REPORT N° 5

ADVERSE EVENTS FOLLOWING IMMUNIZATION FOR COVID-19 VACCINES IN LEBANON

COVID-19 Vaccines - Lebanon

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February 14, 2021 - September 19, 2021

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EXECUTIVE SUMMARY

This executive summary provides an overview of Adverse Events Following Immunization (AEFIs) that were temporally associated (i.e., occurred after administration of the vaccine) to the four COVID-19 vaccines available in Lebanon during the mass campaign immunization between February 14th and September 19th, 2021 (Pfizer-BioNTech Vaccine, AstraZeneca Vaccine, Sputnik V Vaccine and Sinopharm Vaccine). According to the World Health Organization (WHO), an AEFI is any untoward medical occurrence that follows immunization and does not necessarily have a causal relationship with the vaccine. The adverse event may be any unfavorable or unintended sign, abnormal laboratory finding, symptom or disease.

The following information summarizes COVID-19 vaccines doses since their first deployment in Lebanon, from February 14th, 2021 until September 19th, 2021

TOTAL NUMBER OF REGISTERED PERSONS
3,241,932

TOTAL ADMINISTERED DOSES
2,802,835

FIRST DOSE
1,538,064 (54.88%)

SECOND DOSE
1,263,048 (45.06%)

TOTAL PFIZER-BIONTECH DOSES
2,215,246 (79.04%)

TOTAL ASTRAZENECA DOSES
446,729 (15.94%)

TOTAL SPUTNIK V DOSES
117,115 (4.18%)

TOTAL SINOPHARM DOSES
14,502 (0.52%)

FULLY IMMUNIZED
39%

As per the COVID-19 vaccination dashboard provided by IMPACT platform on September 19th, 2021

BACKGROUND

Within the scope of the AEFI surveillance related to the available COVID-19 Vaccines in Lebanon, the Pharmacovigilance (PV) Program established a procedure for the management of reported AEFIs. Vaccine recipients experiencing any AEFI can report through one of the following means: 1214 Hotline Call Center, IMPACT Platform, Vaccination Sites/Hospital Sites through "Kobo tool box: AEFIs Software for reporting" or by direct contact with the PV program, and other sources including Preventive Medicine, Epidemiology Surveillance Program, Health Education and other departments from the MoPH.

A case report refers to a report received by the PV Program which pertains to one individual vaccine recipient who reported at least one adverse event after receiving the COVID-19 vaccine (i.e., temporally associated with the vaccine).

All case reports are screened and validated for data completion. Incomplete or inconsistent case reports are followed-up directly with the initial reporter.

The case reports are classified as serious or non-serious cases. The non-serious case reports are entered directly into the national web-based report management system: VigiFlow. The surveillance aims to establish a rigorous safety profile in regards to the COVID-19 vaccines administered in Lebanon.

HIGHLIGHTS

- A total of 5,256 case reports/19,702 AEFIs were received following the administration of 2,802,835 doses of COVID-19 vaccines (Pfizer BioNTech, AstraZeneca, Sputnik V and Sinopharm) in Lebanon between the 14th of February and the 19th of September, 2021.
  - This is equivalent to a reporting rate of 1.9 case reports/7.0 AEFIs per 1,000 doses administered.
  - This represents an increase of 748 case reports/ 2,993 AEFIs in comparison with the previous report dated from the 14th of February to 1st August 2021.

- The 5,256 case reports were received through one of the following means (Table 1):
  - IMPACT Platform: 3,408 case reports (64.8%)
  - 1214 Hotline call center: 1,243 case reports (23.7%)
  - Vaccination Sites/Hospital Sites through "Kobo tool box: AEFIs Software for reporting"or by direct contact with the PV program: 551 case reports (10.5%)
  - Other reporting sources which may include Preventive Medicine, Epidemiology Surveillance Program, Health Education and other departments from the MoPH: 54 case reports (1.0%)

- Out of the 5,256 case reports (Table 2):
  - 4,275 case reports were associated with dose 1 of vaccination (81.3%)
  - 972 case reports were associated with dose 2 of vaccination (18.5%)
  - 9 case reports were missing this information (0.2%)

- Out of the 5,256 case reports (Table 3):
  - 4,929 case reports were non-serious (93.8% of total case reports)
  - 327 case reports were classified as serious cases as per the WHO definition (6.2% of total case reports), out of which:
    - 225 case reports were serious cases that did not require hospitalization nor lead to death. These were identified as other medically important events (4.28% of total case reports)
    - 102 case reports were serious cases that were either admitted to the hospital or resulted in death (1.94% of total case reports) (refer to Technical Notes for serious cases definition as per WHO)

- Of the total received AEFIs, the 5 most frequently reported AEFIs with the four COVID-19 vaccines available in Lebanon were (Table 6):
  - Injection site pain (46% of total reported AEFIs)
  - General pain which may correspond to body pain or joint pain (46.0% of total reported AEFIs)
  - Fatigue (44.4% of total reported AEFIs)
  - Headache (38.7% of total reported AEFIs)
  - Pyrexia (32.9% of total reported AEFIs)

- The most frequently reported AEFIs per vaccine were: (Table 7, 8, 9, 10)
  - Injection site pain was the most frequently reported non-serious adverse event following the Pfizer-BioNTech Vaccine (39.9% of total reported AEFIs).
  - Fatigue was the most common adverse event following all other vaccines: 58.5% of the total reported AEFIs related to AstraZeneca Vaccine, 65.6% of the total reported AEFIs related to Sputnik V Vaccine, and 50% of the total reported AEFIs related to Sinopharm Vaccine.

