# Israel Ministry of Health

# Survey of reported adverse events after the third Pfizer vaccine shot for Covid-19

**(This report was released on February 10th 2022**
**This translation was done by dedicated volunteers – we apologize for any imperfections you may find, please refer to the original Hebrew document in case of doubt)**

## Background

On December 20, 2020, a vaccination program was launched in Israel using Pfizer's vaccine for Covid-19. By the end of March 2021, more than half of the population had been vaccinated with two vaccine doses.

The decrease in immunity over time and emergence of new variants led to a renewed increase in morbidity in Israel in the summer of 2021.

By the end of July 2021, a third shot of the vaccine (booster shot) was authorized for everyone who had received two shots and at least five months had passed from the second shot.

## Importance of the Survey

From data collection by medical teams or self-reporting by the public of side-effects in temporal proximity (passive monitoring), it appears that there is underreporting; therefore, it is important to identify side-effects in temporal proximity to vaccination with the booster in an active manner via a dedicated survey.

## Goals

### General goals

To determine the frequency of side-effects which appeared within 21-30 days from vaccination with the third Pfizer shot (booster) against Covid-19 among citizens above 18 years of age.

### Specific goals

Examine the prevalence of side-effects in temporal proximity to the third shot grouped according to age and gender.

Examine the time of onset relative to administration of the vaccine and the duration thereof, and to compare it with the side-effects of previous vaccines.

## Methods

Survey type: Retrospective cohort

Population segment: Israeli citizens 18+ and vaccinated with the Pfizer booster shot 21-30 days prior to being interviewed.

General criteria:

1. Citizens living in the community

2. Hebrew speakers

Exclusion criteria:

1. Those recovered from Covid-19 (prior to the survey being conducted)

2. Those without a contact phone number

3. Those who showed difficulty comprehending and were incapable of being interviewed

Sampling method: The sample was taken from the Health Ministry's database of vaccinated individuals, which includes data on all individuals who have been vaccinated for Covid-19 and updated on a daily basis. From the database only people with a telephone number were sampled (about 75% of the total database).

The survey sample was random and stratified by gender (male, female) and age group (18-39, 40-59, 60+).

The survey received authorization of the Information Committee and the Supreme Helsinki Committee of the Health Ministry.

Data acquisition:

Telephone interviews by experienced interviewers / research assistants at the Israeli Center for disease control who underwent training, by means of a structured and computerized questionnaire in Hebrew (CATI system).

A follow-up interview was conducted 7-12 weeks after the initial interview, among 45 of the women who had reported menstrual irregularities in the initial interview (N=59) using a structured questionnaire, to gather additional information to identify side effects and duration.

Questionnaire contents:

1. Demographic characteristics: gender, age
2. Symptoms that appeared in close proximity to the vaccine divided into location, generality, neurological, allergic and other, including a breakdown of the symptoms, the date of their onset, the duration and their severity.
3. Background morbidity

Statistical methods:

The reported rates of occurrence were compared between gender groups and age groups (18-39, 40-59, 60+) using an accepted statistical test (for example a Chi-squared test).

| Total | |
|---|---|
| 4,945 | **Total sample drawn** |
| 624 | **Not within the inclusion criteria** |
| **4,321** | **Total effective sample** |
| 1,427 | **People who haven't been contacted** |
| 347 | **People contacted but could not be interviewed, and 8 attempts were not made to reconnect** |
| 469 | **Refused to be interviewed** |
| 10 | **Partially interviewed** |
| **2,068** | **Interviewed** |
| 2,068/4,321<br>= **47.8%** | **1st calculation of response rate**<br>**Denominator = effective sample** |
| 2,068/2,894<br>=**71.4%** | **2nd calculation of response rate**<br>**Denominator = effective sample – those not contacted** |

The survey included 2,068 interviews which were conducted between the 19.09.21 and 25.10.21; 19 full interviews were not included in the statistical processing due to missing data. Consequently, 2,049 were included in the study.

