2018. *Am J Med*. 2022;135(9):1083-1092.e14. doi:10.1016/j.amjmed.2022.04.010

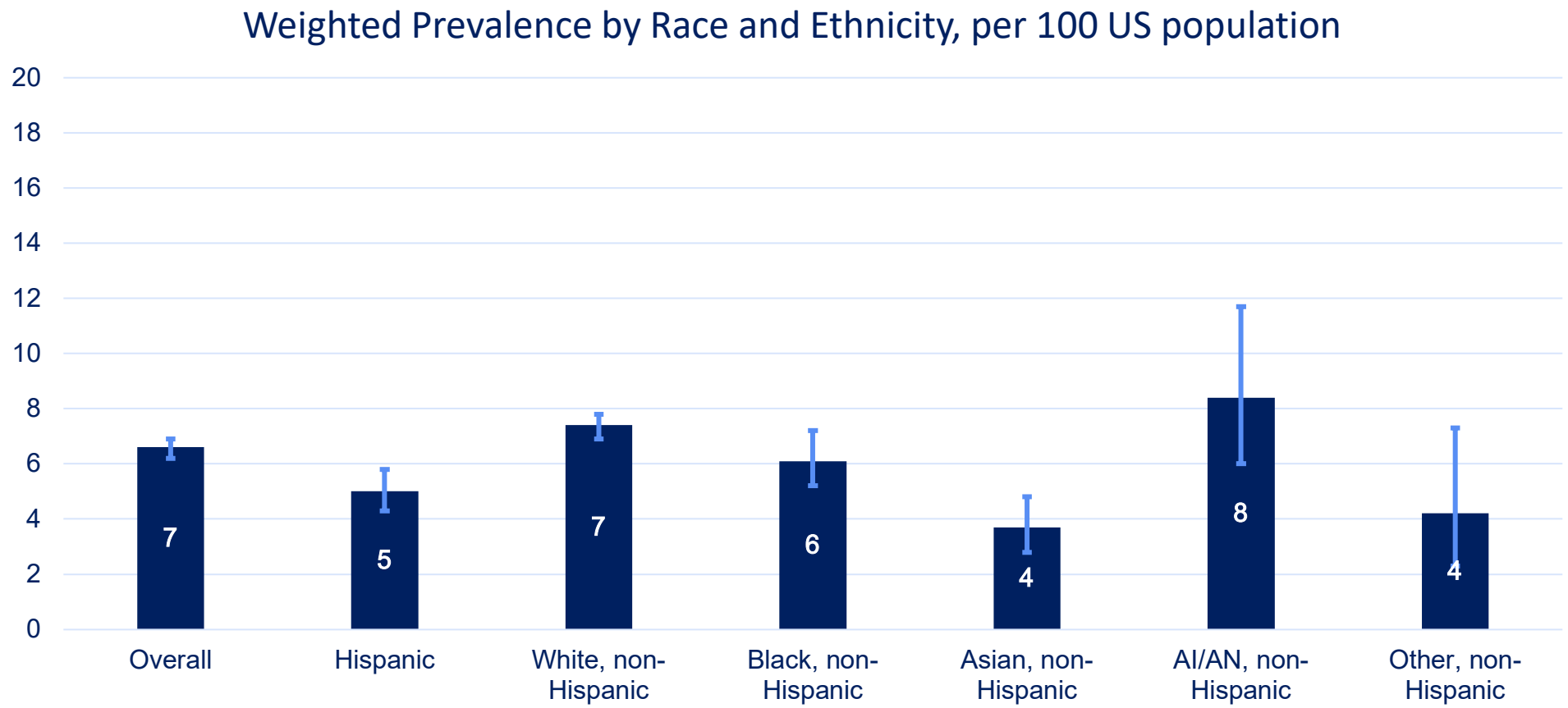
Difference in prevalence of multiple chronic conditions by age and race/ethnicity, National Health Interview Survey, 1999 to 2018



Caraballo C, Herrin J, Mahajan S, et al. Temporal Trends in Racial and Ethnic Disparities in Multimorbidity Prevalence in the United States, 1999-2018. *Am J Med*. 2022;135(9):1083-1092.e14. doi:10.1016/j.amjmed.2022.04.010

Equity

Prevalence of Self-Reported Status of Immunosuppression Among US Adults, NHIS 2021



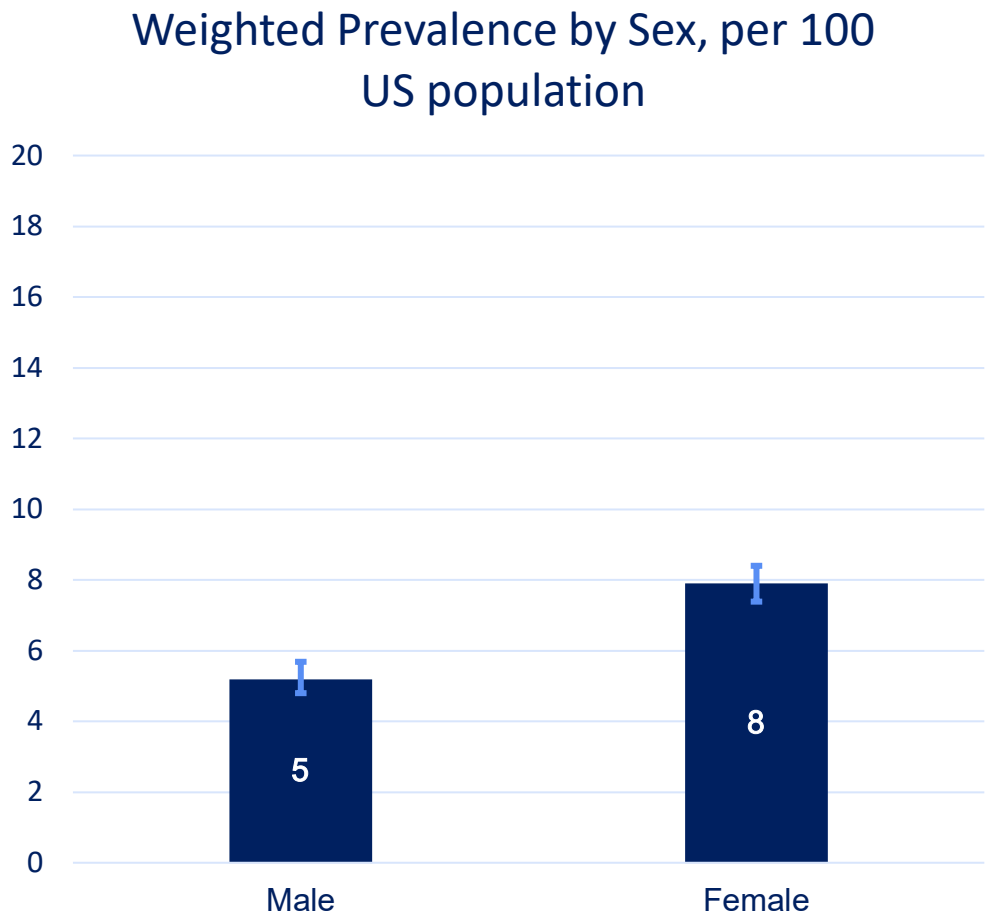
95% Confidence interval represented by error bars

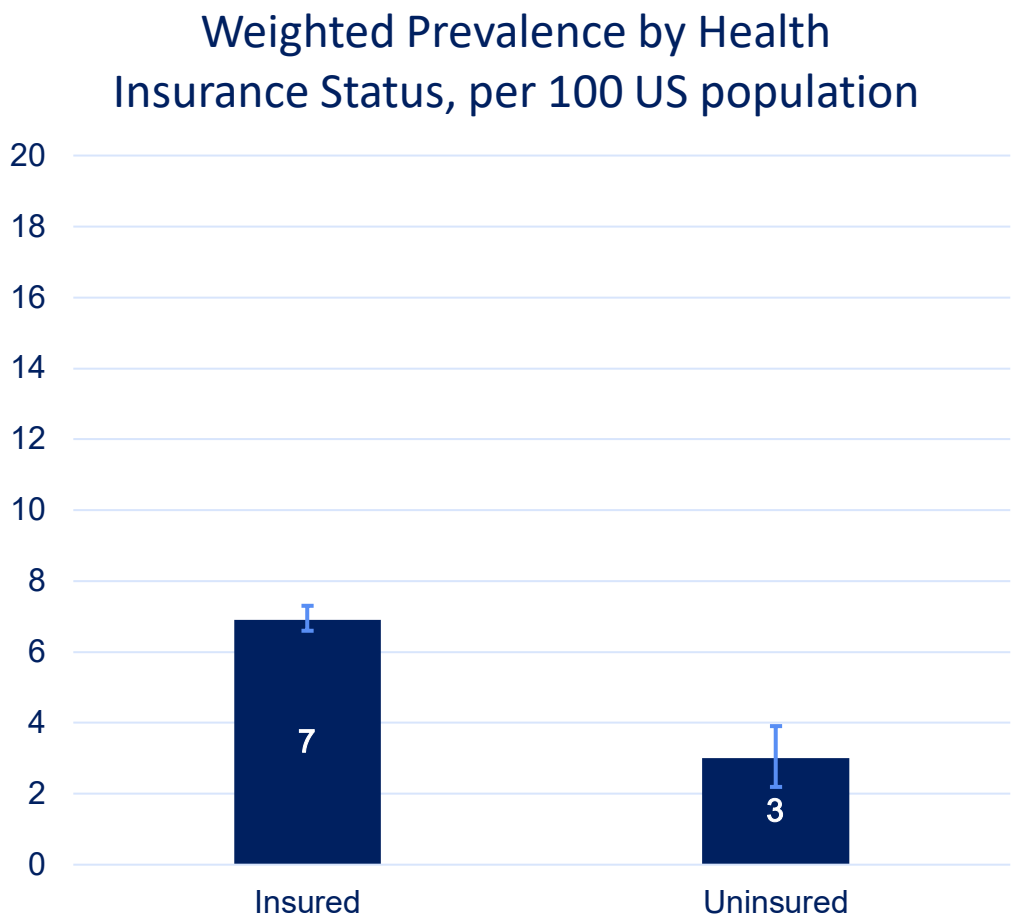
Other: NHIS includes a choice for "some other race" in the questionnaire for respondents who do not identify with the racial and ethnic categories provided

https://jamanetwork.com/journals/jama/fullarticle/2815274

Equity

Prevalence of Self-Reported Status of Immunosuppression Among US Adults, NHIS 2021





95% Confidence interval represented by error bars

https://jamanetwork.com/journals/jama/fullarticle/2815274

Equity

Summary

Public Health Problem – Adults ages ≥65 years

- SARS-CoV-2 continues to circulate year-round with peaks occurring in the winter and late summer
- Adults ≥65 years have the highest rates of hospitalizations due to COVID-19 compared to other age groups, though hospitalizations have decreased over time
- Adults ≥65 years also have the highest rates of death due to COVID-19
- Adults ≥65 years have higher rates of vaccination-only seroprevalence compared to younger ages
- Age-adjusted COVID-19 associated hospitalizations are highest among American Indian/Alaska Native non-Hispanic persons followed by Black non-Hispanic persons and are lowest among Asian and Pacific Islander non-Hispanic persons
- The number of chronic conditions increases with increasing age, and are higher among Black non-Hispanic persons than other racial and ethnic groups
  - By age 50, approximately 25% of Black non-Hispanic persons have 2 or more chronic conditions, and by age 65, approximately 50% have 2 or more chronic conditions

Summary

Public Health Problem – People with moderate or severe immunocompromise

- About 1 in 6 people hospitalized with COVID-19 have an immunocompromising condition
- Risk for severe outcomes during COVID-19–associated hospitalization among adults varies by immunocompromising condition status.
- Prevalence of self-reported immunosuppression status differs by race and ethnicity, sex, and health insurance status

Public Health Problem

Work Group Interpretation

Is COVID-19 disease among adults ages ≥65 years of public health importance?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Is COVID-19 disease among persons with moderate or severe immunocompromise of public health importance?

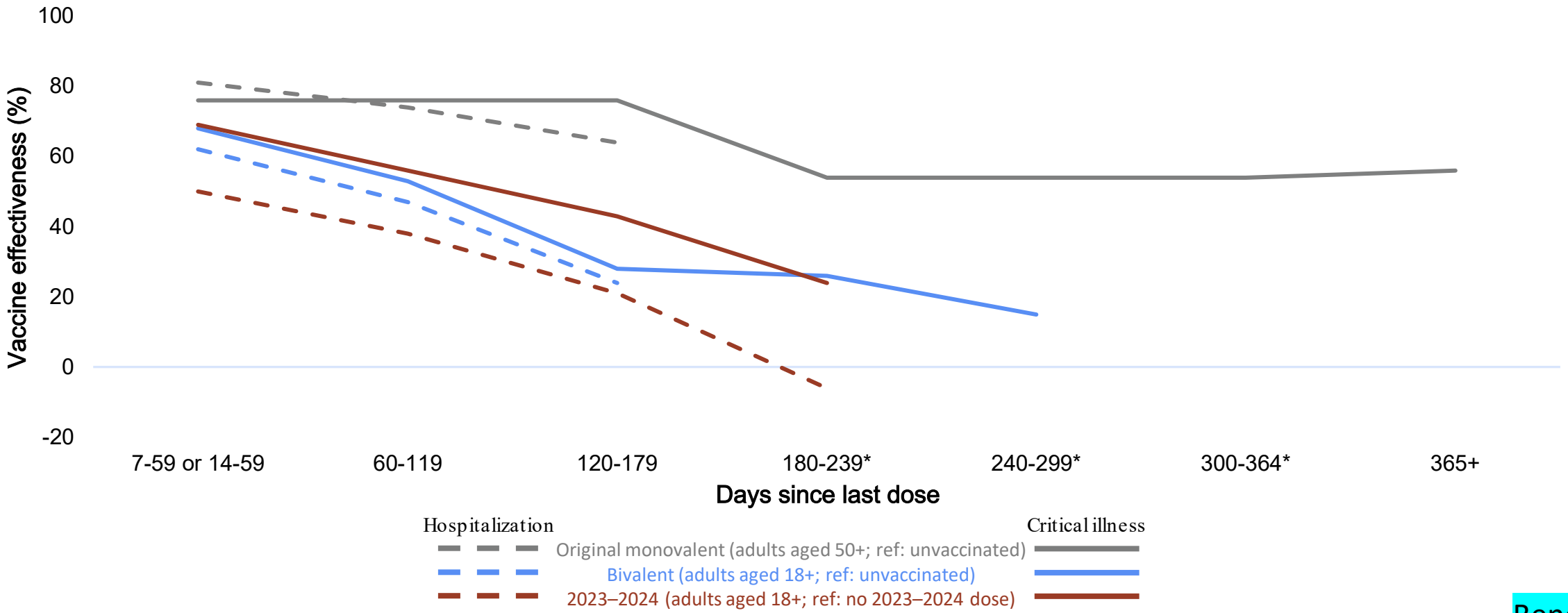
○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

EtR Domain:

Benefits and Harms

COVID-19 vaccine effectiveness (VE) against hospitalization wanes over time, but is more sustained against critical illness, though some waning is evident

Data from VISION and IVY showing VE by vaccine formulation of most recent dose.



Recipients of bivalent and 2023–2024 doses included in this analysis received a single dose of the most recent formulation.