REPORTING OVERVIEW

a. Global Analysis

Table 1 summarizes the case reports by reporting means: 1214 Hotline Call Center, IMPACT Platform, Vaccination Sites/Hospital Sites through "Kobo tool box: AEFIs Software for reporting" or direct contact with the PV program, and other sources including Preventive Medicine, Epidemiology Surveillance Program, Health Education and other departments from the MoPH.

Table 1: Summary of case reports by Means of Reporting

Means of Reporting	IMPACT Platform	1214 Hotline	Vaccination Sites/ Hospital Sites	Others
Number of Case reports	3,408	1,243	551	54
Percentage	64.8%	23.7%	10.5%	1.0%

Table 2 classifies the 5,256 reported cases according to their occurrence: after the first or second dose of COVID-19 vaccine. Out of these 5,256 case reports, 4,275 case reports were post dose 1 (81.3%), while 972 case reports were post dose 2 (18.5%).

Table 2. Summary of case reports according to received dose*

	All Vaccines Combined	Pfizer-BioNTech	AstraZeneca	Sputnik V	Sinopharm
Total Case Reports (%)	5,256	3,001 (57.1)	2,012 (38.28)	227 (4.32)	16 (0.3)
Dose 1 (%)	4,275 (81.3)	2,206 (73.5)	1,887 (93.8)	172 (75.8)	10 (62.5)
Dose 2 (%)	972 (18.5)	790 (26.3)	121 (6.0)	55 (24.2)	6 (37.5)

**1,723 (0.06%) had dose missing*

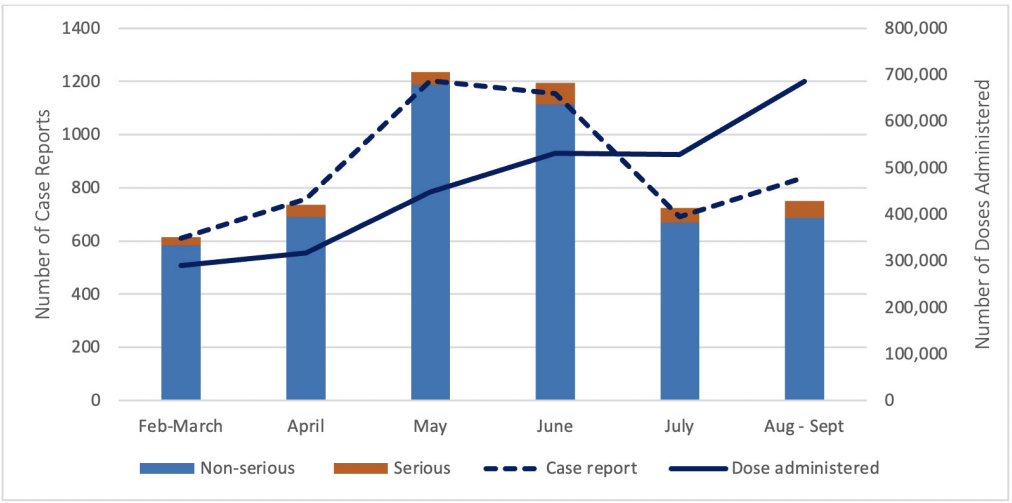
Table 3 represents a summary of all case reports that were received between the period of February 14th to September 19th, 2021

Table 3. Summary of all case reports related to COVID-19 vaccines in Lebanon, from February 14th to September 19th, 2021

	All Vaccines Combined	Pfizer-BioNTech	AstraZeneca	Sputnik V	Sinopharm
Total Doses Administered	2,802,835	2,215,246	446,729	117,115	14,502
Total case reports (%)	5,256	3,001 (57.1)	2,012 (38.3)	227 (4.3)	16 (0.3)
Non serious case reports* (%)	4,929 (93.8)	2,799 (93.3)	1,900 (94.4)	218 (96)	12 (75)
Serious case reports** (%)	327 (6.2)	202 (6.7)	112 (5.6)	9 (4)	4 (25)
Total reporting rate per 1,000 doses administered	1.9	1.4	4.5	1.9	1.1
Serious reporting rate per 1,000 doses administered	0.12	0.09	0.25	0.08	0.27

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24)
** Non-Serious cases include expected local and systemic AEFIs resolved without the need for further follow up or investigation*
***Serious cases are those who meet the WHO seriousness criteria (refer to Technical Notes)*

Figure 1: Number of Case reports, doses administered, non-serious and serious cases by month of the four COVID-19 Vaccines' administration in Lebanon, between the period of February 14th to September 19th, 2021



Case reports are assessed based on the date of vaccine administration. The administration period ranges from February 14th to September 19th, 2021. Accordingly, case reports were received as of February 14th, 2021 with an incremental increase in both serious and non-serious case reports. The highest reporting rate was during the month of May for the non-serious cases and June for the serious cases.

b. Demographics

Tables 4 and 5 present a summary of case reports related to the COVID-19 vaccines by age group, gender and reporter qualification.

