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

ACIP Meeting

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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

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

Week ending date

COVID-19-Associated Hospitalization Rate per 100,000 population

- White, non-Hispanic
- Black, non-Hispanic
- American Indian/Alaska Native, non-Hispanic
- Asian/Pacific Islander, non-Hispanic
- Hispanic
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 infants, children and adolescents

**Weekly Rates, March 2020–May 2024**

**Cumulative Rates**
October 2023–May 2024

Weekly Rates, March 2020–May 2024

Cumulative Rates
October 2023–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**.

- **<6 months**: 75% with no underlying conditions
- **6 months–<2 years**: 58% with no underlying conditions
- **2–4 years**: 36% with no underlying conditions

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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.*

- 50% of 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 infants and children 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

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

*Hospitalizations are limited to those with COVID-19 as a likely primary reason for admission.*
Vaccination Status among Children and Adolescents Ages ≤17 Years with COVID-19-associated Hospitalizations, by Age Group — COVID-NET, October 2023–March 2024

86
80
79

5% of children and adolescents ages ≤17 years with COVID-19-associated hospitalizations received a 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.

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.
Epidemiology of COVID-19–associated hospitalizations among adults

Weekly Rates, March 2020–May 2024

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

![Bar chart showing the in-hospital death rate per 100,000 population by age group.]

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Weighted percent of in-hospital deaths by age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–49 years</td>
<td>3%</td>
</tr>
<tr>
<td>50–64 years</td>
<td>15%</td>
</tr>
<tr>
<td>65–74 years</td>
<td>32%</td>
</tr>
<tr>
<td>≥75 years</td>
<td>50%</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Condition</th>
<th>18–49 years</th>
<th>50–64 years</th>
<th>65–74 years</th>
<th>≥75 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic lung disease</td>
<td>26</td>
<td>41</td>
<td>51</td>
<td>40</td>
</tr>
<tr>
<td>Asthma</td>
<td>19</td>
<td>17</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td>COPD/Bronchitis</td>
<td>4</td>
<td>19</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td><strong>Cardiovascular disease</strong></td>
<td><strong>26</strong></td>
<td><strong>56</strong></td>
<td><strong>65</strong></td>
<td><strong>72</strong></td>
</tr>
<tr>
<td>CAD/CABG/MI</td>
<td>4</td>
<td>18</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>CHF/Cardiomyopathy</td>
<td>8</td>
<td>23</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Stroke/TIA</td>
<td>5</td>
<td>18</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Diabetes</td>
<td>19</td>
<td>41</td>
<td>40</td>
<td>34</td>
</tr>
<tr>
<td>Immunocompromising condition</td>
<td>12</td>
<td>22</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>Neurologic condition</td>
<td>23</td>
<td>32</td>
<td>29</td>
<td>46</td>
</tr>
<tr>
<td>Renal Disease</td>
<td>12</td>
<td>25</td>
<td>25</td>
<td>33</td>
</tr>
<tr>
<td>Severe obesity (BMI ≥40 kg/m²)</td>
<td>16</td>
<td>14</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

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

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 obtained from the Behavioral Risk Factor Surveillance System, 2022 data.

- 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.
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

October 2023–March 2024: 5% of hospitalized children 6 months – ≤17 years had received a 2023–2024 vaccine prior to admission
2/3 of all COVID-19-associated hospitalizations among those aged ≥65 years

During October 2023–March 2024, 11% of hospitalized adult patients had 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
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