Sources: DeCuir, et al., MMWR 2023/ Link-Gelles, ACIP Slides, April 20, 2022; CDC unpublished data updated from Link-Gelles, ACIP Slides, June 23, 2023; CDC unpublished data updated from: Link-Gelles, ACIP Slides, June 27, 2024

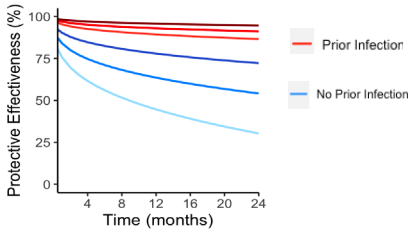
* For original monovalent doses, VE for hospitalization was for 180-364 days from last dose combined. For 2023–2024 doses, VE for hospitalization was for ≥180 days combined, with a median of 228 days (IQR: 202-259).

Benefits

Microsimulation modeling study compares frequency of COVID-19 vaccination by risk group

Step 1: Assign to risk group

- Age group: 18-49, 50-64, 65-74, 75+ years
- Immune status: immunocompetent, immunocompromised (mild, moderate/severe)

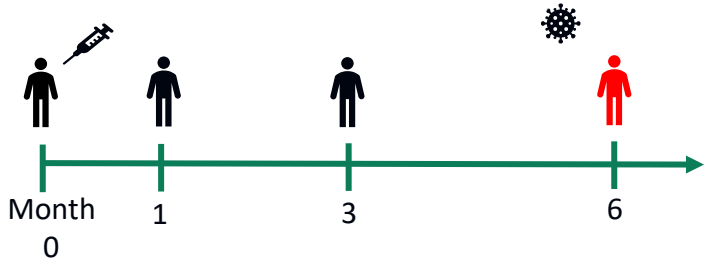


Step 2: Simulate vaccine-induced or hybrid protection

- Vaccine: number doses, timing of last dose
- Prior infection: yes/no, timing of last infection
- Vaccine/hybrid protection data: level of protection and waning curves

Step 3: Calibrate model to data

- Epidemiologic data: COVID-19 severe incidence, seroprevalence
- Calibrated to ~September 2022



Step 4: Run simulation of different vaccine strategies

- Vaccine strategies: One-time (1 dose); Annual (2 doses), Semi-annual (4 doses); Simulate over 2-years
- Simulate person-level waning of protection and COVID-19 at each time step (static infection model)
- Primary study outcome: Absolute annual risk of severe COVID-19

Park, H.J., Gonsalves, G.S., Tan, S.T. *et al.* Comparing frequency of booster vaccination to prevent severe COVID-19 by risk group in the United States. *Nat Commun* **15**, 1883 (2024). https://doi.org/10.1038/s41467-024-45549-9

Annual and semiannual COVID-19 vaccine doses likely to have largest benefit in people ages ≥65 years and people who are immunocompromised

	Absolute annual risk of COVID-19 hospitalization* (cases per 100,000; uncertainty interval)	Annual risk reduction of COVID-19 hospitalization*		NNT to avert one COVID-19 hospitalization*
		Absolute risk (cases per 100,000)	Relative risk (%)	
One-time booster				
18-49 years	98 (85 - 125)	--	--	--
50-64 years	199 (185 - 238)	--	--	--
65-74 years	524 (499 - 562)	--	--	--
75+ years	1,398 (1,332 - 1,501)	--	--	--
Immunocompromised (mild)	1,290 (1,205 – 1,403)	--	--	--
Immunocompromised (moderate/severe)	1,367 (1,266-1,503)	--	--	--
Annual booster				
18-49 years	84 (74 - 106)	14	14%	3,534
50-64 years	171 (159 - 202)	28	14%	1,806
65-74 years	446 (425 - 475)	78	15%	642
75+ years	1,198 (1,144 - 1,272)	199	14%	251
Immunocompromised (mild)	1,180 (1,088 - 1,316)	110	9%	456
Immunocompromised (moderate/severe)	1,183 (1,091-1,307)	184	13%	273
Semiannual booster (every 6 months)				
18-49 years	72 (64 - 90)	26	27%	1,916
50-64 years	147 (136 - 171)	52	26%	968
65-74 years	382 (365-404)	142	27%	353
75+ years	1,030 (988 - 1,088)	368	26%	136
Immunocompromised (mild)	1,095 (987 - 1,255)	195	15%	257
Immunocompromised (moderate/severe)	1,057 (966-1,183)	310	23%	162

NNT: number of persons needed to follow vaccine strategy to prevent one severe COVID-19 case over 2-year period

*Hospitalization for COVID-19 defined as severe COVID-19 in publication

Note: incidence of severe COVID-19 is currently lower than when this model was calibrated, so measures of absolute risk are likely an overestimate and NNTs are likely an underestimate based on current epidemiology

Park, H.J., Gonsalves, G.S., Tan, S.T. *et al.* Comparing frequency of booster vaccination to prevent severe COVID-19 by risk group in the United States. *Nat Commun* **15**, 1883 (2024). https://doi.org/10.1038/s41467-024-45549-9

Summary of Benefits: Adults ≥65 years

- **2023–2024 COVID-19 vaccination provided increased protection against COVID-19 associated ED/UC visits and hospitalizations compared to no 2023–2024 vaccine dose.**
  - Protection waned to 0 against COVID-19-associated ED/UC visits and hospitalization by ~4-6 months
- **Waning patterns of 2023–2024 COVID-19 vaccines appeared similar to previous COVID-19 vaccine formulations; most durable protections appeared to be for critical illness**
  - VE against critical illness remained above 40% at 5 months after vaccination among those ≥65 years
- **As with previous COVID-19 vaccine formulations, effectiveness was similar across age groups**
- **Data from prior seasons shows that an additional dose appeared to provide some additional protection**
- **Updated COVID-19 vaccination helped provide protection against COVID-19–related thromboembolic events (ischemic stroke, venous thromboembolism, and myocardial infarction) in adults 65 years and older.**
- **Based on modeling data, annual and semiannual COVID-19 vaccine doses likely to have largest benefit in people ages ≥65 years and people who are immunocompromised**

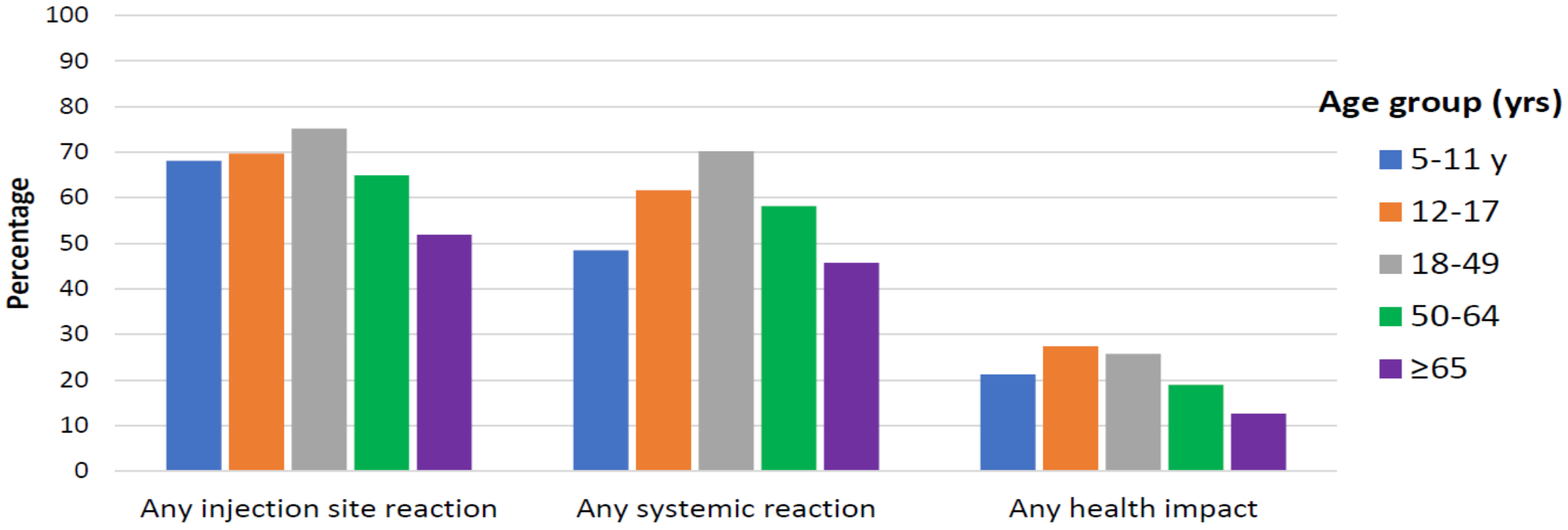
ED/UC: Emergency Department/Urgent Care

Summary of Benefits: People with moderate or severe immunocompromise

- **COVID-19 vaccines provided protection for both persons with and without immunocompromise.**
- **Patterns of COVID-19 VE in immunocompromised were different season-to-season, with generally lower VE compared to non-immunocompromised, but with inconsistent waning patterns**
  - During 2023–2024, VE against hospitalization in people with immunocompromising conditions waned to 0 by ~4-6 months.
- **This inconsistency in waning patterns is likely multifactorial, including:**
  - Heterogeneity among those classified as immunocompromised
  - Variation in underlying immunity and response to prior infection
  - Differing health behaviors (e.g., masking, social distancing) over time and by immunocompromise status
- **Based on modeling data, annual and semiannual COVID-19 vaccine doses likely to have largest benefit in people ages ≥65 years and people who are immunocompromised**

Reactogenicity and health impacts of COVID-19 vaccine were reported less frequently in those ≥65 years vs younger age groups

V-safe: reactions and health impacts reported by participants aged ≥5 years at least once in days 0-7 after bivalent booster dose, by age group, 2022–2023



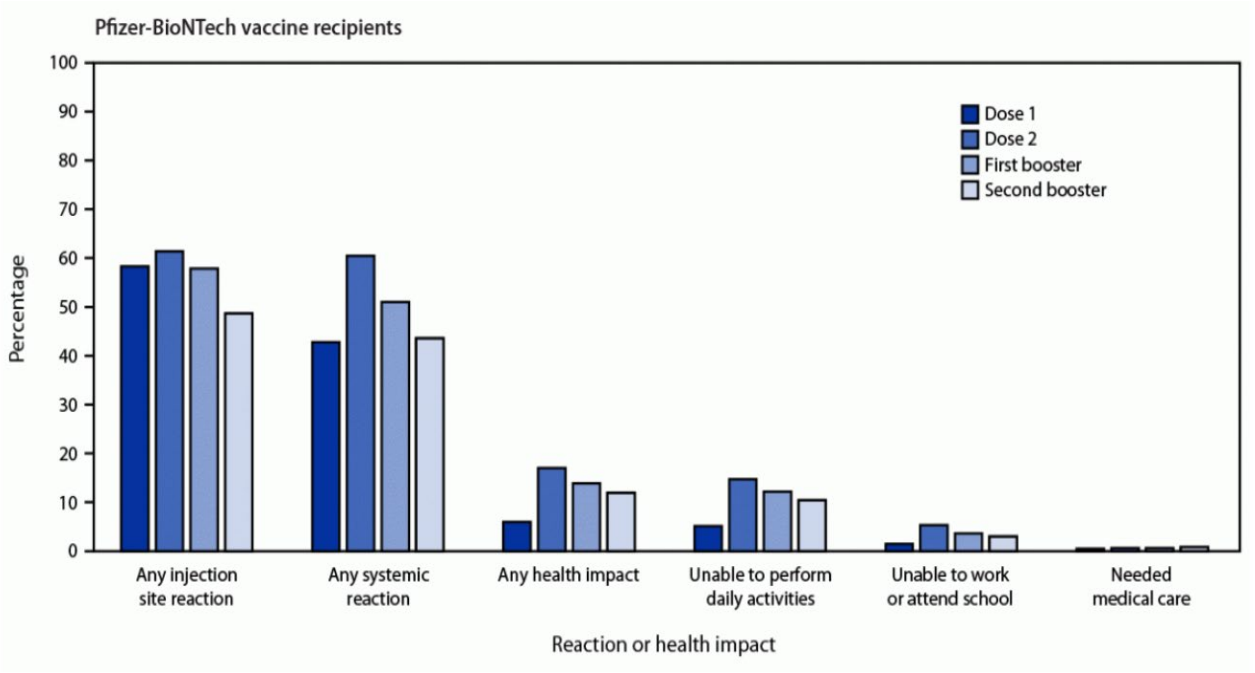
Data for participants aged ≥12 years as of October 23, 2022. Includes 311,205 participants who completed at least 1 survey in the first week after booster dose.
Data for participants aged 5-11 years as of February 5, 2023. Includes 3,588 participants who completed at least 1 survey in the first week after booster dose.

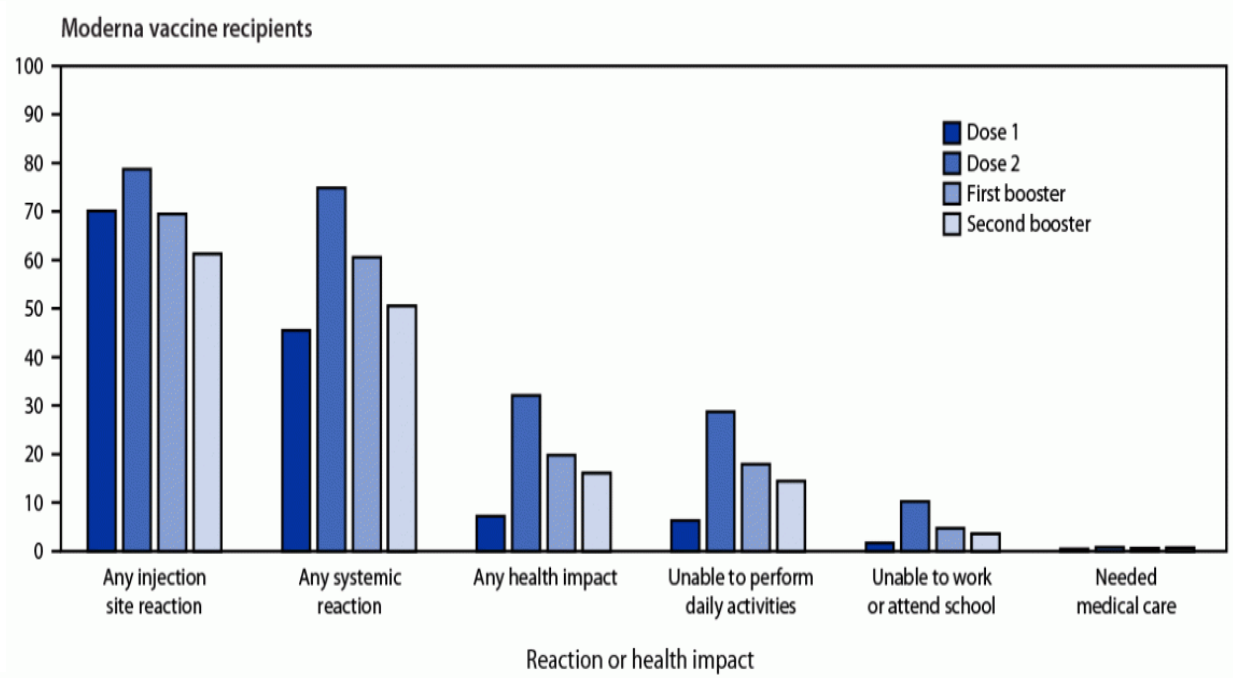
Presented to ACIP on Feb 24, 2023

Harms

Among persons aged ≥50 years, injection site and systemic reactions were reported less frequently to v-safe in subsequent dosing following the initial vaccination series