Table 4. Summary of all case reports related to the four COVID-19 vaccines by age group and gender in Lebanon, from February 14th to September 19th, 2021

Gender	COUNT	PERCENTAGE
Female	3,282	62.4%
Male	1,974	37.6%
Age		
12- 17 years	43	0.8%
18 - 44 years	2,734	52%
45 - 64 years	1,744	33.2%
65 - 74 years	295	5.6%
≥ 75 years	392	7.5%
Unknown Age	48	0.9%

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24)
Note: Age represents the age at time of vaccination. Some case reports may be missing the date of birth

Table 5. Summary of all case reports related to the four COVID-19 vaccines by reporter qualification in Lebanon, February 14th to September 19th, 2021

REPORTER QUALIFICATION	COUNT	PERCENTAGE
Physician	155	2.95%
Pharmacist	185	3.52%
Other Health Professional	375	7.13%
Consumer/Non Health Professional	4,541	86.4%

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24)

c. Non serious Adverse Events Following Immunization

A case report refers to a report received by the PV Program, which pertains to one individual vaccine recipient who has reported at least one adverse event after receiving one of the COVID-19 vaccines (i.e., temporally associated with the vaccine).

The tables below give an overview of the top reported AEFIs.

c.i. Most Reported Non-Serious AEFIs Related to COVID-19 Vaccines:

Table 6. Top 15 reported AEFIs by symptom Preferred Terms (PT)* related to the four COVID-19 vaccines in Lebanon, February 14th to September 19th, 2021

Reported Preferred Terms (MedDRA)	COUNT	PERCENTAGE
Injection site pain	2,271	46.0%
Pain	2,204	44.7%
Fatigue	2,188	44.4%
Headache	1,909	38.7%
Pyrexia	1,625	32.9%
Chills	1,606	32.6%
Nausea	869	17.6%
Injection site swelling	485	9.8%
Abdominal pain	399	8.1%
Diarrhoea	376	7.6%
Dyspnoea	352	7.1%
Injection site erythema	350	7.1%
Cough	290	5.9%
Vomiting	245	5.0%
Rash	205	4.2%

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24.0).
**Preferred Terms (PTs) are distinct descriptors (single medical concept) for a symptom, sign, disease diagnosis, therapeutic indication, investigation, surgical or medical procedure, and medical social or family history characteristic.*

c.ii. Non serious AEFIs per specific vaccine:

Table 7. Top 10 reported AEFIs by symptom Preferred Terms (PT)* related to the Pfizer-BioNTech COVID-19 vaccine in Lebanon, from February 14th to September 19th, 2021

Reported Preferred Terms (MedDRA)	COUNT	PERCENTAGE
Injection site pain	1,118	39.9%
Pain	1,096	39.1%
Fatigue	926	33.1%
Headache	838	29.9%
Pyrexia	663	23.7%
Chills	657	23.5%
Nausea	368	13.1%
Injection site swelling	291	10.4%
Injection site erythema	199	7.1%
Diarrhoea	191	6.8%

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24.0).
**Preferred Terms (PTs), are distinct descriptors (single medical concept) for a symptom, sign, disease diagnosis, therapeutic indication, investigation, surgical or medical procedure, and medical social or family history characteristic.*

Table 8. Top 10 reported AEFIs by symptom Preferred Terms (PT)* related to the AstraZeneca COVID-19 vaccine in Lebanon, from February 14th to September 19th, 2021

Reported Preferred Terms (MedDRA)	COUNT	PERCENTAGE
Fatigue	1,113	58.5%
Injection site pain	1,039	54.6%
Pain	993	52.2%
Headache	964	50.7%
Pyrexia	867	45.6%
Chills	842	44.3%
Nausea	450	23.7%
Abdominal pain	197	10.4%
Injection site swelling	180	9.5%
Dyspnoea	168	8.8%

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24.0).
**Preferred Terms (PTs), are distinct descriptors (single medical concept) for a symptom, sign, disease diagnosis, therapeutic indication, investigation, surgical or medical procedure, and medical social or family history characteristic.*

Table 9. Top 10 reported AEFIs by symptom Preferred Terms (PT)* related to the Sputnik V COVID-19 vaccine in Lebanon, from February 14th to September 19th, 2021

Reported Preferred Terms (MedDRA)	COUNT	PERCENTAGE
Fatigue	143	65.6%
Pain	112	51.4%
Injection site pain	109	50.0%
Chills	106	48.6%
Headache	105	48.2%
Pyrexia	92	42.2%
Nausea	48	22.0%
Diarrhoea	20	9.2%
Injection site swelling	14	6.4%
Abdominal pain	13	6.0%

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24.0).
**Preferred Terms (PTs), are distinct descriptors (single medical concept) for a symptom, sign, disease diagnosis, therapeutic indication, investigation, surgical or medical procedure, and medical social or family history characteristic.*

Table 10. Top 10 reported AEFIs by symptom Preferred Terms (PT)* related to the Sinopharm COVID-19 vaccine in Lebanon, from February 14th to September 19th, 2021