51% of the respondents were men (N = 1,044) and 49% were women (N = 1,005). The sample population was evenly distributed among three age groups (18-39, 40-59, 60+)

**Chronic morbidity rate and exacerbation throughout the sample**

| Report of exacerbation of disease* N (%) | Disease frequency N (%) | Condition/disease |
|---|---|---|
| 18 (6.3) | 285 (14.1) | Hypertension |
| 14 (7.0) | 201 (9.9) | Lung disease |
| 14 (9.3) | 151 (7.5) | Diabetes |
| 6 (5.4) | 110 (5.4) | Heart diseases |
| 24 (26.4) | 91 (4.5) | Anxiety disorder or depression |
| 15 (24.2) | 62 (3.1) | Autoimmune disease (such as joint disease) |

* Percentage of respondents who reported exacerbation of the disease in the month after vaccination out of those who reported the existence of the disease

Symptoms reported in close temporal proximity (up to 21-30 days) of receiving the vaccine

Two-thirds (66.4%, 1,360 in total) of the respondents reported that they suffered from at least one side-effect in temporal proximity to receiving the vaccine.

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age) - similar to the findings of passive monitoring.

| | Rate of reporting at least one side-effect | Statistical significance |
|---|---|---|
| Gender | Male = 57.7%<br>Female = 75.4% | P<0.05 |
| Age | 18-39 = 71.4%<br>40-59 = 69.9%<br>60+ = 57.2% | P<0.05 |

Nearly half (44.1%, 589 in total) of the respondents who reported that they suffered from any side-effect after the vaccination, also reported that as a result they had difficulty performing daily activities (higher in women 50.9%, compared to men 35.4%, P<0.05)

A few individuals (0.5%, 6 in total) of all respondents who reported suffering from any side-effect after the vaccine, were hospitalized following that same side-effect.

Local side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

About half (55.7%, 1,140 in total) of the respondents reported that they suffered from at least one local side-effect in temporal-proximity to vaccination.

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age) - similar to the findings of passive monitoring.

| | Rate of reporting at least one local side-effect | Significance |
|---|---|---|
| Gender | Male = 47.9%<br>Female = 63.8% | P<0.05 |
| Age | 18-39 = 61.6%<br>40-59 = 58.9%<br>60+ = 46.0% | P<0.05 |

Local injection-site side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

About half (55.7%, 1,140 in total) of the respondents reported that they suffered from at least one local injection-site side-effect in temporal-proximity to vaccination.

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age) - similar to the findings of passive monitoring.

| Total n (%) | Female n (%) | Male n (%) | Local AE |
|---|---|---|---|
| 1,108 (54.2) | 626 (62.5) | 482 (46.2) | Pain |
| 473 (23.3) | 317 (31.9) | 156 (15.0) | Limited arms movement |
| 257 (12.6) | 182 (18.2) | 75 (7.2) | Swelling |
| 185 (9.1) | 122 (12.3) | 63 (6.1) | Enlarged lymph nodes proximate to the injection site |
| 131 (7.3) | 92 (10.5) | 39 (4.2) | Redness Local |
| 38 (1.9) | 19 (1.9) | 19 (1.8) | rash |
| 16 (0.8) | 14 (1.4) | 2 (0.2) | Abscess |
| 6 (0.3) | 4 (0.4) | 2 (0.2) | *Other |

| Significance | Rate of reporting at least one local side-effect | |
|---|---|---|
| P<0.05 | 47.9% = Male<br>63.8% = Female | Sex |
| P<0.05 | 61.6% = 39-18<br>58.9% = 59-40<br>46.0% = +60 | Age |

*Including: limited hand movement and numbness at the injection area

General side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

About half (48.6%, 995 in total) of the respondents reported that they suffered from at least one general side-effect in temporal-proximity to vaccination.