V-safe: reactions and health impacts reported by participants **aged ≥50 years** at least once in days 0-7 after doses 1– 4, through July 2022

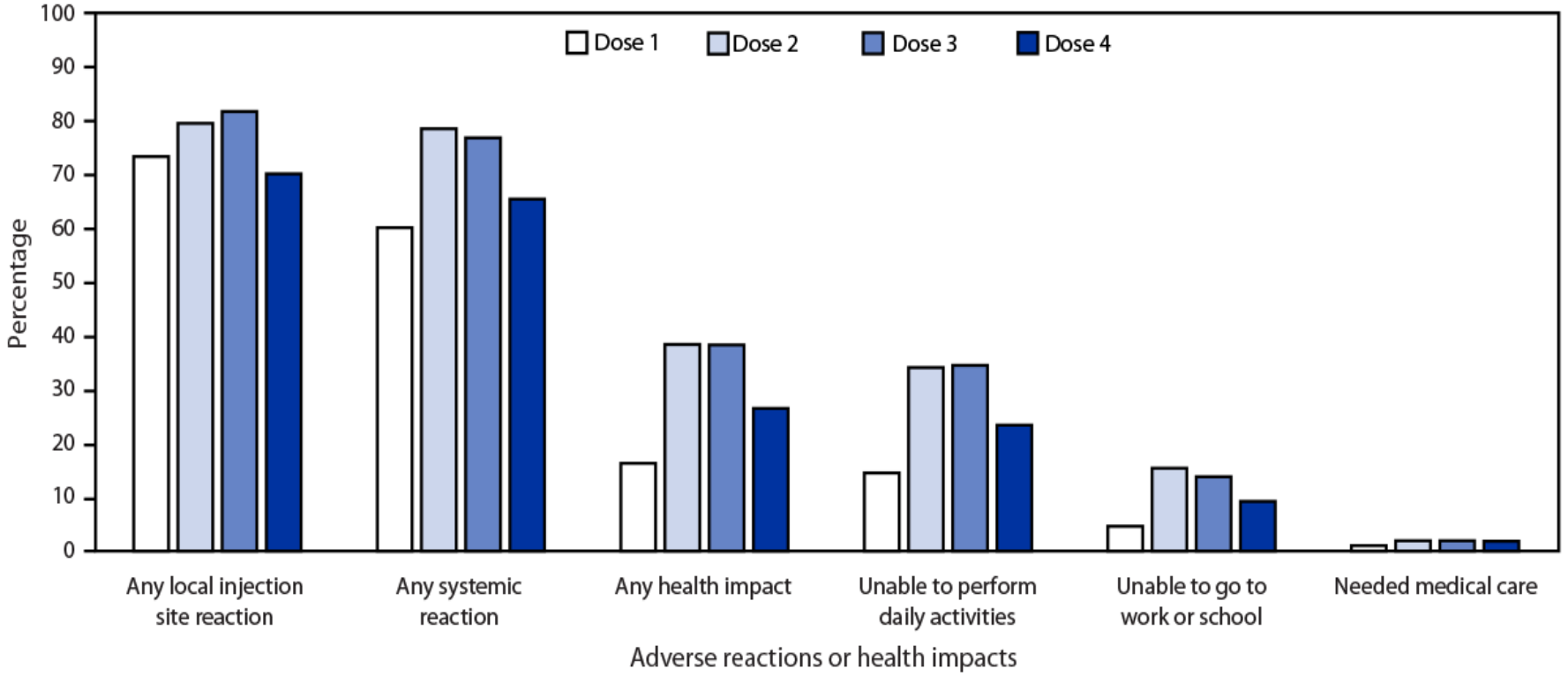




https://www.cdc.gov/mmwr/volumes/71/wr/mm7130a4.htm?s_cid=mm7130a4_w

Local and systemic reactions were less frequently reported to v-safe after mRNA booster (dose 4) than after the 3-dose initial series

V-safe: reactions and health impacts reported by participants aged ≥12 years with **presumed immunocompromise status** at least once in days 0-7 after doses 1–4, through March 2022



https://www.cdc.gov/mmwr/volumes/71/wr/mm7128a3.htm?s_cid=mm7128a3_w

VSD signal for ischemic stroke in 2022–2023

- **Vaccine Safety Datalink (VSD) Rapid Cycle Analysis (RCA) is weekly sequential active surveillance**
- **Ischemic stroke was a prespecified outcome monitored by RCA**
  - No signal following primary series doses (2020–2021)
  - No signal following first booster (3rd) dose (2021–2022)
  - **Signal** following first bivalent vaccine dose (2022–2023)
    - For Pfizer-BioNTech COVID-19 vaccine, bivalent among people aged ≥65 years in the 1–21 days risk interval following vaccination compared to days 22–42
    - Presented to ACIP on February 24, 2023
    - Follow-up ACIP presentations in April 2023 and October 2023
      - Reviewed findings from 7 studies done in 4 countries
      - No clear and consistent evidence of a safety problem

https://www.fda.gov/vaccines-blood-biologics/safety-availability-biologics/cdc-and-fda-identify-preliminary-covid-19-vaccine-safety-signal-persons-aged-65-years-and-older

It is currently unclear if the VSD signal for ischemic stroke in 2023–2024 represents a true increased risk following COVID-19 vaccination

- **Vaccine Safety Datalink (VSD) Rapid Cycle Analysis (RCA) for 2023–2024 identified statistical signals for ischemic stroke following:**
  - Moderna (aged ≥65 years)
  - Pfizer (aged 50-64 years)
- **Presented to ACIP on June 27, 2024**
- **CDC and FDA are continuing to evaluate this outcome**

https://www.cdc.gov/acip/meetings/presentation-slides-june-26-28-2024.html

VSD signal for Guillain-Barré syndrome (GBS) in 2023–2024

- VSD had not identified any signals for GBS with previous mRNA COVID-19 vaccine formulations (i.e., original primary series, original booster, or 2022–2023 bivalent)
- **The increased rate ratio observed for Pfizer COVID-19 vaccine during the 2023–2024 season may or may not represent a true risk**
  - A large number of analyses may find some associations by chance alone
  - Surveillance analyses may have residual confounding
- If there is a true risk, then the estimated excess GBS cases of 4.1 per million doses is similar to previous estimates for other vaccines for adults
  - Influenza: 1 - 2 cases per million doses[1]
  - Recombinant Zoster Vaccine: 3 - 6 cases per million doses[2]
- **There were insufficient doses of Moderna or Novavax vaccines administered in the VSD to assess the rate of GBS with those vaccines**

[1] Perez-Vilar S, et al. Guillain-Barré Syndrome After High-Dose Influenza Vaccine Administration in the United States, 2018-2019 Season. J Infect Dis. 2021 Feb 13;223(3):416-425.
[2] Janusz CB, et al. Projected risks and health benefits of vaccination against herpes zoster and related complications in US adults. Human Vaccines & Immunotherapeutics, 18(5), 2022.

Pending information relevant to VSD signals for ischemic stroke and GBS

- FDA's 2023–2024 COVID-19 vaccine safety surveillance using commercial health plans and Medicare claims databases results are expected later this year, which will provide additional information about ischemic stroke, GBS, and other outcomes
- A follow-up VSD study is in progress to further examine the risk of ischemic stroke after mRNA COVID-19 vaccines during 2022–2023 and 2023–2024

VSD: Vaccine Safety Datalink; GBS: Guillain-Barré syndrome

Summary: COVID-19 vaccine safety

- **Robust safety surveillance over 3 years of COVID-19 vaccine use demonstrated that serious adverse events have been rare.**
  - Anaphylactic reactions have been rarely reported following receipt of COVID-19 vaccines.
  - Rare risk of myocarditis and pericarditis, however this is predominately in males ages 12-39 years.
    - There has been no increased risk observed in adults aged ≥65 years
    - Whether the risk might be different in immunocompromised people is unknown
- **COVID-19 vaccine doses continue to be reactogenic**
  - The rate of local and systemic reactions reported to V-safe was lower with additional doses than after the initial series
  - Most vaccine recipients have mild reactions, but during 2023–2024, at least 10% reported health impact events during the 7 days post-vaccination, such as being unable to complete daily activities
  - Overall, symptoms less frequent and severe among older adults compared with adolescents and younger adults.

Domain Equity Question:

Are the desirable and undesirable anticipated effects demonstrated across all populations equally?

Are the desirable and undesirable anticipated effects demonstrated across all populations equally?

- There is no evidence to suggest that COVID-19 vaccine effectiveness varies substantially by race/ethnicity.[1,2]
  - Differences in vaccine hesitancy/uptake, crowding, access to care, and prior infection could impact vaccine effectiveness and these factors may also differ by race/ethnicity.
- There is no evidence to suggest that COVID-19 vaccine safety profiles vary by race/ethnicity, however risk has been shown to differ by age and sex.
  - Risk for myocarditis is highest in adolescent and young adult males.
- Benefits and harms for the U.S. population are best assessed when clinical trial and study populations are optimally representative of the U.S. population.

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9619452/
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9763212/

Benefits and Harms

How substantial are the desirable anticipated effects of a second dose of 2024–2025 COVID-19 vaccine in adults ages ≥65 years?

- How substantial are the anticipated effects for each main outcome for which there is a desirable effect?

○ **Minimal**	○ **Small**	○ **Moderate**	○ **Large**	○ **Varies**	○ **Don't know**

Benefits and Harms

How substantial are the undesirable anticipated effects of a second dose of 2024–2025 COVID-19 vaccine in adults ages ≥65 years?

- How substantial are the anticipated effects for each main outcome for which there is an undesirable effect?

○ Minimal	○ Small	○ Moderate	○ Large	○ Varies	○ Don't know

Majority Opinion

Minority Opinion

Benefits and Harms

Do the desirable effects of a second dose of 2024–2025 COVID-19 vaccine outweigh the undesirable effects in adults ages ≥65 years?

- What is the balance between the desirable effects relative to the undesirable effects?

○ Favors intervention (Additional dose of 2024 – 2025 COVID-19 vaccine)
○ Favors comparison (No additional dose of 2024 – 2025 COVID-19 vaccine)
○ Favors both
○ Favors neither
○ Unclear

Benefits and Harms

How substantial are the desirable anticipated effects of a second dose of 2024–2025 COVID-19 vaccine in people with moderate or severe immunocompromise?

- How substantial are the anticipated effects for each main outcome for which there is a desirable effect?

○ **Minimal**	○ **Small**	○ **Moderate**	○ **Large**	○ **Varies**	○ **Don't know**

Benefits and Harms

How substantial are the undesirable anticipated effects of a second dose of 2024–2025 COVID-19 vaccine in people with moderate or severe immunocompromise?

- How substantial are the anticipated effects for each main outcome for which there is an undesirable effect?

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Majority Opinion

Minority Opinion

Benefits and Harms

Do the desirable effects of a second dose of 2024–2025 COVID-19 vaccine outweigh the undesirable effects in people with moderate or severe immunocompromise?

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○ Favors neither
○ Unclear

Benefits and Harms

How substantial are the desirable anticipated effects of additional doses (i.e., 3 or more) of 2024–2025 COVID-19 vaccine in people with moderate or severe immunocompromise?

- How substantial are the anticipated effects for each main outcome for which there is a desirable effect?

○ Minimal	○ Small	○ Moderate	○ Large	○ Varies	○ Don't know

Benefits and Harms

How substantial are the undesirable anticipated effects of additional doses (i.e., 3 or more) of 2024–2025 COVID-19 vaccine in people with moderate or severe immunocompromise?

- How substantial are the anticipated effects for each main outcome for which there is an undesirable effect?

○ **Minimal** ○ **Small** ○ **Moderate** ○ **Large** ○ **Varies** ○ **Don't know**

Benefits and Harms

Do the desirable effects of additional doses (i.e., 3 or more) of 2024–2025 COVID-19 vaccine outweigh the undesirable effects in people with moderate or severe immunocompromise?

- What is the balance between the desirable effects relative to the undesirable effects?

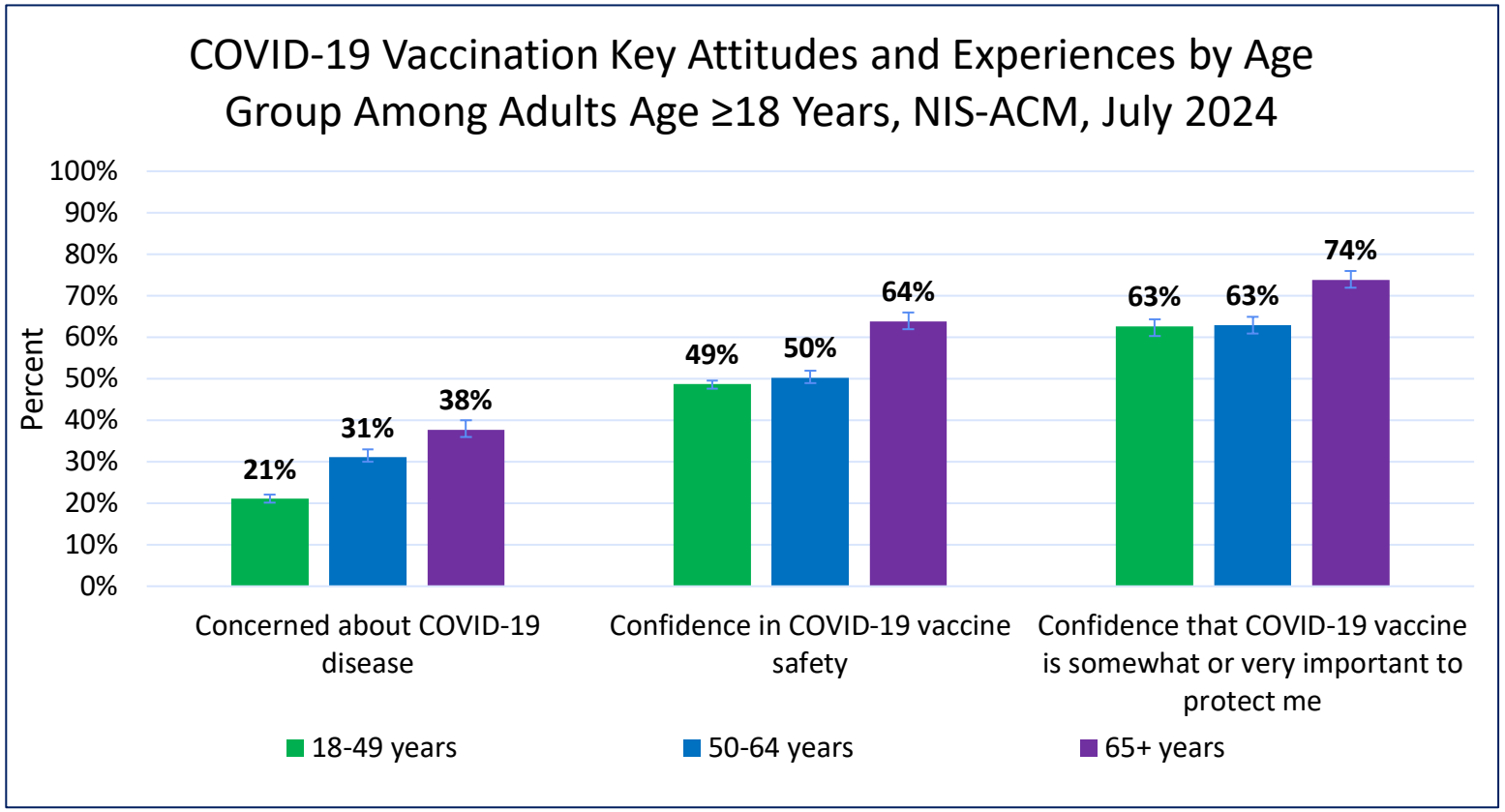
○ Favors intervention (Additional doses of 2024 – 2025 COVID-19 vaccine)
○ Favors comparison (No additional dose of 2024 – 2025 COVID-19 vaccine)
○ Favors both
○ Favors neither
○ Unclear

EtR Domain:

Values

Key attitudes and experiences among adults 18 years and older, July 2024

National Immunization Survey-Adult COVID Module (NIS-ACM)



Generally, adults ages 65 years and older were more concerned about COVID-19 disease and had higher confidence in vaccine safety and vaccine importance; those ages 18–49 years and 50–64 years were less concerned and confident.

