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ATAGI 2023 booster advice

Recommendations from the Australian Technical Advisory Group on Immunisation (ATAGI) regarding COVID-19 boosters in 2023. These recommendations replace previous ATAGI COVID-19 vaccine booster advice.

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The goal of the Australian COVID-19 vaccination program remains the prevention of severe illness from COVID-19. ATAGI has evaluated this risk in the context of high population levels of hybrid immunity (i.e., combined immunity from past infection and past vaccination), the evidence regarding COVID-19 vaccine effectiveness, including for new bivalent vaccines, and the changing epidemiology of COVID-19 related to newly emerged subvariants of Omicron.

These recommendations replace previous ATAGI COVID-19 vaccine booster advice.

Overview

- ATAGI **recommends** a 2023 COVID-19 vaccine booster dose for adults in the following groups, if their last COVID-19 vaccine dose or confirmed infection (whichever is the most recent) was 6 months ago or longer, and regardless of the number of prior doses received:
 - All adults aged 65 years and over
 - Adults aged 18-64 years who have medical comorbidities that increase their risk of severe COVID-19, or disability with significant or complex health needs.
- ATAGI advises the following groups should **consider** a 2023 booster dose if their last COVID-19 vaccine dose or confirmed infection (whichever is the most recent) was 6 months ago or longer, and regardless of the number of prior doses received, based on an individual risk benefit assessment with their immunisation provider.
 - All Adults aged 18-64 years without risk factors for severe COVID-19
 - Children and adolescents aged 5-17 years who have medical comorbidities that increase their risk of severe COVID-19, or disability with significant or complex health needs.
- ATAGI advises that a booster dose is **not recommended** at this time for children and adolescents aged under the age of 18 who do not have any risk factors for severe COVID-19.
- Regarding vaccine choice, all currently available COVID-19 vaccines are anticipated to provide benefit as a booster dose, however bivalent mRNA booster vaccines are preferred over other vaccines. These include: Pfizer Original/Omicron BA.4/5, as well as Pfizer Original/Omicron BA.1 or Moderna Original/Omicron BA.1. Moderna Original/Omicron BA.4/5 is currently under evaluation by the Therapeutic Goods Administration.
- COVID-19 vaccine can be co-administered with influenza and other vaccines.
- Administration of a 2023 COVID-19 booster dose should aim to occur prior to June 2023 and at a time of 6 months or greater following the most recent COVID-19 vaccine dose or confirmed infection.
- Ongoing surveillance of COVID-19 infection rates and clinical outcomes, new variants, and vaccine effectiveness will inform future recommendations for additional booster doses.

ATAGI 2023 Booster Advice*

Age	At risk**	No risk factors
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Age	At risk**	No risk factors
<5 years	Not recommended	Not recommended
5-17 years	Consider	Not recommended
18-64 years	Recommended	Consider
≥ 65 years	Recommended	Recommended

*mRNA bivalent booster preferred; for ages in which a bivalent vaccine is not approved, use a vaccine approved for that age group. A 2023 booster dose should be given 6 months after a person's last dose or confirmed infection.

**Includes those with a medical condition that increases the risk of severe COVID-19 illness (refer to ATAGI clinical guidance) or those with disability with significant or complex health needs or multiple comorbidities which increase the risk of poor outcomes from COVID-19.

Rationale

Epidemiology of SARS-CoV-2 as of February 2023

Multiple new Omicron subvariants have emerged since the BA.4/5 wave in Australia during July and August 2022, displaying increased immune-escape properties (e.g. BQ.1 and XBB)^{1,2}. These have co-circulated without any specific subvariant establishing clear dominance. Numerous immunological studies report reduced neutralisation of new Omicron subvariants by both vaccine-induced and naturally derived antibodies^{3,4}. COVID-19 vaccines may have a reduced and/or shorter duration of protection against infection from these subvariants compared with older variants, however vaccines (together with hybrid immunity from natural infection) continue to provide strong protection against severe COVID-19. Of note, early evidence suggests that the newer Omicron subvariants do not cause more severe disease compared with the original Omicron subvariant (BA.1)⁵.

Anticipated benefits of a 2023 COVID-19 vaccine booster dose

An additional COVID-19 booster dose is anticipated to address waning of protection against severe COVID-19 prior to winter. This will provide an increase in protection against severe illness and protect the healthcare system during a time of high demand.

