COVID-19 Vaccine Safety Monitoring and Surveillance Findings in Ethiopia.

Adverse Events Following Immunizations (AEFIs) Reports of AstraZeneca/Covisheild COVID-19 Vaccine in Ethiopia from March 22, 2020 to June 20, 2021.

December 2021

Addis Ababa, Ethiopia.

1. Introduction

Adverse Events Following Immunizations (AEFIs) are reported to Ethiopian Food and Drug Authority (EFDA) by health care providers and vaccine recipients. EFDA investigates and assesses all AEFI reports and conducts causality analysis where necessary and take appropriate actions accordingly.

This report provides a summary of adverse events following immunization (AEFIs) that are temporally associated (i.e., occur after receiving the vaccine) with receipt of AstraZeneca/ Covishield Covid-19 vaccine. It is important to note that AEFIs described in this report are defined as any untoward medical occurrences that followed immunization and do not necessarily have a causal relationship with the vaccine.

The Covid-19 vaccine on which surveillance is conducted is manufactured by Serum Institute of India (AstraZeneca) with batch number of 41212008 and its expiry date was 15/7/2021.

During this active surveillance, 11476 participants who received the first dose of AstraZeneca/ Covishield Covid-19 vaccine were recruited after obtaining their consent. Participants were observed for first 30 minutes after vaccination at the vaccination site. Then daily for seven days and then after weekly via telephone for consecutive 3 months from March 22, 2020 to June 20, 2021.

Out of 11476 participants followed, a total of 4970 reported one or more AEFI and were considered for analysis. Thus, the total prevalence rate of AEFI in this surveillance is calculated to be 43.3%. As there were incomplete data in each variable, intention-to-treat analysis is used to analyze the data (only the complete data is used to compute frequency and percentage).

1.1 Active surveillance participant by regions for covishield vaccine

Covishield vaccine was distributed to different regions to vaccinate those considered as high-risk group of population. Among the regions included in the active surveillance, the majority the participants were from Addis Ababa which accounted for (91.1%, 10,361), followed by Harari (4.4 %, 489), and then Oromia (2.7%, 299). (Missing value = 118).

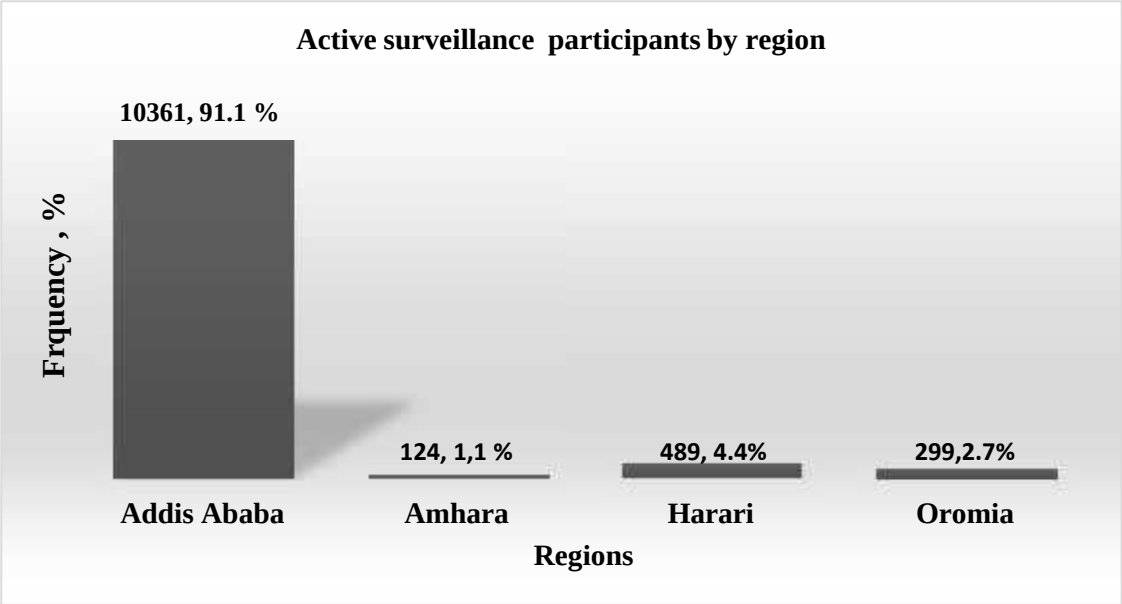

Figure 1: Active surveillance participant by regions for Covishield/AstraZeneca vaccine from March 22 to June 20, 2020, Ethiopia (N=11,273).

