Norwegian
Medicines Agency

Reported suspected adverse reactions to COVID-19 vaccines as of 14.12.2021

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About the report

- Since January 2021, the Norwegian Medicines Agency has published a weekly report presenting information on suspected adverse reactions to COVID-19 vaccines which have been assessed. From November 2021, these reports have been published less frequently. In December, reports will be published during the weeks 49 and 50. The first report in 2022 will be published in week 1.
- The adverse reaction reports in the report are submitted by patients, health professionals and producers.
- Symptoms or illnesses that occur after vaccination are reported if there is any *suspicion* of a possible link. As a result, it cannot be assumed that there is a causal relationship between the suspected adverse reaction and the vaccine.
- The report summarises all reports of suspected adverse reactions that have been treated. As a result, there is a difference between the number of reports which have been received and those which have been assessed, because reports are continually being assessed.
- All reports are counted, regardless of whether or not the event being reported is believed to be linked to vaccination.
- The fact that a report has been assessed means that the severity of the incident has been determined, and the symptoms have been translated into international terminology and categorised (see Appendix 1).
- We prioritise and assess serious reports of suspected adverse reactions first. The reports therefore does not give a true picture of the distribution between serious and non-serious events.
- The reports provide a snapshot of the adverse reactions at the time of reporting and rarely contain complete information about the event. The interpretation and assessment of causality are based on the information that is available at the time of reporting.
- The reporting scheme is a vital tool in the monitoring of vaccines. The reports submitted by health professionals and members of the public give us signals as to whether there are any events that we should investigate further. It is not known with any certainty what proportion of these events are being reported, while a report does not necessarily indicate a causal relationship. As a result, the number of reports submitted to the Norwegian Medicines Agency cannot normally be used to determine how often or how many adverse reactions a vaccine could give rise to, or to compare the safety profiles of different vaccines.
- The term “temporal link” between vaccination and an adverse reaction is used in the report. “Temporal link” is not a precisely defined time period, but six weeks is often used as a guide for health professionals when they are assessing whether adverse reactions have occurred with a temporal link to vaccination. Some adverse reactions can occur after more than six weeks have elapsed and may still be suspected as being linked to vaccination. As long as the person submitting the report suspects there may be a link between vaccination and the adverse reaction, the report will be counted, regardless of how long has passed since vaccination.

Summary

This report is based on reports that are assessed until 14 December 2021. The assessed adverse reaction reports do not provide a basis for revising the current overall recommendations regarding the use of the vaccines.

More reports than expected indicate a good reporting culture
The Norwegian Medicines Agency receives many reports and has found that both health professionals and the general population have a low threshold for reporting suspected adverse reactions following vaccination against COVID-19. There may be a number of reasons why we are receiving large numbers of reports:

- A high proportion of the population has been or will be vaccinated over a short period of time.
- The COVID-19 vaccines tend to cause strong reactions in more people than we are accustomed to with other vaccines. More people are therefore experiencing common adverse reactions.
- It has become much easier to report suspected adverse reactions online. Health professionals previously had to fill in a paper form.
- The provision of clear information about adverse reactions means that health professionals and the population are more aware and tend to report reactions more readily.
- Health professionals are obliged to report suspected adverse reactions following vaccination.

Common and known adverse reactions
Most reports of adverse reactions following COVID-19 vaccination, regardless of the type of vaccine used, concern common and transient adverse reactions such as headache, fatigue, malaise, fever, nausea and pain in the body. These usually appear on the first or second day after vaccination and last around two to three days. These are known adverse reactions which are described in the product information for the vaccines.

Serious adverse reactions
Most of the serious suspected adverse reactions which have been reported concern medical conditions or symptoms which are relatively common in the population. The timing of the events soon after vaccination may therefore be coincidental. Reports of serious events are given priority and assessed before non-serious reports. Serious reports are discussed in a separate section on page 5.

Adverse reaction news:

Together with this report, we publish a news article discussing topical issues.

