HSA's COVID-19 Vaccine Safety Update #15
(30 December 2020 – 30 June 2023)

This is the Health Sciences Authority's (HSA) 15th safety update of the COVID-19 vaccines covering the period from the roll-out of the vaccines on 30 December 2020 to 30 June 2023. It provides an overview of the reports by healthcare professionals of ***suspected adverse events*** [1] ***(AEs)*** associated with COVID-19 vaccines to HSA. Based on HSA's assessment of local and overseas data, the benefits of the vaccines continue to outweigh the known risks.

2 The COVID-19 vaccines* used in Singapore are:

- mRNA vaccines (monovalent and bivalent versions): Pfizer-BioNTech/Comirnaty, Moderna/Spikevax
- Protein subunit vaccine: Nuvaxovid
- Inactivated vaccines: Sinovac-CoronaVac, Sinopharm

3 Since January 2023, HSA has been receiving significantly fewer COVID-19 vaccines AE reports and the safety profiles of the vaccines have been reviewed to be consistent, with no new safety signals. The safety of the COVID-19 vaccines is also now more established following extensive safety data accumulated from their wide global uptake during the pandemic. HSA will therefore cease publishing our regular safety update reports on COVID-19 vaccines. Nonetheless, as part of our post-market surveillance programme, HSA will continue to closely monitor the safety profile of all COVID-19 vaccines used in Singapore and will inform members of the public should there be any significant new safety concerns.

** Pfizer-BioNTech/Comirnaty vaccine is registered as a therapeutic product by HSA. Moderna/Spikevax, Nuvaxovid, Sinovac-CoronaVac are authorised under the Pandemic Special Access Route (PSAR). Bivalent versions for both Pfizer-BioNTech/Comirnaty and Moderna/Spikevax are also authorised under the PSAR. Sinopharm is supplied via HSA's Special Access Route.*

Key Updates (as of 30 June 2023)

i) mRNA COVID-19 Vaccines

- A total of 15,926,075 doses of the monovalent mRNA COVID-19 vaccines and 1,292,537 doses of the bivalent mRNA COVID-19 vaccines were administered. These comprised 10,723,558 primary doses, 4,806,023 first booster doses,1,554,989 second booster doses and 134,042 third booster doses.

- The reporting rates of AEs and serious[2] AEs for the mRNA vaccines (monovalent and bivalent versions) remained rare at 0.10% (17,904 reports) and 0.007% (1,163 reports) respectively. The serious AE reporting rates for the first, second and third booster doses

[1] An adverse event is any untoward medical occurrence in a patient administered a pharmaceutical product (including vaccines) but does not necessarily have a causal relationship with this treatment/vaccination.

[2] An adverse event is classified as serious when the event resulted in hospitalisation/extended stay in hospital, resulted in a significant reduction in functioning level/disability, resulted in a life-threatening illness (e.g., anaphylaxis) or death, resulted in birth defects or is a medically important event.

were at 0.004% (187 reports), 0.002% (25 reports) and 0.001% (2 reports) respectively, which were lower compared to the primary doses at 0.009% (954 reports).

- Myocarditis is a recognised potential risk following mRNA vaccination. The incidence of myocarditis remained rare, with reporting rates of 0.2 per 100,000 doses (0.0002%) for the bivalent vaccines and 1.1 per 100,000 doses (0.0011%) for the primary vaccination series of the monovalent vaccines. Two deaths certified as myocarditis had been ruled by the State Coroner as likely related to the COVID-19 vaccination [3,4] following more than 17 million doses of mRNA COVID-19 vaccines administered in Singapore. Most myocarditis cases following vaccination are mild, with patients responding well to treatment. The local precautionary measure on the avoidance of strenuous physical activity or exercise for two weeks following mRNA COVID-19 vaccination has been implemented since September 2021 to mitigate this rare risk. COVID-19 infection is also known to be associated with myocarditis. A study found an additional 4 cases of myocarditis per 100,000 persons infected.[5]

- There were no new safety findings from the use of the mRNA vaccines in all age groups, including children, since the last update in February 2023 (Please refer to the previous HSA's COVID-19 Vaccine Safety Update for details).

ii) Nuvaxovid, Sinovac-CoronoVac and Sinopharm COVID-19 Vaccine

- A total of 49,485 doses of the Nuvaxovid vaccine were administered. The serious AE reporting rate remained rare at 0.02% (9 reports).

- A total of 824,173 doses of the Sinovac-CoronoVac and Sinopharm vaccines were administered. The serious AE reporting rate remained rare at 0.005% (41 reports).

- As with the mRNA vaccines, there were no new safety findings for the protein-subunit and the inactivated vaccines since the last update published in February 2023 (Please refer to the previous HSA's COVID-19 Vaccine Safety Update for details).

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[3] https://www.moh.gov.sg/news-highlights/details/state-coroner-s-finding-on-death-related-to-covid-19-vaccination

[4] https://www.moh.gov.sg/news-highlights/details/state-coroner-s-finding-on-death-related-to-covid-19-vaccination-16apr2023

[5] Patone, M., Mei, X.W., Handunnetthi, L. et al. Risks of myocarditis, pericarditis, and cardiac arrhythmias associated with COVID-19 vaccination or SARS-CoV-2 infection. Nat Med (2021). https://doi.org/10.1038/s41591-021-01630-0

Interpretation of the data

HSA reviews the submitted AE reports, in consultation with our expert panels.[6] AEs are reported by healthcare professionals to HSA when they suspect that the AEs may be associated with the vaccine. This does not necessarily mean that the vaccine has caused the AEs. In some instances, these AEs are related to an underlying or undiagnosed disease or the natural progression of an underlying disease. It may be coincidental that the event occurred around the same time when the vaccine was given but is not caused by the vaccine. The causality based on isolated cases of individual events usually cannot be established as many illnesses cause the same symptoms and signs, and there are generally no confirmatory tests for diagnosing an AE. Hence, AEs are assessed and interpreted in the context of background incidence rates of such occurrences (i.e., historical rates in our general population unexposed to the COVID-19 vaccines). While each individual report is carefully reviewed, the totality of data from all sources (e.g., mechanistic actions, clinical assessments of local AE reports from healthcare professionals, public self-reported AEs, epidemiological studies, literature and overseas reports) has to be considered before drawing any evidence-based conclusions on the safety of the vaccine.

The type and number of reports received for the different COVID-19 vaccines are not directly comparable as the vaccines may have been used in the vaccination programme for different lengths of time and may have been administered to different numbers of people with different underlying medical conditions and across different settings. Similarly, the AE numbers or rates between countries should not be directly compared as the usage of the vaccines may be different and the AE reporting systems are often also different.

The description of suspected AEs in this update reflects the available information known at the time by HSA. These data may undergo changes as more information on individual reports becomes available through follow-up, and as more data are reported and evaluated.

[6] HSA has appointed seven Expert Panels to review neurological AEs, cardiac AEs, thromboembolic and haematological AEs, renal AEs, ear AEs, immunological AEs and severe hypersensitivity reactions such as anaphylaxis.