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age) - similar to the findings of passive monitoring.

| | Rate of reporting at least one general side-effect | Significance |
|---|---|---|
| Gender | Male = 38.3%<br>Female = 59.4% | P<0.05 |
| Age | 18-39 = 54.5%<br>40-59 = 53.8%<br>60+ = 36.6% | P<0.05 |

## General side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

| Total n (%) | Female n (%) | Male n (%) | General AE |
|---|---|---|---|
| 856 (42.5) | 523 (52.9) | 333 (32.4) | Weakness / tiredness |
| 529 (26.3) | 345 (34.9) | 184 (17.9) | Head ache |
| 520 (25.7) | 336 (33.9) | 184 (17.9) | Muscle pain / joints |
| 344 (17.1) | 236 (23.9) | 108 (10.6) | Shaking |
| 306 (15.2) | 202 (20.5) | 104 (10.2) | Temperature above 38 degrees Celsius |
| 186 (9.3) | 135 (13.7) | 51 (5.0) | Dizziness / feeling faint |
| 139 (6.9) | 105 (10.6) | 34 (3.3) | Nausea / vomiting |
| 110 (5.5) | 69 (7.0) | 41 (4.0) | Chest pain |
| 101 (5.0) | 61 (6.2) | 40 (3.9) | Digestive system problems* |
| 84 (4.2) | 59 (6.0) | 25 (2.5) | Enlarged lymph nodes (distal to the injection region) |
| 78 (3.9) | 40 (4.1) | 38 (3.7) | Coughing |
| 41 (2.0) | 26 (2.6) | 15 (1.5) | Anxiety |
| 40 (2.0) | 19 (1.9) | 21 (2.0) | Other |

* Includes: abdominal pain / constipation / diarrhea / heartburn

** Includes: colds / phlegm or mucus / sore throat, side-effects on the legs (swelling / heaviness / weakness), low fever / feeling cold, sores in the mouth, hot flashes, hair loss, contractions in pregnant women, restlessness, insomnia, clouding of consciousness and shortness of breath on exertion.

Neurological side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

A minority (4.5%, 91 in total) of the respondents reported that they suffered from at least one neurological side-effect in temporal-proximity to vaccination.

The rate of reporting changed significantly by gender (higher in women) but not by age group - similar to the findings of passive monitoring.

| | Rate of reporting at least one neurological side-effect | Significance |
|---|---|---|
| Gender | Male = 2.1%<br>Female = 6.9% | P<0.05 |
| Age | 18-39 = 3.7%<br>40-59 = 5.1%<br>60+ = 4.5% | P>0.05 |

## Neurological side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

**A minority (4.5%, 91 in total) of the respondents reported that they suffered from at least one neurological side-effect in temporal-proximity to vaccination.**

The rate of reporting changed significantly by gender (higher in women) but not by age group - similar to the findings of passive monitoring.

| Total n (%) | Female n (%) | Male n (%) | Neurological AE |
|---|---|---|---|
| 68 (3.4) | 52 (5.3) | 16 (1.5) | Paresthesia |
| 11 (0.5) | 8 (0.8) | 3 (0.3) | Bell's Palsy |
| 11 (0.5) | 6 (0.6) | 5 (0.5) | Blurred vision / vision disturbance |
| 8 (0.4) | 5 (0.5) | 3 (0.3) | Memory impairment |
| 7 (0.4) | 5 (0.5) | 2 (0.2) | acute hearing disturbance |
| 4 (0.2) | 3 (0.3) | 1 (0.1) | seizures/convulsions |
| 3 (0.2) | 3 (0.3) | 0 (0.0) | Loss of consciousness |
| 5 (0.3) | 4 (0.4) | 1 (0.1) | Other* |

*Includes involuntary movements / eye tics, vertigo*

| Significance | Rate of reporting at least one neurological side-effect | |
|---|---|---|
| P<0.05 | 2.1% = Male<br>6.9% = Female | **Gender** |
| P>0.05 | 3.7% = 39-18<br>5.1% = 59-40<br>4.5% = +60 | **Age** |

Allergic side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

A minority (3.9%, 80 in total) of the respondents reported that they suffered from at least one allergic side-effect in temporal-proximity to vaccination.