1.2 Sociodemographic Characteristics of Participants with AEFI and Non-AEFI

From a total of 11,046 vaccine recipients, the mean (±SD) age of the participants was 46.61(17.83) years with a range of 18 to 110. Out of the total, the most frequent age was **65 years (510, 4.5%),** followed by 55 years (486, 4.3%), and then 30 (487, 4.3%) years. (See in Figure 1) (Missing Value = 346)

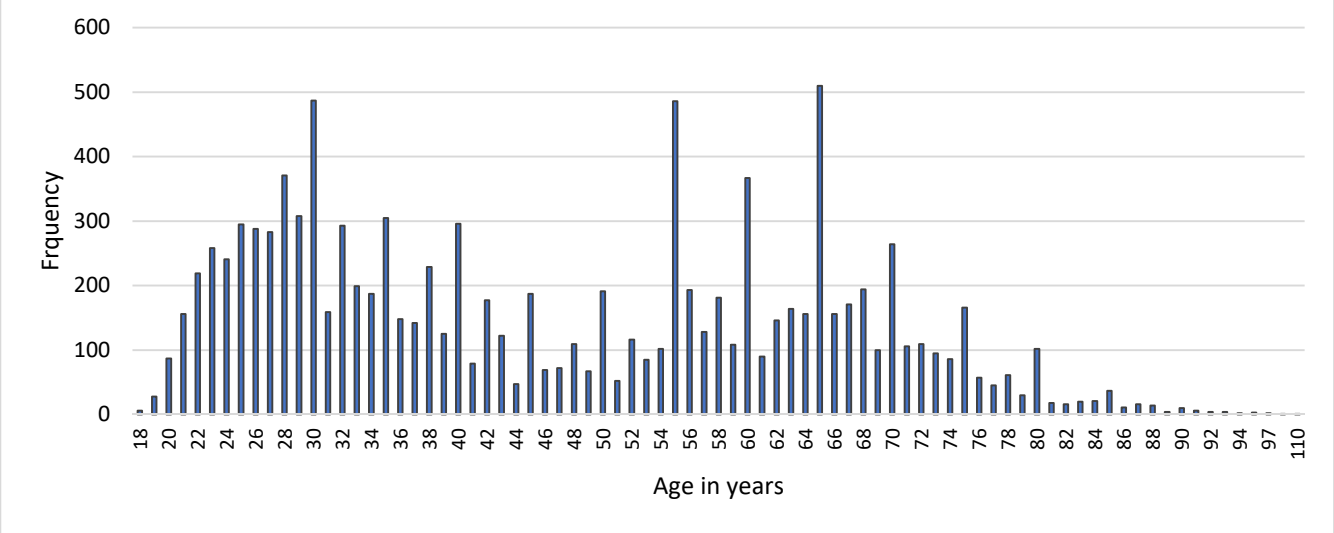

Figure 2: Age distribution of all vaccine recipients with AEFI and non-AEFI from March 22 to June 20, 2020, Ethiopia (N=11,273).

From a total of 11, 238 participants, majority (55%) were males and less than half (45%) of were females. Among females, 7 lactating and 8 pregnant women were reported. (Missing value = 154) (See in Figure 2)