Click here to read news article

Vaccines in the COVID-19 vaccination programme

- Comirnaty (BioNTech/Pfizer), mRNA vaccine
- Spikevax (Moderna), mRNA vaccine

Vaccines withdrawn from or offered outside the COVID-19 vaccination programme:

- The Janssen COVID-19 vaccine is offered, but not as part of the vaccination programme.
- Vaxzevria (AstraZeneca): In May 2021, the government decided to withdraw this vaccine from the Norwegian vaccination programme.

Key figures as of 14.12.2021

From the start of the vaccination programme in Norway on 27 December 2020 through to 14 December 2021, **45,153** reports of suspected adverse reactions have been received following COVID-19 vaccination; **24,369 (54 %)** of these have been assessed. The fact that the reports have been assessed means that they have been classified and sorted, but not necessarily that a final assessment of causality has been made in all cases.

The number of reports must be interpreted in light of the number of people who have been vaccinated. As of 14 December 2021, a total of **9,205,000** doses of COVID-19 vaccines have been administered in Norway. Over **4,260,000** people have received their first dose of vaccine, over **3,883,000** have received their second dose and over **1,060,000** received their third dose (Source: SYSVAK, https://statistikk.fhi.no/sysvak).

Table 1: Distribution of reports by gender

Gender	Female	Male	Unknown gender
Total number of reports	19 597	4 737	35
Number of serious reports	2 816	1 376	11
** The table shows number of reports that have been assessed.*			

Comment on Table 1:

Numerous studies have indicated that women are more likely than men to contact the health service and report adverse reactions.

Table 2: Distribution of reports by age

	Age group										
	12-17	**18-29**	**30-39**	**40-49**	**50-59**	**60-69**	**70-79**	**80-89**	**90+**	**Unknown age**	**Total**
Serious reports	43	580	669	752	751	513	404	262	126	103	4 203
Non serious reports	285	4 423	4 997	4 345	3 123	1 332	553	296	125	687	20 166
Total	328	5 003	5 666	5 097	3 874	1 845	957	558	251	790	24 369
** The table shows number of reports that have been assessed.*											

Comment on Table 2:

Breastfed infants:

A total of 18 reports have been received regarding children under the age of 12 who are being breastfed, but who have not been vaccinated. Various symptoms have been reported in the children concerned after the mother received a vaccine dose, including fever, abdominal pain, nausea, anxiety, rash or cold. In most of the breastfed children, the symptoms appeared 0-3 days after the mother had been vaccinated. Such symptoms are very common in infants and toddlers and are probably not due to the mother receiving the mRNA vaccine. The mRNA from the vaccines is not passed in breast milk.

- Nine reports concern symptoms in the child after the mother received Vaxzevria (AstraZeneca)
- Seven reports concern symptoms in the child after the mother received Comirnaty (BioNTech/Pfizer)
- Two reports concern symptoms in the child after the mother received Spikevax.

One of the reports is classified as serious due to the child being admitted to hospital. There is generally a low threshold for admitting young children to hospital. The child was recovering when the suspected adverse reactions were reported.

Events following vaccination are reported on the basis of suspicions and there is not necessarily any causal relationship. All reports are included in the report, regardless of whether or not an event is believed to be linked to vaccination.

Young people and adverse reaction reports

Experience has shown that adverse reactions are more commonly reported in younger adults than in older adults. This can be attributed to the fact that younger people have a stronger immune response and more noticeable common adverse reactions, or that reports are issued more frequently for younger people in order to clarify whether the reaction is an adverse reaction to the vaccine or not. Younger people also tend to be more likely to report adverse reactions themselves.

Reports classified as serious

So far, 4,203 reports of events which are classified as serious have been assessed. This accounts for 17 % of all reports which have been assessed. We prioritise the assessment of serious reports first, so that reports that have not been assessed are virtually all non-serious reports.