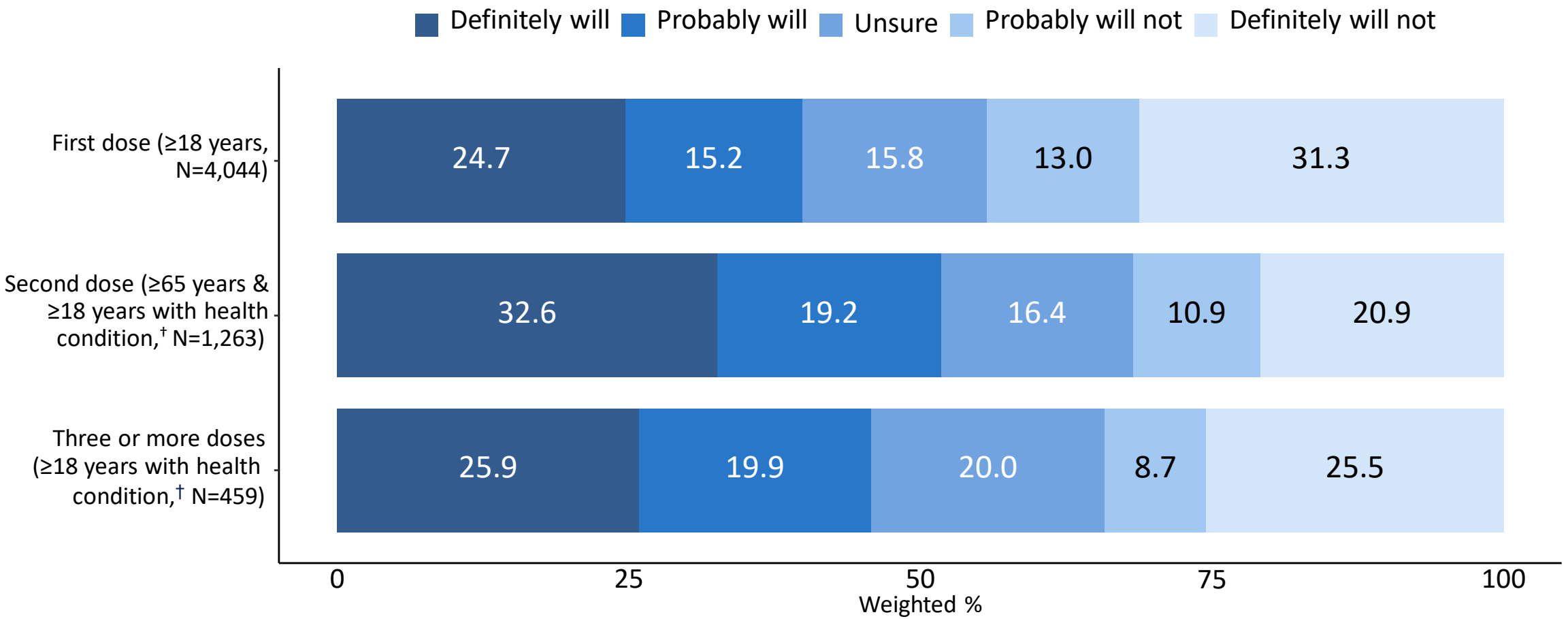
The July estimates are based on data collected July 1–27 2024.
CDC. COVID-19 Vaccination Coverage and Vaccine Confidence Among Adults.
https://www.cdc.gov/covidvaxview/interactive/adults.html?CDC_AAref_Val=https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/interactive/adults.html
Accessed October 3, 2024

Values: People with moderate or severe immunocompromise

- **Limited data exists on concern about COVID-19 disease specifically in people with moderate or severe immunocompromise**

Intent to receive 2024–2025 COVID-19 vaccination among adults ≥18 years

*Omnibus Surveys, August 8–26, 2024 (N=4,044)**



*165 respondents excluded from analysis due to inconsistent answers.

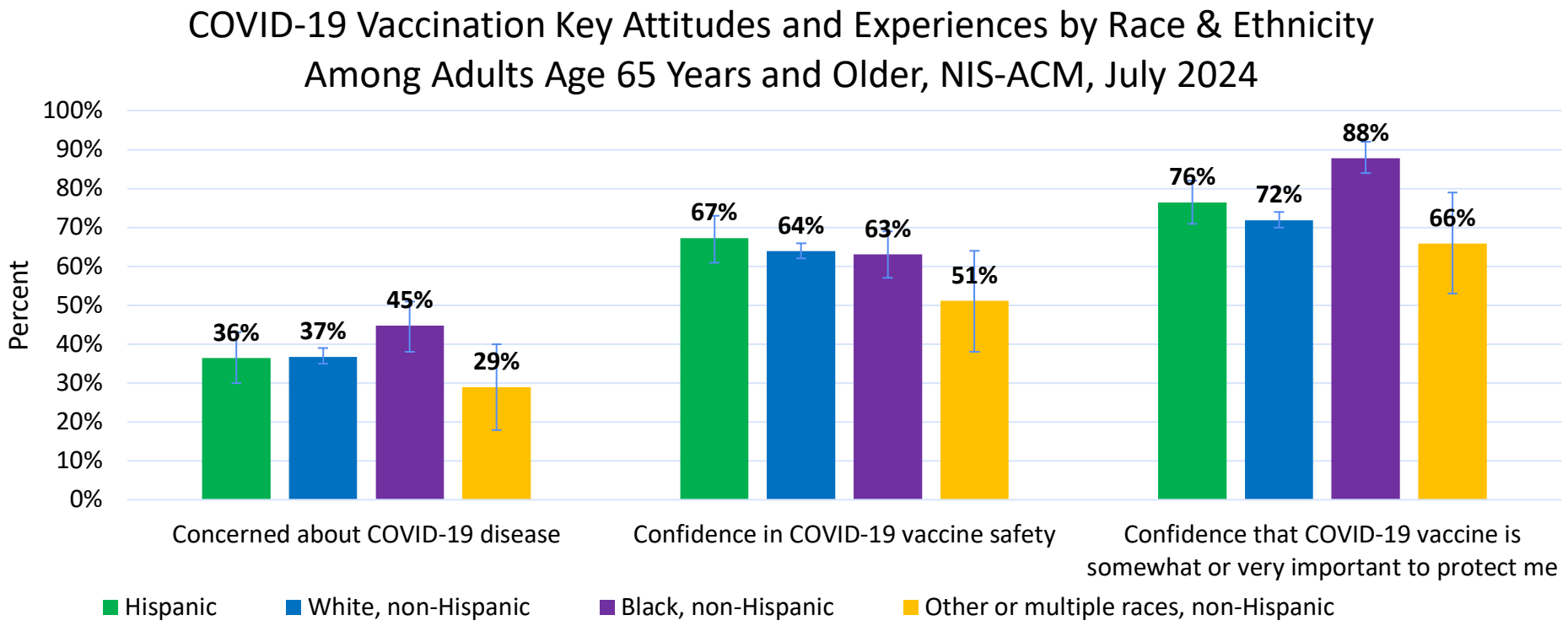
† Health condition includes cancer (excluding basal cell carcinoma and squamous cell carcinoma), solid organ or blood stem cell transplant, HIV, and immunocompromised state.

Domain Equity Question:

Is there important variability in how patients or populations value the outcome?

Key attitudes and experiences among adults 65 years and older, July 2024

National Immunization Survey-Adult COVID Module (NIS-ACM)



The July estimates are based on data collected July 1–27 2024.

CDC. COVID-19 Vaccination Coverage and Vaccine Confidence Among Adults. https://www.cdc.gov/covidvaxview/interactive/adults.html?CDC_AAref_Val=https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/interactive/adults.html Accessed October 3, 2024

Equity

Values

Criteria 1:

Do adults ages ≥65 years feel that the desirable effects are large relative to undesirable effects?

- How do adults ages ≥65 years view the balance of desirable versus undesirable effects?
- Would adults ages ≥65 years feel that the benefits outweigh the harms?

○ Minimal	○ Small	○ Moderate	○ Large	○ Varies	○ Don't know

Values

Criteria 2:

Is there important uncertainty about, or variability in, how adults ages ≥65 years value the main outcomes?

- Is there evidence that the variability is large enough to lead to different decisions?

○ Important uncertainty or variability
○ Probably important uncertainty or variability
○ Probably not important uncertainty or variability
○ No important uncertainty or variability
○ No known undesirable outcomes

Values

Criteria 1:

Do people with moderate or severe immunocompromise feel that the desirable effects are large relative to undesirable effects?

- How do immunocompromised persons ≥6 months of age view the balance of desirable versus undesirable effects?
- Would immunocompromised persons ≥6 months of age feel that the benefits outweigh the harms?

○ Minimal	○ Small	○ Moderate	○ Large	○ Varies	○ Don't know

Values

Criteria 2:

Is there important uncertainty about, or variability in, how persons with moderate or severe immunocompromise value the main outcomes?

- Is there evidence that the variability is large enough to lead to different decisions?

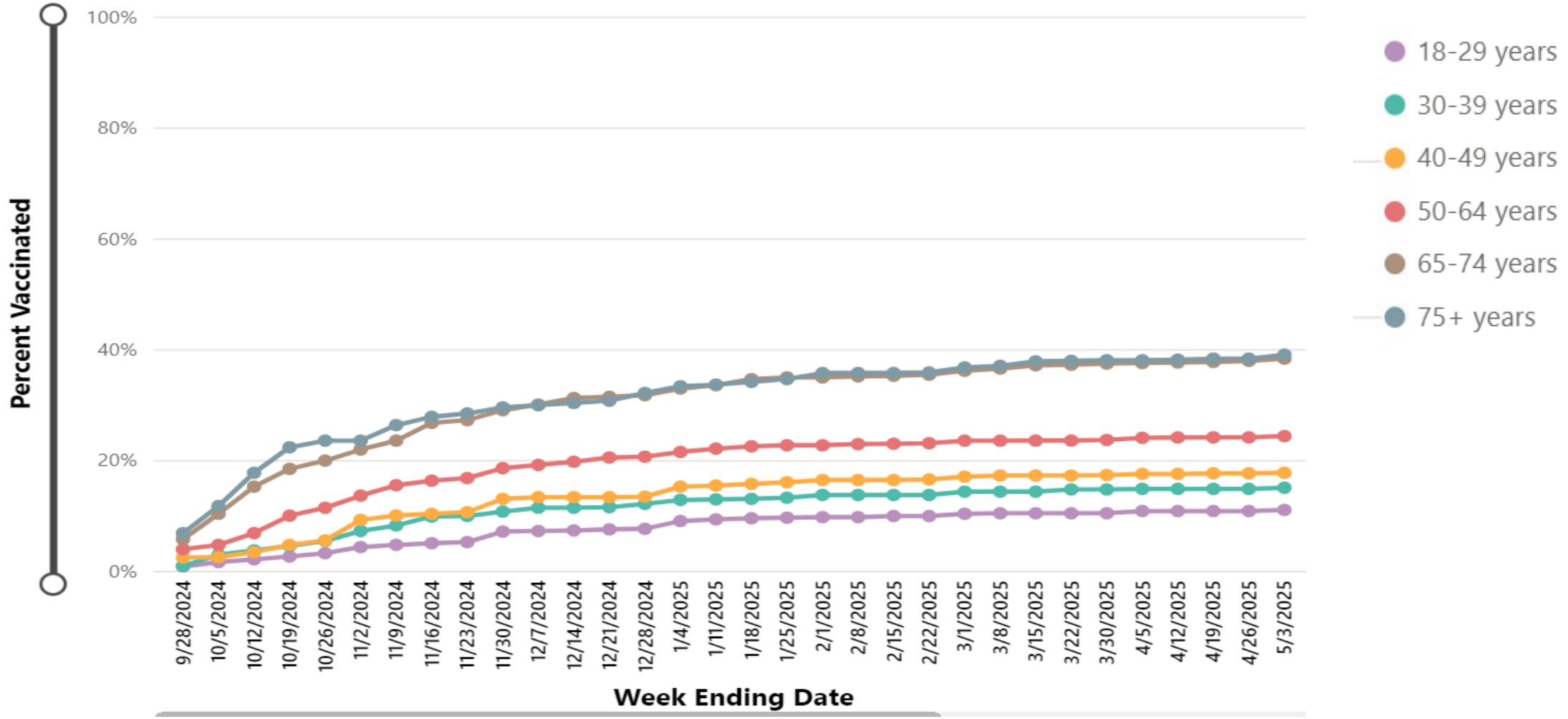
- ○ Important uncertainty or variability
- ○ Probably important uncertainty or variability
- ○ Probably not important uncertainty or variability
- ○ No important uncertainty or variability
- ○ No known undesirable outcomes

EtR Domain:

Acceptability

Percent vaccinated with 2023–2024 COVID-19 vaccine

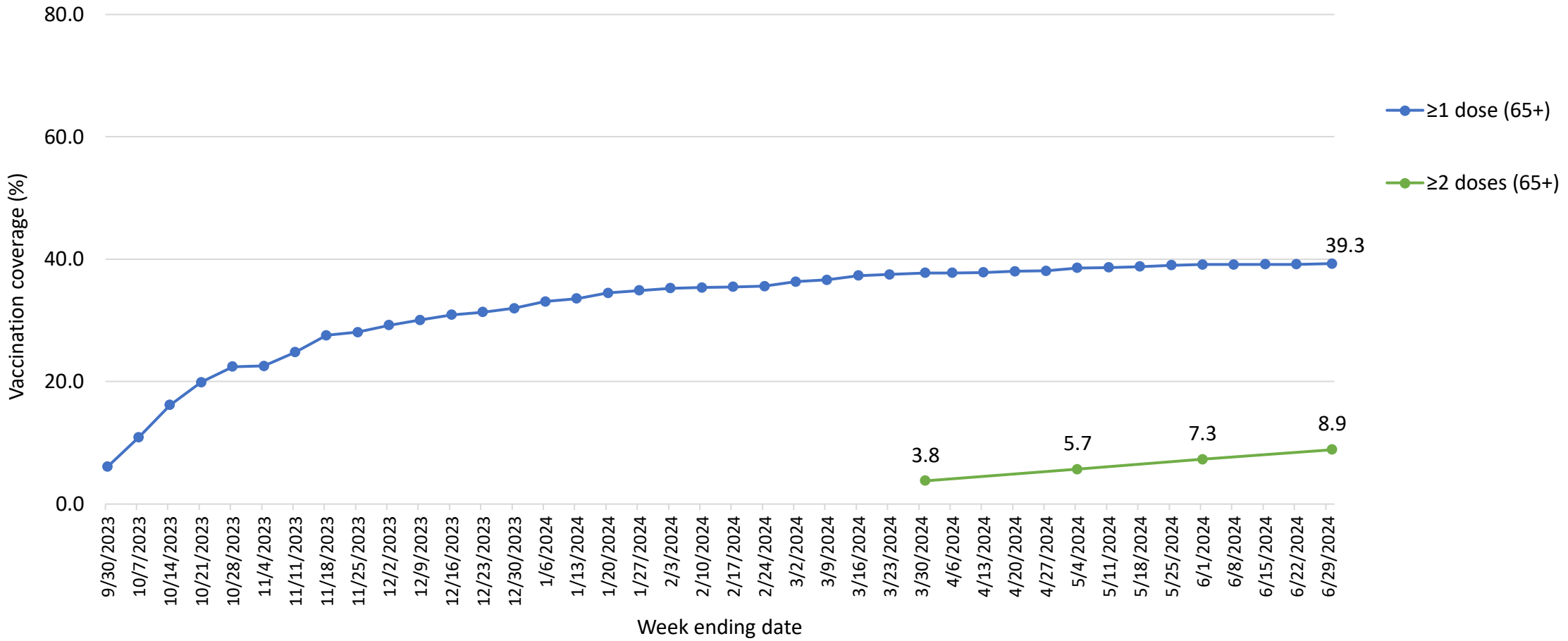
National Immunization Survey-Adult COVID Module (NIS-ACM)



https://www.cdc.gov/covidvaxview/weekly-dashboard/adult-vaccination-coverage.html accessed October 4, 2024

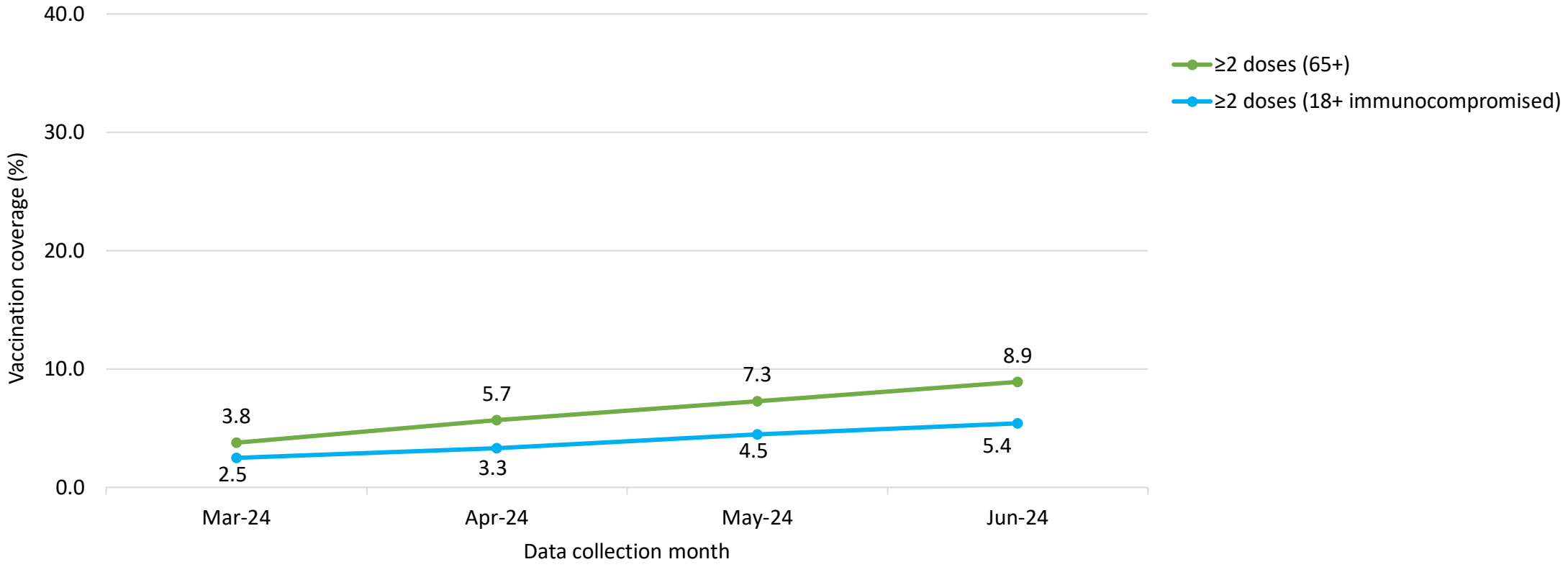
COVID-19 vaccination coverage (≥1 dose and ≥2 doses) among adults 65 years and older, 2023–2024

National Immunization Survey-Adult COVID Module (NIS-ACM)



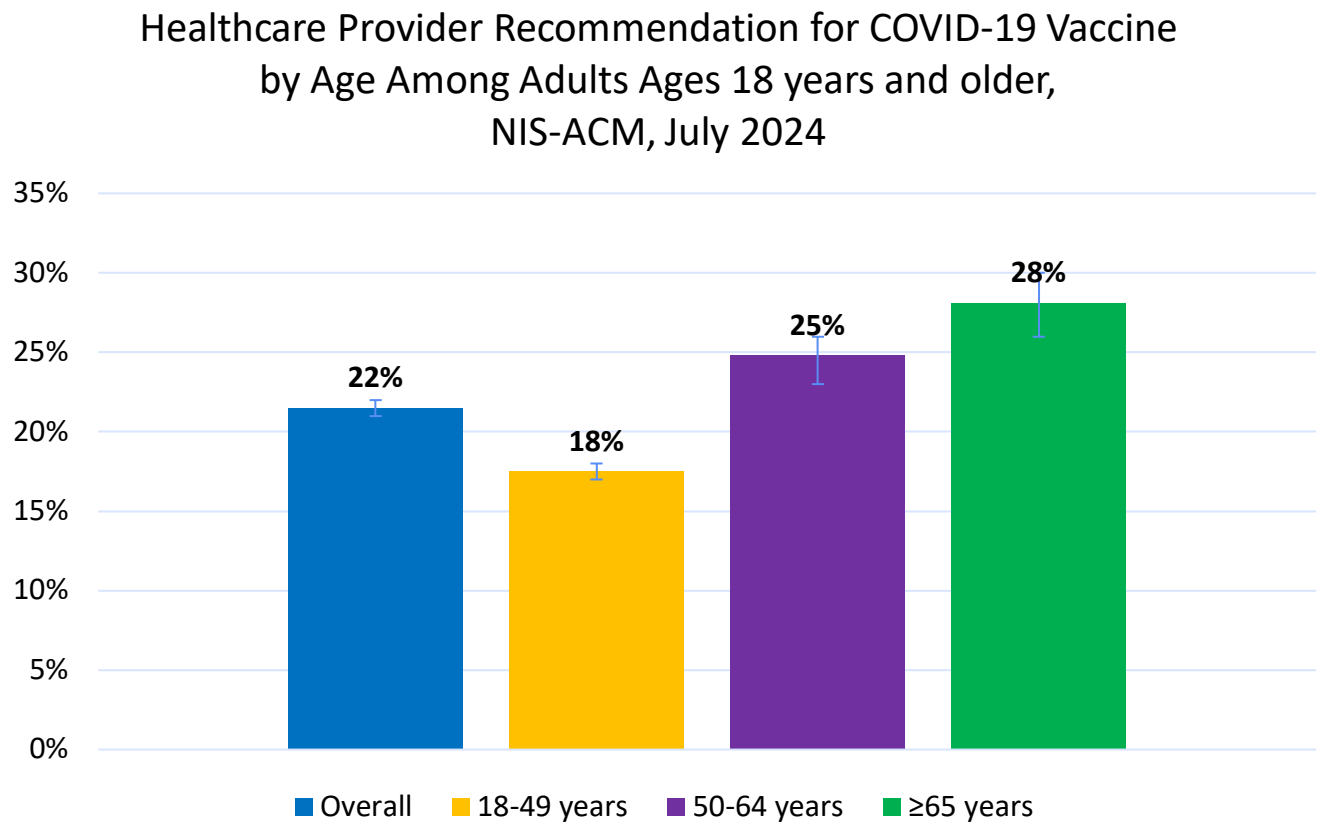
COVID-19 Vaccination Coverage (≥2 Doses) Among Adults 65 Years and Older and Adults 18 Years and Older Who Are Immunocompromised, 2024

National Immunization Survey-Adult COVID Module (NIS-ACM)



Healthcare provider recommendation for COVID-19 vaccine, by age, among adults ages 18 years and older, July 2024

National Immunization Survey-Adult COVID Module (NIS-ACM)



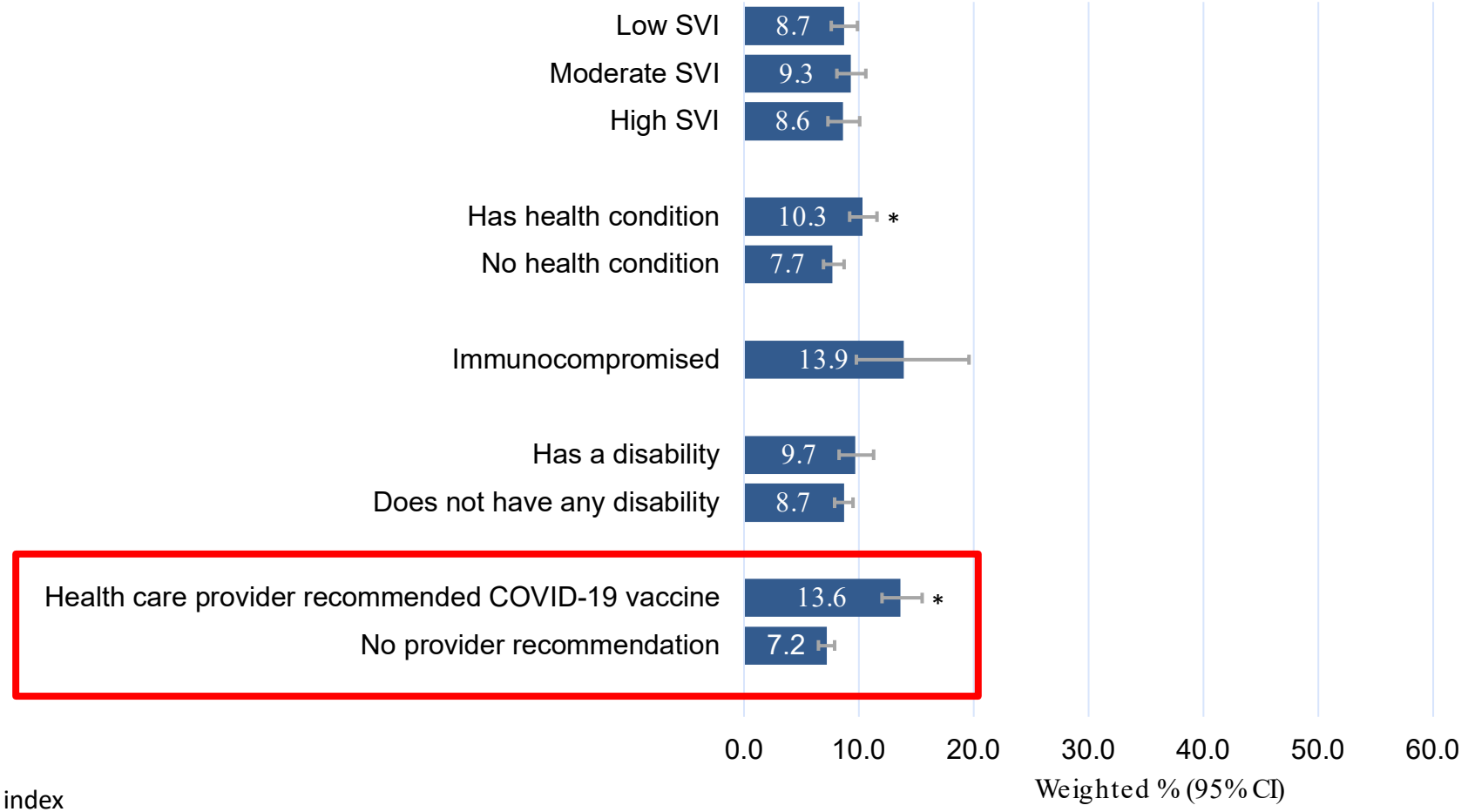
A healthcare provider recommendation for COVID-19 vaccine was highest among adults ages ≥65 years

The July estimates are based on data collected July 1–27 2024.

CDC. COVID-19 Vaccination Coverage and Vaccine Confidence Among Adults. https://www.cdc.gov/covidvaxview/interactive/adults.html?CDC_AAref_Val=https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/interactive/adults.html Accessed October 4, 2024

A healthcare provider recommendation was higher among adults 65 and older who had received ≥2 doses of 2023–2024 COVID-19 vaccine by end of June 2024

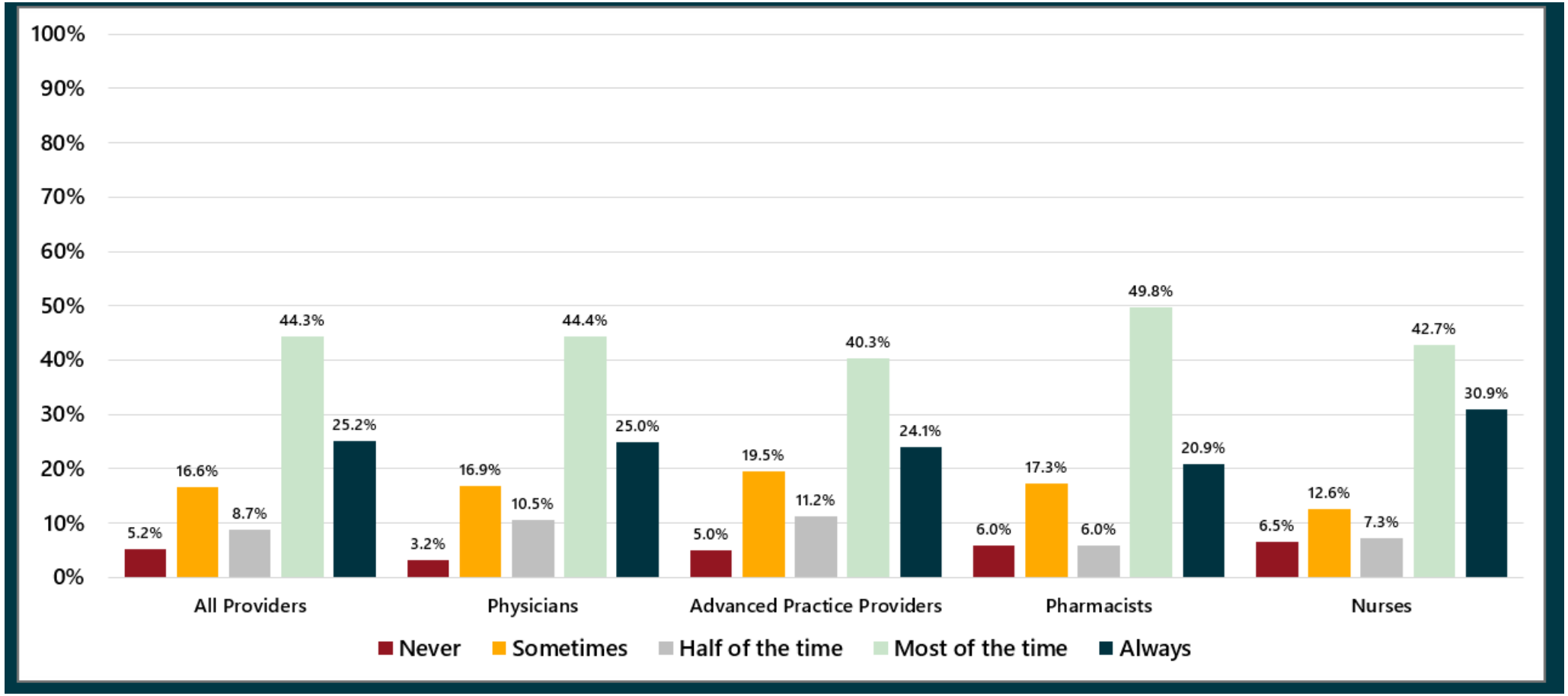
National Immunization Survey-Adult COVID Module (NIS-ACM)