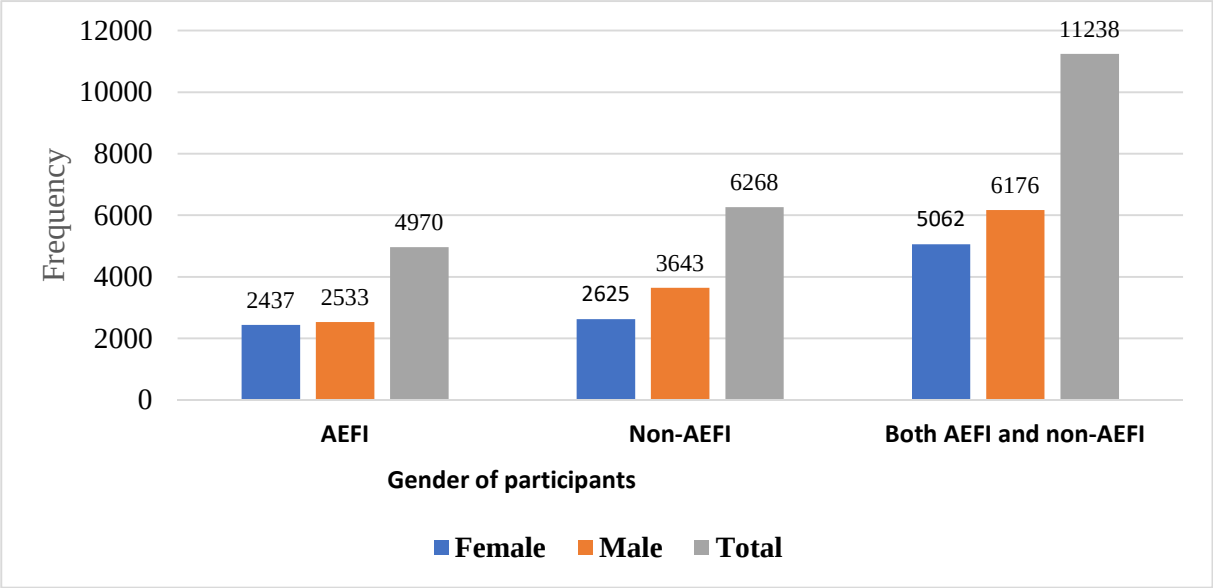

Figure 2. Gender distribution of participants with AEFI and non-AEFI occurrence from March 22 to June 20, 2020, Ethiopia (N=11,273).

1.3 Clinical characteristics of participants with AEFI and non-AEFI

Out a total of 11,405 vaccine recipients, nearly one-third (3578, 31.4%) of the participants were taking medication/s for their co-morbid diseases.

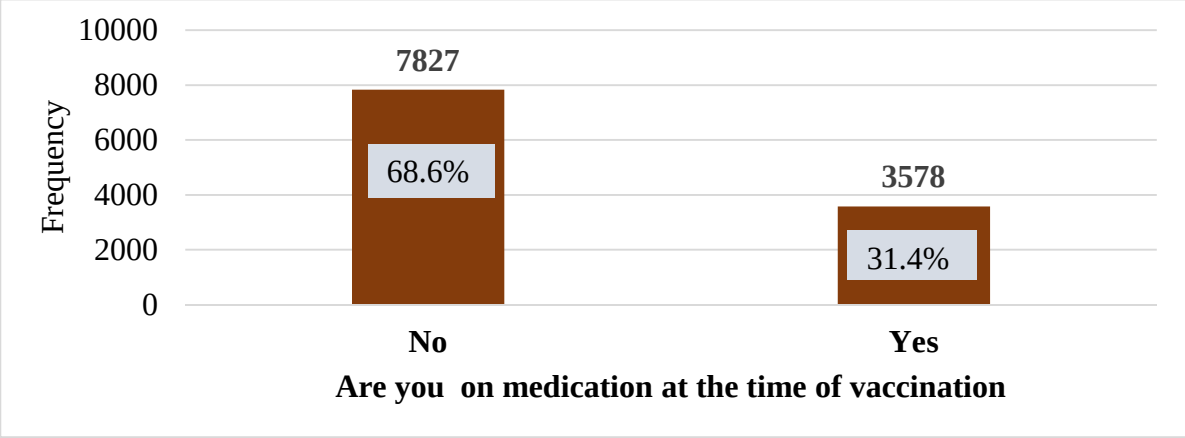

Figure 3. Percentage of participants on medication for co-morbidities (N=11, 405).

1.4 Types of co-morbidities of all vaccine recipients

Out of a total 11, 405 participants, 3236 had one or more comorbidity. Among those, hypertension (972, 8.5%), diabetes (617, 5.4%), and diabetes and hypertension (430, 3.8%) were the most frequent comorbidities (Table 1). Most of the two or more co-morbidities comprise diabetes + hypertension + cardiac diseases and chronic kidney disease + HIV + dyslipidemia.

