

Centers for Disease Control and Prevention
National Center for Immunization and Respiratory Diseases

COVID-19–Associated Hospitalizations among Children and Adults — COVID-NET

ACIP Meeting

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RESP-NET Hospitalization Surveillance Team

Surveillance and Prevention Branch

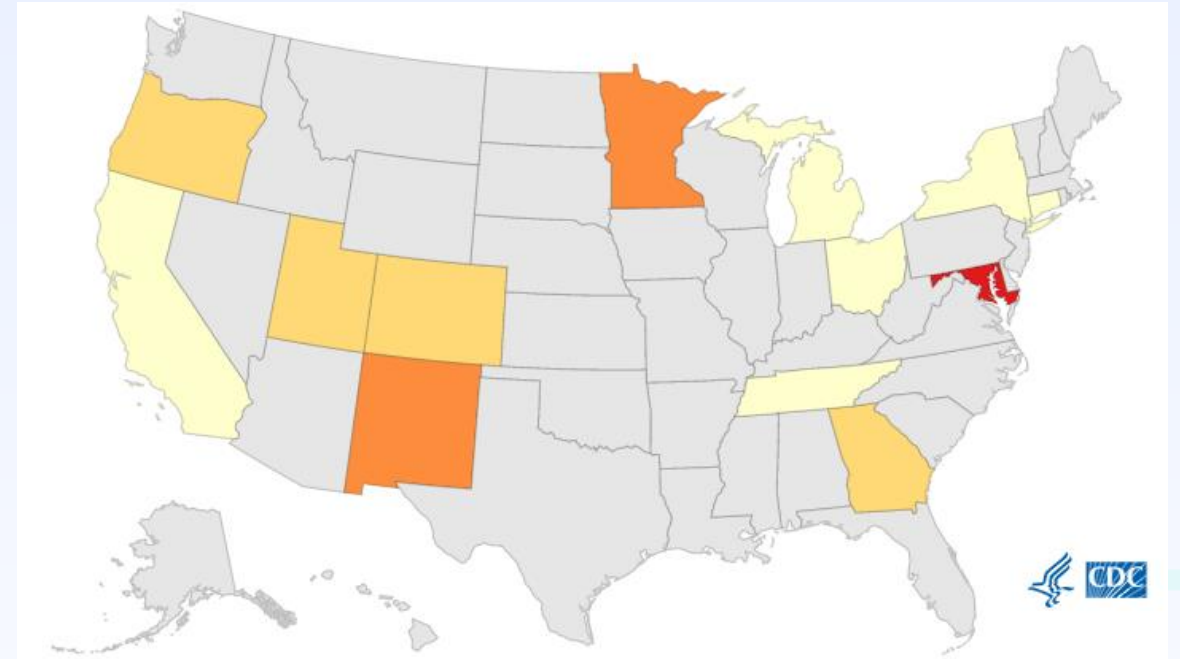
Coronavirus and Other Respiratory Viruses Division



National Center for Immunization
and Respiratory Diseases

COVID-NET: A RESP-NET population-based hospitalization surveillance platform

- RESP-NET: COVID-NET, RSV-NET, FluSurv-NET
- >300 acute-care hospitals
- 98 counties in 13 states
- In 9 of 10 HHS regions
- ~10% of U.S. population
- Positive SARS-CoV-2 within 14 days of or during hospitalization
- Screening or clinician-driven testing
- Clinical data: representative sample of COVID-NET patients



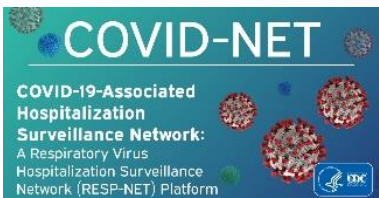
Percentage of state population represented by participating COVID-NET counties

9% - < 31.75%

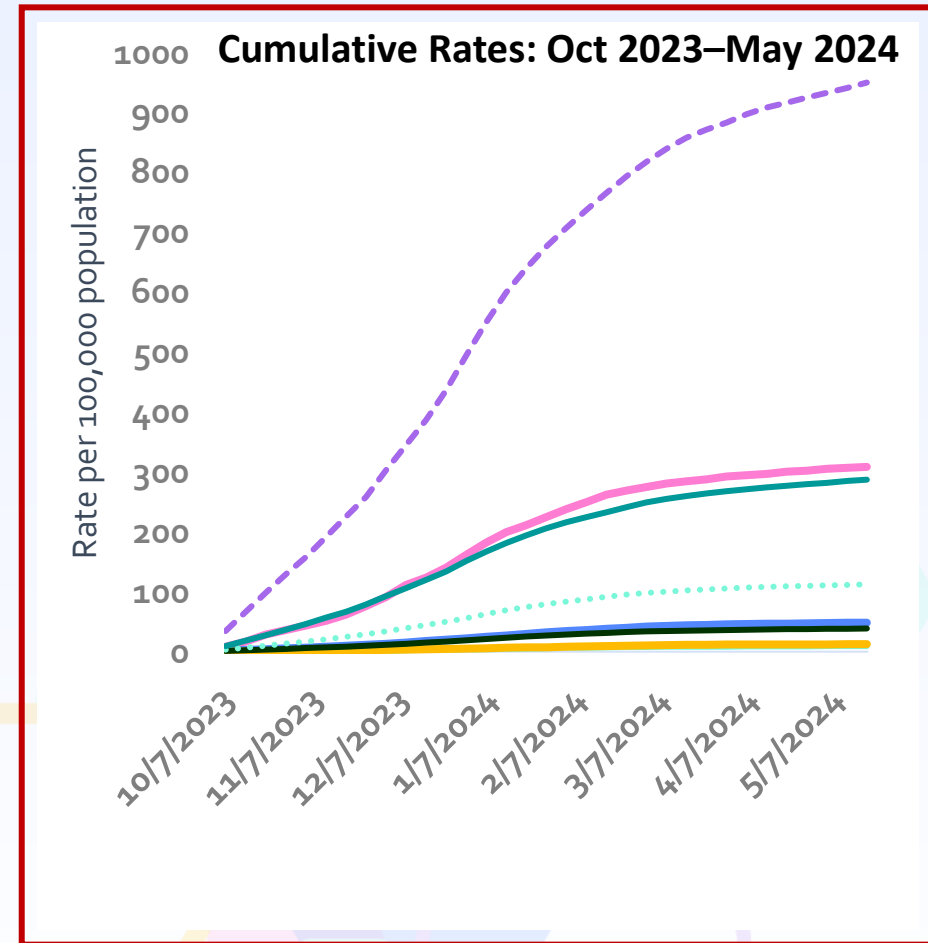
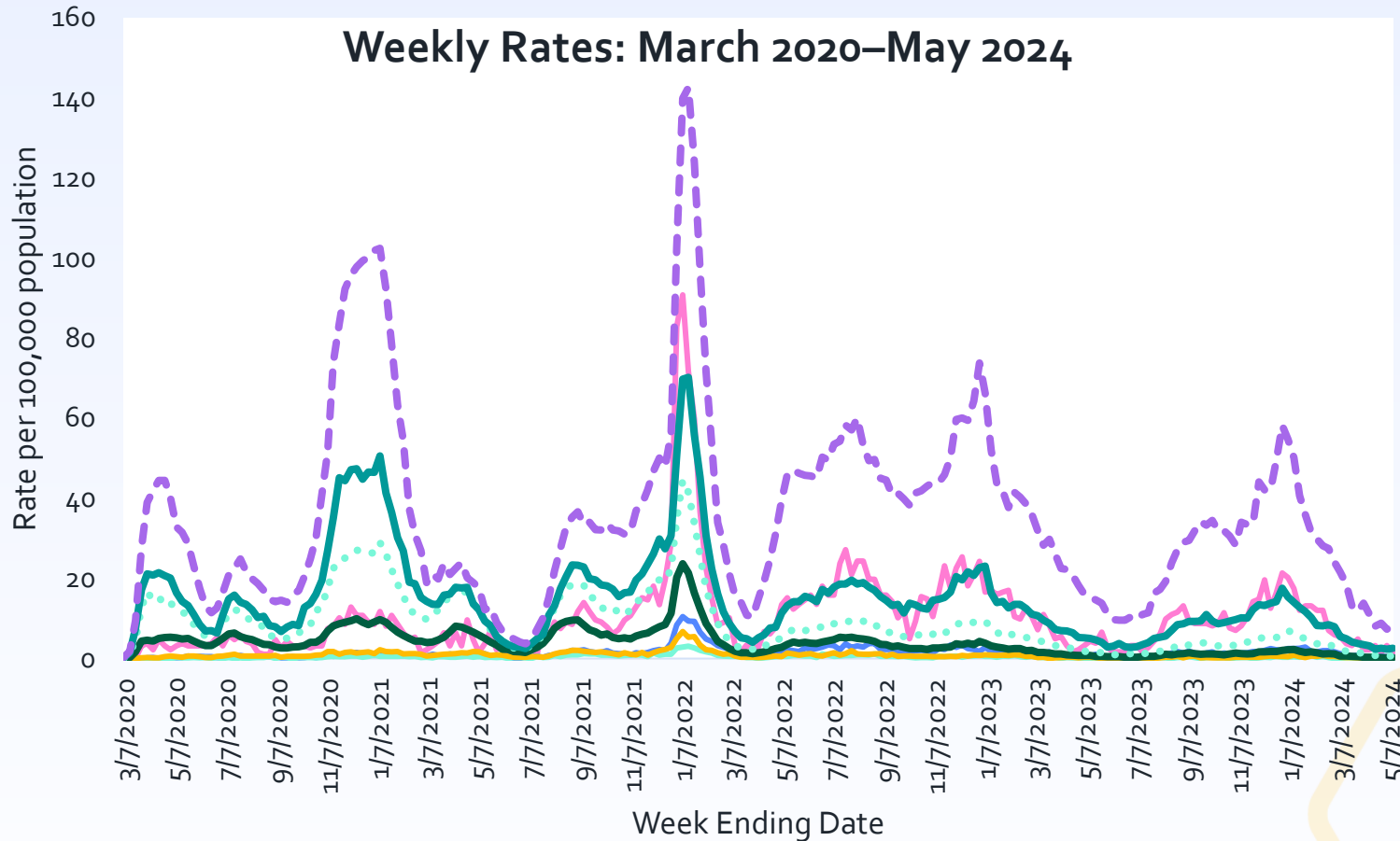
31.75% - < 54.5%