It is recommended to defer vaccination for 6 months following a confirmed SARS-CoV-2 infection, as this, together with prior vaccine doses received, will boost protection against COVID-19. ATAGI notes that testing rates have decreased and there are likely to have been many people with undetected SARS-CoV-2 infection within recent months. There are no safety concerns for individuals receiving a COVID-19 vaccine who may have had undetected SARS-CoV-2 infection within the past 6 months.

The increase in protection against severe illness from COVID-19 following a booster dose is most beneficial for people at higher risk of severe illness, i.e., older adults and those with relevant medical risk factors^{6,7}. Studies conducted throughout the pandemic, including during Omicron epidemic waves have identified a higher risk of hospitalisation among older adults and adults with immunosuppression or other chronic medical conditions, compared with younger or healthy adults^{8,9}.

ATAGI considers a booster dose beneficial for all adults aged 65 years and older. The risk of severe disease increases with each decade of age. With similar levels of hybrid immunity to the Australian population, UK modelling during the Omicron era found that 800 people aged 70 years and above would need to be given a booster to prevent one hospitalisation from COVID-19, compared with 8000 people aged 50 to 59 years and 92,500 people aged 40-49 years¹⁰. However, a booster dose may still be beneficial for people aged 5-64 years based on individual circumstances such as underlying conditions that increase their risk of severe disease.

For children and adolescents aged 5-17 years with risk factors for severe illness, a booster dose may be beneficial; decision-making around booster vaccination should be based on an individual risk-benefit assessment with their immunisation provider. The risk of severe disease with current high population levels of hybrid immunity in children and adolescents aged 5-17 years without risk factors is now considered to be lower than when previous ATAGI booster advice was issued. At present, most at-risk children aged 6 months to <5 years who have received a primary course have done so within recent months and a booster dose is not recommended at present.

ATAGI continues to recommend a primary course of vaccination against COVID-19, followed by a booster dose for those eligible, even in individuals who have had past infection. Adults who have already been infected with an Omicron subvariant and vaccinated with 3 doses of COVID-19 vaccine are at lower risk of reinfection and hospitalisation compared to those who have been infected but not vaccinated¹¹.

Potential risks of a COVID-19 booster dose

For people aged under 65 years, the decision to have a 2023 COVID-19 booster dose in the coming months should take into account an individual's age, risk factors for severe COVID-19, number and timing of previous doses or previous infection, and risk factors (predominantly age) for myocarditis and pericarditis following vaccination.

Adolescents and younger adults have a lower age-related risk of severe COVID-19, and a comparatively higher risk of myocarditis following vaccination. The risk of myocarditis is highest in people aged 16-30 years (peak 16-18 years), and is higher in males than females¹²⁻¹⁴. The risk of myocarditis appears to be lower after COVID-19 booster doses in comparison with dose 2

of the primary course and is lower following Pfizer COVID-19 vaccine as compared with Moderna COVID-19 vaccine in some contexts^{14,15}. See [COVID-19 vaccination – Guidance on myocarditis and pericarditis after COVID-19 vaccines](#) for more information.

Vaccine choice

Any age-appropriate COVID-19 vaccine, including original (ancestral virus-based) vaccines, are expected to boost neutralising antibodies and thereby provide additional protection against any infection and longer lasting protection against severe disease.

However, most immunogenicity studies have shown a trend towards BA.4/5-based vaccines inducing higher neutralising activity against Omicron subvariants (including BQ.1 and XBB) than original vaccines or BA.1-containing vaccines^{4,16–18}, although a few studies reported similar neutralising antibody titres when comparing the responses to different vaccines¹⁹. Early published and preprint data on whether these increases in neutralisation activity translate into measurable differences in clinical protection suggest a small advantage in vaccine effectiveness with bivalent vaccines over original vaccines in preventing hospitalisation and death^{20,21}. However, further confirmatory studies are awaited. Early data suggest that the vaccine effectiveness of BA.1-based bivalent booster vaccines is similar to ancestral-based booster doses, but potentially with slower waning of protection^{6,22}.

For more information on which vaccines are available for each age group refer to the [COVID-19 vaccine doses and administration webpage](#). Bivalent Original/Omicron BA.1 vaccines are only registered for use in people aged 18 years and over. The Pfizer bivalent Original/Omicron BA.4/5 vaccine is registered for use from 12 years of age.

There are currently insufficient data to determine the timing of any additional future COVID-19 booster doses. However it is likely, as with influenza vaccine, that regular doses of COVID-19 vaccine will be needed to maintain immunity against SARS-CoV-2 over years to come, particularly for those at highest risk of severe disease. ATAGI will continue to monitor data on the duration of protection from booster doses, as well as on new circulating virus variants or subvariants, and will provide updated vaccine advice as required.

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