SVI: Social vulnerability index

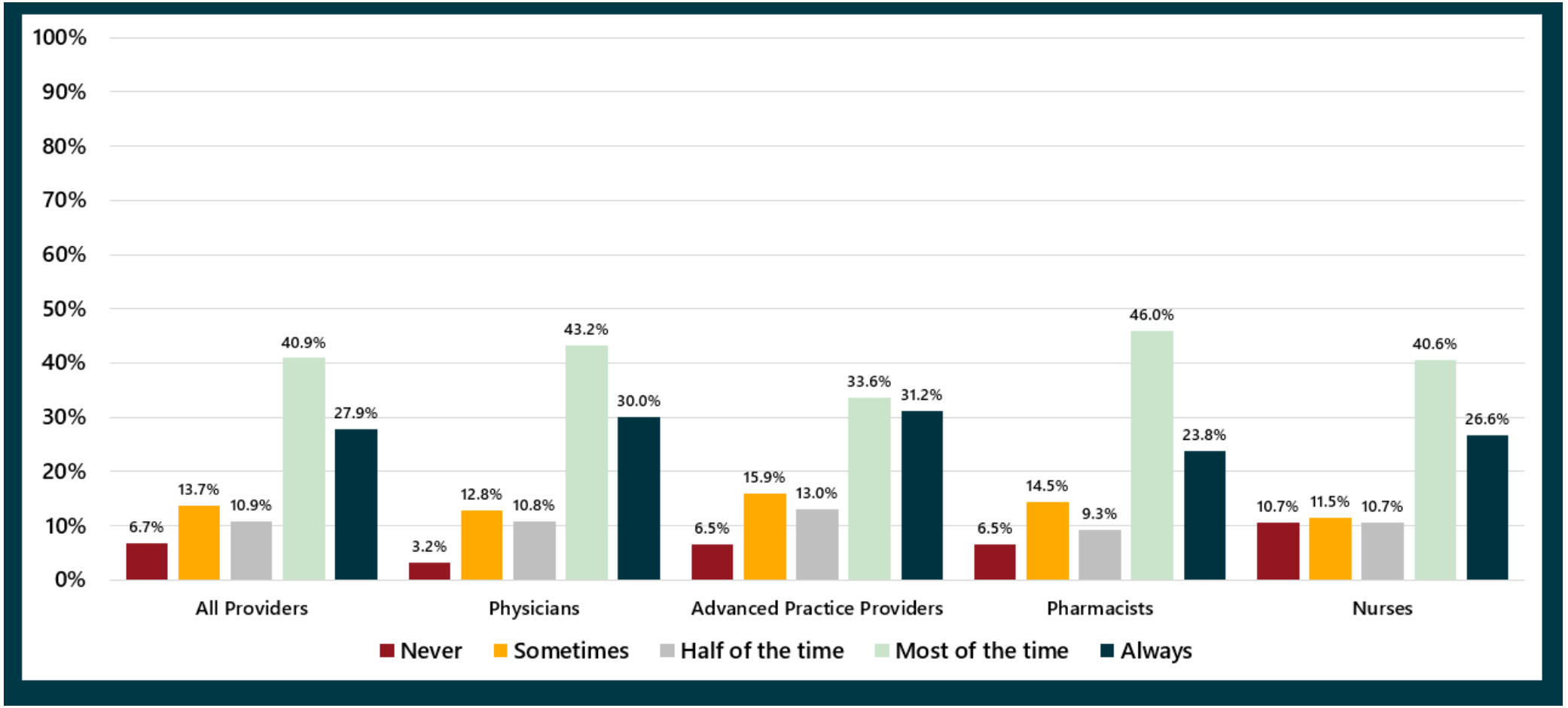
*Statistically significant at p<0.05 (referent categories: No health condition, No provider recommendation).

70% of healthcare provider respondents reported recommending a second COVID-19 vaccination to eligible patients aged 65 years and older most of the time or always, *October 2024 Survey*



N= 1,000, data from University of Iowa/RAND, unpublished survey of physicians, advanced practice providers, pharmacists, and nurses who spend at least 50% of time providing outpatient care and have vaccines administered at worksite. October 9-16 2024.

68% of healthcare provider respondents reported recommending a second COVID-19 vaccination to eligible patients who were immunocompromised most of the time or always , *October 2024 Survey*



N= 1,000, data from University of Iowa/RAND, unpublished survey of physicians, advanced practice providers, pharmacists, and nurses who spend at least 50% of time providing outpatient care and have vaccines administered at worksite. October 9-16 2024.

Work Group Professional Organization Liaison Feedback

- Feedback was obtained via the WG liaisons from organizations* that focus on older adults, people with immunocompromise, healthcare providers, and pharmacists
- Prefer **age-based recommendations** (universal) over risk-based or shared clinical decision-making
  - Implementation challenges for both risk-based and shared clinical decision-making on top of an already complicated vaccination schedule
  - Shared clinical decision-making recommendations can appear to have lower confidence and are difficult to communicate
- Frequent changes in vaccine recommendations create confusion
- Most preferred **one to two total doses a year**
- Reiterate that **self-attestation** of being moderately or severely immunocompromised is permissible

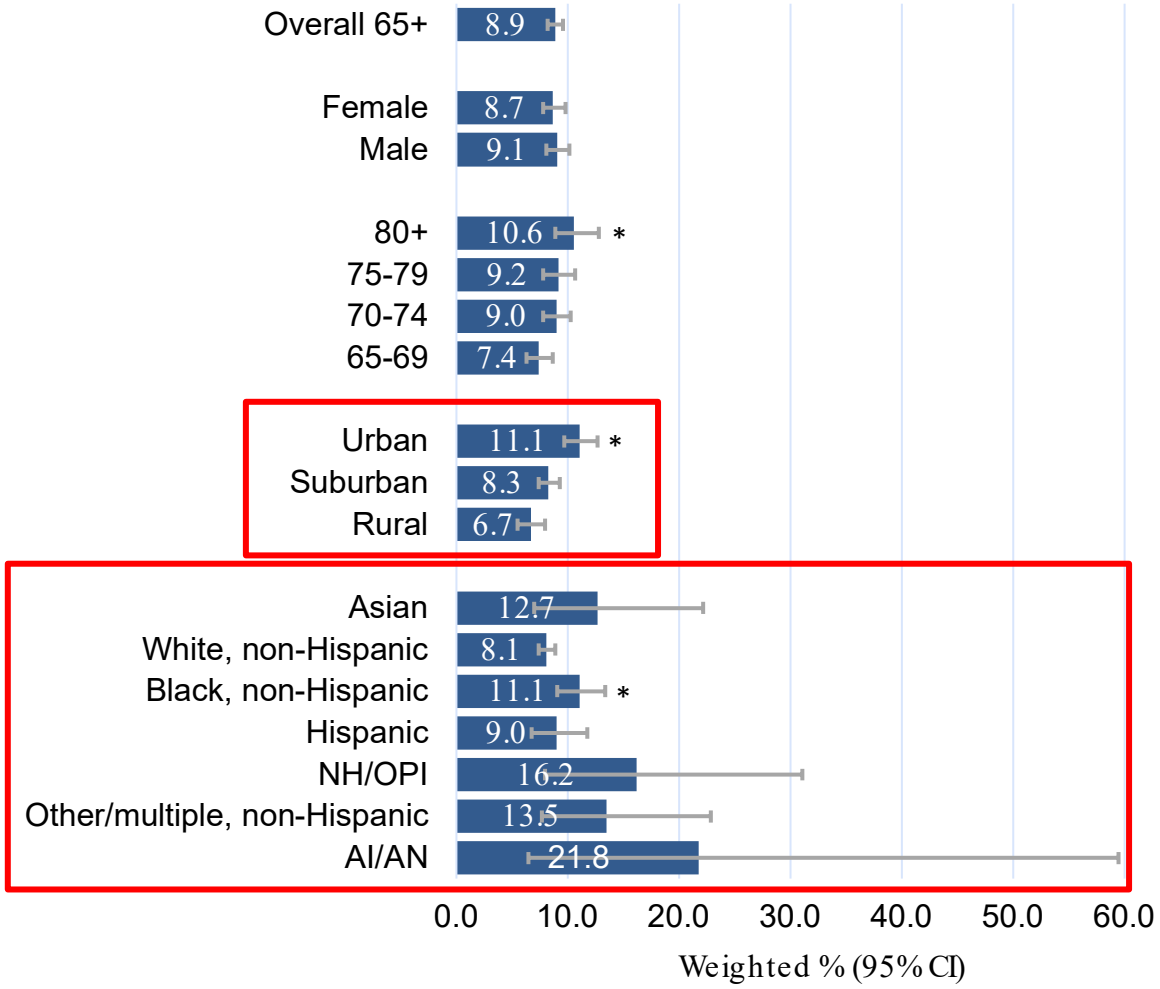
*Infectious Diseases Society of America, American Geriatrics Society, American Pharmacists Association, Society for Healthcare Epidemiology of America

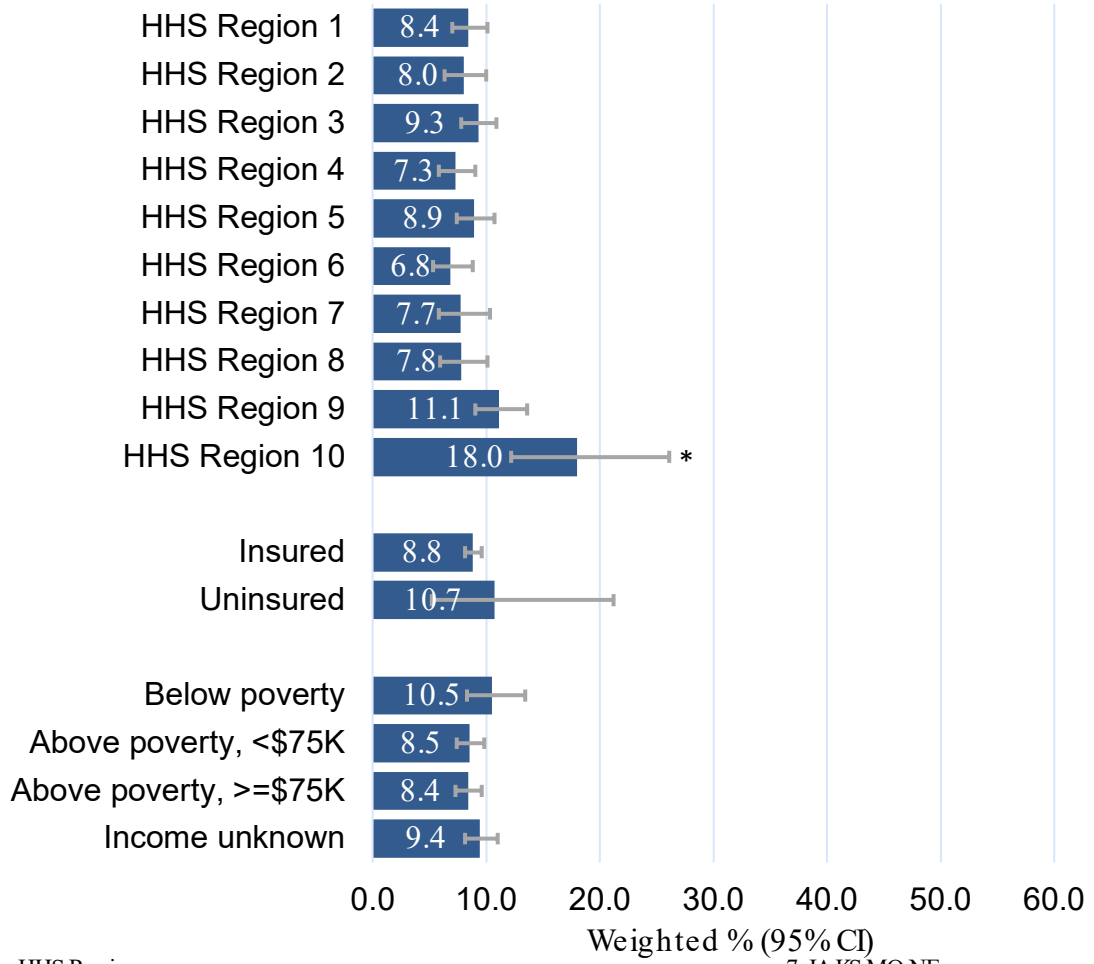
Domain Equity Question:

Is the intervention equally acceptable across all populations?