The rate of reporting changed significantly by gender (higher in women) but not by age group - similar to the findings of passive monitoring.

| | Rate of reporting at least one allergic side-effect | Significance |
|---|---|---|
| Gender | Male = 2.6%<br>Female = 5.3% | $P<0.05$ |
| Age | 18-39 = 3.8%<br>40-59 = 4.1%<br>60+ = 3.7% | $P>0.05$ |

## Allergic side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

**A minority (3.9%, 80 in total) of the respondents reported that they suffered from at least one allergic side-effect in temporal-proximity to vaccination.**

The rate of reporting changed significantly by gender (higher in women) but not by age group - similar to the findings of passive monitoring.

| Total n (%) | Female n (%) | Male n (%) | Allergic AE* |
|---|---|---|---|
| 40 (2.0) | 26 (2.6) | 14 (1.3) | Rash |
| 34 (1.7) | 23 (2.3) | 11 (1.1) | Itching |
| 30 (1.5) | 20 (2.0) | 10 (1.0) | dyspnea |
| 13 (0.6) | 8 (0.8) | 5 (0.5) | Facial swelling / throat swelling |

| Significance | Rate of reporting at least one allergic side-effect | |
|---|---|---|
| P<0.05 | 2.6% =Male<br>5.3% = Female | Gender |
| P>0.05 | 3.8% = 39-18<br>4.1% = 59-40<br>3.7% = +60 | Age |

* no instances of anaphylaxis wer reported in the sample

Other side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

A minority (4.1%, 83 in total) of the respondents reported that they suffered from at least one other side-effect in temporal-proximity to vaccination.

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age).

| | Rate of reporting at least one other side-effect | Significance |
|---|---|---|
| Gender | Male = 0.7%<br>Female = 7.6% | P<0.05 |
| Age | 18-39 = 6.6%<br>40-59 = 4.5%<br>60+ = 0.9% | P<0.05 |

## Other side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

**A minority (4.1%, 83 in total) of the respondents reported that they suffered from at least one other side-effect in temporal-proximity to vaccination.**

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age).

| Total n (%) | Female n (%) | Male n (%) | Other side-effects |
|---|---|---|---|
| 4 (0.2) | 4 (0.4) | 0 (0.0) | Herpes simplex |
| 3 (0.2) | 3 (0.3) | 0 (0.0) | Herpes zoster |
| - | 59 (9.6) | - | Menstrual abnormalities* |
| 22 (1.1) | 15 (1.5) | 7 (0.7) | Other** |

| Significance | Rate of reporting at least one other side-effect | |
|---|---|---|
| P<0.05 | 0.7% =Male<br>7.6% =Female | **Gender** |
| P<0.05 | 6.6% = 39-18<br>4.5% = 59-40<br>0.9% = +60 | **Age** |

*Percentage from the total number of females in the sample under the age of 54 (N=615)

** The other most common side-effects included: eye problems (5 cases), changes in sense of taste / smell (4 cases), myocarditis (one case).

Follow-up interview of women who reported menstrual irregularities

A follow-up interview was carried out between 7-12 weeks subsequent to the initial survey.

There was participation of 47 (79.7%) women, of the 59 women (between ages 19 to 50) who reported menstrual irregularities in temporal-proximity to the third vaccination in the initial survey.

In total **45** were entered into the data set (2 were excluded because the original report related to prior vaccination shots and not the third vaccination).

Out of the total number of women who participated in the follow-up interview:

88.6% testified to having a regular menstrual cycle prior to the Covid-19 booster vaccination.

31.1% sought medical treatment due to the menstrual irregularities.

9.1% received medication for it.

39.0% suffered from similar side-effects after prior Covid-19 vaccinations; however most (67%) indicated that the side-effects waned prior to the third vaccination and returned after receiving it.

About half of the women reported that the side-effects were ongoing at the time of the follow-up interview.