Table 1: Types and frequency of comorbidities of participants (N=3236).

S.No	**Types of comorbidities**	**Frequency**	**Percent (%)**
1	Hypertension	972	8.5
2	Diabetes	617	5.4
3	HIV/AIDS	221	1.9
4	Asthma and/or COPD	220	1.9
5	Cardiac disease	58	0.5
6	CNS disorders	45	0.4
7	Chronic kidney disease /Acute kidney disease	38	0.3
8	Thyroid disorders	28	0.2
9	Diabetes and Hypertension	430	3.8
10	Two or more comorbidities	460	4.0
11	Dyslipidemia	39	0.3
12	Others	108	0.9
13	Total	3236	28.4

1.5 Sociodemographic characteristics of participants with AEFI

From a total of 11, 476 participants, 4970 of them encountered with one or more AEFIs. The occurrence of AEFI among the four city/towns was reported as follows. Of which, Addis Ababa accounts for the majority (90.3%, 4488), followed by Harar (6.1 %, 304), and then Jimma (2.9%, 145).

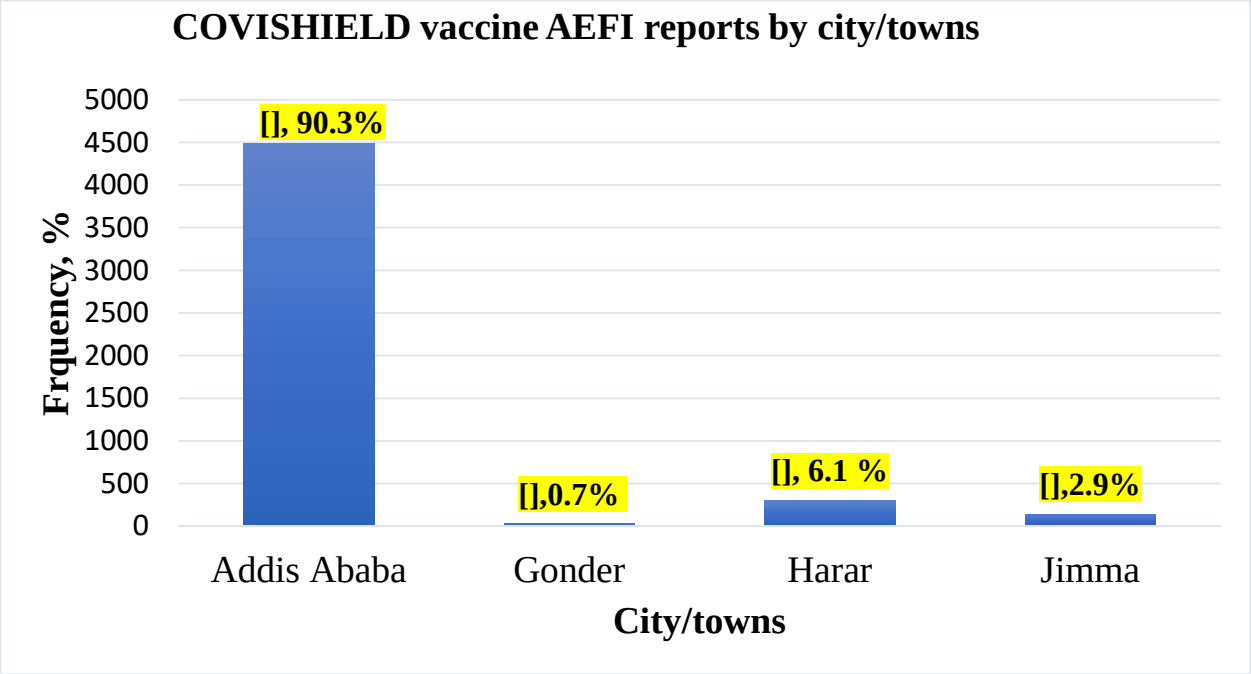

Figure 4. COVISHIELD vaccine AEFI reports by city/towns for participants with AEFI from March 22 to June 20, 2020, Ethiopia (N= 4970).