Reported Preferred Terms (MedDRA)	COUNT	PERCENTAGE
Fatigue	6	50.0%
Injection site pain	5	41.7%
Dyspnoea	3	25.0%
Nausea	3	25.0%
Pain	3	25.0%
Pyrexia	3	25.0%
Vomiting	2	16.7%
Cough	2	16.7%
Dizziness	2	16.7%
Headache	2	16.7%

Table 11. Summary of number and percentage of reported non-serious AEFIs by System Organ Class (SOC)* related to the four COVID-19 vaccines in Lebanon, from February 14th to September 19th, 2021

System Organ Class (SOC)	All Vaccines Combined	Pfizer-BioNTech	AstraZeneca	Sputnik V	Sinopharm
General disorders and administration site conditions	4,285 (86.9)	2,338 (83.5)	1,734 (91.2)	203 (93.1)	10 (83.3)
Nervous system disorders	2,200 (44.6)	1,002 (35.8)	1,079 (56.7)	114 (52.3)	5 (41.7)
Gastrointestinal disorders	1,352 (27.4)	671 (22.0)	666 (35.0)	66 (30.3)	3 (25.0)
Respiratory, thoracic and mediastinal disorders	534 (10.8)	293 (10.5)	220 (11.6)	18 (8.3)	3 (25.0)
Musculoskeletal and connective tissue disorders	525 (10.6)	274 (9.8)	234 (12.3)	16 (7.3)	1 (8.3)
Skin and subcutaneous tissue disorders	359 (7.3)	177 (6.3)	164 (8.6)	17 (7.8)	1 (8.3)
Vascular disorders	112 (2.3)	55 (2.0)	57 (3.0)	0 (0.0)	0 (0.0)
Cardiac disorders	101 (2.0)	65 (2.3)	36 (1.9)	0 (0.0)	0 (0.0)
Investigations**	96 (1.9)	64 (2.3)	31 (1.6)	0 (0.0)	1 (8.3)
Eye disorders	86 (1.7)	37 (1.3)	46 (2.4)	2 (0.9)	1 (8.3)
Infections and infestations	64 (1.3)	43 (1.5)	17 (0.9)	3 (1.4)	1 (8.3)
Blood and lymphatic system disorders	48 (1.0)	38 (1.4)	8 (0.4)	2 (0.9)	0 (0.0)
Ear and labyrinth disorders	45 (0.9)	27 (1.0)	14 (0.7)	4 (1.8)	0 (0.0)
Psychiatric disorders	33 (0.7)	12 (0.4)	21 (1.1)	0 (0.0)	0 (0.0)
Reproductive system and breast disorders	33 (0.7)	14 (0.5)	18 (0.9)	1 (0.5)	0 (0.0)
Injury, poisoning and procedural complications	32 (0.6)	14 (0.5)	18 (0.9)	0 (0.0)	0 (0.0)
Metabolism and nutrition disorders	29 (0.6)	11 (0.4)	18 (0.9)	0 (0.0)	0 (0.0)
Immune system disorders	25 (0.5)	15 (0.5)	10 (0.5)	0 (0.0)	0 (0.0)
Renal and urinary disorders	10 (0.2)	5 (0.2)	5 (0.3)	0 (0.0)	0 (0.0)
Surgical and medical procedures	1 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Data Source: VigiLyze (Dataset date: 19/09/2021, MedDRA version: 24.0)
**System Organ Classes (SOCs) are groupings by etiology (e.g. Infections and infestations), manifestation site (e.g. Gastrointestinal disorders) or purpose (e.g. Surgical and medical procedures)*
*** Investigations include cases of abnormal blood pressure, increased blood pressure, decreased blood pressure, increased systolic blood pressure, increased heart rate, increased Fibrin D-Dimer, decreased weight, and cases who tested positive or negative for SARS COVID 1 and 2.*

d. Serious Adverse Events Following Immunization

According to the WHO, a serious AEFI is an event that results in death, hospitalization or prolongation of an existing hospitalization, persistent or significant disability or incapacity, congenital anomaly/birth, defect or is life-threatening. The ICH E2A and E2D Guidelines (refer to Technical Notes) have also stated that other situations such as other medically important event or reaction which may jeopardize the patient or may require intervention to prevent one of the outcomes stated in the serious case definition, should also be considered serious after applying medical and scientific judgment. Those "other situations" are open to interpretation and could vary from jurisdiction to jurisdiction. In this report, serious case reports following immunization were classified as follows:

- **Other Medically Important Events:** This includes unexpected AEFIs, local or systemic, that may be serious in their nature but did not require hospitalization nor resulted in death. They may include ER visits and may or may not be resolved in the next 48 hours. These case reports are followed by the PV team over the phone without further investigation.

- **Serious Cases :** This includes cases that resulted in death, hospitalization, disability, congenital abnormalities, or were life threatening. These are investigated and evaluated for causality assessment.

327 case reports were classified as serious cases as per the WHO definition, out of which 225 case reports did not require hospitalization nor lead to death. These were identified as other medically important events. 102 case reports were serious cases that were either admitted to the hospital or resulted in death.

d.i: Serious Cases:

A total of 102 case reports were classified as serious (cases of suspected hospitalization or death post vaccination). Out of these 102 cases, 39 case reports fit the WHO definition of seriousness criteria, but they did not require on-site investigations and they were followed up by phone only. 63 cases were serious reports that required full investigation. Of the 63 serious cases, 43 reports have been completed with a final decision by the Serious AEFI Special Committee at the Ministry of Public Health. The remaining 20 case reports are still under assessment by the PV team.

