Australian Government
Department of Health

ATAGI
Australian Technical Advisory Group on Immunisation

Australian Technical Advisory Group on Immunisation (ATAGI) recommendations on the use of a booster dose of COVID-19 vaccine

27 October 2021

The overarching goal of Australia's COVID-19 vaccination program is to protect all people in Australia from the harm caused by SARS-CoV-2, primarily through preventing serious illness and death. As the virus that causes COVID-19, SARS-CoV-2, is likely to become endemic in Australia, ATAGI strongly advises that the first priority for providing optimal community-wide protection against COVID-19 is achieving very high vaccination coverage of two vaccination doses for all eligible Australians.

ATAGI anticipates that booster doses of COVID-19 vaccines are likely to be warranted, in time, for all Australians aged 18 years and older to mitigate against waning immunity to SARS-COV-2 and emergence of SARS-CoV-2 variants. Evidence on the benefits and risks of booster doses is still limited but supports the benefit and safety of booster vaccination, particularly in high-risk groups.

Recommendations

ATAGI advises that, based on current evidence, the highest priority groups to receive booster doses are those with risk factors for severe COVID-19 and/or those at increased occupational risk of COVID-19, notably:

- People at greater risk of severe COVID-19: individuals aged 50 years and older, those with underlying medical conditions, residents of aged care and disability facilities, and Aboriginal and Torres Strait Islander adults. In these groups the benefit of a booster dose is primarily to reduce the risk of severe COVID-19.
- People at increased occupational risk of COVID-19: a booster dose for individuals in this group is expected to reduce their likelihood of SARS-CoV-2 infection and associated occupation-related impacts, acknowledging that infection will be mostly mild in these individuals due to prior vaccination and younger age. Booster doses may also reduce the potential for infected individuals to transmit SARS-CoV-2, although evidence for this is currently limited.

ATAGI notes that these groups considered most likely to benefit from booster doses include individuals first eligible during the initial rollout of vaccination in Australia.

To facilitate implementation of the national COVID-19 vaccine booster program, ATAGI supports the use of a single booster dose for those who completed their primary COVID-19 vaccine course ≥6 months ago. This will initially include, but not be limited to, the groups above who were prioritised in the rollout of the vaccine program from early 2021.

This recommendation will be reviewed in January 2022, as groups other than the high-risk groups listed above will become eligible in larger numbers.

Version 1.0

Comirnaty (Pfizer) is recommended as a single booster dose, irrespective of the primary COVID-19 vaccine used. Although not preferred, Vaxzevria (AstraZeneca) can also be used as a booster dose in the following situations:

- For individuals who have received Vaxzevria (AstraZeneca) for their first two doses if there are no contraindications or precautions for use.
- If a significant adverse reaction has occurred after a previous mRNA vaccine dose which contraindicates further doses of mRNA vaccine (e.g., anaphylaxis, myocarditis).

ATAGI will make a recommendation on the potential use of Spikevax as a booster in due course.

ATAGI recommends that it is acceptable to co-administer a COVID-19 booster vaccine dose with an influenza vaccine.[1,2] Data on the potential for co-administration with other vaccines is currently being reviewed and detailed information on this will be included in the upcoming revised ATAGI Clinical Guidance on Use of COVID-19 Vaccine in Australia.

Booster doses are not currently recommended for those aged <18 years. In this age group, severe COVID-19 is uncommon, and the primary course of COVID-19 vaccines generates a strong immune response, so the benefit from additional doses of vaccine is likely to be small. In addition, there are currently only very limited data on the safety of repeated mRNA vaccine doses in this age group.

In severely immunocompromised individuals who have recently been recommended to receive a third dose of a primary COVID-19 vaccine,[3] booster doses (i.e. 4th doses) are not yet recommended. Further information on booster doses in this group will be provided soon.