54.5% - < 77.25%

77.25% - 100%



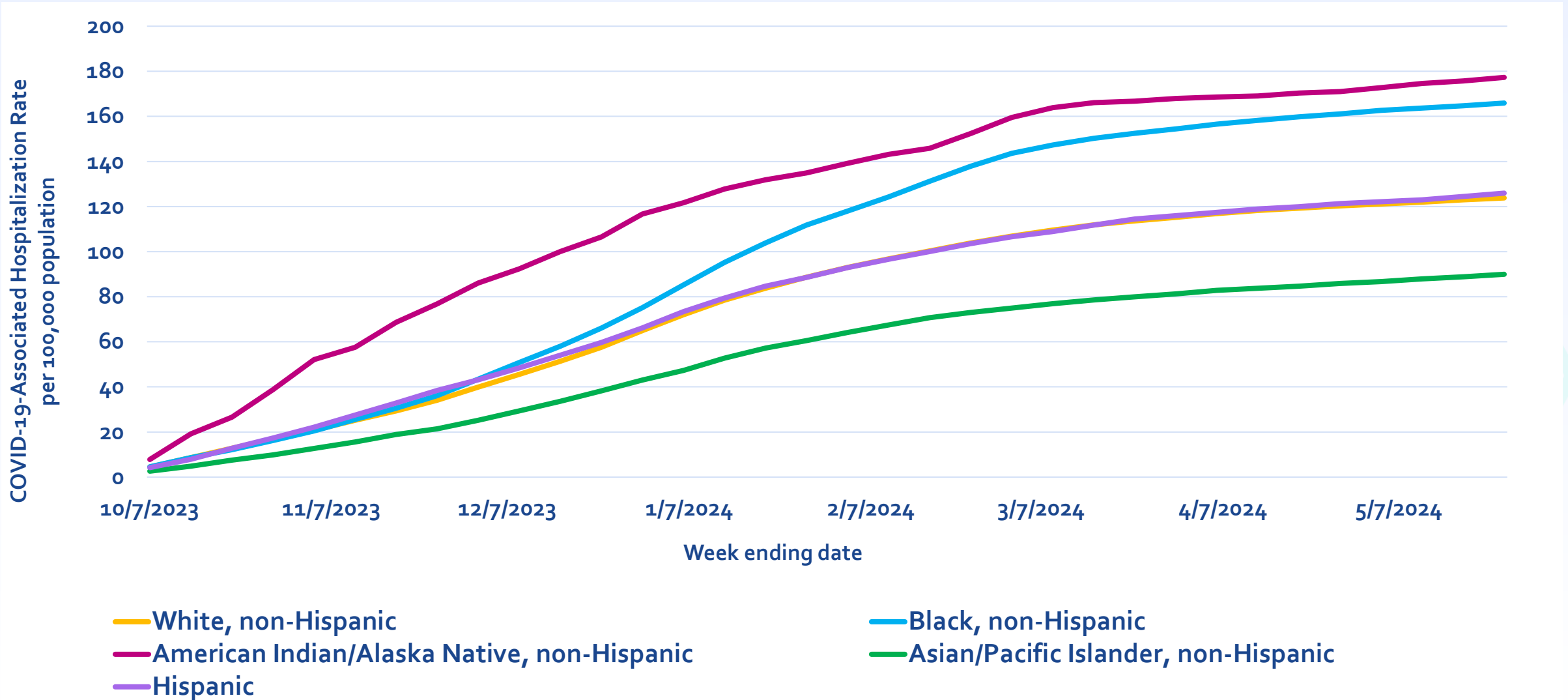
Population-Based Rates of COVID-19-Associated Hospitalizations — COVID-NET, March 2020–May 2024



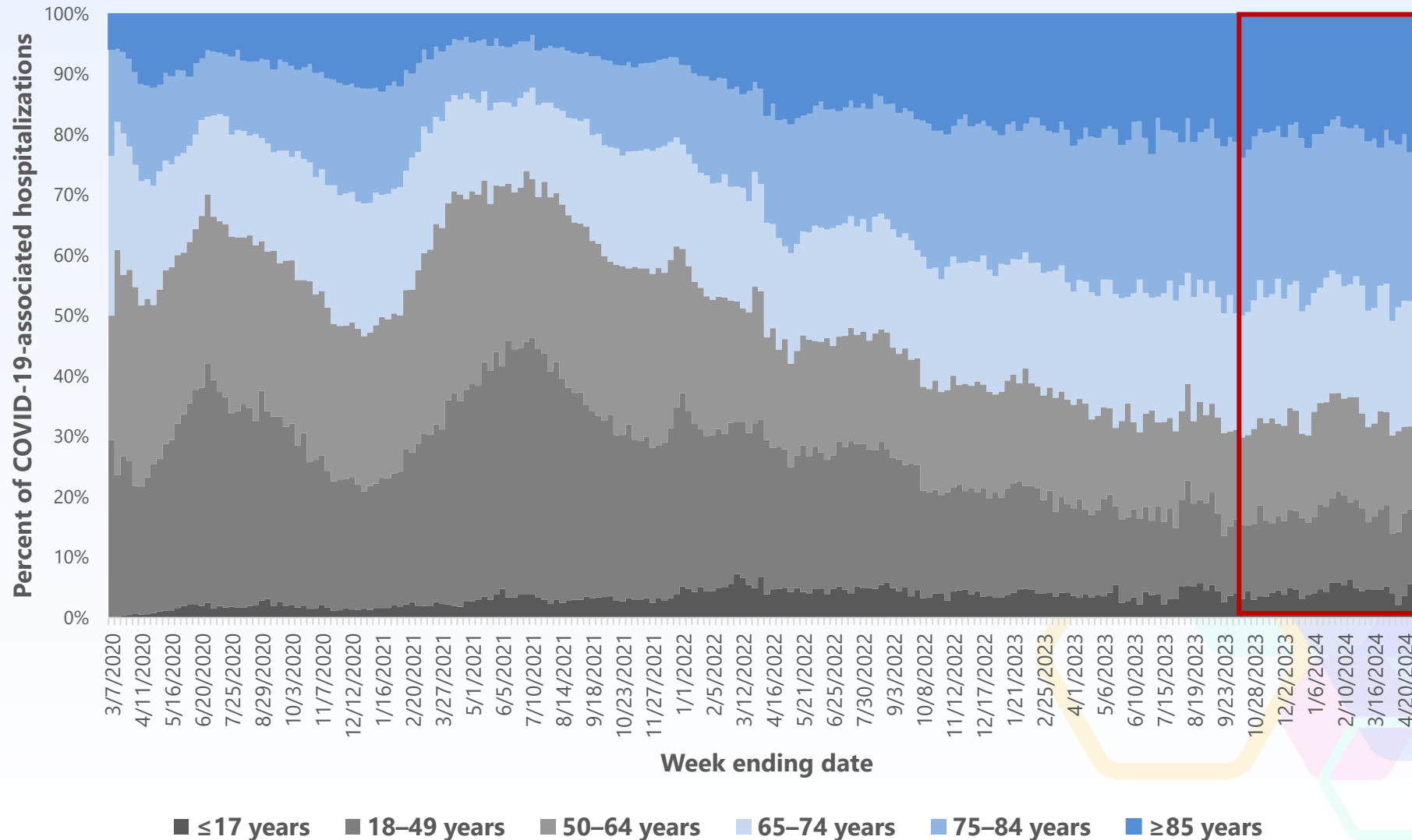
- <6 months
- 6 months–4 years
- ⋯ 5–11 years
- 12–17 years
- 18–49 years
- ⋯ 50–64 years
- 65–74 years
- - - ≥75 years

Rates highest in ≥75 years, followed by infants <6 months and adults 65–74 years

Age-Adjusted Cumulative Rates of COVID-19-Associated Hospitalizations by Race and Ethnicity, All Ages — COVID-NET, October 2023–May 2024