The tables below show detailed description of the 63 serious cases.

Table 12. Summary of 43* serious case reports that have been completed with a final decision by the Serious AEFI Special Committee by gender, age groups, dose number and time of AEFI occurrence

	All Cases	Pfizer-BioNTech	AstraZeneca	Sinopharm
Number of case report (%)	43	34 (79.07)	8 (18.60)	1 (2.33)
Age (years)				
18 - 44 years	5	3	1	1
45 - 64 years	11	5	6	0
65 - 74 years	4	3	1	0
≥ 75 years	23	23	0	0
Median Age in years (range)	75 (25-95)	79.5 (25-95)	54.5 (29-65)	43
Sex (%)				
Male	21 (48.84)	16 (47.06)	5 (62.5)	0
Female	22 (51.16)	18 (52.94)	3 (37.5)	1 (100)
Dose number (%)				
1st	29 (67.44)	21 (61.76)	7 (87.5)	1 (100)
2nd	13 (30.23)	13 (38.24)	0	0
1st and 2nd **	1 (2.33)	0	1 (12.5)	0
Median TTO in days (range)* **	5 (0-32)	5 (0-26)	11.5 (2-32)	20
Median TTO in days (range) per dose				
1st	8 (0-32)	7 (0-26)	14 (2-32)	20
2nd	3 (0-19)	3 (0-19)	0	0
1st and 2nd **	9	0	9	0
Mean TTO in days (SD) per dose**				
1st	10.14 (8.44)	8.9 (7.65)	12.43 (10.47)	20
2nd	5.54 (6.74)	5.54 (6.74)	0	0
1st and 2nd **	9	0	9	0
Seriousness Criteria (%)				
Fatal	17 (39.53)	13 (38.24)	3 (37.5)	1 (100)
Hospitalized	26 (60.47)	21 (61.76)	5 (62.5)	0
AEFI Committee Decision (%)				
Coincidental	28 (65.12)	25 (73.53)	2 (25)	1 (100)
Indeterminate	13 (30.23)	9 (26.47)	4 (50)	0
Consistent	2 (4.65)	0	2 (25)	0

**43 case reports' assessment has been completed by the PV team and the Serious AEFI Special Committee at MoPH*
***This is an immunization-error case in which the patient received both doses during the same vaccination session*
****TTO: Time to onset*
*****SD: Standard deviation*

Table 13: Summary of reported AEFIs for the 43* serious cases by Vaccine

Vaccine Brand / AEFI	Pfizer BioNtech (N=34)	AstraZeneca (N=8)	Sinopharm (N=1)
Aspiration Pneumonia with Respiratory Failure	1	0	0
Atrial Fibrillation with Ischemic Cerebrovascular Accident (CVA)	1	0	0
Atypical Pneumonia	1	0	0
Cardiac Arrest	7	1	0
Cerebral Hemorrhage	0	1	0
Extensive Portal Vein Thrombosis extending to the Superior Mesenteric Vein	0	1	0
Fatal Atrial Fibrillation	1	0	0
Hemorrhagic Cerebrovascular Accident (CVA)	0	1	0
Hyperstimulation of Immune System	1	0	0
Ischemic Cerebrovascular Accident (CVA)	13	1	0
Myocardial Infarction	4	1	0
Oxygen Desaturation with Dyspnea	1	0	0
Polypnea, Cyanosis and hypotension	0	0	1
Post-Surgical Bleeding	0	1	0
Pulmonary Edema	1	0	0
Pulmonary Embolism	1	0	0
Severe Allergic Reaction	1	0	0
Thrombosis of Left Axillary Artery	1	0	0
Vaccine-induced Immune Thrombotic Thrombocytopenia (VITT)	0	1	0

**43 case reports' assessment has been completed by the PV team and the Serious AEFI Special Committee at MoPH*

Table 14. Summary of 20* serious case reports that are still under assessment by the PV team by gender, age groups, dose number and time of AEFI occurrence

	All Cases	Pfizer-BioNTech	AstraZeneca
Number of case report (%)	20	15 (75)	5 (25)
Age (years)			
18 - 44 years	6	4	2
45 - 64 years	9	6	3
65 - 74 years	5	5	0
Median Age in years (range)	56.5 (19-73)	63 (19-73)	45 (38-63)
Sex (%)			
Male	12 (60)	11 (73.33)	1 (20)
Female	8 (40)	4 (26.67)	4 (80)
Dose number (%)			
1st	11 (55)	7 (46.67)	4 (80)
2nd	9 (45)	8 (53.33)	1 (20)
Median TTO in days (range)**	3.5 (0-16)	3 (0-16)	4 (0-5)
Median TTO in days (range) per dose			
1st	4 (0-15)	0 (0-15)	4.5 (0-5)
2nd	3 (0-16)	3.5 (0-16)	1
Mean TTO in days (SD) per dose****			
1st	3.91 (4.89)	4.14 (6.07)	3.5 (2.38)
2nd	4.89 (5.06)	5.38 (5.18)	1
Seriousness Criteria (%)			
Fatal	3 (15)	3 (20)	0
Hospitalized	17 (85)	12 (80)	5 (100)

**20 serious case reports that are still under assessment by the PV team*
***TTO: Time to onset*
****SD: Standard deviation*

DESCRIPTION OF ADVERSE EVENTS FOLLOWING IMMUNIZATION

The age group of vaccine recipients who mostly reported AEFIs was between 18 to 44 years old (52%), with females reporting more than males (62.4% vs. 37.6%) (Table 4). The majority of the reporters were consumers/non-healthcare professionals. (86.4%).