What types of events are classified as serious

Reports of adverse reactions are generally classified as serious when the event:

- results in or extended a stay in hospital
- results in a prolonged reduction in function level
- results in life-threatening illness or death
- results in birth defects/congenital malformations
- is on the EMA's list of important medical events (Important medical event (IME) list)

Hospital admission is the most common reason why an event is classified as serious, and this applies to 44 % of serious reports. In these cases, the descriptions provided by the person submitting the report cover everything from patients who are only kept under observation for a short period of time and go on to recover quickly, to patients with a life-threatening symptoms and illness which results in

permanent injury.

IME-list
The EMA has compiled a list of important medical events which are always to be classified as serious (the IME list). The summary below lists the conditions on the IME list which are most frequently reported following COVID-19 vaccination (in descending order).

- Pericarditis
- blood clot in the lungs
- fainting (syncope)
- vaginal bleeding after menopause
- myocarditis
- deep vein thrombosis
- anaphylactic reaction
- blood clots (thrombosis)
- abnormal heart rhythms (arrhythmia)
- blood clots or bleeding in the brain

Most of the serious suspected adverse reactions which have been reported concern medical conditions which are relatively common in the population. The timing of the events may therefore be coincidental.

Reactions which health professionals should be aware of

Other serious events have also been observed following vaccination where no causal relationship has been established. The Norwegian Medicines Agency wishes healthcare professionals to be aware of the following conditions in persons who are vaccinated:

- chest pain and breathing difficulties
- numbness
- reduced sensation and paralysis
- lasting symptoms, such as long-lasting headache or vaginal bleeding

Table 3: Distribution of reports of suspected adverse reactions according to severity.

Vaccine	Comirnaty (BioNTech/Pfizer)			Spikevax (Moderna)			Vaxzevria (AstraZeneca)	COVID-19 Vaccine Janssen
Number of doses administered	1.dose	2. dose	3. dose	1.dose	2. dose	3. dose	1.dose	1.dose
	3 565 006	2 858 593	940 624	547 222	1 021 227	119 332	142 544 ***	6 023
Total number of reports	**11 681***			**3 938***			**8 828***	**20***
Number of reports involving death	213**			14**			6**	0**
Serious reports other than death	2 591			791			642	3
Non-serious reports	8 875			3 133			8 180	17
	**The table shows number of reports that have been assessed* ***The fact that a person dies soon after being vaccinated does not necessarily mean that there is a causal relationship.* ****Vaxzevria has not been administered in Norway since 11 March, but number of doses administered may continue to increase as it reflects post-registraton of doses administered abroad. Post-registration of vaccines administered abroad may effect the number of doses administered for all the coronavirus vaccines*.							

Comment on Table 3:

The data concerning the various coronavirus vaccines are not directly comparable. The vaccines have been administered to a different number of people with different disease profile and ages.

Reports on deaths

So far, 233 reports of deaths have been assessed. There is a temporal link between some of the deaths and vaccination, while other deaths are due to Covid-19 in fully vaccinated people several months after the last dose. Most deaths have occurred amongst elderly persons receiving nursing care and residents of nursing homes.

Amongst the 233 deaths, 15 reports relate to deaths in fully vaccinated people who have been diagnosed with COVID-19. The patients who died was diagnosed with COVID-19 from 2 to 10 months after vaccination, and the events are reported due to suspected vaccination failure. Breakthrough infection was discussed in the report from 28. September 2021.

Persons over the age of 60

Every week, more than 300 residents die in Norwegian nursing homes and other similar institutions. Many of the elderly nursing home residents who have been vaccinated are very frail or terminally ill patients. It is therefore to be expected that deaths will occur with a temporal link to vaccination, without there necessarily being any causal link to the vaccine. The reports on many of these deaths in the elderly state that no link with vaccination is suspected, and that the death is being reported for

the sake of completeness.

An expert group of geriatric specialists have looked into the first 100 deaths that were reported after Comirnaty. There is some uncertainty regarding the assessments, but in 10 cases a causal relationship between vaccination and death was considered to be "probable". In these cases, it was apparent that common vaccine adverse reactions may have contributed to more serious illness.