Out the total participants who developed AEFI, 2533 (51%) were males and 2437 (49%) were females. Among the females, 5 lactating and 5 pregnant were reported. The mean (±SD) age of participants with AEFI was 42.1(± 16.3) years with a range of 18 to 99. Age between 22 to 36 years were the most frequently encountered group of population with AEFI (Figure 5). The height and weight of participants with AEFI were described in Table 2.

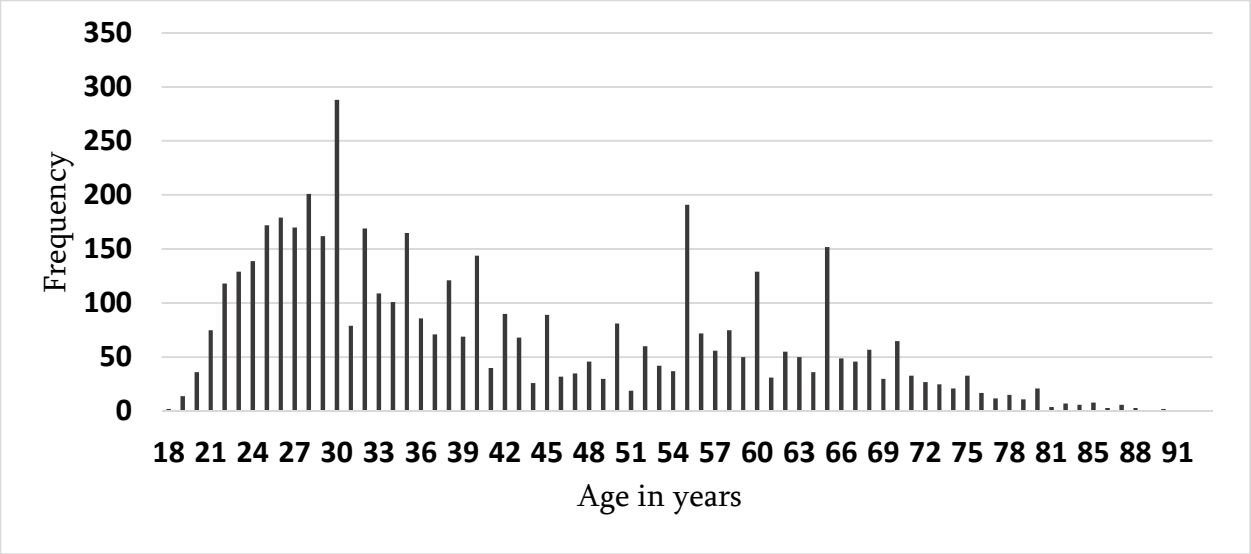

Figure 5. Age distribution of vaccine recipients with AEFI from March 22 to June 20, 2020, Ethiopia (N= 4970)

Table 2. Sociodemographic characteristics of participants with AEFI from March 22 to June 20, 2020, Ethiopia (N=4,970).

Characteristics	Variables	Frequency	Remark
Age in years	Mean (±SD), range	42.1(± 16.3) years, 18-99	75 incomplete data
Gender	Male (%)	2533 (51%)	
	Female (%)	2437 (49 %)	
Height (cm)	Mean (±SD), range	167 cm (± 8.9), 106-195	1605 incomplete data
Weight (kg)	Mean (±SD), range	66.4 kg (±12.45) 30-156	1322 incomplete data

1.6 Clinical characteristics of participants with AEFI

1.6.1 Class of drugs taken by participant with AEFI for various disease at the time of vaccination.

Out of the total 4970 participants with AEFI, nearly one-fourth (26.5%, 1316) of the participants were reported on medication. Among those, 1277 participants were taking the medications for

their comorbidity diseases. Of which, **cardiovascular (32.6 %, 416) and antidiabetics (32.4 %, 414)** were the most frequently used class of drugs (See Figure 7).