The most reported AEFIs for all COVID-19 vaccines per symptom were injection site pain (46% of total reported AEFIs), general pain (44.7% of total reported AEFIs), fatigue (44.4% of total reported cases) and headache (38.7% of total reported AEFIs) (Table 6).

Injection site pain was the most frequently reported non-serious adverse event following the Pfizer-BioNTech Vaccine (39.9% of total reported AEFIs). Fatigue was the most common adverse event following all other vaccines: 58.5% of the total reported AEFIs related to AstraZeneca Vaccine, 65.6% of the total reported AEFIs related to Sputnik V Vaccine, and 50% of the total reported AEFIs related to Sinopharm Vaccine (Tables 7, 8, 9, 10).

The most reported AEFIs by System Organ Class (SOC) were General Disorders and Administration Site Conditions (86.9% of total reported AEFIs per SOC), followed by Nervous System Disorders (44.6% of total reported AEFIs per SOC) and Gastrointestinal Disorders (27.4% of total reported AEFIs per SOC) (Table 11).

Serious AEFIs requiring Hospitalization or with Fatal Outcome (Tables 12, 13, 14)

AEFIs are classified as serious according to the seriousness criteria of WHO (refer to the Technical Notes). These cases either require a phone call only or an investigation followed by a causality assessment in order to evaluate the potential relationship between the AEFI and the vaccine and to implement the appropriate follow-up actions. The investigation is carried out by the PV team members. It includes an extensive and rigorous scientific evaluation based on available information about the vaccination site, the patient's medical records, laboratory results, and information retrieved from the recipient or his/her relatives. After collecting all the available information, the investigation report is filled, and a causality assessment is performed by a group of experts to review the potential causal association between the AEFI and the vaccine. WHO forms and tools are used to carry out both the investigation and the causality assessment. Findings are discussed with the Serious AEFI Special Committee at Ministry of Public Health. In the period of time covered by this report, there were 102 case reports classified as serious per the WHO-UMC definition, representing 1.94% of all case reports and a serious AEFI reporting rate of 0.036 per 1,000 doses of vaccines.

Overview of completed serious case reports (Table 12, 13)

Out of the 43 serious case reports that were completed with a final decesion by the Serious AEFI Special Committee, there are 26 cases of hospitalization and 17 cases of death temporally associated with the receipt of the COVID-19 vaccine.

For the 26 suspected hospitalization cases post-vaccination (12 Males, 14 Females), the vaccine recipients' age range was between 25 and 95 years old. 18 hospitalizations occurred after the first dose, while the remaining 7 hospitalizations occurred after the second dose. There is one case of immunization error where the patient received both doses during the same vaccination session. The 26 vaccine recipients experienced AEFIs within few hours to 32 days post-vaccination. The Serious AEFI Special Committee at the Ministry of Public Health confirmed the coincidental causality assessment in all cases except for 7 case reports. 6 of them were considered as indeterminate, and the 7th case report was classified as consistent due to immunization error.

In the 17 suspected cases of death post vaccination (9 Males, 8 Females), the vaccine recipients' age range was between 29 and 92 years old. 11 death cases were after the first dose while the remaining 6 cases were after the second dose. The 17 vaccine recipients experienced AEFIs within 20 minutes to 20 days post-vaccination. The Serious AEFI Special committee at the MoPH confirmed the coincidental classification in 9 case reports, 7 case reports were considered as indeterminate, and 1 case reports showed a consistent association due to the lack of other clearly attributing factors.

Overview of serious case reports under assessment (Table 14)

Out of the 20 serious case reports that are still under assessment by the PV team, there are 17 cases of hospitalization and 3 cases of death temporally associated with the receipt of the COVID-19 vaccine.

For the 17 hospitalized cases post vaccination (9 Males, 8 Females) the vaccine recipients' age range was between 19 and 73 years old. 11 hospitalizations occurred post dose 1, while the remaining 6 hospitalizations occurred post dose 2. The 17 vaccine recipients experienced AEFIs within few minutes to 16 days' post vaccination.

In the 3 suspected cases of death post vaccination (3 Males), the vaccine recipients' age range was between 40 and 69 years old. All cases were after the second dose. The 3 vaccine recipients experienced AEFIs within 3 to 7 days post-vaccination (Table 14).

SIGNALS

The PV team has adopted two sources for identifying signals (refer to Technical Notes) associated with AEFIs following Pfizer-BioNTech and AstraZeneca COVID-19 Vaccine:

The French National Security Agency of Medicines and Health Products (ANSM) and the World Health Organization-Uppsala Monitoring Center (WHO-UMC) Classification.