Persons under the age of 60
We have received 14 reports of deaths following vaccination in people under the age of 60. Four of these cases concern deaths resulting from the very rare, but serious adverse reaction known as thrombosis with thrombocytopenia syndrome (TTS) following vaccination with Vaxzevria.
For the remaining deaths, the causal relationship with vaccination is uncertain.

Reports on pericarditis and myocarditis after vaccination with mRNA-vaccine

A number of cases of pericarditis (inflammation of the lining around the heart) and myocarditis (inflammation of the heart muscle) have been observed in persons who have been vaccinated with Comirnaty or Spikevax. Persons of all ages have been affected, but most cases of myocarditis have been reported in men under 30 years of age.

As of 14 Desember 2021, 215 cases of pericarditis and 120 cases of myocarditis have been reported in Norway after vaccination with mRNA-vaccine.

In addition there are 3 reports on pericarditis after vaccination with Vaxzevria.

It is not yet known whether those who have developed pericarditis or myocarditis after covid vaccination are at risk of recurrence after their next dose and, as a precaution, the Norwegian Institute of Public Health therefore recommends that persons who have developed these inflammatory conditions should refrain from further covid vaccination.

Table 4: Age distribution of reports on pericarditis and myocarditis after mRNA-vaccine

	Aldersgruppe							
	12-29	**30-39**	**40-49**	**50-59**	**60-69**	**70-89**	**Ukjent alder**	**Total**
Perikarditt	48	37	35	33	34	26	2	215
Myokarditt	56	13	18	12	11	9	1	120

Table 5: Gender distribution of reports on pericarditis and myocarditis after mRNA-vaccine

	Kvinner	**Menn**
Perikarditt	81	134
Myokarditt	32	88

Reports of suspected adverse reactions in the 12 – 17 age group

We highly prioritise the assessment of reports in the 12 -17 age group. We are closely monitoring the situation and are particularly alert to reports of serious events following vaccination.

As of 14 Desember 2021, over 417,000 doses have been administered to children and adolescents aged 12 to 17. During the period December 2020 to 14 Desember 2021, we have received and assessed 328 adverse reaction reports concerning this age group. 43 of these are classified as serious.

Adolescents normally experience the same common and transient adverse reactions as adults following vaccination. Amongst the more rarely known adverse reactions are inflammation of the heart muscle (myocarditis) and inflammation of the heart lining (pericarditis). We have so far received two (2) adverse reaction report concerning this in this age group. Look out for symptoms such as chest pain, wheezing or rapid or irregular heart rate which particularly occurs during the first week after vaccination. Fever and cough may also occur.

Over 75% of the adverse reaction reports in this age group are from girls. Many reports concern menstrual disorders. Most of these are classified as non-serious.

Menstrual cycle and uterine bleeding disorders

We have so far assessed 2,379 reports of menstrual disorders. Most of these reports concern women between the ages of 20 and 49. 215 of these reports are classified as serious.

"In many of these cases, it is not the menstrual disorder, but other ailments that have been reported at the same time, which means that the report is classified as serious overall," says Ingrid Aas, Senior Consultant at the Norwegian Medicines Agency.

If menstrual disorders are prolonged and affect the person’s ability to work and carry out other daily chores, the report will also often be classified as serious.

We have also received 178 reports concerning women who have suffered unexpected vaginal bleeding after menopausal age. 172 of these are classified as serious. Unexpected vaginal bleeding after menopausal age is always classified as serious if it occurs more than one year after the last menstruation.

NIPH is conducting a major study in an attempt to determine whether or not there is a link between COVID-19 vaccines and bleeding disorders.

We do not yet know whether women who have experienced menstrual disorders in connection with their first or second dose are at greater risk of experiencing such disorders again when they receive their third dose or booster dose.

How can we detect new adverse reactions?

