



HSA's Safety Update #1

Pfizer-BioNTech and Moderna COVID-19 vaccines

(30 December 2020 – 18 April 2021)

Introduction

This is a safety update of the mRNA COVID-19 vaccines covering the period from the first roll-out of the vaccines on 30 December 2020 to 18 April 2021. It provides an overview of the reports of **suspected adverse events (AEs)** associated with COVID-19 vaccines received by HSA and HSA's current assessment of these AEs. This will be a monthly publication to update members of the public of findings from HSA's safety monitoring of the COVID-19 vaccines.

Summary (as of 18 Apr 2021)

- A total of 2,796 suspected AE reports (0.13% of administered doses) were received, with 95 reports (0.004% of administered doses) classified as serious AEs after assessment, of which there were 20 cases of anaphylaxis.
- The most commonly reported AEs were consistent with those typically observed following vaccination. They include dizziness, fever, muscle aches and pain, headache and allergic reactions (such as itch, rash, hives, swelling of eyelids, face and lips). These are also in line with the events described in the COVID-19 vaccines product information.
- Rare instances of anaphylaxis, a severe life-threatening allergic reaction, have occurred in association with the COVID-19 vaccines. The incidence rate of anaphylaxis locally is similar to the incidence rates reported overseas. Cases of Bell's Palsy (facial muscle weakness which will generally recover completely even without treatment), an adverse event of special interest (AESI), have also been observed in some vaccine recipients. The incidence rate is within the background incidence.
- While rare cases of unusual blood clots associated with low platelets (blood cells that help form blood clots to stop bleeding) have been reported with other types of COVID-19 vaccines overseas, no cases have been reported locally with the Pfizer-BioNTech and Moderna COVID-19 vaccines.
- It is important to note that heart attacks and strokes can occur naturally in people, regardless of whether they are vaccinated or not. A greater frequency of heart attacks and strokes has not been observed in vaccinated persons locally and to date, there is also no evidence that the vaccines can directly cause these events. No deaths from heart attacks, strokes or any other causes suspected to be associated with the vaccines have been reported locally.
- Based on available data, the benefits of the Pfizer-BioNTech and Moderna COVID-19 vaccines continue to outweigh the known risks in a pandemic. HSA will continue to actively monitor the safety profile of the COVID-19 vaccines.

Background

2 The Health Sciences Authority (HSA) has granted interim authorisation for two mRNA COVID-19 vaccines in Singapore under the Pandemic Special Access Route (PSAR):

- Pfizer-BioNTech COVID-19 Vaccine authorised on 14 December 2020
- Moderna COVID-19 Vaccine authorised on 3 February 2021

3 As with all other vaccines, HSA actively monitors the safety of the COVID-19 vaccines to ensure that the benefits of the vaccines continue to outweigh the risks. This is achieved through adverse event monitoring systems to detect any potential safety concerns so that relevant measures can be taken to ensure that the vaccines remain safe for use. HSA reviews the submitted adverse event¹ (AE) reports, in consultation with our expert panels².

How to interpret the data

4 AEs are reported by healthcare professionals to HSA when they suspect that the AE may be associated with the vaccine. This does not necessarily mean that the vaccine has caused the AE. 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 baseline 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, epidemiological studies and literature) has to be considered before drawing any evidence-based conclusions on the safety of the vaccine.

5 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.

6 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.

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 HSA has appointed three Expert Panels to adjudicate neurological AEs, cardiac AEs and severe hypersensitivity reactions such as anaphylaxis.

Overview of adverse event reports

7 In Singapore, the Pfizer-BioNTech COVID-19 vaccine was rolled out for use on 30 December 2020, followed by the Moderna COVID-19 vaccine on 12 March 2021. As the former which had been deployed over a longer period and comprised 92% of the doses administered in our population, most of the AEs reported were associated with the Pfizer-BioNTech COVID-19 vaccine. As of 18 April 2021, HSA has received 2,796 suspected AE reports (0.13% of doses administered) associated with the use of Pfizer-BioNTech and Moderna COVID-19 vaccines (see Table 1). 70% of the cases involved individuals less than 60 years old, although they constituted about 50% of the population who have received the vaccines. It was noted that in the clinical trials of both vaccines, persons younger than 60 years of age tend to experience more reactogenic AEs than those aged 60 years and above. Generally, younger individuals have more active immune responses and may experience more AEs to the vaccines. This is part of the body's natural response to build immunity against COVID-19 infection.