I. Signals Identified in Lebanon based on the ANSM Signals

In Lebanon, the below reported AEFIs during the time of this report may be considered as potential or confirmed signals for both vaccines, Pfizer-BioNTech and AstraZeneca, which are aligned with the ANSM signals list:

For Pfizer BioNTech Vaccine:

- The **potential** signals include:
  - Cardiac Rhythm disorders
  - Rheumatoid Polyarthritis
  - Spontaneous Hematomas
  - Menstrual Irregularities

- The **confirmed** signals include:
  - Hypertension
  - Pericarditis

For AstraZeneca Vaccine:

- The **potential** signal includes:
  - Hypertension
  - Mucocutaneous bleeding
  - Bell's Palsy and Facial Paralysis
  - Dyspnea and asthma associated with flu-like symptoms
  - Deafness
  - Heart rhythm disturbances

- The **confirmed** signals include:
  - Flu-like symptoms
  - Thrombosis associated with thrombocytopenia

II. Signals Identified in Lebanon based on the WHO-UMC Vigibase Signals

The WHO UMC Vigibase has highlighted Trigeminal Neuralgia, Hearing Loss/Tinnitus, and Photophobia (refer to Technical Notes) as confirmed signals with both Pfizer-BioNTech and AstraZeneca while Myocarditis/pericarditis (refer to Technical Notes) was a confirmed signal for Pfizer BioNTech.

In Lebanon, both vaccines have reported AEFIs that may be considered as associated potential signals per the WHO-UMC classification.

For Pfizer BioNTech Vaccine:

- Trigeminal Neuralgia
- Tinnitus
- Pericarditis

For AstraZeneca Vaccine:

- Trigeminal Neuralgia
- Tinnitus

COMPARISON WITH INTERNATIONAL AEFI DATA

In regards to the four COVID-19 vaccines, the most frequently reported AEFIs in the WHO-UMC global database Vigibase (including 2, 149, 616 COVID-19 reported cases to date) were: Headache (26.8% of total reported AEFIs), Pyrexia (21.7% of total reported AEFIs), Fatigue (18.6% of total reported AEFIs), Chills (14.7% of total reported AEFIs), and Myalgia (14% of total reported AEFIs).

The results are compatible with the National Data which included Fatigue, Chills, Headache, and Pyrexia among the top 10 most reported AEFIs in Lebanon (Table 6).

CONCLUSION

In the scope of post-marketing surveillance conducted by the PV Program, 5,256 case reports corresponding to 19,702 AEFIs were received following the administration of 2,802,835 doses of COVID-19 vaccines (Pfizer-BioNTech, AstraZeneca, Sputnik V and Sinopharm) in Lebanon between the 14th of February and the 19th of September, 2021. This is equivalent to a reporting rate of 1.9 case reports and 7.0 AEFIs per 1,000 doses administered.

The IMPACT Platform was the main mean of reporting. The vaccine recipients were the main reporters. The age group of vaccine recipients who mostly reported AEFIs was between 18 and 44 years old, with females reporting more AEFIs than males. Most AEFIs reported at the national basis are compatible with those reported at the international level.

In Lebanon, Trigeminal Neuralgia and Tinnitus/Hearing Loss are confirmed signals following vaccination with Pfizer-BioNTech Vaccine and AstraZeneca Vaccine. In addition, Hypertension and Pericarditis are confirmed signals following Pfizer-BioNTech while Thrombosis, Flue Like Symptoms and Photophobia were identified as confirmed signal following AstraZeneca Vaccine.

The PV Program at the Ministry of Public Health continues to conduct constant monitoring for the safety of COVID-19 vaccines in collaboration with its partners, including individual case review, daily analysis of surveillance data for vaccine safety signals, and regular reporting.

TECHNICAL NOTES

- Important Medical Event Terms List: The EudraVigilance Expert Working Group (EV-EWG) has coordinated the development of an Important Medical Event Terms (IME, MedDRA version: 24.0) list. This IME list aims to facilitate the classification of suspected adverse reactions as well as aggregated data analysis and case assessment in the frame of the day-to-day PV activities of stakeholders. The IME list is intended for guidance purposes only.

- EudraVigilance is the system for managing and analyzing information on suspected adverse reactions to medicines which have been authorized or being studied in clinical trials in the European Economic Area (EEA). The European Medicines Agency (EMA) operates the system on behalf of the European Union (EU) medicines regulatory network.

- MedDRA (Medical Dictionary for Regulatory Activities) is a standardized medical terminology, published by the International Council for Harmonization, used in particular for coding cases of adverse effects in clinical study reports and pharmacovigilance databases, and to facilitate searches in these databases.

- PIDM: The WHO Program for International Drug Monitoring (PIDM), established in 1968, provides a forum for WHO Member States to collaborate in the monitoring of drug safety, and notably, the identification and analysis of new adverse reaction signals from data submitted to the WHO global individual case safety report (ICSR) database by member countries.

- Seriousness Criteria: According to the WHO, a serious AEFI is an event that results in death, hospitalization or prolongation of an existing hospitalization, persistent or significant disability or incapacity, congenital anomaly/birth, defect or is life-threatening.