Percent of Weekly Hospitalizations by Age Group — COVID-NET, March 2020–May 2024



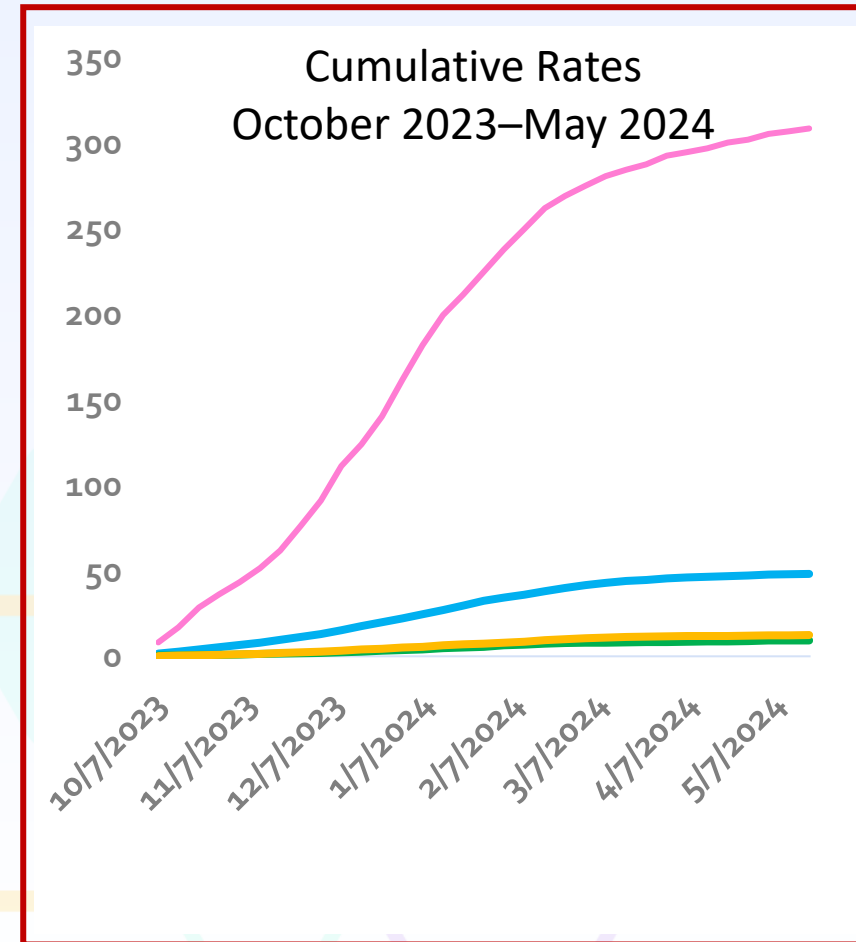
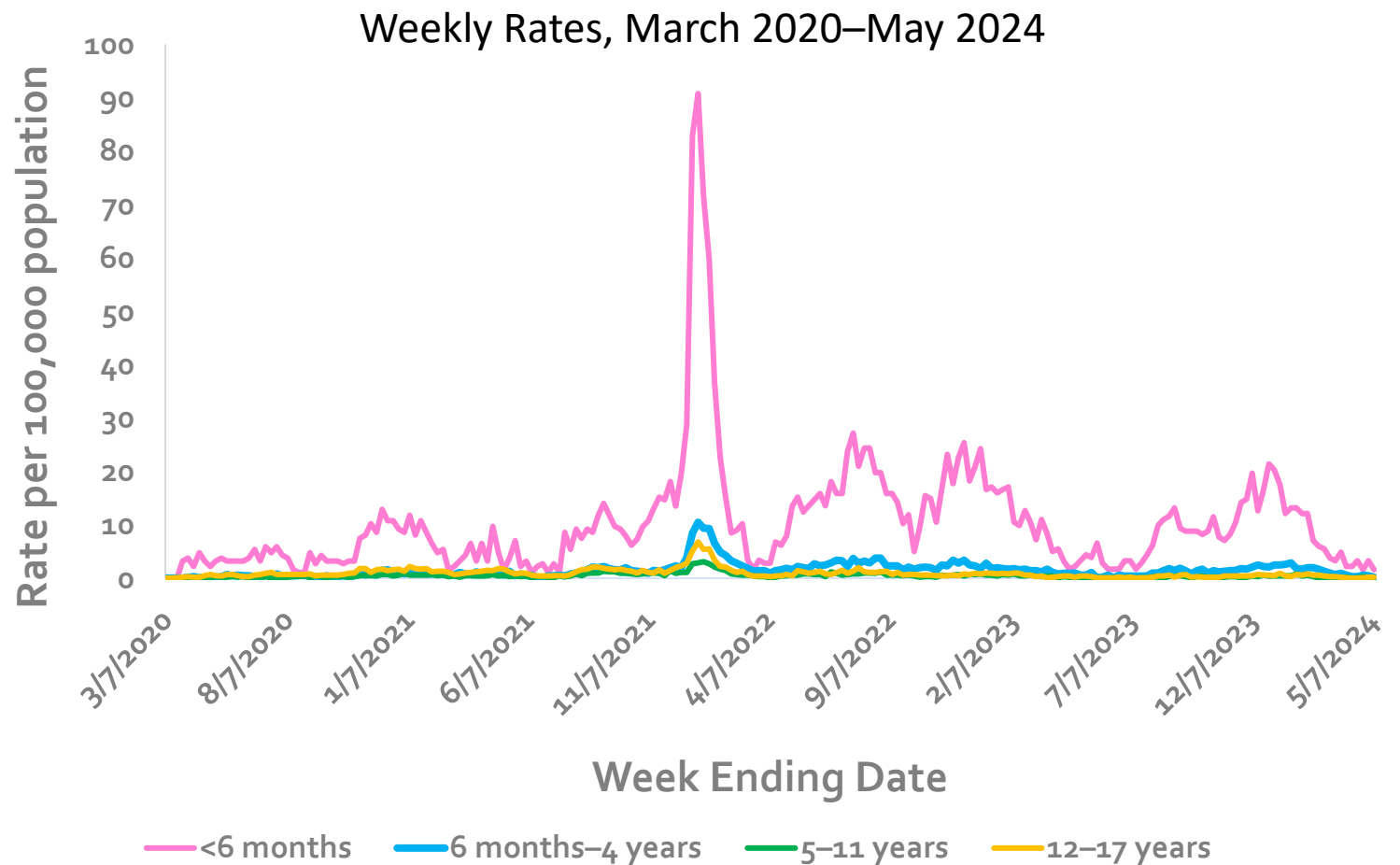
During
October 2023–
May 2024:

- **≥65**: **67%** of COVID-19 hospitalizations
- **<65**: **33%** of COVID-19 hospitalizations
- **≥75**: **46%** of COVID-19 hospitalizations
- **≤17**: **4%** of COVID-19 hospitalizations

