INTERVIEW

Paediatric COVID vaccination FAQs

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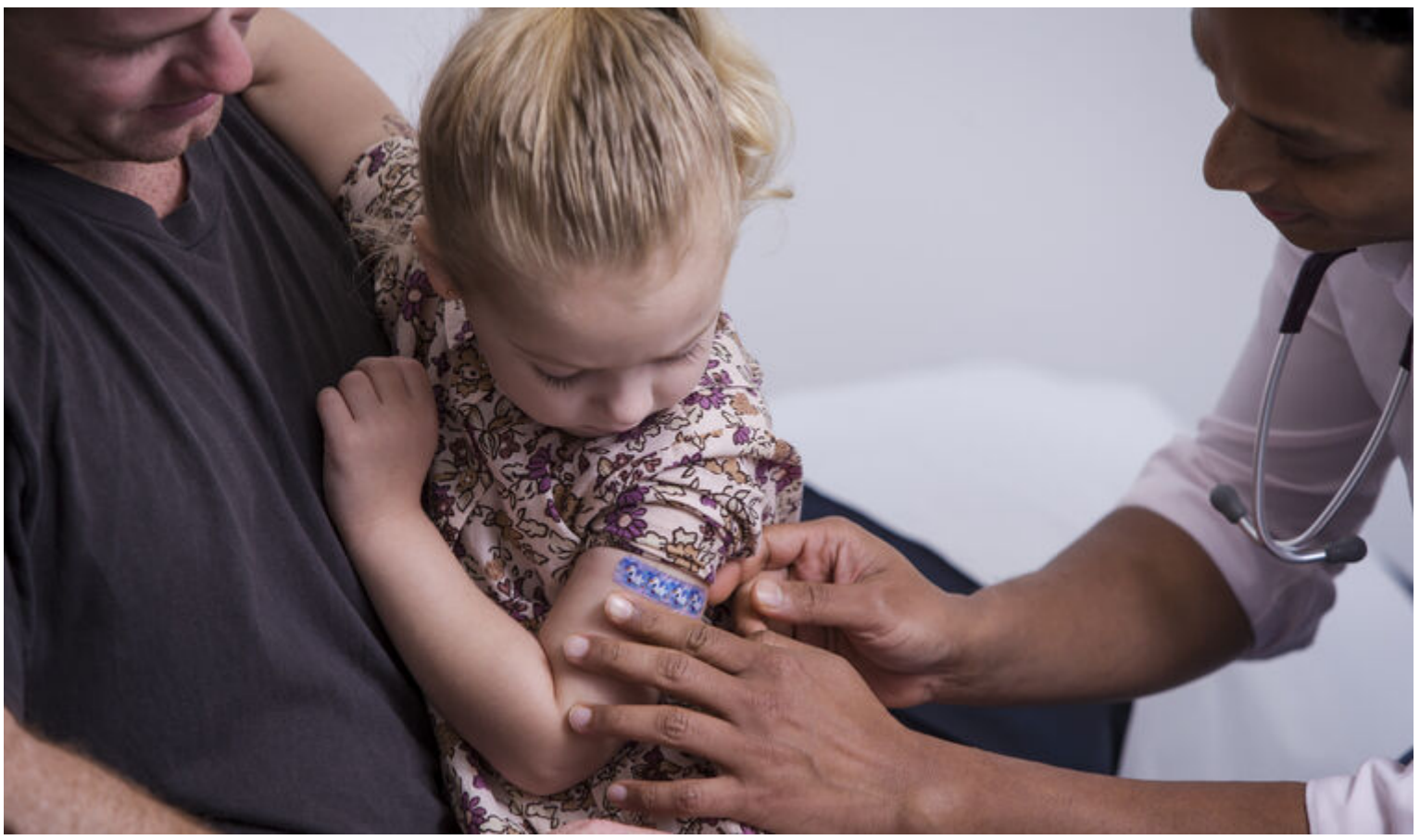
A team of GPs and academics answer commonly asked patient questions regarding the risks and benefits of immunising children against COVID-19.



Less than 40% of children in Australia aged 5–11 have received two doses of a COVID-19 vaccine.

In Australia, around 70% of people aged 16 and over have had at least three doses of a COVID-19 vaccine, while 96.2% of this cohort has had at least two.

However, uptake among children remains markedly lower. According to the Department of Health and Aged Care, only around 73% of children aged 12–15 have received two doses, and in children aged 5–11, that rates drops further still to 38%.

Factors contributing to COVID-19 vaccine delay in children include caregiver concerns regarding the safety and effectiveness of vaccines, as well as misunderstanding of the risks of infection and the benefits of vaccination for children.

But what does the latest research into COVID-19, vaccination, and children indicate? The team of GPs and academics behind the COVID Risk Calculator (CoRiCal) has the answers.