## Follow-up interview - Primary issues reported for menstrual cycle irregularities

| N (%) | Changes in the menstrual cycle* |
|---|---|
| 17 (37.8) | Delayed menstruation |
| 14 (31.1) | Increase in menstrual bleeding |
| 13 (28.9) | Early onset of menstruation |
| 12 (26.7) | Extended duration of menstrual bleeding |
| 11 (24.4) | Repeated bleeding during the month |
| 9 (20.0) | Strong pains during menstruation |
| 4 (8.9) | Weakened menstrual bleeding |
| 3 (6.7) | Cessation of menstruation |
| 2 (4.4) | Reduced duration of menstrual bleeding |
| 1 (2.2) | Single occurrence of bleeding post-vaccination (at an unexpected time) |
| 1 (2.2) | Reoccurrence of bleeding after the end of menstruation |
| 4 (8.9) | Other** |

*It was allowed to report on more than one side-effect

**other = blood clotting, decreased pain during menstruation, irregularity, and premenstrual syndrome including irritability and pain

# General timeframe for onset and type of side-effect and duration

| Other AE N=83 n (%) | Allergic AE N=80 n (%) | Nerves system AE N=91 n (%) | General AE N=995 n (%) | local AE N=1,140 n (%) | |
|---|---|---|---|---|---|
| | | | | | Timeframe for onset of side-effect |
| 2 (4.1) | 3 (4.1) | 13 (15.7) | 28 (2.9) | 106 (9.4) | Immediately and up to one hour |
| 5 (10.2) | 23 (31.1) | 22 (26.5) | 555 (56.9) | 752 (66.7) | From the first hour to 24 hours |
| 19 (38.8) | 26 (35.1) | 24 (28.9) | 327 (33.5) | 259 (23.0) | 1-7 days |
| 23 (46.9) | 22 (29.7) | 24 (28.9) | 65 (6.7) | 10 (0.9) | From one week to one month |
| | | | | | Side effect duration |
| 1 (2.2) | 7 (9.2) | 19 (21.3) | 261 (26.8) | 269 (23.8) | Up to 24 hours |
| 6 (13.3) | 19 (25.0) | 18 (20.2) | 415 (42.7) | 636 (56.3) | Between 1-3 days |
| 8 (17.8) | 14 (18.4) | 7 (7.9) | 115 (11.8) | 158 (14.0) | Between 4-7 days |
| 11 (24.4) | 11 (14.5) | 3 (3.4) | 58 (6.0) | 42 (3.7) | More than 1 week |
| 19 (42.2) | 25 (32.9) | 42 (47.2) | 124 (12.7) | 24 (2.1) | Ongoing |

## Severity of the side-effect

| Other AE N=83 n (%) | Allergic AE N=80 n (%) | Nerve system AE N=91 n (%) | General AE N=995 n (%) | Local AE N=1,140 n (%) | |
|---|---|---|---|---|---|
| | | | | | Comparison of the severity of the AE to similar side-effects of previous vaccinations |
| 1 (1.9) | 5 (6.7) | 5 (5.6) | 149 (15.3) | 157 (14.0) | Currently less severe |
| 5 (9.4) | 15 (20.0) | 11 (12.4) | 165 (16.9) | 237 (21.1) | Currently more severe |
| 15 (28.3) | 8 (10.7) | 18 (20.2) | 245 (25.2) | 478 (42.5) | Similar severity |
| 32 (60.4) | 47 (62.7) | 55 (61.8) | 415 (42.6) | 252 (22.4) | Not comparable* |
| 14 (26.4) | 33 (43.4) | 16 (18.2) | 431 (43.9) | 252 (22.3) | Report of medication taken |
| 16 (30.2) | 18 (23.7) | 19 (21.6) | 72 (7.4) | 34 (3.0) | Medical treatment sought |

*Not comparable because did not suffer from similar side-effects from previous vaccinations