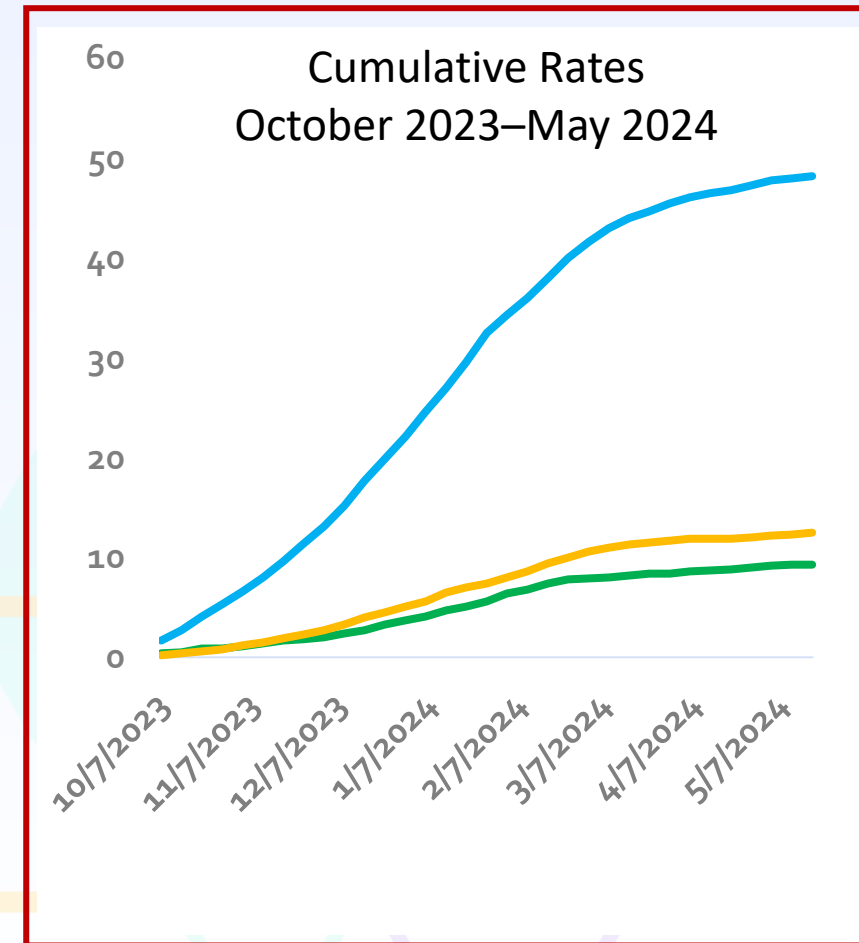
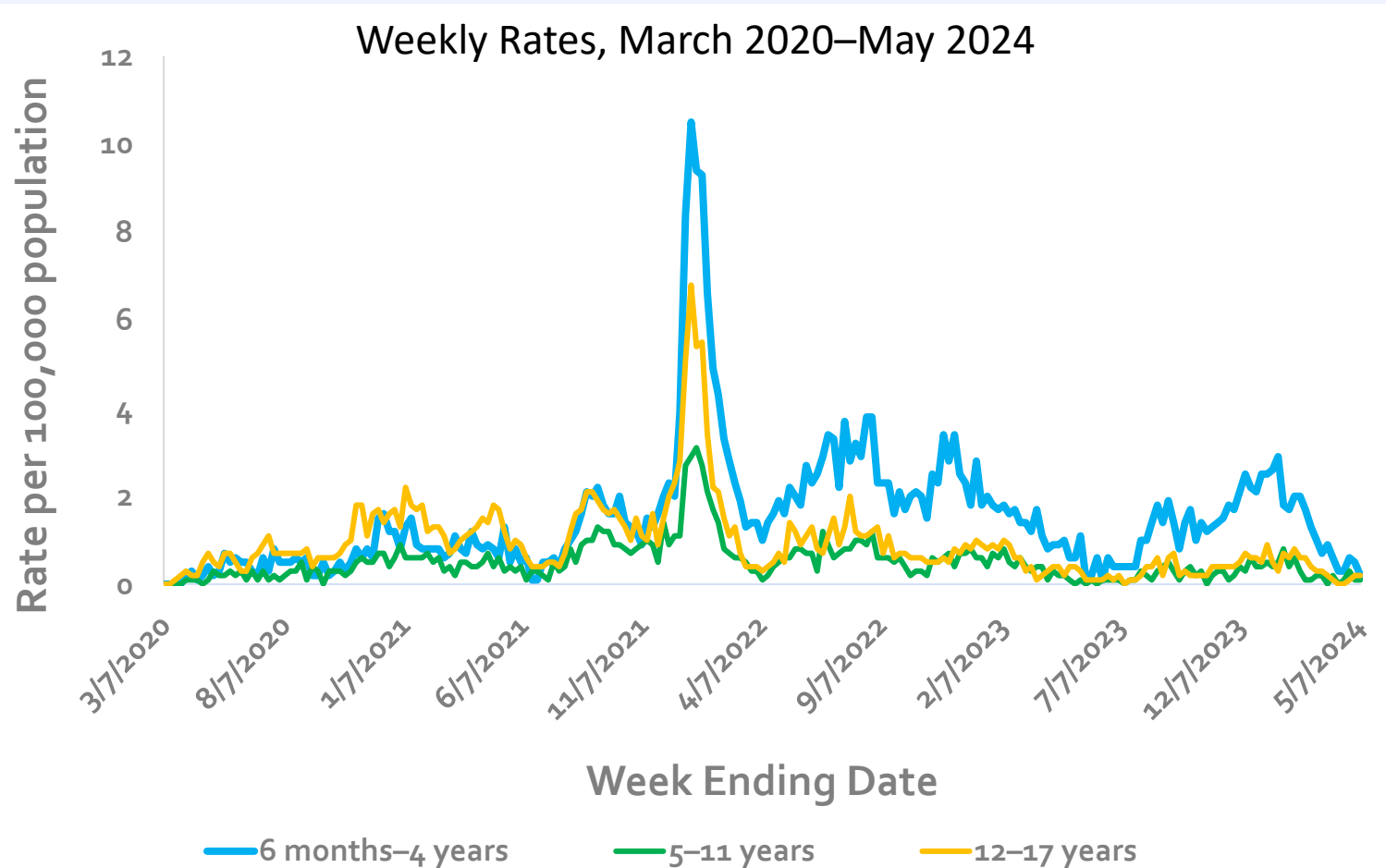
Epidemiology of COVID-19–associated hospitalizations among children and adolescents



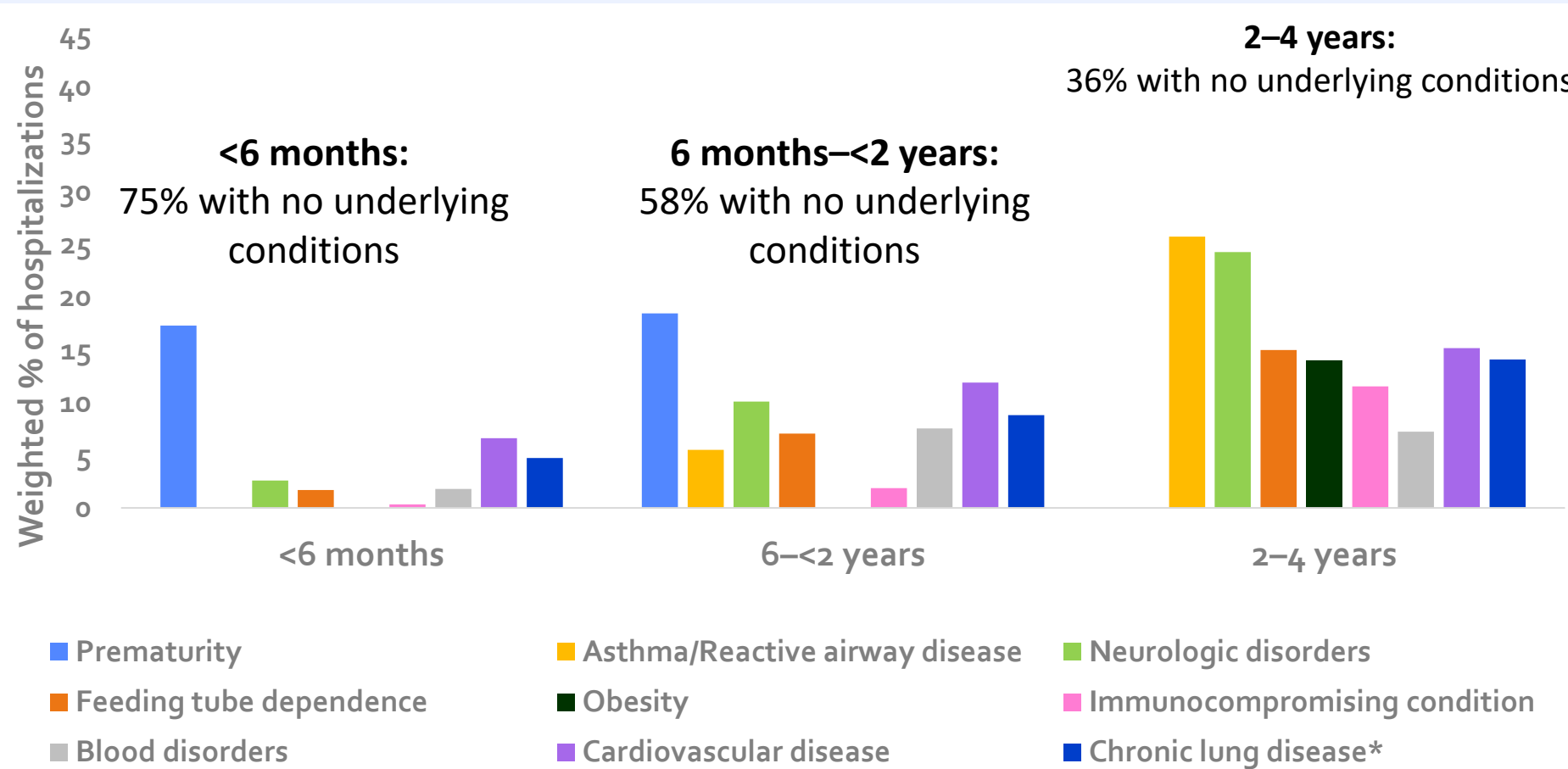
Population-Based Rates of COVID-19-Associated Hospitalizations among Children and Adolescents Ages ≤ 17 Years — COVID-NET, March 2020–May 2024



Population-Based Rates of COVID-19-Associated Hospitalizations among Children and Adolescents Ages 6 months–17 Years — COVID-NET, March 2020–May 2024



Underlying Medical Conditions among Infants and Children Ages ≤4 Years with COVID-19-associated Hospitalization, by Age Group — COVID-NET, July 2023–March 2024