Table 1. Overview of vaccination data and no. of suspected AE reports received for COVID-19 vaccines (as of 18 April 2021)

	COVID-19 Vaccines (Pfizer-BioNTech and Moderna)
No. of persons who have received the first dose	1,364,124
No. of persons who received two doses*	849,764
Total no. of doses administered	2,213,888
No. of suspected AE reports	2,796 (0.13% of doses administered)
No. of suspected serious ³ AE reports	95 (0.004% of doses administered)

* The full vaccination regimen for Pfizer-BioNTech and Moderna COVID-19 vaccines comprises 2 doses.

8 The most commonly reported AEs (see Figure 1) are consistent with those typically observed following vaccination. These include dizziness, fever, muscle ache and pain, headache and allergic reactions (such as itch, rash, hives, swelling of eyelids, face, lips). These reported AEs generally resolved within a few days. These AEs are also in line with the events described in the COVID-19 vaccines product information and those reported overseas.

³ 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.

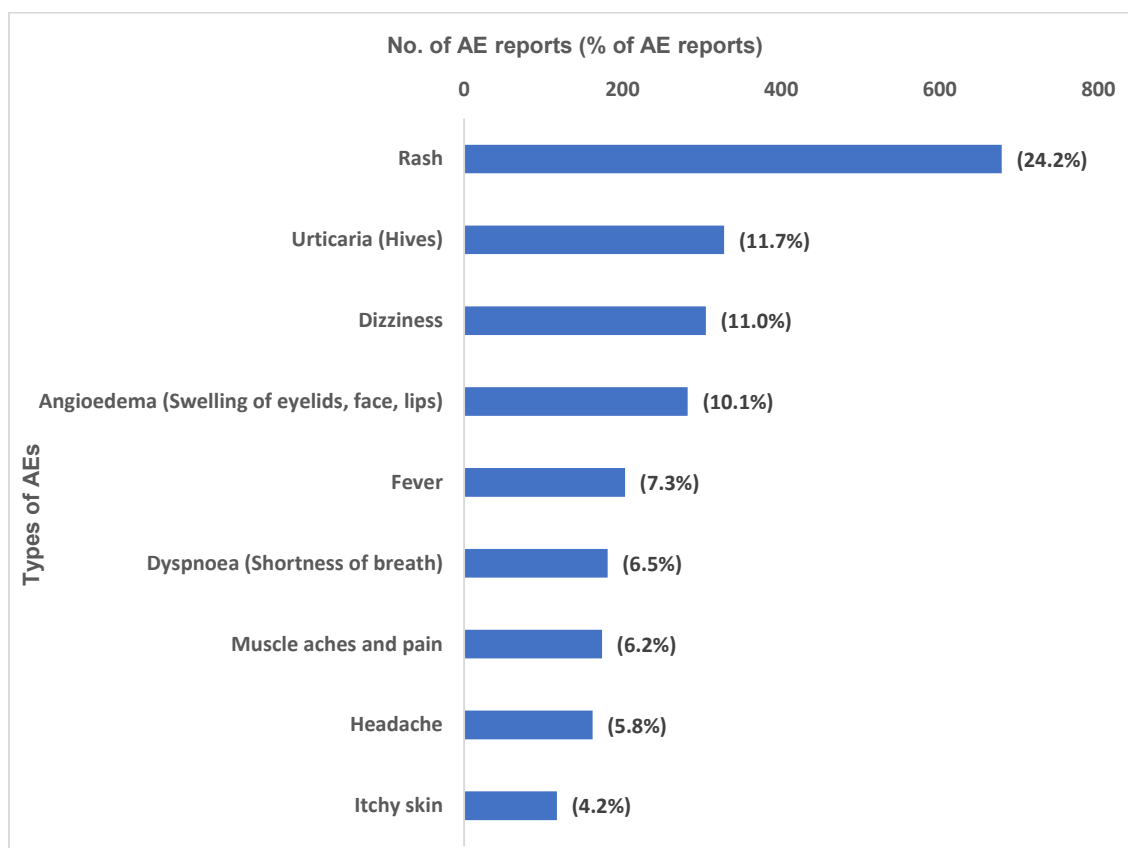


Figure 1. Most commonly reported AEs associated with the use of Pfizer-BioNTech and Moderna vaccines (as of 18 April 2021)