# Summary of results

| Other side-effects | Allergic side-effects | Neurological side-effects | General AE | Local AE | |
|---|---|---|---|---|---|
| **4%** | **4%** | **4.5%** | **49%** | **56%** | **Percentage of respondents** |
| 1% | 3% | 2% | 38% | 48% | **Male** |
| 8% | 5% | 7% | 59% | 64% | **Female** |
| In women until the age of 54 - menstrual irregularities (10%) | 1. Rash<br>2. Itchiness<br>3. Dyspnea | 1. Paresthesia<br>2. Bell's Palsy<br>3. Blurred vision / vision disturbance | 1. Weakness / tiredness<br>2. Headache<br>3. Muscle pain / joints | 1. Pain<br>2. Limitation of arm movement<br>3. Local swelling | **Most common AE** |
| **In the majority of cases )about 85%( after 1 day to one month from vaccination** | **In the majority of cases (about 65%) after 1 day to one month from vaccination** | In the majority of cases (about 60%) after 1 day to one month from vaccination | In the majority of cases **(about 90%)** between one hour to one week from vaccination | In the majority of cases )about **90%(** between one hour to one week from vaccination<br>In the majority of cases between 1-3 days | **Onset of side-effect** |
| **In the majority of cases over 1 week or still ongoing** | **ONGOING in many cases (33%)** | In many cases )47%( still ongoing | **In the majority of cases between 1 hour to 3 days** | In the majority of cases between 1-3 days | **Duration of side-effect** |
| **26%** | **43%** | **18%** | **44%** | **22%** | **Report of medication taken** |
| **30%** | **24%** | **22%** | **7%** | **3%** | **Medical treatment sought** |
| 40% (in 91% of the AE of the present vaccination they were not more severe) | 37% (in 80% of the AE of the present vaccination they were not more severe) | 38% (in 88% of the AE of the present vaccination they were not more severe) | 57% (in 83% of the AE of the present vaccination they were not more severe) | 78% -(in 79% of the AE of the present vaccination they were not more severe) | **Report of similar AE of previous vaccination** |

## Other side-effects reported in close temporal-proximity (up to 21-30 days) of receiving the vaccine

**A minority (4.1%, 83 in total) of the respondents reported that they suffered from at least one other side-effect in temporal-proximity to vaccination.**

The rate of reporting changed significantly by gender (higher in women) and (higher with a younger respondent age).

| Total n (%) | Female n (%) | Male n (%) | Other side-effects |
|---|---|---|---|
| 4 (0.2) | 4 (0.4) | 0 (0.0) | Herpes simplex |
| 3 (0.2) | 3 (0.3) | 0 (0.0) | Herpes zoster |
| - | 59 (9.6) | - | Menstrual abnormalities* |
| 22 (1.1) | 15 (1.5) | 7 (0.7) | Other** |

| Significance | Rate of reporting at least one other side-effect | |
|---|---|---|
| P<0.05 | 0.7% =Male<br>7.6% =Female | **Gender** |
| P<0.05 | 6.6% = 39-18<br>4.5% = 59-40<br>0.9% = +60 | **Age** |

*Percentage from the total number of females in the sample under the age of 54 (N=615)

** The other most common side-effects included: eye problems (5 cases), changes in sense of taste / smell (4 cases), myocarditis (one case).

## Conclusions

1. Side-effects are more commonly reported by women and younger people.

2. Most side-effects which were reported between 21-30 days after the booster shot for Covid-19 for the age group 18+ in Israel were local or general; the majority did not require medical treatment, and waned between one to three days.

3. Neurological side-effects, allergic and other, were less common (about 4%); however 10% of women (until the age of 54) who reported other side-effects, suffered from menstrual irregularities.

4. Neurological side-effects, allergic and other appeared a longer period of time after the vaccination (until a month later) and often continued to the time of the survey (21-30 days from the vaccination); more than a fifth of those who reported those side-effects, sought medical treatment for them.

5. In the majority of reported side effects of all types, the occurrence of the side effect of the third vaccination was not more severe in comparison to the previous vaccinations.