Are all children at risk from getting COVID?

Yes.

While a sizable proportion of children (82% in the Australian PAEDS SARS-COV-2 Serosurvey conducted in 2022) have had COVID, immunity against re-infection is short-lived in children who have had COVID-19 or who have been vaccinated.

The Omicron variants of COVID-19 are more transmissible than the original strain and earlier variants. They are causing more cases in children, but they are not causing more severe disease. Children are most likely to catch COVID-19 from household or close family contact with infected adults.

Can COVID be a serious health issue in children?

Children tend to get mild disease and most do not need to go to hospital, especially since the emergence of Omicron. Nonetheless, the incidence of hospitalisation was reduced by two-thirds in children who have had a COVID vaccine during the Omicron period.

Rarely, around one in 3000 children infected with COVID-19 develop a post-COVID multi-inflammatory syndrome (MIS-C) that affects many organs in their body. The incidence of MIS-C in the Australian setting, when Omicron has been circulating, is eight cases per 100,000 children.

Two doses of the Pfizer COVID vaccine prevented 84% of MIS-C cases in patients ages 5–18 years. Another study showed that the incidence of MIS-C following a COVID vaccine in older children (aged 12–20 years) was one in every million who had evidence of SARS-CoV-2 infection, and three per 10 million in those without.

Long COVID in children is possible but there is considerable debate about its nature and extent in children.

Can children spread COVID to other children and vulnerable adults?

Yes, but other people can also spread COVID to these groups. The more challenging ethical issue is whether (and by how much) vaccination reduces the risk of transmission of COVID from children to other vulnerable people, and therefore whether children should be vaccinated to reduce spread – especially when the risks from COVID are much less in children.

Should all children get vaccinated against COVID?

Yes, vaccination is recommended for everyone in Australia aged five years and over. Vaccination is also recommended for children aged six months to under five years who are severely immunocompromised or have disability, as well as those who have complex and/or multiple health conditions that increase their risk of severe COVID-19.

Despite this clear advice from the Department of Health and Aged Care (DoH), the World Health Organization (WHO) has recently 'downgraded' children as a priority group to get a COVID vaccine.

WHO do state that primary and booster doses are safe and effective in children and adolescents. However, considering the low burden of disease, the Strategic Group of Experts on Immunization (SAGE) urges countries considering vaccination for this age group to base their decisions on contextual factors such as the disease burden, cost effectiveness, and other health or programmatic priorities and opportunity cost.

They also indicate that COVID vaccines in children should not be at the expense of administering traditional essential vaccines for children such as the rotavirus, measles, and pneumococcal conjugate vaccines.

Every year in the US, prior to the availability of a vaccine, three children died of the hepatitis A virus, eight children died of meningococcus, 16 children died of varicella, 17 people of all ages died of rubella, and 20 children died of rotavirus. Between October 2020 and October 2021, 66 children in the US aged 5–11 died of SARS-CoV-2 infection.

What are the main risks of the COVID vaccine in children?

Local side effects are fairly common. Children are likely to experience mild side effects, such as fever, fatigue/sleepiness and pain at the injection site after vaccination, but these usually resolve within 48 hours.

More serious, but uncommon adverse effects include myocarditis. This mostly occurs after the second dose of an mRNA vaccine in males under 40, but it can occur at any age and in both sexes.

Myocarditis is inflammation of the heart and there are many possible causes, including COVID-19. When Omicron has been circulating, the incidence of myocarditis in children who have had COVID is approximately 1 in 250 – a much higher incidence than after an mRNA COVID vaccine.

Data from 40 healthcare systems participating in a large network found that the risk of cardiac complications is significantly higher after SARS-CoV-2 infection than after mRNA COVID-19 vaccination for both male patients and female patients in all age groups.

Does vaccination against COVID in children provide a longer duration of immunity compared with the child getting COVID?

There is good evidence, in adults, that hybrid immunity (ie immunity from both vaccination and past infection) provides a higher level of protection against COVID.

Recent studies suggest that hybrid immunity provides some protection against infection for at least seven or eight months. This means that individuals who have had wild COVID will get a better level of protection by having a COVID vaccine.

We await evidence about whether a similar benefit to hybrid immunity is seen in children. There is also no data available about long-term protection after both natural infection and vaccination in children.

In a British study, primary Omicron infection elicited a weak antibody response and only 53% of children developed detectable neutralising antibodies. Vaccination elicited the highest levels of antibody response and was also strongly immunogenic following prior natural infection with Omicron.

The investigators concluded that 'vaccination may represent the most effective approach to control infection whilst cellular immunity should offer strong clinical protection'.

What tools and aids are available for parents to assess the risks and benefits of their child getting a COVID vaccine?