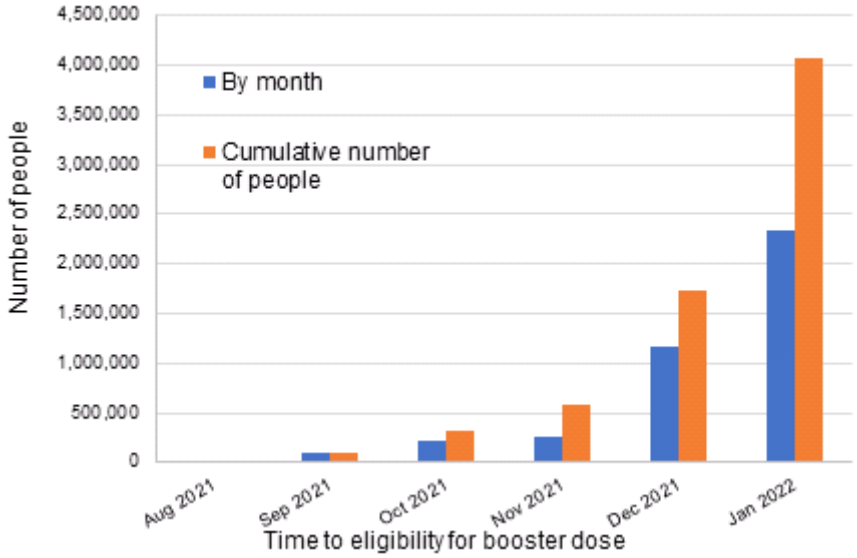
Background:

Definition of booster doses and eligibility

A booster dose refers to an additional vaccine dose after the primary vaccine course. A primary COVID-19 vaccine course consists of two doses of the following COVID-19 vaccines available in Australia: Comirnaty (Pfizer), Spikevax (Moderna) or Vaxzevria (AstraZeneca); or one dose of the Johnson & Johnson/Janssen COVID-19 vaccine (which is registered but not available in Australia). Mixed schedules of these vaccines are also included in the definition of an acceptable primary course, as are additional TGA-recognised vaccines[4]. For people with severe immunocompromise, a primary course is defined as 3 doses of a COVID-19 vaccine, as recommended by ATAGI.[3]

Based on dates of primary course completion (i.e., for most individuals, receipt of second doses), approximately 1.7 million people in Australia will be eligible for a booster dose by the end of 2021 (Figure 1).

Figure 1: Cumulative and by month number of people aged ≥18 years eligible for a booster dose of COVID-19 vaccine to January 2022, calculated by 6 months-time since primary vaccine schedule completion



Summary of evidence:

Benefits of booster doses

Current evidence suggests that humoral immunity to SARS-CoV-2 (measured by virus-specific antibody) wanes, and there is a reduction in protection against infection following vaccination over time, particularly from 6 months onwards.[5-7] The reduction in protection is similar for Delta and other virus variants.[5,8] However, protection against severe disease has been shown to remain high and wane to a lesser degree than against infection or non-severe disease in many studies, including for the Delta variant.[5-11] Protection against transmission from vaccinated individuals who are infected also appears to wane over time.[12]

Administration of a COVID-19 vaccine booster dose 6 months or more after completion of the primary vaccine course has been demonstrated to augment immune responses and is anticipated to increase protection, particularly in older people where waning is more pronounced.[13-16] Data from Israel, where booster doses have been administered to large numbers of people, show reductions in the rate of infection in all eligible age groups, severe disease in those aged ≥40 years, and deaths in those ≥60 years, after the booster dose.[17-19] A booster dose may also reduce the potential of infected individuals to transmit the virus to others, although evidence to support this is currently limited.

Safety of booster doses

Studies suggest that the common mild and transient side effects after booster doses are comparable to those following primary vaccine doses[13-16,20,21]. However, there are limited data on the incidence of rare but potentially serious adverse events following booster doses, such as myocarditis and pericarditis which have been particularly associated with second doses of the mRNA vaccines, Comirnaty (Pfizer) and Spikevax (Moderna), in younger people.[19,22-26] Preliminary data from Israel on the use of Comirnaty as a booster dose suggests the risk of myocarditis with the booster dose is not increased, as compared with the risk after second doses of vaccine.[19]

Choice of vaccine for boosters

Changes to the Product Information to recognise the use of Comirnaty as a booster dose were approved by the TGA on 27 October, 2021. Comirnaty has already been approved for use by a number of other countries' regulatory agencies as a booster, such as the US (FDA), Canada (Health Canada) and United Kingdom (MHRA) and recommended under their programs.

A small study suggests that Vaxzevria (AstraZeneca), when used as a booster, augments humoral and T cell immune responses and is well tolerated [15]. A booster dose of half-dose Spikevax (Moderna) is currently being evaluated and further information is expected in the coming months.