2023–2024 COVID-19 vaccine ≥2 dose coverage among adults aged ≥65 years varied by race and ethnicity and urbanicity

National Immunization Survey-Adult COVID Module (NIS-ACM)





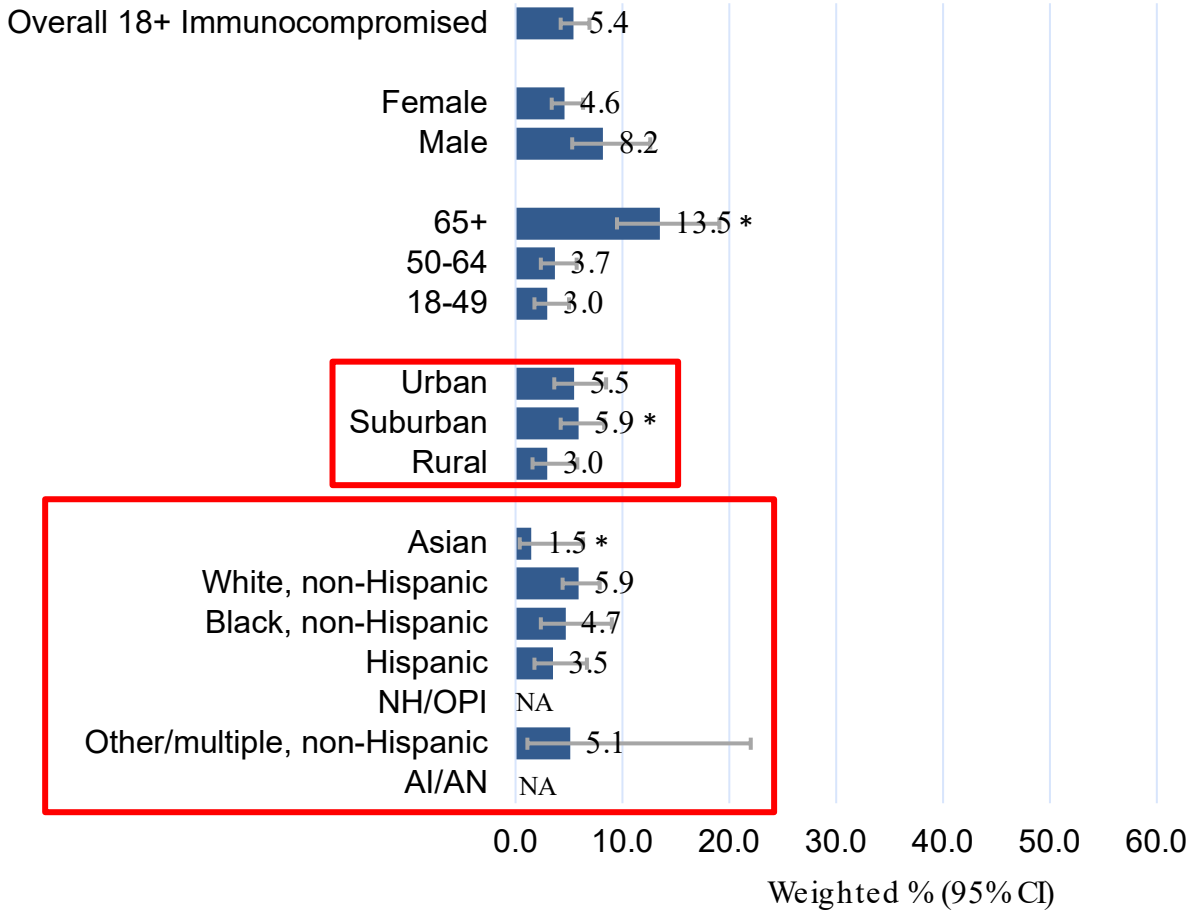
AI/AN: American Indian or Alaska Native; NH/OPI: Native Hawaiian or Other Pacific Islander.
*Statistically significant at p<0.05 (referent categories: Age 65-69, Rural, White non-Hispanic, HHS Region 1).

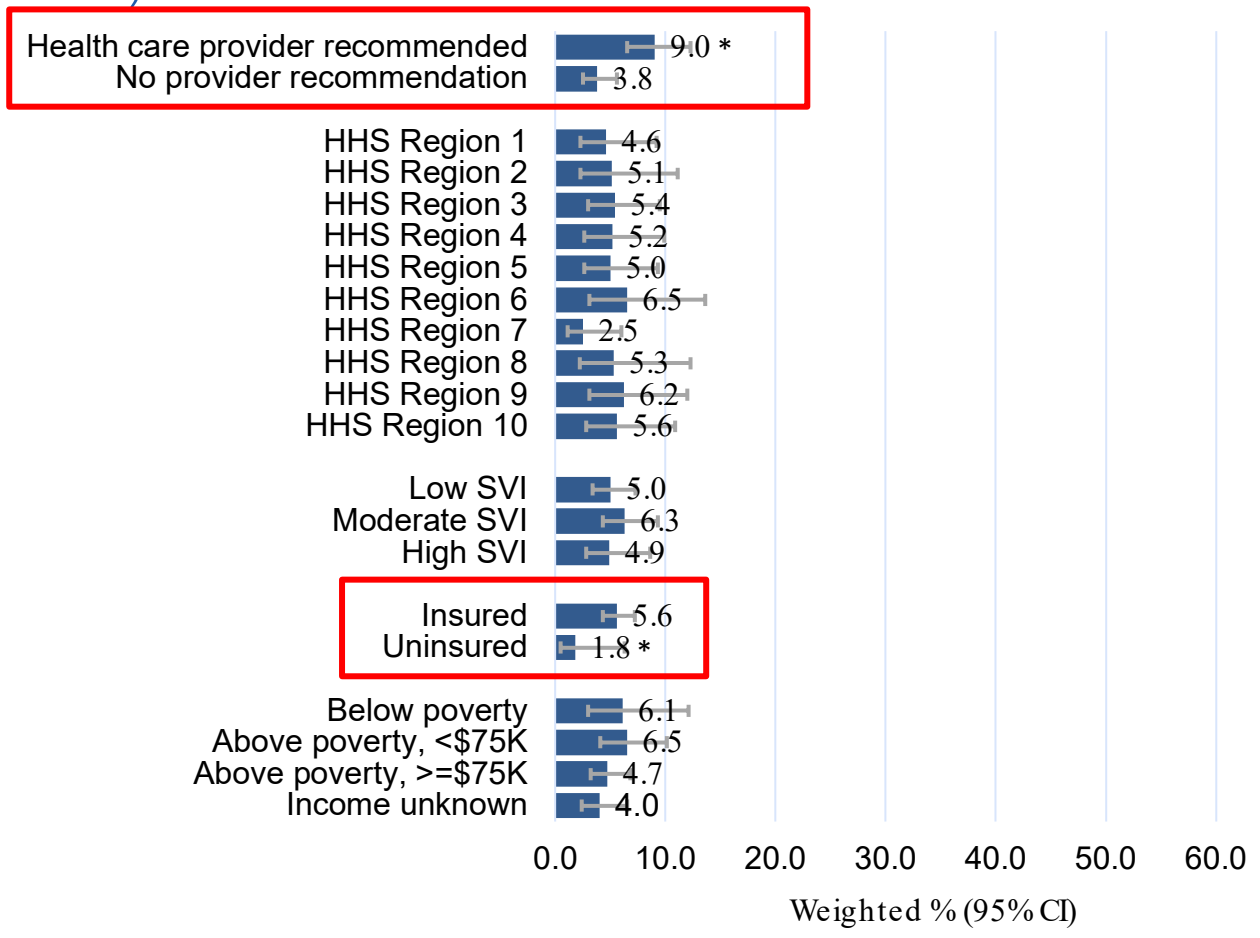
HHS Regions
1: CT,ME,MA,NH,RI,VT
2: NJ,NY,PR,VI
3: DE,DC,MD,PA,VA,WV
4: AL,FL,GA,KY,MS,NC,SC,TN
5: IL,IN,MI,MN,OH,WI
6: AR,LA,NM,OK,TX
7: IA,KS,MO,NE
8: CO,MT,ND,SD,UT,WY
9: AZ,CA,HI,NV,GU
10: AK,ID,OR,WA

Equity

2023–2024 COVID-19 ≥2 dose vaccine coverage among immunocompromised adults ≥18 years varied by urbanicity, race and ethnicity, healthcare provider recommendation and insurance status

National Immunization Survey-Adult COVID Module (NIS-ACM)





NA: estimate not reported because denominator is <30; AI/AN: American Indian or Alaska Native; NH/OPI: Native Hawaiian or Other Pacific Islander.

*Statistically significant at p<0.05 (referent categories: Age 18-49, Rural, White non-Hispanic, No Provider Recommendation, Insured).

HHS Regions
1: CT,ME,MA,NH,RI,VT
2: NJ,NY,PR,VI
3: DE,DC,MD,PA,VA,WV
4: AL,FL,GA,KY,MS,NC,SC,TN
5: IL,IN,MI,MN,OH,WI
6: AR,LA,NM,OK,TX
7: IA,KS,MO,NE
8: CO,MT,ND,SD,UT,WY
9: AZ,CA,HI,NV,GU
10: AK,ID,OR,WA

Equity

Acceptability

Would recommending a second dose of the 2024 – 2025 COVID-19 vaccine for adults ages ≥65 years be acceptable to key stakeholders?

- Are there key stakeholders that would not accept the distribution of benefits and harms?
- Are there key stakeholders that would not accept the undesirable effects in the short term for the desirable effects (benefits) in the future?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Acceptability

Would recommending a second dose of the 2024 – 2025 COVID-19 vaccine for people ages ≥6 months with moderate or severe immunocompromise be acceptable to key stakeholders?

- Are there key stakeholders that would not accept the distribution of benefits and harms?
- Are there key stakeholders that would not accept the undesirable effects in the short term for the desirable effects (benefits) in the future?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Acceptability

Would recommending additional doses (i.e., 3 or more) of the 2024 – 2025 COVID-19 vaccine for people ages ≥6 months with moderate or severe immunocompromise be acceptable to key stakeholders?

- Are there key stakeholders that would not accept the distribution of benefits and harms?
- Are there key stakeholders that would not accept the undesirable effects in the short term for the desirable effects (benefits) in the future?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

EtR Domain:

Feasibility

Based on survey data, physicians think shared clinical decision-making (SCDM) increases time and confusion[1]

68% strongly agreed SCDM will require more time with patients

44% either strongly or somewhat agreed they find it hard to explain what a SCDM recommendation means to patients

76% either strongly or somewhat agreed SCDM creates confusion

42% either strongly or somewhat agreed they did not know how to implement SCDM as intended by the ACIP

1 Kempe A, Lindley MC, O'Leary ST, et al. Shared Clinical Decision-Making Recommendations for Adult Immunization: What Do Physicians Think? *J Gen Intern Med*. 2021;36(8):2283-2291. https://pubmed.ncbi.nlm.nih.gov/33528783/. Numbers cited based on General Internal Medicine physician responses, N=281.

Domain Equity Question:

Is the intervention equally feasible to implement across all populations?

Vaccine equity considerations

- **Social Determinants of Health drive differences in vaccine access creating disparities in uptake.**
- **Additional dose recommendations may further increase these disparities. For example:**
  - **Insurance:** decreased access with the end of the Bridge Access Program
  - **Disability:** increased prevalence with age creating potential challenges getting to vaccination sites
  - **Setting:** decreased access in setting with existing challenges (e.g., long-term care)
- **In the absence of an ACIP recommendation, decreased access if required to pay out-of-pocket.**

Feasibility

Is a second dose of the 2024 – 2025 COVID-19 vaccine feasible to implement among adults ≥65 years?

- Is a second dose of the 2024 – 2025 COVID-19 vaccine program sustainable?
- Are there barriers that are likely to limit the feasibility of implementing a second dose of the 2024 – 2025 COVID-19 vaccine or require considerations when implementing it?
- Is access to a second dose of the 2024 – 2025 COVID-19 vaccine an important concern?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Majority Opinion

Minority Opinion

Feasibility

Is a second dose of the 2024 – 2025 COVID-19 vaccine feasible to implement among persons with moderate or severe immunocompromise?

- Is a second dose of the 2024 – 2025 COVID-19 vaccine program sustainable?
- Are there barriers that are likely to limit the feasibility of implementing a second dose of the 2024 – 2025 COVID-19 vaccine or require considerations when implementing it?
- Is access to a second dose of the 2024 – 2025 COVID-19 vaccine an important concern?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Feasibility

Are additional doses (i.e., 3 or more) of the 2024 – 2025 COVID-19 vaccine feasible to implement among persons with moderate or severe immunocompromise?

- Are additional doses of the 2024 – 2025 COVID-19 vaccine program sustainable?
- Are there barriers that are likely to limit the feasibility of implementing additional doses of the 2024 – 2025 COVID-19 vaccine or require considerations when implementing it?
- Is access to additional doses of the 2024 – 2025 COVID-19 vaccine an important concern?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

EtR Domain:

Resource Use

Incremental cost-effectiveness ratios (ICERs), societal perspective, per 1000, *preliminary results*

Age group	Intervention strategy	Projected costs	Incremental costs	Projected QALYs	Incremental QALYs	ICER ($/QALY)
5-11 y	No 2024-2025 vax	$39,723	-	26,788	-	-
	2024-2025 COVID-19 vax, 1-dose	$191,776	$152,053	26,789	0.6566	$231,570
	2024-2025 COVID-19 vax, 2-dose	$353,283	$161,507	26,789	0.2129	$758,268
12-17 y	No 2024-2025 vax	$46,010	-	24,638	-	-
	2024-2025 COVID-19 vax, 1-dose	$214,115	$168,105	24,639	0.6733	$249,670
	2024-2025 COVID-19 vax, 2-dose	$394,045	$179,930	24,639	0.1942	$926,390
18-49 y	No 2024-2025 vax	$128,351	-	20,208	-	-
	2024-2025 COVID-19 vax, 1-dose	$289,206	$160,855	20,209	0.4802	$335,010
	2024-2025 COVID-19 vax, 2-dose	$474,497	$185,290	20,209	0.1633	$1,134,840
50-64y	No 2024-2025 vax	$218,703	-	12,278	-	-
	2024-2025 COVID-19 vax, 1-dose	$347,499	$128,796	12,279	0.6197	$207,834
	2024-2025 COVID-19 vax, 2-dose	$523,448	$175,949	12,279	0.1957	$898,653
≥65 y	No 2024-2025 vax	$336,230	-	6,525	-	-
	2024-2025 COVID-19 vax, 1-dose	$419,404	$83,174	6,527	1.4132	$58,855
	2024-2025 COVID-19 vax, 2-dose	$577,132	$157,729	6,528	0.4424	$356,534

ICER = incremental cost effectiveness ratio; QALY = quality-adjusted life year

ICER, scenario analysis varying probability of hospitalization, societal perspective, *preliminary results*

Age group	Intervention strategy	ICER ($/QALY)					
		¼ base case	½ base case	Base case	2x base case	3x base case	4x base case
5-11 y	2024-2025 vaccination, 1-dose	$237,123	$235,256	$231,570	$224,381	$217,426	$210,693
	2024-2025 vaccination, 2-dose	$772,119	$767,458	$758,268	$740,400	$723,184	$706,585
12-17 y	2024-2025 vaccination, 1-dose	$256,292	$254,067	$249,670	$241,081	$232,755	$224,680
	2024-2025 vaccination, 2-dose	$942,860	$937,321	$926,390	$905,095	$884,525	$864,645
18-49 y	2024-2025 vaccination, 1-dose	$363,779	$353,853	$335,010	$300,917	$270,898	$244,263
	2024-2025 vaccination, 2-dose	$1,209,252	$1,183,547	$1,134,840	$1,046,999	$969,960	$901,847
50-64 y	2024-2025 vaccination, 1-dose	$317,597	$274,393	$207,834	$121,533	$68,015	$31,582
	2024-2025 vaccination, 2-dose	$1,234,636	$1,101,255	$898,653	$641,036	$484,085	$378,439
≥65 y	2024-2025 vaccination, 1-dose	$192,897	$127,480	$58,855	$1,483	Cost saving	Cost saving
	2024-2025 vaccination, 2-dose	$775,607	$569,600	$356,534	$180,751	$103,912	$60,824

Adjusted risk of hospitalization by underlying condition: hypertension: 2.8, coronary artery disease: 1.3, history of stroke: 0.9, diabetes: 3.2, obesity: 2.9, severe obesity: 4.4, chronic kidney disease: 4.0, asthma: 1.4, chronic obstructive pulmonary disease: 0.9 . Ko et al 2021.
ICER = incremental cost effectiveness ratio; QALY = quality-adjusted life year

Domain Equity Question:

Is the intervention a reasonable and efficient allocation of resources across all populations?

Is the intervention a reasonable and efficient allocation of resources across all populations?