We work systematically to analyse the reports so that we can respond quickly if new combinations of symptoms arise, or if common medical conditions occur more frequently following vaccination than we would expect. We work in three different ways:

1. **Health professionals assess individual cases of medical conditions and report when they suspect adverse reactions. The government authorities assess the reports in order to look for unknown combinations of symptoms or to determine whether there are any factors associated with the progression of the conditions which would indicate a link with vaccination.**

   E.g.: It was a combination of observant doctors at Oslo University Hospital, a robust and fast electronic monitoring system and analyses by the University Hospital of Northern Norway and the Preparedness Register which enabled Norway to help reveal that, in rare cases, Vaxzevria can give rise to a serious combination of symptoms involving blood clotting and low blood platelet counts.

2. **We carry out statistical analyses where we investigate whether the number of reports of a combination of symptoms is higher than expected.**

   E.g.: Such statistical analyses of reported adverse reactions have shown that serious allergic reactions occur more frequently following COVID-19 vaccination than with vaccination with influenza vaccines. It is also such analyses that have led to myocarditis and pericarditis being included as rare adverse reactions in the product information for Comirnaty (BioNTech/Pfizer) and Spikevax (Moderna).

3. **Health registers are used to assess and investigate further, and to confirm or disprove possible links between vaccination and reported symptoms or diagnoses. This is done in partnership with the Norwegian Institute of Public Health.**

   E.g.: Further investigation of possible links concerning symptoms reported via the spontaneous reporting system can be carried out by linking the Norwegian Immunisation Register (SYSVAK) to other health registers, to see whether any diagnoses occur more frequently following vaccination than is otherwise the case.

   The Norwegian Institute of Public Health and research institutions in many countries are also conducting registry studies to see whether there is any increase in the prevalence of diseases amongst vaccinated people that are not necessarily identified through the adverse reaction reports.

Appendix 1:

Number of suspected adverse reactions according to category

A single adverse reaction report can include a number of suspected adverse reactions or symptoms. Suspected adverse reactions are presented below, grouped according to the category to which they belong for each vaccine type and the types of suspected adverse reactions which have been reported most frequently. The categories are the highest level in a hierarchical, standardised medical terminology which is used internationally (MedDRA). Using this terminology makes it possible compare reports internationally.

Suspected adverse reactions to mRNA vaccines Comirnaty (BioNTech/Pfizer) and Spikevax (Moderna)

The most frequently reported symptoms following vaccination with the mRNA vaccines primarily consist of known adverse reactions within the general symptoms category, and include reactions at the vaccine injection site, decreased general condition, fever and general malaise. Headache, dizziness and drowsiness after vaccination are also frequently

Figure 1: Reported suspected adverse reactions by category for mRNA vaccines Comirnaty and Spikevax