More detailed information on these recommendations will be provided soon, in the *ATAGI Clinical Guidance on Use of COVID-19 Vaccine in Australia* and associated COVID-19 Vaccine Program documents.

Uncertainties and evidence gaps

The impact, safety and optimal timing of booster doses will be reviewed regularly by ATAGI with key time points being January 2022 (as groups other than the high-risk groups listed above become eligible) and as information on other vaccines (e.g. Spikevax and Novavax) become available.

Other key evidence gaps include: the future epidemiology of COVID-19 in Australia, the duration of protection following booster doses, the protection against severe COVID-19 outcomes in younger individuals, the impact of boosters on transmission, the potential for new variants to emerge and the need for variant vaccines, and the need for any future additional booster doses.

As for all vaccines, ATAGI recommends that receipt of a COVID-19 vaccine booster dose should be recorded in the Australian Immunisation Register. However, at this time, evidence is insufficient to support a time, or population in whom, boosters should be strictly required to qualify an individual as fully vaccinated under public health orders. ATAGI may provide further advice on this issue in coming months.

References

1. Lazarus R, Baos S, Cappel-Porter H, et al. The Safety and Immunogenicity of Concomitant Administration of COVID-19 Vaccines (ChAdOx1 or BNT162b2) with Seasonal Influenza Vaccines in Adults: A Phase IV, Multicentre Randomised Controlled Trial with Blinding (ComFluCOV). 2021. Available from: https://ssrn.com/abstract=3931758 (Accessed 9/10/2021).
2. Sanofi. Positive results from the first study of high-dose influenza vaccine with a COVID-19 mRNA booster support co-administration recommendations. 2021. Available from: https://www.sanofi.com/en/media-room/press-releases/2021/2021-10-07-07-00-00-2309981 (Accessed 12/10/2021).
3. Australian Technical Advisory Group on Immunisation (ATAGI). ATAGI statement on the use of a 3rd primary dose of COVID-19 vaccine in individuals who are severely immunocompromised. 2021. Available from: https://www.health.gov.au/news/atagi-statement-on-the-use-of-a-3rd-primary-dose-of-covid-19-vaccine-in-individuals-who-are-severely-immunocompromised (Accessed 18/10/2021).
4. Therapeutics Goods Administration. COVID-19 vaccines not registered in Australia but in current international use - TGA advice on "recognition". 2021. Available from:

https://www.tga.gov.au/covid-19-vaccines-not-registered-australia-current-international-use-tga-advice-recognition (Accessed 18/10/2021).
5. Tartof SY, Slezak JM, Fischer H, et al. Effectiveness of mRNA BNT162b2 COVID-19 vaccine up to 6 months in a large integrated health system in the USA: a retrospective cohort study. *The Lancet* 2021.
6. Goldberg Y, Mandel M, Bar-On YM, et al. Waning immunity of the BNT162b2 vaccine: A nationwide study from Israel. *medRxiv* 2021:2021.08.24.21262423.
7. Chemaitelly H, Tang P, Hasan MR, et al. Waning of BNT162b2 Vaccine Protection against SARS-CoV-2 Infection in Qatar. *N Engl J Med* 2021.
8. Andrews N, Tessier E, Stowe J, et al. Vaccine effectiveness and duration of protection of Comirnaty, Vaxzevria and Spikevax against mild and severe COVID-19 in the UK. 2021. Available from: https://khub.net/documents/135939561/338928724/Vaccine+effectiveness+and+duration+of+protection+of+covid+vaccines+against+mild+and+severe+COVID-19+in+the+UK.pdf/10dcd99c-0441-0403-dfd8-11ba2c6f5801 (Accessed 28/09/2021).
9. de Gier B, Kooijman M, Kemmeren J, et al. COVID-19 vaccine effectiveness against hospitalizations and ICU admissions in the Netherlands, April- August 2021. *medRxiv* 2021:2021.09.15.21263613.
10. Nunes B, Rodrigues AP, Kislaya I, et al. mRNA vaccines effectiveness against COVID-19 hospitalizations and deaths in older adults: a cohort study based on data-linkage of national health registries in Portugal. *medRxiv* 2021:2021.08.27.21262731.
11. Self WH, Tenforde MW, Rhoads JP, et al. Comparative Effectiveness of Moderna, Pfizer-BioNTech, and Janssen (Johnson & Johnson) Vaccines in Preventing COVID-19 Hospitalizations Among Adults Without Immunocompromising Conditions - United States, March-August 2021. *MMWR Morb Mortal Wkly Rep* 2021;70:1337-43.
12. Eyre DW, Taylor D, Purver M, et al. The impact of SARS-CoV-2 vaccination on Alpha & Delta variant transmission. *medRxiv* 2021:2021.09.28.21264260.
13. Falsey AR, Frenck RW, Walsh EE, et al. SARS-CoV-2 Neutralization with BNT162b2 Vaccine Dose 3. *New England Journal of Medicine* 2021.
14. Food and Drug Administration. Vaccines and Related Biological Products Advisory Committee. BNT162b2 [COMIRNATY (COVID-19 Vaccine, mRNA)] Evaluation of a Booster Dose (Third Dose). VACCINES AND RELATED BIOLOGICAL PRODUCTS ADVISORY COMMITTEE BRIEFING DOCUMENT. . 2021. Available from: https://www.fda.gov/media/152161/download (Accessed 10/10/2021).
15. Choi A, Koch M, Wu K, et al. Safety and immunogenicity of SARS-CoV-2 variant mRNA vaccine boosters in healthy adults: an interim analysis. *Nature Medicine* 2021.
16. Flaxman A, Marchevsky NG, Jenkin D, et al. Reactogenicity and immunogenicity after a late second dose or a third dose of ChAdOx1 nCoV-19 in the UK: a substudy of two randomised controlled trials (COV001 and COV002). *The Lancet* 2021;398:981-90.
17. Patalon T, Gazit S, Pitzer VE, et al. Short Term Reduction in the Odds of Testing Positive for SARS-CoV-2; a Comparison Between Two Doses and Three doses of the BNT162b2 Vaccine. *medRxiv* 2021:2021.08.29.21262792.
18. Bar-On YM, Goldberg Y, Mandel M, et al. Protection Across Age Groups of BNT162b2 Vaccine Booster against Covid-19. *medRxiv* 2021:2021.10.07.21264626.
19. Israeli Mnistry Of Health, Weizmann Institute of Science, Gertner Institute, Hebrew University & Technion. Food and Drug Administration, Vaccines and Related Biological Products Advisory Committee October 14-15, 2021 Meeting Presentation: Booster protection across ages - data from Israel. 2021. Available from: https://www.fda.gov/media/153086/download.
20. Hause AM, Baggs J, Gee J, et al. Safety Monitoring of an Additional Dose of COVID-19 Vaccine - United States, August 12-September 19, 2021. *MMWR Morb Mortal Wkly Rep* 2021;70:1379-84.

21. Mofaz M, Yechezkel M, Guan G, et al. Self-reported and physiological reactions to the third BNT162b2 mRNA COVID-19 (booster) vaccine dose. *medRxiv* 2021:2021.09.15.21263633.
22. Su J. Myopericarditis following COVID-19 vaccination: Updates from the Vaccine Adverse Event Reporting System (VAERS). 2021. Available from: https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-08-30/03-COVID-Su-508.pdf (Accessed 11/10/2021).
23. Public Health Ontario. Myocarditis and Pericarditis Following Vaccination with COVID-19 mRNA Vaccines in Ontario: December 13, 2020 to August 7, 2021. 2021. Available from: https://www.publichealthontario.ca/-/media/documents/ncov/epi/covid-19-myocarditis-pericarditis-vaccines-epi.pdf?sc_lang=en (Accessed 10/10/2021).
24. Norwegian Institute of Public Health. Myocarditis in boys and young men can occur more often after the Spikevax vaccine from Moderna. 2021. Available from: https://www.fhi.no/en/news/2021/myocarditis-in-boys-and-young-men-can-occur-more-often-after-the-spikevax-v/ (Accessed 11/10/2021).
25. Kyto V, Sipila J, Rautava P. Gender differences in myocarditis: a nationwide study in Finland. *European Heart Journal* 2013;34:3505-.
26. Li X, Ostropolets A, Makadia R, et al. Characterising the background incidence rates of adverse events of special interest for covid-19 vaccines in eight countries: multinational network cohort study. *Bmj* 2021.