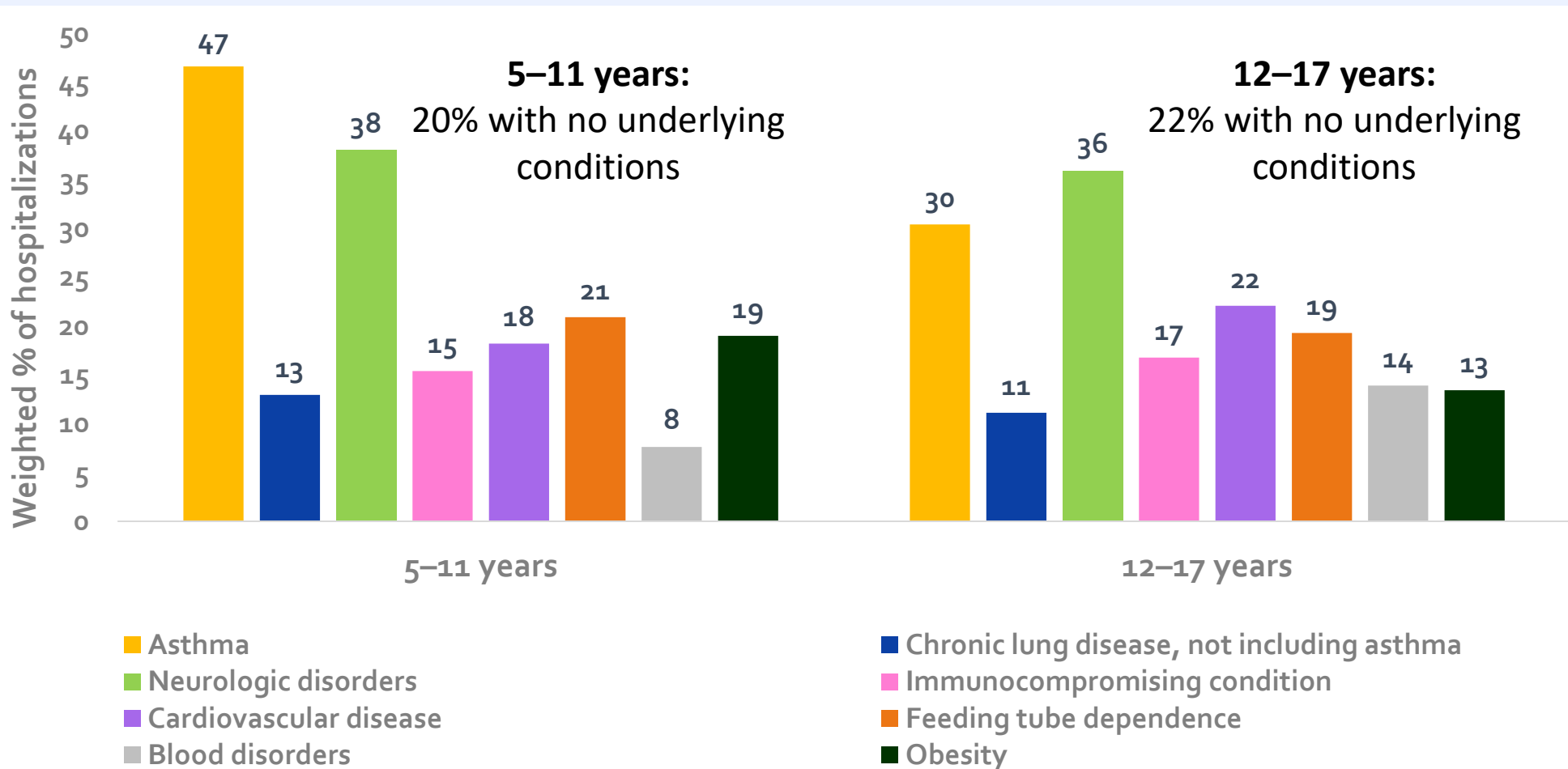


• **50%** of infants, children, and adolescents ages ≤17 years with COVID-19-associated hospitalization have **no underlying medical conditions.**

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

* Not including not asthma or reactive airway disease. Among children <2 years old, chronic lung disease includes bronchopulmonary dysplasia and chronic lung disease of prematurity.

Percent of COVID-19-Associated Hospitalizations with Underlying Medical Conditions among Children and Adolescents Ages 5–17 Years with COVID-19-associated Hospitalizations, by Age Group — COVID-NET, July 2023–March 2024



- **50%** of hospitalized infants, children, and adolescents ages ≤ 17 years with COVID-19-associated hospitalization have **no underlying medical conditions**.
- Among COVID-19-associated hospitalizations, children and adolescents **ages ≥ 5 years** are **more likely to have underlying medical conditions** relative to children and infants ages ≤ 4 years.

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

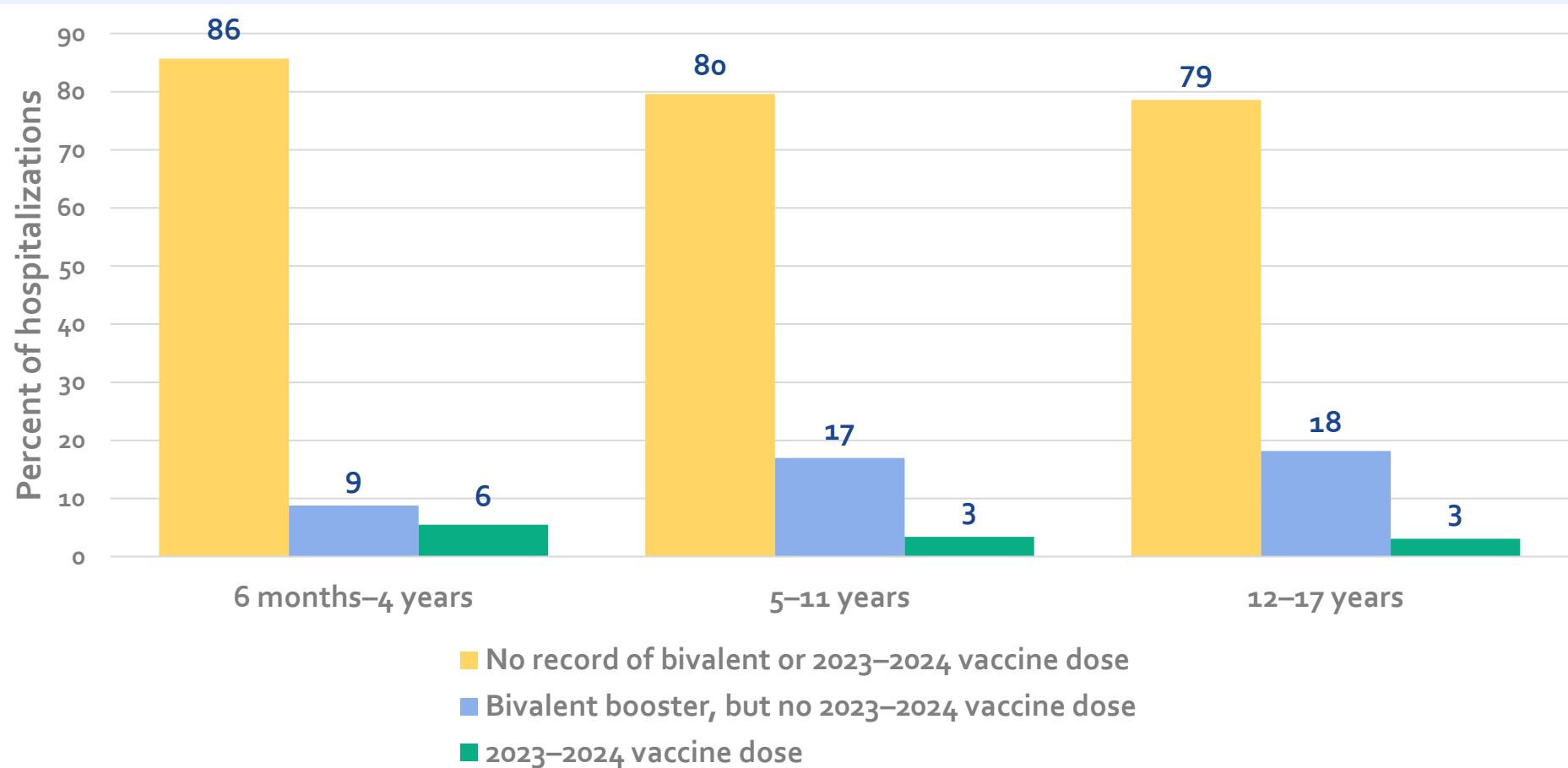
Only the most common underlying conditions are presented.

Underlying Medical Conditions among Patients Admitted to ICU among Children and Adolescents Ages ≤ 17 Years with COVID-19-associated Hospitalization, July 2023–March 2024

Age category	Among all hospitalized children, % with no underlying conditions	Among those admitted to ICU, % with no underlying conditions (n=363)	Among those with no underlying conditions, what % were admitted to ICU? (n=791)
<6 months	75%	56%	18%
6–23 months	58%	52%	17%
2–4 years	32%	28%	20%
5–11 years	16%	4%	5%
12–17 years	18%	19%	28%
Overall ≤ 17 Years	50%	40%	18%

Hospitalizations are limited to those with COVID-19 as the presenting complaint upon admission.