Several tools are available to help parents work through the costs and benefits associated with a child getting a COVID vaccine.

The COVID Risk Calculator (CoRiCal) team, which includes academics and clinicians from Flinders University, the University of Queensland, Queensland University of Technology and Sydney University, has successfully built a Bayesian network modelling framework for risk-benefit analysis of COVID-19 vaccines in Australia.

The recently released children's version of CoRiCal can incorporate multiple sources and types of evidence, and assumptions can be rapidly updated. Model outputs are publicly accessible through the web-based calculator which is supported by the Immunisation Coalition that enables users to define scenarios (age, sex, vaccination status) and see personalised risk-benefit outputs (eg developing myocarditis from a vaccine versus from SARS-CoV-2 infection).

CoRiCal can be used by individuals or for facilitating shared decision making between clinicians and patients or parents.

The National Centre for Immunisation Research and Surveillance (NCIRS) has also developed a decision aid for parents with children who wish to look at the costs and benefits of their child having a COVID vaccine).

What countries are recommending a COVID vaccine for children?

About 120 countries have approved COVID-19 vaccines for children but at different ages. Some notable exceptions include the UK and some Scandinavian countries.

If a child has had COVID, should they get a COVID vaccine?

Yes; however, the DoH has suggested thatif a child has had COVID-19 you should wait three months after the confirmed infection before they receive a COVID-19 vaccine dose.

This delay helps to optimise their vaccine protection. A longer gap between infection and vaccination is likely to lead to a better immune response and result in longer protection from reinfection.

The next scheduled dose of COVID-19 vaccine should be given as soon as possible after three months.

As highlighted above, there are benefits from hybrid immunity so a child's level of protection is likely to be enhanced if they have a COVID vaccine some time following a bout of COVID.

Can children get a COVID vaccine at the same time as their routine childhood vaccines?

The DoH has provided specific advice about co-administering a COVID vaccine with other routinely administered childhood vaccines.

For children aged 5–11, they suggest that if a child has had COVID-19, you do not need to defer other vaccinations – for example, the flu vaccine. But they should not get any vaccine if they are acutely unwell (eg have a fever).

For children aged six months to under five years, they recommend waiting 7–14 days between the child's COVID-19 vaccine and other vaccines to minimise the risk of adverse events, such as fever.

The COVID-19 vaccine can be administered with other vaccines in special circumstances, such as with outreach programs to remote areas or children receiving complicated catch-up schedules.

The Australian Technical Advisory Group on Immunisation (ATAGI) has made recommendations on the use of COVID-19 vaccines in Australia, including co-administration.

'There is limited evidence on the safety and effectiveness of co-administering COVID-19 vaccines at the same time as other vaccines,' the clinical guidance states.

'Providers need to balance the opportunistic need for co-administration with the benefits of giving the vaccines on separate visits.

'There is the potential for an increase in mild-to-moderate adverse events when more than one vaccine is given at the same time. Co-administration or near administration (eg within days) with another vaccine may also make it challenging to attribute potential adverse events.

'Providers should ensure that parents/guardians of young children receiving COVID-19 vaccines are aware of the increased potential for local reactions.'

Table summarising the pros and cons of vaccinating healthy children against COVID (assuming majority of cases are due to Omicron variants)

Pros	**Cons**
Reasonable likelihood of getting COVID • While global burden of disease in children is low, it is not negligible. • Nearly two-thirds of children hospitalised with COVID have no underlying conditions	Children have fewer and milder symptoms than adults
Some impact on reducing community transmission of COVID	Impact on transmission is uncertain
Effective in reducing the likelihood of: • Getting COVID • Being hospitalised due to COVID • Severe COVID • Multi Inflammatory Syndrome in Children: Vaccinating children who have had COVID may have improved (hybrid) immunity	• Adverse effects of vaccination eg myocarditis • Large proportion of children have had COVID so have some level of immunity • Imprinting associated risk
Long COVID Long COVID in children is possible but there is considerable debate about its nature and extent in children	
COVID vaccines are safe	Long term safety of vaccines unknown

Impact on routine childhood vaccinations • routine childhood vaccinations provide an opportunity to vaccinate against COVID	Impact on routine childhood vaccinations • may be delayed
Helps to minimise school disruption	Vaccination is only one component in keeping schools safe
Impact of new variants uncertain	Risk to undermining trust in vaccination
Recommended COVID vaccines in children are provided free to parents	Vaccine cost
Endemicity • In the context of endemic disease, leaving children unvaccinated provides a potential reservoir for the emergence of new variants	Endemicity • Most COVID disease is mild in children, leaving them as a potential reservoir would result in mild primary infection and a natural booster of immunity in adults

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Yes 52%

No 34%

Unsure 13%

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