- ICH E2A Guidelines: Aims to develop standard definitions and terminology for key aspects of clinical safety reporting. It also provides guidance on the appropriate mechanism for handling expedited (rapid) reporting, in the investigational (i.e. pre-approval) phase.

- Signal: According to the World Health Organization (WHO), a "signal" is a reported information on a possible causal relationship between an AE and a drug, the relationship being unknown or incompletely documented previously. Usually more than one report is required to generate a signal, depending on the seriousness of the event and the quality of the information.

- Trigeminal Neuralgia: is a neuropathic pain condition affecting the fifth cranial nerve and causing one of the most severe pains to be experienced. Symptoms include extreme, sporadic, sudden burning or shock like pain lasting from seconds up to two minutes and is usually unilateral.

- Myocarditis: An inflammation of the heart muscle (myocardium). Common myocarditis signs and symptoms include chest pain, rapid or abnormal heartbeat (arrhythmias), shortness of breath, or fluid buildup with leg swelling.

- Photophobia: Abnormal light sensitivity. It can occur as a symptom of various condition such as migraine headache or ophthalmic inflammation.

- VigiFlow is a web-based individual case safety report (ICSR) management system that is available for use by national PV centers of the WHO Program for International Drug Monitoring.

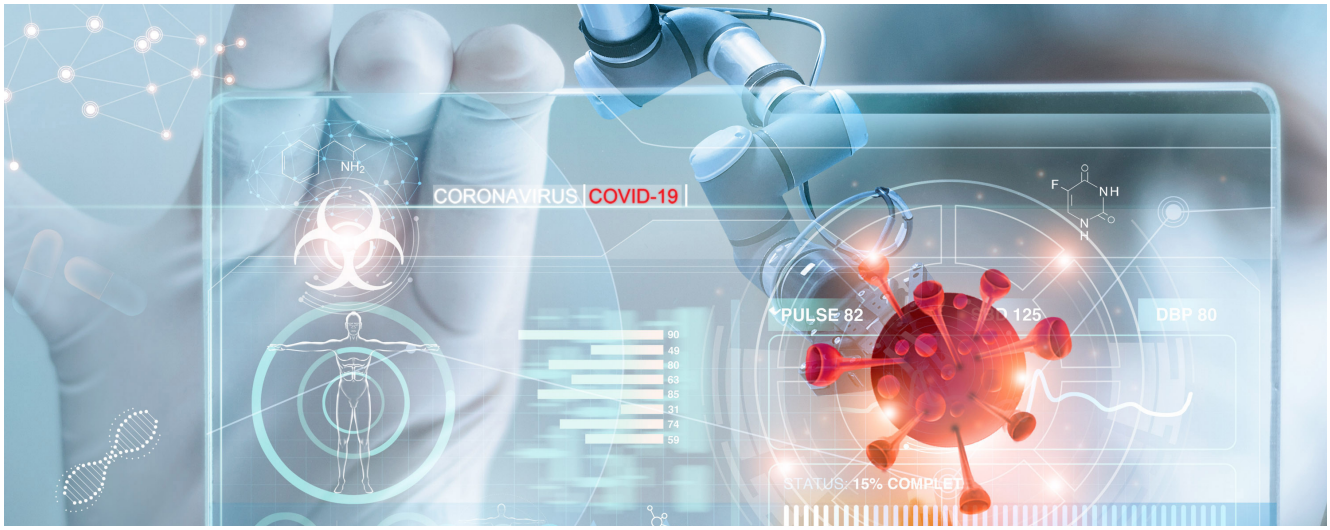
- VigiBase is the WHO global ICSR database that contains ICSRs submitted by the participating member states enrolled under WHO's international drug monitoring program. It is the single largest drug safety data repository in the world.

- VigiLyze supports the collection, processing, and sharing of data of case reports to facilitate effective data analysis. VigiLyze is a signal detection and management system that can use national, regional or global data as the starting point for quantitative signal detection.

DATA CAVEATS

- Each case report refers to a reporter who reported an AEFI after receiving a dose of COVID-19 vaccine. A case report may contain multiple AEFIs. Therefore, the total number of AEFIs can exceed the number of individual case reports reported in a given time frame. Case reports that did not contain an AEFI at the time of data extraction or was missing the Vaccine name have been excluded.
- AEFI reporting rates were calculated using the number of vaccines' specific AEFIs reported in the specified time period in Lebanon divided by the doses of vaccines administered in the same time period in Lebanon.
- The information available in this report does not represent Uppsala Monitoring Center (UMC) nor WHO's opinions.

DISCLAIMER:



CITATION:

Ministry of Public Health – Quality Assurance of Pharmaceutical Products – Pharmacovigilance Program (2021). Adverse Events Following Immunization for COVID-19 Vaccines in Lebanon: February 14th, 2021 to September 19th, 2021; Beirut, Lebanon.

FOR FURTHER INFORMATION:

For further information, contact us via email: pv@moph.gov.lb

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    - o Adult-Onset Still's Disease: https://vigilyze.who-umc.org/downloadfile/61408ed6f94ed01e4cbaff67?activity=News&organization=Uppsala%20Monitoring%20Centre
    - o Giant Cell Arteritis: https://vigilyze.who-umc.org/downloadfile/61236a518a76f7eafabff984?activity=News&organization=Uppsala%20Monitoring%20Centre
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