Vaccination Status among Children and Adolescents Ages ≤ 17 Years with COVID-19-associated Hospitalizations, by Age Group — COVID-NET, October 2023–March 2024



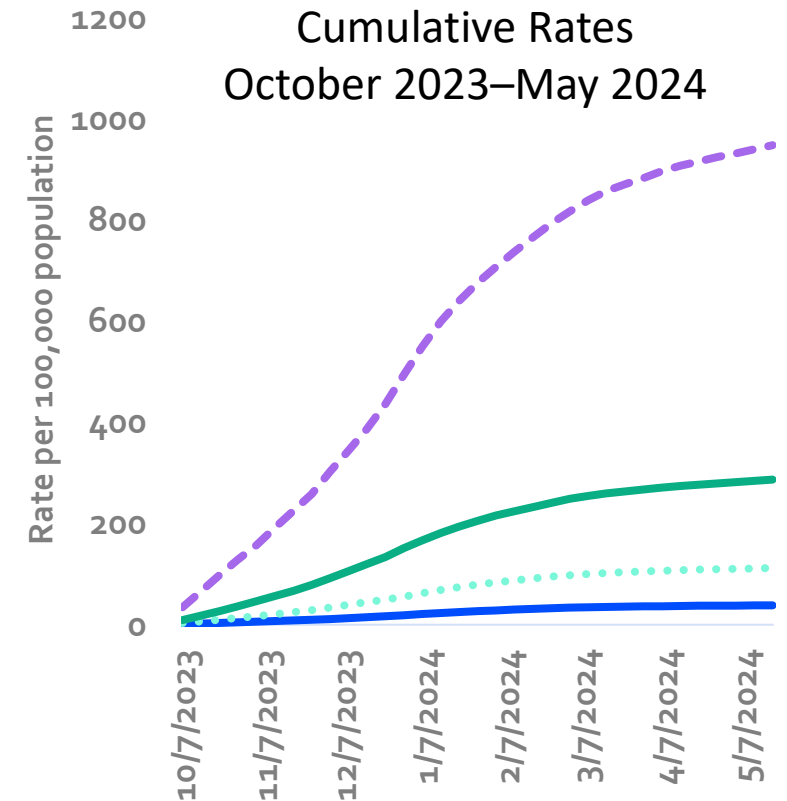
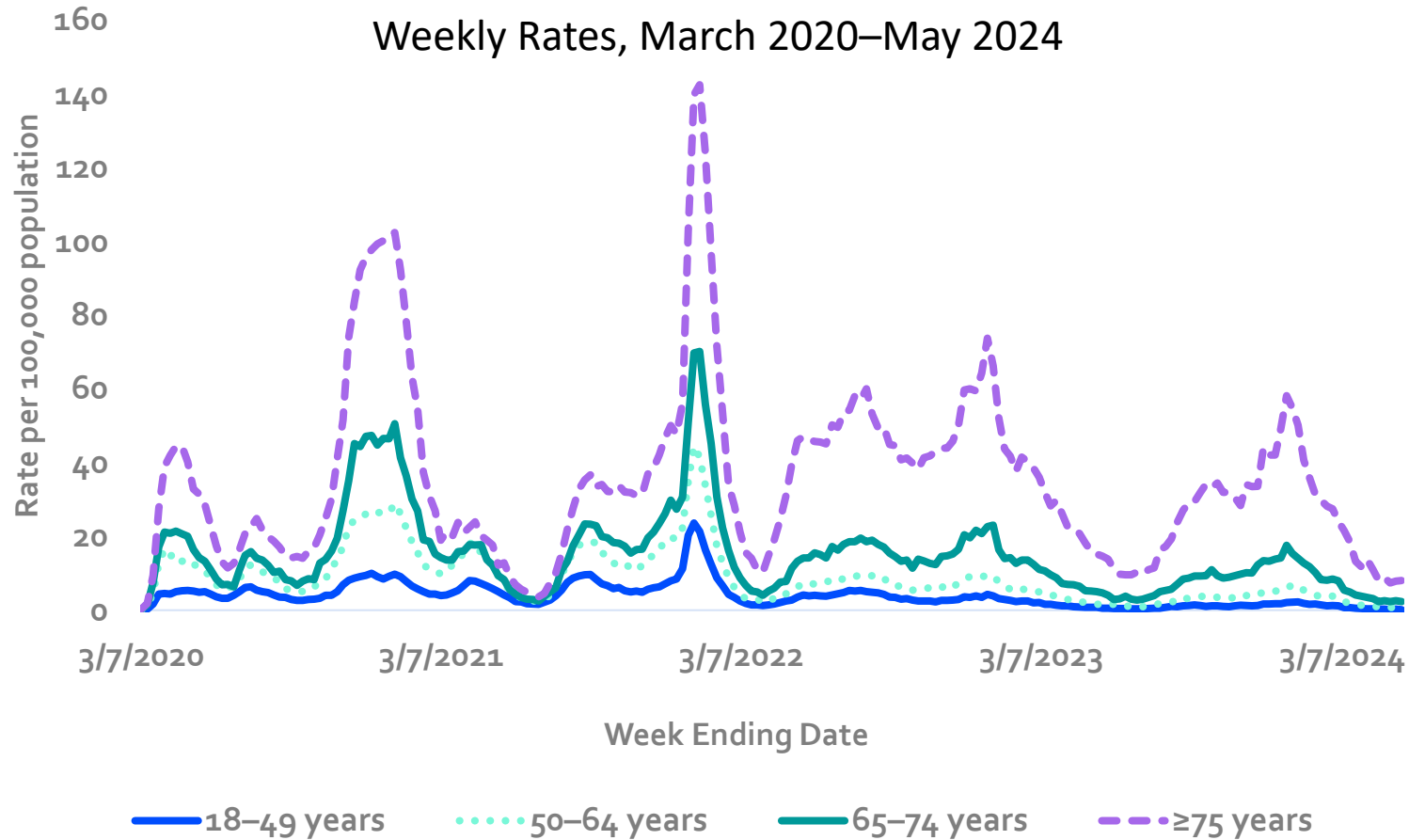
- **5%** of children and adolescents ages ≤ 17 years with COVID-19-associated hospitalizations received a **2023–2024 vaccine dose**.

No record of bivalent or 2023–2024 vaccine dose: No recorded doses of COVID-19 bivalent or the 2023-2024 vaccine dose since August 2022. **Bivalent booster, but no 2023–2024 vaccine dose:** Received COVID-19 bivalent booster vaccination but no record of receiving 2023-2024 vaccine dose since August 2022. **2023–2024 vaccine dose:** Received 2023-2024 vaccine dose. Persons with unknown vaccination status are excluded. Hospitalizations are limited to those with COVID-19 as the presenting complaint upon admission.

Epidemiology of COVID-19–associated hospitalizations among adults

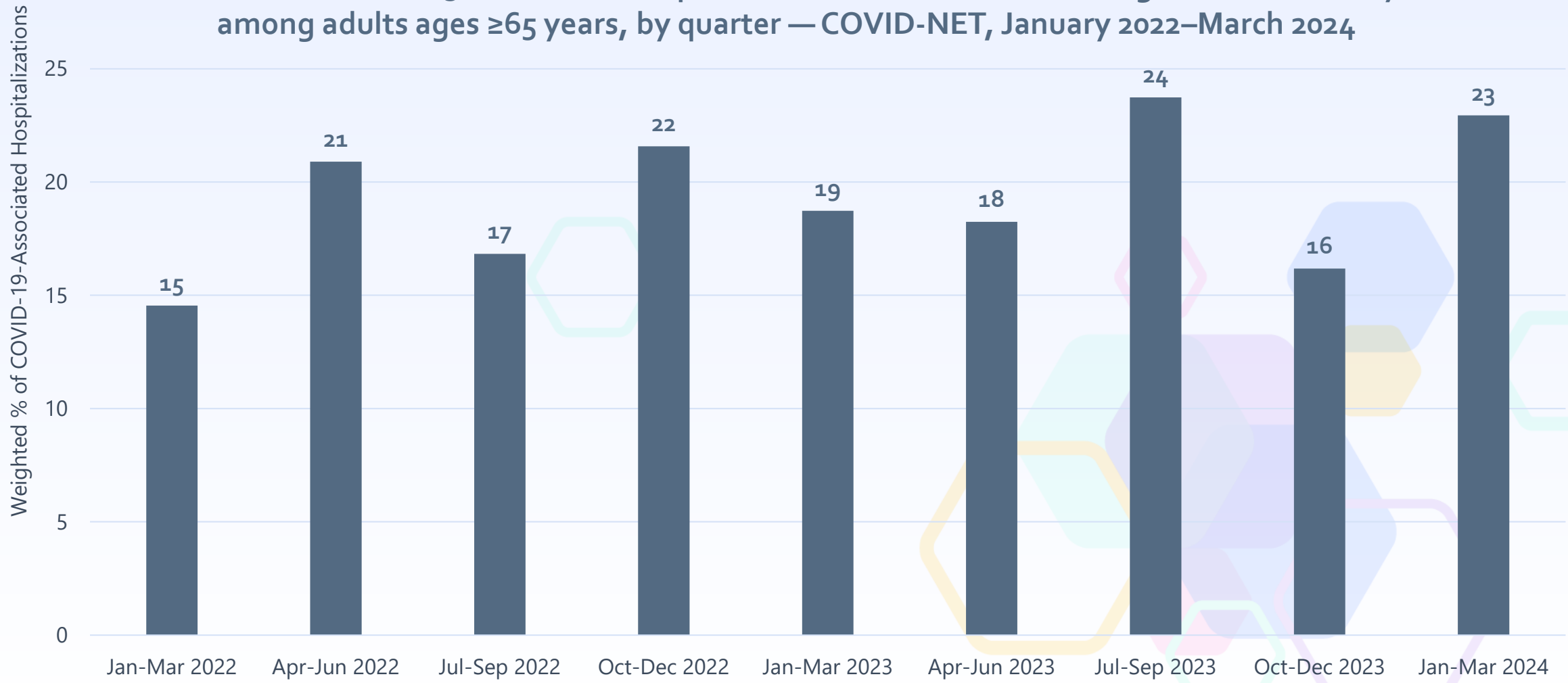


Weekly Population-Based Rates of COVID-19-Associated Hospitalizations among Adults Ages ≥ 18 Years — COVID-NET, March 2020–May 2024