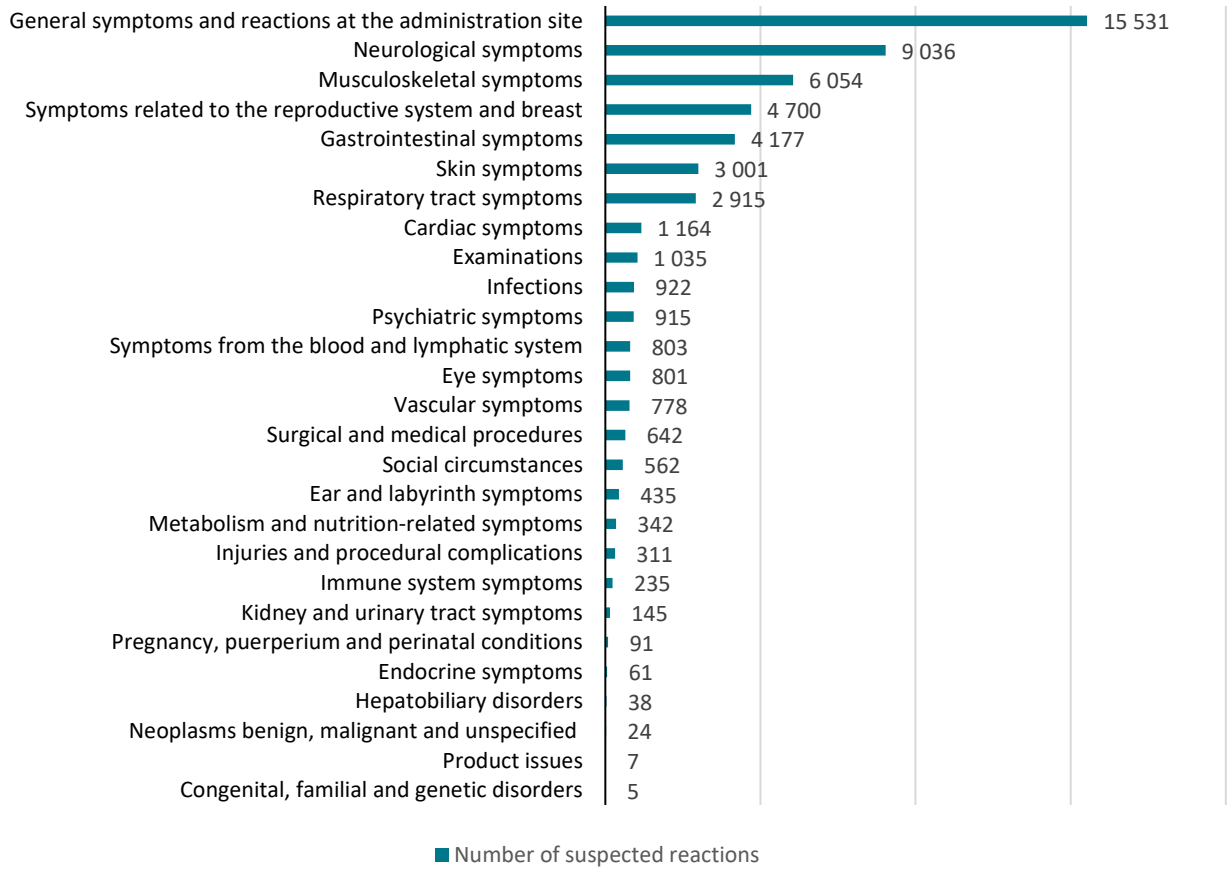

Table 6: Reported suspected adverse reactions by category for Comirnaty and Spikevax

A report can cover several adverse reactions and there will therefore be many more adverse reactions than reports.

Category	Number of suspected adverse reactions
General symptoms and reactions at the vaccine administration site E.g.: Pain and reactions at the injection site, discomfort, fever, fatigue, decreased general condition	15 262
Neurological symptoms E.g.: Headache, dizziness, drowsiness, syncope, loss of smell and taste	8 833
Musculoskeletal symptoms E.g.: Muscle pain, joint pain, muscle stiffness, pain in the extremities	5 922
Symptoms relating to the reproductive organs and breast E.g.: Breast pain and menstrual disorder	4 469
Gastrointestinal symptoms E.g.: Stomach pain, nausea, vomiting, diarrhoea	4 109
Skin symptoms E.g.: Rash, itching, redness, cold sweats, acne, night sweat	2 939
Respiratory tract symptoms E.g.: Difficulty breathing, shortness of breath, cough, irritation of the respiratory	2 857
Cardiac symptoms E.g.: Bradycardia, tachycardia, pericarditis, atrial fibrillation, extrasystoles	1 129
Examinations E.g.: Abnormal and raised heart rate, decreased blood pressure, decrease in oxygen saturation	996
Infections E.g.: Pneumonia, cold symptoms, shingles	903
Psychiatric symptoms E.g.: Sleep abnormalities, restlessness, lethargy, hallucination	893
Symptoms from the blood and lymphatic system E.g.: Swollen lymph nodes	792
Eye symptoms E.g.: Blurred vision, twitch, itchy eyes, photophobia, double vision, eye pain	783
Vascular symptoms E.g.: Flushes, pallor, low blood pressure**,** haemorrhage, deep vein thrombosis	763
Surgical and medical procedures E.g.: Hospitalisation, oxygen therapy, revaccination with other Covid-19 vaccine	610
Social circumstances E.g.: Bedridden, impaired work ability	540
Ear and labyrinth symptoms E.g.: Discomfort in the ear**,** tinnitus	419
Metabolic and nutrition-related symptoms E.g.: Reduced appetite, dehydration, high blood sugar	334
Injuries and procedural complications E.g.: Fall, bruise, wound	306
Immune system symptoms E.g.: Allergic reaction	230