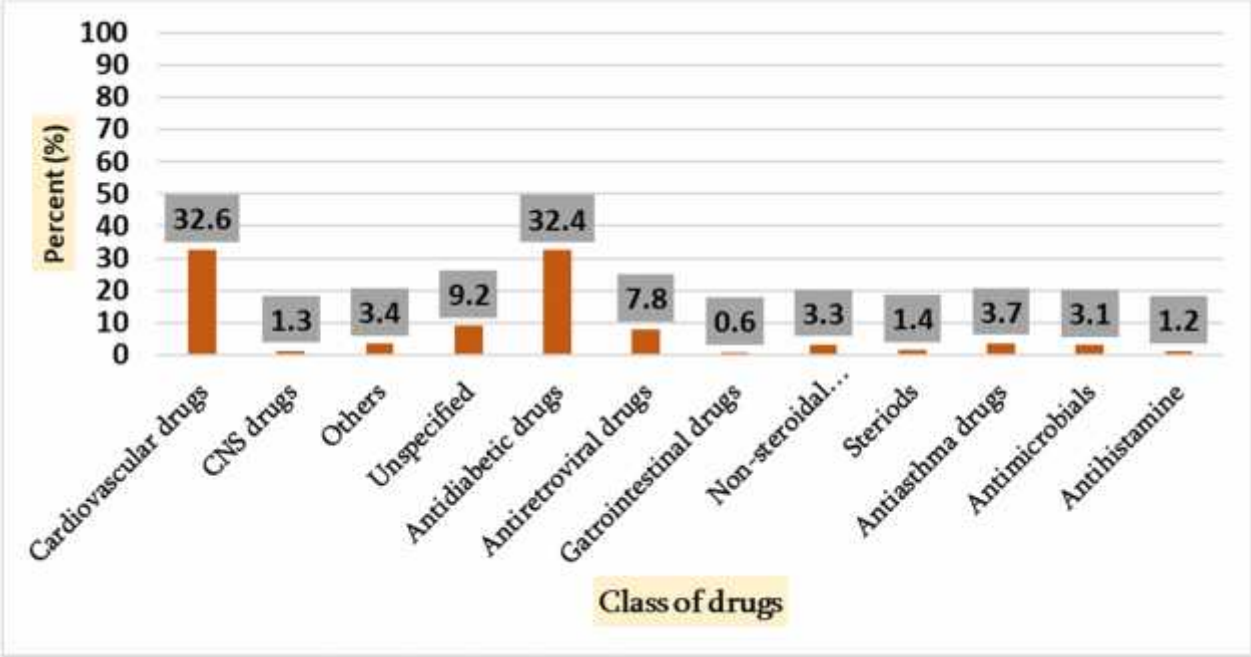

Figure 6. Class of drugs used by vaccine recipients with AEFI from March 22 to June 20, 2020, Ethiopia (n=1277).

Others includes Chemotherapy, Vitamin and minerals, Atropine, Ferrous sulphate, Blood and blood product, Implant, Interferon, Tamoxifen, Mycophenolate, Levothyroxine, and IV fluids.

1.6.2 Types of common comorbid disease of vaccine recipients with AEFI

In this surveillance, from 4970 participants with AEFI, only (22.86%, 1136) were having a co-morbid disease. Of which, multiple comorbidities accounts for 29.8% (339), followed by hypertension 28.1% (319), and then diabetes 18.9 % (215). (See Figure 8)