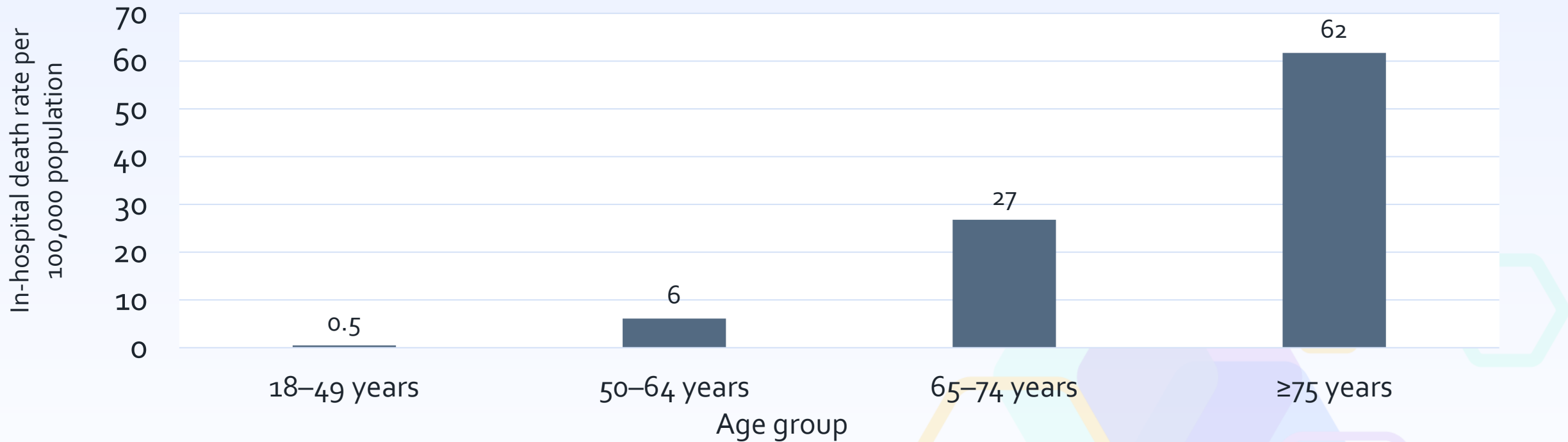


During January 2022–March 2024, 19% of COVID-19-associated hospitalizations among adults ages ≥ 65 years were residents of a long-term care facility.

Percent of COVID-19-associated hospitalizations admitted from a long-term care facility among adults ages ≥ 65 years, by quarter — COVID-NET, January 2022–March 2024

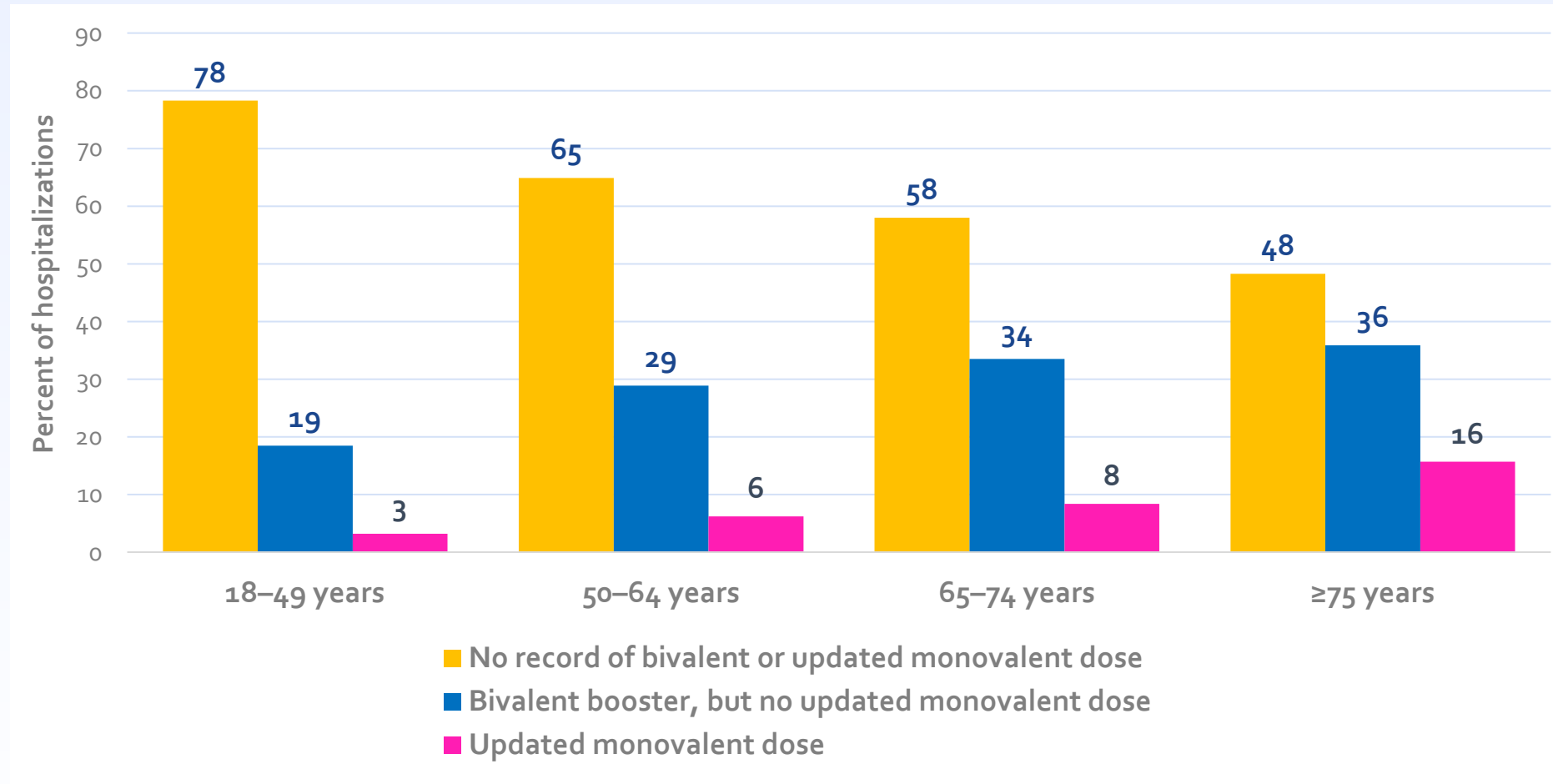


Cumulative In-Hospital Death Rate during COVID-19-Associated Hospitalization per 100,000 Population by Age Group — COVID-NET, October 2023–March 2024



Weighted percent of in-hospital deaths by age group	18–49 years	50–64 years	65–74 years	≥75 years
	3%	15%	32%	50%

Vaccination Status among Adults Ages ≥ 18 Years with COVID-19-associated Hospitalization, by Age Group — COVID-NET, October 2023–March 2024



- **11%** of adults ages ≥ 18 years with COVID-19-associated hospitalizations received a **2023–2024 vaccine dose**.
- **57%** of COVID-19-associated hospitalizations among adults ages ≥ 18 years had not received a COVID-19 vaccine after August 2022.

No record of bivalent or 2023–2024 vaccine dose: No recorded doses of COVID-19 bivalent or 2023–2024 vaccine dose since August 2022. **Bivalent booster, but no 2023–2024 vaccine dose:** Received COVID-19 bivalent booster vaccination but no record of receiving 2023–2024 vaccine dose since August 2022. **2023–2024 vaccine dose:** Received 2023–2024 vaccine dose. Persons with unknown vaccination status are excluded.

Percent of COVID-19-associated Hospitalizations among Adults Ages ≥ 18 Years with Underlying Medical Conditions, by Age Group, with Top 4 Categories Highlighted — COVID-NET, July 2023–March 2024

Condition	18–49 years	50–64 years	65–74 years	≥ 75 years
Chronic lung disease	26	41	51	40
<i>Asthma</i>	19	17	17	10
<i>COPD/Bronchitis</i>	4	19	30	19
Cardiovascular disease	26	56	65	72
<i>CAD/CABG/MI</i>	4	18	34	32
<i>CHF/Cardiomyopathy</i>	8	23	29	29
<i>Stroke/TIA</i>	5	18	13	20
Diabetes	19	41	40	34
Immunocompromising condition	12	22	22	11
Neurologic condition	23	32	29	46
Renal Disease	12	25	25	33
Severe obesity (BMI ≥ 40 kg/m ²)	16	14	6	3

COPD: chronic obstructive pulmonary disease; CAD: coronary artery disease; CABG: coronary artery bypass graft; TIA: transient ischemic attack
 Pink cells indicate the 4 most common underlying medical conditions within each age group; dark pink cells indicate the most common condition.