Kidney and urinary tract symptoms E.g.: Urine retention, frequent urination, acute kidney injury	141
Pregnancy, puerperium and perinatal conditions E.g.: Spontaneous abortion, bleeding during pregnancy	88
Endocrine symptoms E.g.: Hypothyroidism, hyperthyroidism, thyroiditis	58
Hepatobiliary disorders E.g.: Portal vein thrombosis, hepatitis, gallstone	36
Neoplasms benign, malignant and unspecified	24
Product issues	7
Congenital, familial and genetic disorders	5

Suspected adverse reactions to viral vector vaccines Vaxzevria (AstraZeneca) and COVID-19 Vaccine Janssen (Janssen Cilag International NV)

These vaccines are not part of the Norwegian vaccination programme. Vaxzevria has not been administered in Norway since 11 March 2021. The Janssen COVID-19 vaccine is offered, but not as part of the vaccination programme. The number of suspected adverse reactions will increase if new reports are assessed. The number of suspected adverse reactions may also decrease if there are multiple reports of the same adverse reaction for the same patient (duplicates). The reports will then be merged and one of them deleted.

The most frequently reported symptoms following vaccination with the viral vector vaccines primarily consist of known adverse reactions within the general symptoms category, and include reactions at the vaccine injection site, decreased general condition, fever and general malaise. Headache, dizziness and drowsiness after vaccination are also frequently

Figure 2: Number of reported suspected adverse reactions by category for viral vector vaccines Vaxzevria and COVID -19 Vaccine Janssen