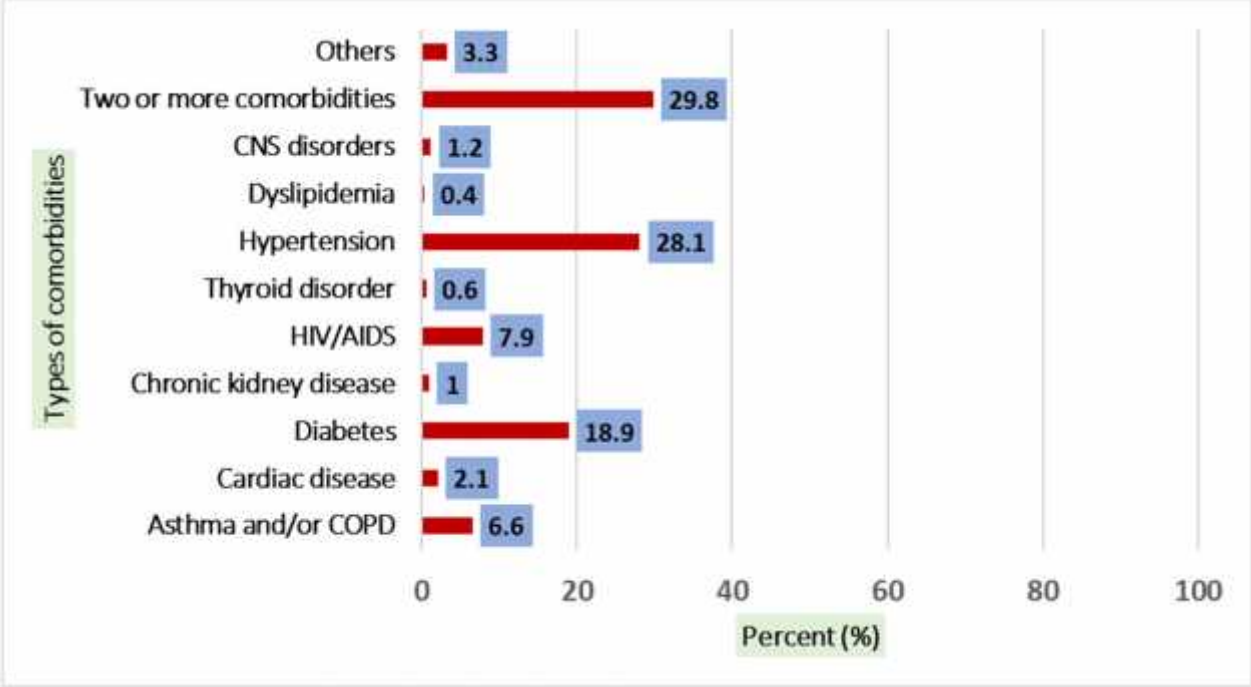

Figure 8. Type of common comorbidities of participants with AEFI from March 22 to June 20, 2020, Ethiopia (n=1136).

Key: Multiple comorbidities include diabetes and hypertension, diabetes and dyslipidemia, hypertension and cardiac problem, human immune deficiency virus (HIV) and dyslipidemia.
Others includes Anemia, Breast CA, COVID-19 positive, Gastrointestinal disorders, Allergic reaction and Eye disease.

In this surveillance, out of 4,877 participants with AEFI, 204(4.1%) reported history of allergy. Moreover, 42 (0.8%) reported about vaccine received within the past 6 months. (Table 3).

Table 3: Clinical characteristics of clients with AEFI from March 22 to June 20, 2020, Ethiopia (N=4970)

Characteristics	Response	Frequency (%)	Remark
Comorbidity *	Yes	1143 (23.0%)	
	No	3827(77.0%)	
On medications at the time of vaccination	Yes	1316 (26.5%)	
	No	3654 (73.5%)	
Any known allergy (N= 4,877)	Yes	204 (4.1%)	
	No	4673(94.0 %)	
Any vaccine received within 6 months	Yes	42(0.8%)	
	No	4928(99.2%)	
Any substance use	Yes	31(0.6%)	
	No	4939(99.4%)	

1.6.3 Occurrence of AEFI within 30minutes during vaccination

From a total of 4970 participants who experience AEFI, 101 (2%) encountered one or more AEFIs within 30 minutes following vaccination. Twenty-six participants (25.7%) encountered at least AEFI related to the injected arm. Of which, injection site pain (13.9%) was being the most common symptom. Majority of the participants who experience AEFI within 30 minutes (74.3%) reported having one or more systemic AEFIs. The most commonly reported systemic symptoms within 30 minutes following immunization were headache (21.8%), body weakness/tiredness (8.9%) and fever (7.9%). Nineteen participants (18.8%) reported two or more AEFIs within 30 minutes. (Table 4).

Table 4: Type and frequency of AEFI within 30minutes of vaccination from March 22 to June 20, 2020, Ethiopia (N= 101).

Type of AEFIs encountered within 30 minutes	Frequency	Percent (%)
Blurred vision	4	4.0
Body weakness/tiredness	**9**	**8.9**
Burning sensation	3	3.0
Dizziness	4	4.0
Fever	**8**	**7.9**
Headache	**22**	**21.8**
Injection site pain	**12**	**11.9**
Nausea	6	5.9
Two or more AEFIs	19	18.8
Others	14	13.9

Key: *Injection site pain and nausea as well as sweating and chills were most frequent in those with two or more AEFIs*

Others include dizziness, palpitation and vertigo

As most of the AEFIs encountered within 30 minutes were **mild and/or moderate, among 101** participants having an AEFI within 30 minutes, only 10 (9.9%) reported receiving medication. Among those who received treatment for AEFIs that encountered within 30 minutes, 8 (80%) received paracetamol and the remaining two received ibuprofen and dextrose 40%, respectively. The medications were given mainly for the treatment of headache and to relieve pain. Following the occurrence of AEFIs, the outcomes of the 10 participants who received treatments were categorized as recovering (5) and recovered fully (5) within a day.