- **A second dose of COVID-19 vaccine is most cost-effective in older adults in whom disease burden is highest.**
- **A second dose of COVID-19 vaccine is likely more cost-effective in populations with a higher prevalence of risk factors, such as underlying conditions, which increase their probability of hospitalization due to COVID-19.**
  - We do not have information specific to cost effectiveness of additional doses in people with moderate or severe immunocompromise

Summary
Resource Use

- **Second dose of 2024–2025 COVID-19 vaccine in adults 65 and older**
  - Base case ICER: $356,534/QALY

- **For all COVID-19 vaccines, if list prices were reduced, vaccination would be more cost-effective**

QALY: Quality-adjusted life year

Resource Use

Is a second dose of the 2024 – 2025 COVID-19 vaccine in adults ≥65 years a reasonable and efficient allocation of resources?

- What is the cost-effectiveness of a second dose of the 2024 – 2025 COVID-19 vaccine?
- How does the cost-effectiveness of a second dose of the 2024 – 2025 COVID-19 vaccine change in response to changes in context, assumptions, etc.?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Resource Use

Is a second dose of the 2024 – 2025 COVID-19 vaccine in persons ≥6 months of age with moderate or severe immunocompromise a reasonable and efficient allocation of resources?

- What is the cost-effectiveness of a second dose of the 2024 – 2025 COVID-19 vaccine?
- How does the cost-effectiveness of a second dose of the 2024 – 2025 COVID-19 vaccine change in response to changes in context, assumptions, etc.?

○ **No**	○ **Probably no**	○ **Probably yes**	○ **Yes**	○ **Varies**	○ **Don't know**

Resource Use

Are additional doses (i.e., 3 or more) of the 2024 – 2025 COVID-19 vaccine in persons ≥6 months of age with moderate or severe immunocompromise a reasonable and efficient allocation of resources?

- What is the cost-effectiveness of additional doses of the 2024 – 2025 COVID-19 vaccine?
- How does the cost-effectiveness of additional doses of the 2024 – 2025 COVID-19 vaccine change in response to changes in context, assumptions, etc.?

○ No	○ Probably no	○ Probably yes	○ Yes	○ Varies	○ Don't know

Minority Opinion

Work Group Interpretations

Work Group Interpretation

- **A harmonized recommendation for older adults and immunocompromised persons would ease implementation and help simplify an already complicated immunization schedule**
  - Some work group members were not in favor of a harmonized recommendation but rather supported having differing recommendations in the two populations under consideration
- **Relative absence of data makes selecting the correct number of recommended doses challenging for immunocompromised persons, especially given the heterogeneity of this population**
- **Despite hesitations about a shared clinical decision-making recommendation, many Work Group members acknowledged the benefit for people with moderate or severe immunocompromise**
  - Allowing for flexibility in additional doses may allow these patients to time around travel, life events, chemotherapy, etc.

Work Group Interpretation

- **There was low uptake of more than one dose of 2023–2024 vaccine**
  - Complexity of existing schedule has led to reduced adherence by clinicians
- **Provider recommendations directly impact uptake, and as part of this recommendation, provider education and ensuring providers are on board is critical to improving adherence**
- **While simpler vaccine recommendations aren't perfect, there may be benefits in increasing vaccine uptake, and enhancing protection at the population level**
- **Focusing on number of doses of 2024–2025 vaccine rather than additional doses in recommendations could help reduce complexity and improve uptake**

Work Group Judgements - a second dose of 2024–2025 COVID-19 vaccine in adults ≥65 years

EtR Domain	Question	Work Group Judgments
Public Health Problem	Is COVID-19 disease among older adults of public health importance?	Yes
Benefits and Harms	How substantial are the desirable anticipated effects?	Moderate/Large
	How substantial are the undesirable anticipated effects?	Minimal/Small
	Do the desirable effects outweigh the undesirable effects?	Favors intervention
Values	Do older adults feel that the desirable effects are large relative to undesirable effects?	Moderate
	Is there important uncertainty about, or variability in, how older adults value the main outcomes?	Probably important uncertainty or variability/Probably not important uncertainty or variability
Acceptability	Would recommending a second dose of the 2024–2025 COVID-19 vaccine for older adults be acceptable to key stakeholders?	Probably yes/Yes
Feasibility	Is a second dose of the 2024–2025 COVID-19 vaccine feasible to implement among older adults?	Probably yes/Yes
Resource Use	Is a second dose the 2024–2025 COVID-19 vaccine in older adults a reasonable and efficient allocation of resources?	Probably yes/Yes

Evidence to Recommendations Framework

Summary: Work Group Interpretations - a second dose of 2024–2025 COVID-19 vaccine in adults ≥65 years

Balance of consequences	Undesirable consequences *clearly outweigh* desirable consequences in most settings	Undesirable consequences *probably outweigh* desirable consequences in most settings	The balance between desirable and undesirable consequences is *closely balanced* or *uncertain*	Desirable consequences *probably outweigh* undesirable consequences in most settings	Desirable consequences *clearly outweigh* undesirable consequences in most settings	There is insufficient evidence to determine the balance of consequences

Majority Opinion

Minority Opinion

Evidence to Recommendations Framework

Summary: Work Group Interpretations - a second dose of 2024–2025 COVID-19 vaccine in adults ≥65 years

Is there sufficient information to move forward with a recommendation?

Yes	No

Evidence to Recommendations Framework

Summary: Work Group Interpretations - a second dose of 2024–2025 COVID-19 vaccine in adults ≥65 years

Type of recommendation	We do not recommend the intervention	We recommend the intervention for individuals based on shared clinical decision-making	We recommend the intervention

Work Group Judgements - a second dose of 2024–2025 COVID-19 vaccine in people ages ≥6 months with moderate or severe immunocompromise

EtR Domain	Question	Work Group Judgments
Public Health Problem	Is COVID-19 disease among persons ≥6 months of age with moderate or severe immunocompromise of public health importance?	Yes
Benefits and Harms	How substantial are the desirable anticipated effects?	Moderate
	How substantial are the undesirable anticipated effects?	Minimal/Small
	Do the desirable effects outweigh the undesirable effects?	Favors intervention
Values	Do persons ≥6 months of age with moderate or severe immunocompromise feel that the desirable effects are large relative to undesirable effects?	Moderate/Large
	Is there important uncertainty about, or variability in, how persons ≥6 months of age with moderate or severe immunocompromise value the main outcomes?	Probably important uncertainty or variability/Probably not important uncertainty or variability
Acceptability	Would recommending an additional dose of the 2024–2025 COVID-19 vaccine for persons ≥6 months of age with moderate or severe immunocompromise be acceptable to key stakeholders?	Probably yes/Yes
Feasibility	Is an additional dose of the 2024–2025 COVID-19 vaccine feasible to implement among persons ≥6 months of age with moderate or severe immunocompromise?	Probably yes/Yes
Resource Use	Is an additional dose the 2024–2025 COVID-19 vaccine in persons ≥6 months of age with moderate or severe immunocompromise a reasonable and efficient allocation of resources?	Probably yes/Yes

Evidence to Recommendations Framework

Summary: Work Group Interpretations - second dose in people ages ≥6 months with moderate or severe immunocompromise

Balance of consequences	Undesirable consequences *clearly outweigh* desirable consequences in most settings	Undesirable consequences *probably outweigh* desirable consequences in most settings	The balance between desirable and undesirable consequences is *closely balanced* or *uncertain*	Desirable consequences *probably outweigh* undesirable consequences in most settings	Desirable consequences *clearly outweigh* undesirable consequences in most settings	There is insufficient evidence to determine the balance of consequences

Majority Opinion

Minority Opinion

Evidence to Recommendations Framework

Summary: Work Group Interpretations – a second dose in people ages ≥6 months with moderate or severe immunocompromise

Is there sufficient information to move forward with a recommendation?

Yes	No

Evidence to Recommendations Framework

Summary: Work Group Interpretations - a second dose in people ages ≥6 months with moderate or severe immunocompromise

Type of recommendation	We do not recommend the intervention	We recommend the intervention for individuals based on shared clinical decision-making	We recommend the intervention

Work Group Judgements - additional doses (i.e., 3 or more) of 2024–2025 COVID-19 vaccine in people ages ≥6 months with moderate or severe immunocompromise

EtR Domain	Question	Work Group Judgments
Public Health Problem	Is COVID-19 disease among persons ≥6 months of age with moderate or severe immunocompromise of public health importance?	Yes
Benefits and Harms	How substantial are the desirable anticipated effects?	Moderate
	How substantial are the undesirable anticipated effects?	Minimal/Small
	Do the desirable effects outweigh the undesirable effects?	Favors intervention/Unclear
Values	Do persons ≥6 months of age with moderate or severe immunocompromise feel that the desirable effects are large relative to undesirable effects?	Moderate/Large
	Is there important uncertainty about, or variability in, how persons ≥6 months of age with moderate or severe immunocompromise value the main outcomes?	Probably important uncertainty or variability/Probably not important uncertainty or variability
Acceptability	Would recommending additional doses (i.e., 3 or more) of the 2024–2025 COVID-19 vaccine for persons ≥6 months of age with moderate or severe immunocompromise be acceptable to key stakeholders?	Probably yes/Yes
Feasibility	Are additional doses (i.e., 3 or more) of the 2024–2025 COVID-19 vaccine feasible to implement among persons ≥6 months of age with moderate or severe immunocompromise?	Probably yes/Yes
Resource Use	Are additional doses (i.e., 3 or more) of the 2024–2025 COVID-19 vaccine in persons ≥6 months of age with moderate or severe immunocompromise a reasonable and efficient allocation of resources?	Varies

Evidence to Recommendations Framework

Summary: Work Group Interpretations - Additional doses (i.e., 3 or more) in people ages ≥6 months with moderate or severe immunocompromise

Balance of consequences	Undesirable consequences *clearly outweigh* desirable consequences in most settings	Undesirable consequences *probably outweigh* desirable consequences in most settings	The balance between desirable and undesirable consequences is *closely balanced* or *uncertain*	Desirable consequences *probably outweigh* undesirable consequences in most settings	Desirable consequences *clearly outweigh* undesirable consequences in most settings	There is insufficient evidence to determine the balance of consequences

Evidence to Recommendations Framework

Summary: Work Group Interpretations - additional doses (i.e., 3 or more) in people ages ≥6 months with moderate or severe immunocompromise

Is there sufficient infromation to move forward with a recommendation?

Yes	No

Evidence to Recommendations Framework

Summary: Work Group Interpretations - additional doses (i.e., 3 or more) in people ages ≥6 months with moderate or severe immunocompromise

Type of recommendation	We do not recommend the intervention	We recommend the intervention for individuals based on shared clinical decision-making	We recommend the intervention

ACIP Voting Language

In addition to previously recommended 2024–2025 vaccination:

- ACIP recommends **a second dose*** of 2024–2025 COVID-19 vaccine for adults ages 65 years and older
- ACIP recommends **a second dose**** of 2024–2025 COVID-19 vaccine for people ages 6 months–64 years who are moderately or severely immunocompromised
- ACIP recommends **additional doses (i.e., 3 or more doses)** of 2024–2025 COVID-19 vaccine for people ages 6 months and older who are moderately or severely immunocompromised under ***shared clinical decision-making***

*If previously unvaccinated and receiving Novavax, 2 doses are recommended as initial vaccination series followed by a third dose of any age-appropriate 2024-2025 COVID-19 vaccine 6 months (minimum interval 2 months) after second dose.

**If previously unvaccinated or receiving initial vaccination series, at least 2 doses of 2024–2025 vaccine are recommended, and depending on vaccination history more may be needed. This additional 2024–2025 vaccine dose is recommended 6 months (minimum interval 2 months) after completion of initial vaccination series.

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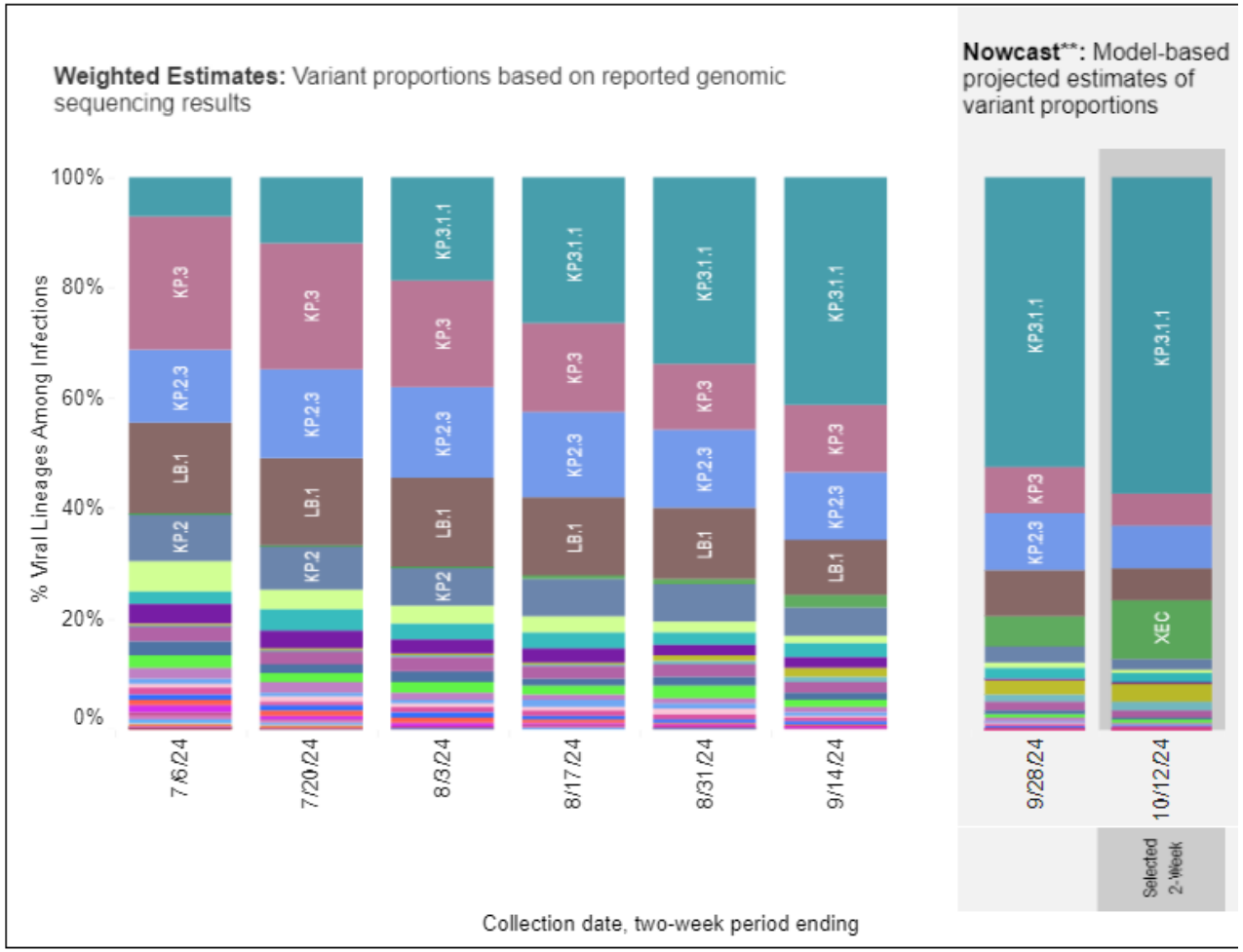
- Immunization Services Division
- National Center for Immunization and Respiratory Diseases
- University of Michigan COVID-19 Vaccination Modeling Team

Thank you

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

Backup

Weighted and Nowcast Estimates in the US for 2-week periods, June 23–October 12, 2024



** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates
https://covid.cdc.gov/covid-data-tracker/#variant-proportions