How Effective Are COVID-19 Vaccines Against Omicron in Children (6 months to 18 years)?

Vaccine effectiveness (VE) is how vaccines work in the real world (not just in clinical trials)

**WHO- Authorized vaccines for use in children**

- Primary course: Pfizer BioNTech & Moderna monovalent (≥6 months), Novavax (≥12 years), Sinovac (≥3 years)
- Booster dose: Pfizer BioNTech monovalent and ancestral/omicron bivalent & Moderna monovalent (≥12 years)

**Other vaccines with country approvals for use in children**

- Sinopharm, Covaxin, Soberana 02 & Soberana Plus, Pfizer BioNTech and Moderna ancestral/omicron bivalent (≥6 months), + others

**Key Facts**

**COVID-19 disease in children**

- While infection rates are similar in adults and children, SARS-CoV-2 rarely causes severe disease in children.
- Children with immunocompromising or underlying conditions are at higher risk of severe disease.
- Rarely, COVID-19 can cause long-term consequences such as Multisystem Inflammatory Syndrome in Children (MIS-C) or long COVID, even after mild illness.
- Infected children, especially adolescents, can transmit SARS-CoV-2 to others.

**Effectiveness of the primary vaccination series**

- Against **severe disease**, mRNA vaccines provide good protection and inactivated vaccines provide moderate protection, but some declines are seen by six months.
- Protection against **symptomatic disease** and **infection** (of any severity) is lower and wanes rapidly.

**After a booster shot (3rd dose) of an mRNA vaccine:**

- Protection against **severe disease** improved and remained high for 2-3 months.
- Protection against **infection or symptomatic disease** was good immediately after vaccination but fell substantially within 1-3 months.

**Countries should consider several factors in formulating policies for COVID-19 vaccine use in children, including disease severity, vaccine coverage, and indirect consequences of COVID-19 among children.**

**COVID vaccines have no evident safety concerns in children, and severe reactions are rare.**

Evidence in this brief was provided by VIEW-hub, a publicly available resource made possible by support from the Coalition for Epidemic Preparedness Innovations (CEPI) and the World Health Organization. Additional COVID-19 vaccine briefs available [here](https://view-hub.org/covid-19).
### How Effective Are Vaccines Against Omicron in Children?

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Severe Disease/ Hospitalization/ Death</th>
<th>Symptomatic Disease</th>
<th>Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12 years</td>
<td>48-100%&lt;sub&gt;5&lt;/sub&gt;</td>
<td>48-67%&lt;sub&gt;4&lt;/sub&gt;</td>
<td>31-60%&lt;sub&gt;10&lt;/sub&gt;</td>
</tr>
<tr>
<td>12-18 years</td>
<td>76-89%&lt;sub&gt;3&lt;/sub&gt;</td>
<td>51-83%&lt;sub&gt;7&lt;/sub&gt;</td>
<td>38-76%&lt;sub&gt;9&lt;/sub&gt;</td>
</tr>
<tr>
<td>3-17 years</td>
<td>67%&lt;sub&gt;1&lt;/sub&gt;</td>
<td>No data</td>
<td>40%&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td>&lt;12 years</td>
<td>59-67%&lt;sub&gt;2&lt;/sub&gt;</td>
<td>No data</td>
<td>38%&lt;sub&gt;1&lt;/sub&gt;</td>
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<tr>
<td>&lt;12 years</td>
<td>59-69%&lt;sub&gt;3&lt;/sub&gt;</td>
<td>40&lt;sub&gt;1&lt;/sub&gt;</td>
<td>38%&lt;sub&gt;1&lt;/sub&gt;</td>
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<tr>
<td>3-17 years</td>
<td>58%&lt;sub&gt;1&lt;/sub&gt;</td>
<td>No data</td>
<td>30%&lt;sub&gt;1&lt;/sub&gt;</td>
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</table>

<table>
<thead>
<tr>
<th>Booster</th>
<th>Pfizer or Moderna (mRNA)</th>
<th>&lt;12 years</th>
<th>No data</th>
<th>77%&lt;sub&gt;1&lt;/sub&gt;</th>
<th>No data</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>11-18 years</td>
<td>94-96%&lt;sub&gt;2&lt;/sub&gt;</td>
<td>62-87%&lt;sub&gt;3&lt;/sub&gt;</td>
<td>56-89%&lt;sub&gt;8&lt;/sub&gt;</td>
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<tr>
<td>Booster</td>
<td>Sinovac</td>
<td>3-17 years</td>
<td>73%&lt;sub&gt;1&lt;/sub&gt;</td>
<td>No data</td>
<td>39%&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-17 years</td>
<td>76%&lt;sub&gt;1&lt;/sub&gt;</td>
<td>No data</td>
<td>-1%&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

- Values represent the range of estimates found across all included studies evaluating VE within 3 months of the final dose among children, except for VE of Sinopharm against Severe disease/Hospitalization/Death (available estimates were within 6 months of the final dose).
- Subscript represents the number of estimates included in range.

### How Long Do Vaccines Protect Children Against Omicron?

#### PRIMARY SERIES

**Average Vaccine Effectiveness (a meta-analysis)**

- **Severe disease**: Across 4 widely used vaccines, average VE of primary series vaccination declined on average by 10 percentage points over 6 months.
- **Symptomatic disease**: VE declined on average by 52 percentage points over 6 months.

#### BOOSTER

Evidence from just 3 studies so far shows:

- **Severe disease**: VE of an mRNA booster dose remained high (76-84%) up to 6 months after vaccination.
- **Symptomatic disease**: VE of an inactivated booster (Sinovac) was initially high but waned rapidly.

- **Severe disease**: Across 4 widely used vaccines, average VE of primary series vaccination declined on average by 10 percentage points over 6 months.
- **Symptomatic disease**: VE declined on average by 52 percentage points over 6 months.

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**- MORE EVIDENCE IS NEEDED -**
Evidence is limited overall and is especially sparse for the following:

**FIRST BOOSTER DOSE PROTECTION IN CHILDREN**: Little evidence exists on protection of booster doses in children and adolescents, particularly against severe disease, and on how long protection lasts.

**SECOND BOOSTER DOSE PROTECTION IN CHILDREN**: There is no data on how well a second booster dose of any vaccine protects children from Omicron.

**BIVALENT BOOSTER DOSE PROTECTION**: One study found that, relative to primary vaccination, a bivalent mRNA booster dose was 77-47% effective against infection in children at 1-2 months after vaccination. There is no data on the absolute effectiveness of bivalent mRNA boosters in children.

**PROTECTION AGAINST TRANSMISSION**: We don’t know how well vaccines can prevent onward transmission of Omicron by children and adolescents, though the limited evidence available suggests vaccines only have a small impact on the risk of onward transmission of Omicron in general.

**VACCINE EFFECTIVENESS OF NON-mRNA VACCINES**: There is limited data on how well non-mRNA vaccines (e.g. Sinopharm, Sinovac) protect against infection, symptomatic and severe disease in children, and how long protection lasts.

**YOUNGER CHILDREN**: There is limited data on how well vaccines protect younger children from Omicron, particularly those under 5 years of age.

**VULNERABLE CHILDREN**: There is no data on how well vaccines perform in immunocompromised and vulnerable children.

**OMICRON SUB-VARIANTS**: We don’t know how well the vaccines work against Omicron BA.4, BA.5, BQ.1, BQ.1.1, and XBB.1.5 in children, currently the most common sub-variants.