1.6.4 AEFI encountered after 30 minutes

Out of the 4970 participants with AEFIs, 4608 (92.7%) reported one or more AEFIs 30 minutes after vaccination. Headache (31.3%), injection site pain/redness/swelling /numbness (21.8%), chills (14.9%), fever (12.2%) and arthralgia/joint pain (6.1%) were the most frequently reported AEFIs after 30 minutes of vaccination (**Table**)

Table 5: Type and frequency of AEFI after 30minutes of vaccination from March 22 to June 20, 2020, Ethiopia (n=4608).

Types of AEFIs encountered after 30 minutes	**Frequency**	**Percent (%)**
Abdominal crampy pain	16	0.3
Arthralgia/ Joint pain	**281**	**6.1**
Back pain	75	1.6
Chills	**687**	**14.9**
Blurred vision	8	0.2
Cough	22	0.5
Diarrhea	16	0.3
Dizziness	48	1.0
Fever	**562**	**12.2**
Flue like symptoms	10	0.2
Headache	**1444**	**31.3**
Injection site pain/redness/swelling /numbness	**1005**	**21.8**

Insomnia	28	0.6
Itching	18	0.4
Loss of appetite	11	0.2
Myalgia	145	3.1
Nausea and/or vomiting	94	2.0
Sweating	17	0.4
Others	121	2.6

Among the most commonly reported AEFIs, the majority (85.9%) occurred within the first 24 hours post-vaccination. Moreover, almost all (99.8%) of the AEFIs were reported within a week following vaccination. Other AEFIs reported were loss of appetite 11 (0.24%), chest pain 8 (0.2%), flue-like symptoms 7 (0.2%) and shortness of breath 7 (0.2%).

Out of the 4608 participants who had AEFIs after 30 minutes, 22.7 % has taken medications. Seventy-five percent (75 %) of those who took medications used paracetamol. Ibuprofen and diclofenac were the 2nd and 3rd commonly used medications (**Table 5**).

Table 6: Types of medications used for AEFIs encountered after 30 minutes of vaccination with covishield Covid-19 vaccine (n=576).

Name of drugs used	**Frequency**	**Percent (%)**
Diclofenac	75	7.3
Ibuprofen	77	7.5
Paracetamol	**771**	**75.5**
Tramadol	15	1.5
Antibiotics	6	.6
Unspecified	58	5.7
Others	19	1.9

Most the encountered AEFIs after 30 minutes were mild and/or moderate and occurred with the first week following immunization. Majority 431 (74.8) of those who received treatments for AEFIs encountered after 30 minutes were fully recovered within a week (**Table 7**)

Table7: Treatment outcome of AEFI after 30 minutes in those who received medications (n=576)

Participant status after AEFIs	Frequency	Percent (%)
Not recovered	7	1.2
Recovered fully	431	74.8
Recovering	138	24

At the end of the follow up period, all the participants (n= 576) who had AEFI and took treatment were fully recovered.

2. AEFIs reported as Serious

A total of 29 cases were reported as a serious AEFIs. Of those, 6 participants were Covid-19 positive at the time of vaccination. From the total, 28 reported cases were carefully investigated. Of them 10 were considered as non-serious AEFIs (disregarded as non-serious), whereas, 18 of them were considered as serious AEFIs (e.g., hospitalization, death). From the serious AEFI clinical cases, 10 were death cases, and 8 were fully recovered.

Summary

From the total of 11476 participants followed during active surveillance, 4970 (43.31 %) experienced one or more AEFIs. To this effect, most of the AEFIs reported were mild and/or moderate. Headache, injection site pain and fatigue/ body weakness were the most frequently reported AEFIs. In addition, out of a total 18 serious AEFIs reported, 10 were death cases.