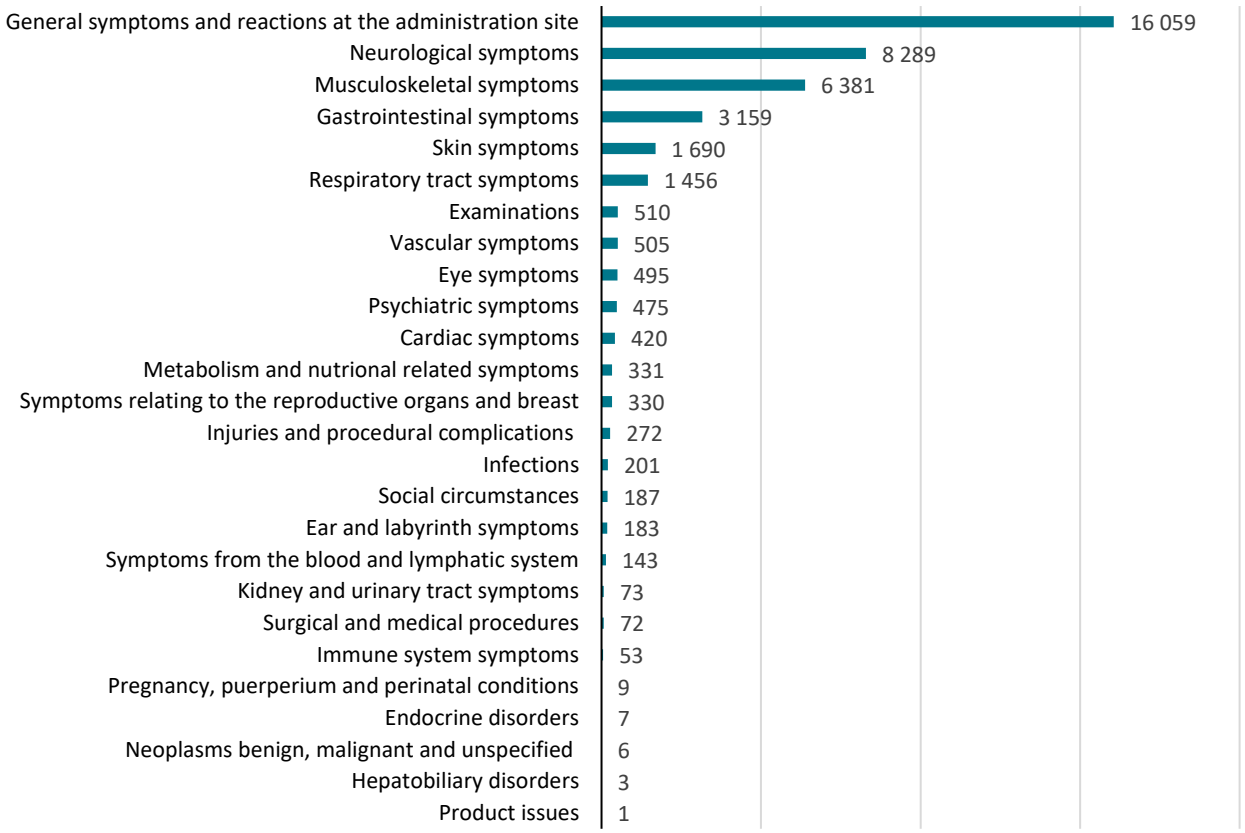

Table 7: Reported suspected adverse reactions by category for Vaxzevria and COVID-19 Vaccine Janssen

A report can cover several adverse reactions and there will therefore be many more adverse reactions than reports.

Category	Number of reported adverse reactions*
General symptoms and reactions at the vaccine administration site E.g.: Pain and reactions at the injection site, discomfort, fever, fatigue, decreased general condition	16 059
Neurological symptoms E.g.: Headache, dizziness, drowsiness, numbness	8 289
Musculoskeletal symptoms E.g.: Muscle pain, joint pain, back pain	6 381
Gastrointestinal symptoms E.g.: Stomach pain, nausea, vomiting, diarrhoea	3 159
Skin symptoms	1 690

E.g.: Rash, skin pain, cold sweats	
Respiratory tract symptoms E.g.: Difficulty breathing, hyperventilation, nasal congestion, pain and swelling of pharynx	1 456
Examinations E.g.: Abnormal and raised heart rate	510
Vascular symptoms E.g. Flushing	505
Eye symptoms E.g.: Blurred vision, twitch, eye pain	495
Psychiatric symptoms E.g.: Sleep abnormalities, insomnia	475
Cardiac symptoms E.g.: Palpitations	420
Symptoms relating to the reproductive organs and breast E.g. Pain in reproductive organs and nipples	331
Metabolic and nutrition-related symptoms E.g.: Reduced appetite	330
Injuries and procedural complications E.g. Contusion	272
Infections E.g. Sinus infection, cold symptoms	201
Social circumstances E.g.: Bedridden	187
Ear and labyrinth symptoms E.g.: Discomfort in the ear, sound sensitivity	183
Symptoms from the blood and lymphatic system E.g.: Swollen lymph nodes	143
Surgical and medical procedures E.g.: revaccination with different COVID-19 vaccine	73
Kidney and urinary tract symptoms E.g.: Frequent urination	72
Immune system symptoms E.g.: anaphylactic reaction, allergic reaction	53
Pregnancy, puerperium and perinatal conditions E.g.: spontaneous abortion	9
Endocrine symptoms	7
Neoplasms, benign, malignant and unspecified	6
Hepatobiliary disorders	3
Product issues	1

** The number of reported adverse reactions may also decrease if there are multiple reports of the same adverse reaction for the same patient (duplicates). The reports will then be merged and one of them deleted*