Serious adverse events

9 Of the 2,796 suspected AE reports received, 95 of the reports were assessed as serious. Serious AEs comprised 0.004% of doses administered. Among the serious reports, the most frequently reported AEs were anaphylaxis and other severe allergic reactions. There were 20 reports of anaphylaxis and 20 reports of severe allergic reactions. Other serious AEs form a very small percentage (<0.5%) of the total number of AE reports received, and these include breathing difficulty, fast heart rate, an increase or decrease in blood pressure, chest discomfort, syncope (fainting), limb numbness or pain, changes in vision and increase in liver enzymes. These serious AEs are being closely monitored by HSA. Background disease incidence⁴ or underlying medical conditions are taken into consideration in determining the contributory role, if any, of the vaccines to these events. Most of the individuals were reported to have recovered or are recovering from the events.

10 It is important to note that heart attacks and strokes can occur naturally in people, regardless of whether they are vaccinated or not. Due to the large numbers of people being vaccinated, it is expected that, by chance, some individuals may experience other medical events such as heart attacks and strokes in the days or weeks after vaccination which may not be related to the vaccination. A greater frequency of heart attacks and strokes has not

⁴ The incidence of new cases of disease in a population over a specified period of time in the absence of vaccination

been observed in vaccinated persons locally. No deaths suspected to be associated with the vaccines have been reported locally.

11 While rare cases of unusual blood clots associated with low platelets (blood cells that help form blood clots to stop bleeding) have been reported with other COVID-19 vaccines overseas, no cases have been reported locally with the Pfizer-BioNTech and Moderna mRNA vaccines.

Adverse events of special interest⁵

12 An adverse event of special interest (AESI) is a pre-specified medically significant event that has been observed historically with other vaccines. Anaphylaxis and Bell's Palsy are examples of AESIs that have been reported historically with the use of other vaccines. Hence, HSA is closely monitoring the occurrence of such adverse events.

Anaphylaxis reports

13 Anaphylaxis is a rare and potentially life-threatening allergic reaction that can occur following vaccination in certain susceptible individuals. Safeguards have been put in-place to mitigate this risk. These include pre-vaccination screening, observing all vaccinated persons for 30 minutes after vaccination and ensuring that all the vaccination centres are medically equipped and staffed by qualified medical professionals at all times to provide medical treatment in the rare event that they are needed.

14 There were 20 cases of anaphylaxis reported with the Pfizer-BioNTech and Moderna COVID-19 vaccines. All the patients were reported to have recovered after medical treatment. The incidence rate of anaphylaxis reported locally with the vaccines is about 1.4 per 100,000 doses administered. This is similar to the incidence rates reported overseas of around 0.5 to 2 per 100,000 doses administered.

Bell's Palsy reports

15 Bell's Palsy, also known as peripheral facial nerve palsy, is caused by inflammation of the facial nerve. It is a condition that causes temporary weakness or paralysis of the facial muscles. It was reported in the clinical trials of the Pfizer-BioNTech and Moderna COVID-19 vaccines, but the numbers were assessed to be within background incidences. Most of the patients will generally have complete recovery even without treatment.

16 Twenty-five cases of Bell's Palsy have been reported, with most of the reports being non-serious. The local incidence rate is estimated to be 3.45 per 100,000 persons per month, which is within the background incidence of 1.1 to 4.4 per 100,000 persons per month prior to the introduction of vaccination.

⁵ Definition of AESI adapted from World Health Organization (WHO), Dec 2020. *COVID-19 Vaccines: Safety Surveillance Manual*[online] [24 Mar 2021 viewed]. Available from: <https://www.who.int/publications/i/item/10665338400>

Conclusion

17 Based on the local AE reports received, most of the AEs are largely expected with vaccination and reflect what has been reported in the clinical trials. HSA is closely monitoring the serious AEs and AESIs so that relevant measures can be taken to safeguard vaccine recipients should there be a safety concern.

18 Based on available data, the benefits of the Pfizer-BioNTech and Moderna COVID-19 vaccines continue to outweigh the known risks in a pandemic.

19 HSA and MOH will continue to monitor the safety profile of the COVID-19 vaccines closely and update members of the public of any significant safety concerns detected with the vaccines.

**HEALTH SCIENCES AUTHORITY
SINGAPORE**