We used 3 data sources to calculate COVID-19–associated hospitalization rates by chronic condition and age group



Numerator

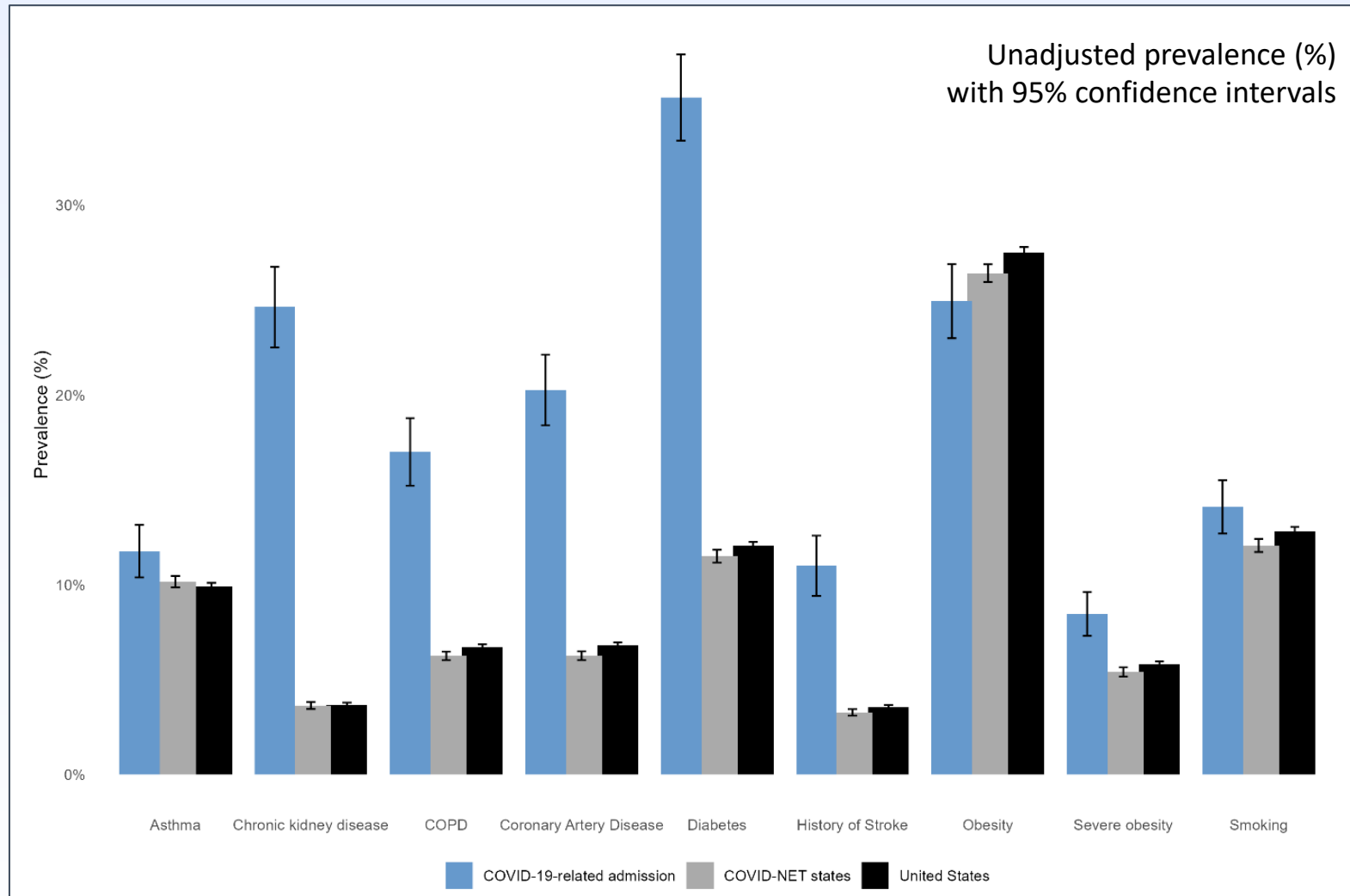
- COVID-19–Associated Hospitalization Surveillance Network (COVID–NET)



Denominator

- Behavioral Risk Factor Surveillance System (BRFSS)
- Census population counts

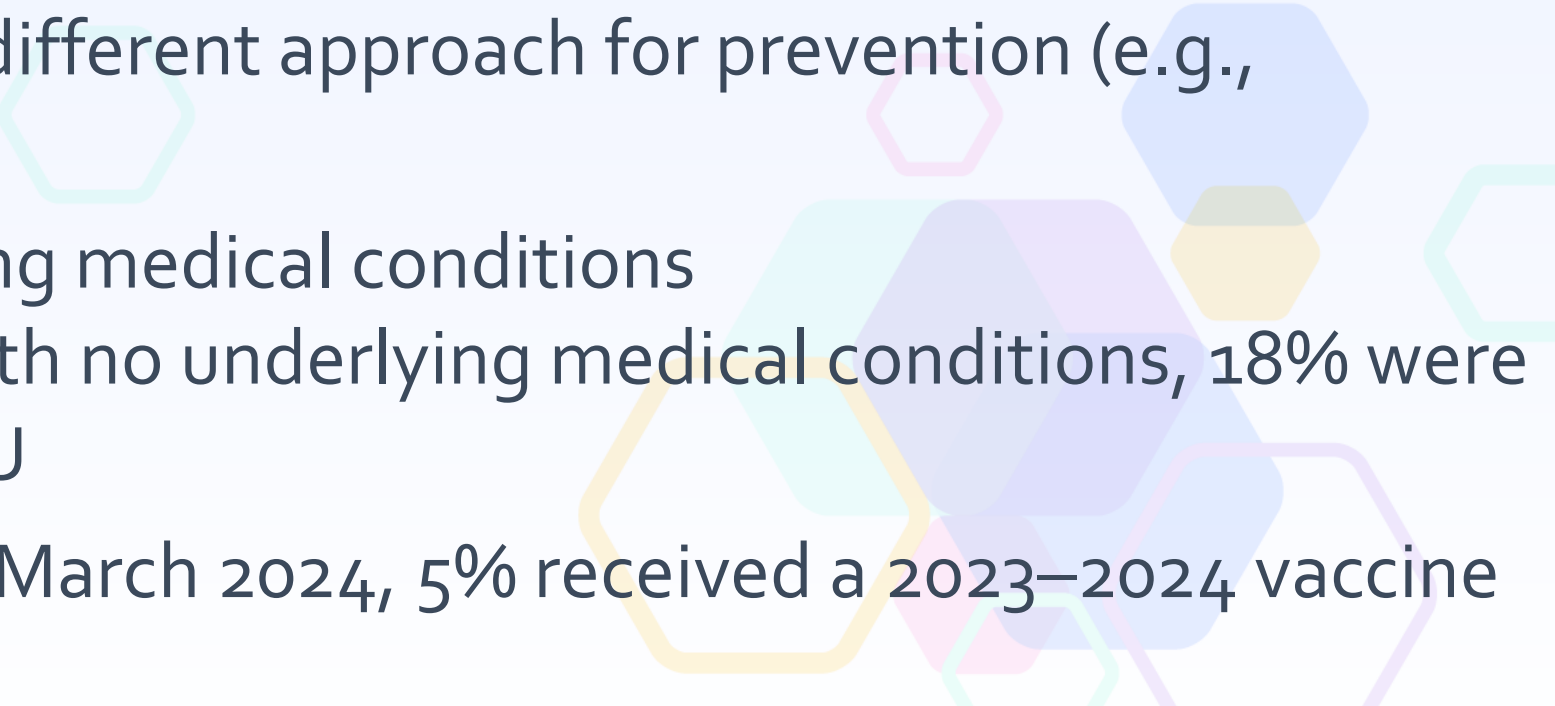
Prevalence of chronic conditions among hospitalized adults in COVID-NET, adults in COVID-NET states, and adults in the United States aged ≥ 18 years, 2022



- Except for asthma and obesity, unadjusted prevalence is higher among hospitalized COVID-19 patients relative to the general population
- In adjusted models, except for obesity, all other 8 conditions examined were found to increase the risk for COVID-19-associated hospitalization.
 - Magnitude of increased risk varied by condition and age group.
 - Age ≥ 75 remains a strong risk factor for hospitalization even in adjusted models
- Results are limited to community-dwelling adults

Data are preliminary and subject to change. Obesity is defined as BMI 30–39 kg/m²; severe obesity is defined as BMI ≥ 40 kg/m². Only includes community dwelling residents. Non-community dwelling persons, including those who resided in a long-term care facility upon admission, are excluded. COVID-19-related admissions are those where the primary reason for admission is COVID-19-related illness. Prevalence data from COVID-NET states and United states are obtain from the Behavioral Risk Factor Surveillance System, 2022 data.

Summary – Infants, Children, and Adolescents

- Rates of COVID-19-associated hospitalizations highest among those ≤ 4 years
 - Rates highest among infants ages < 6 months who are not vaccine eligible and require a different approach for prevention (e.g., maternal vaccination)
 - 50% have no underlying medical conditions
 - Among children with no underlying medical conditions, 18% were admitted to the ICU
 - During October 2023–March 2024, 5% received a 2023–2024 vaccine prior to admission
- 

Summary – Adults

- 2/3 of all COVID-19-associated hospitalizations among those ages ≥ 65 years
- During October 2023–March 2024, 11% received a 2023–2024 vaccine dose prior to admission
- Underlying conditions increase risk for hospitalization, but age remains strongly associated with the risk for hospitalization



Acknowledgements

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