

Ministry of Health-Gavi supported immunization partners Joint Report

Section 1: Country situation: overview Immunization Service performance

The Ethiopian routine immunisation program targets more than 3.6 million birth cohorts (2015 EFY) annually with 13 antigens including COVID 19 Vaccines. In the reporting period, about 19,777 health facilities were reporting immunisation services provided out of about 21,631 health facilities that were providing and reporting health services in the country. Majority of the Tigray health facilities are not reporting their immunization performance through the DHIS 2 platform and difficult to get their report because infrastructure and system damage.

Routine immunisation in Ethiopia is monitored through various sources of data such as administrative and survey data. The trend of national administrative immunisation coverage has shown slight decline from 2019 to 2022 from 96% to 93% for Penta 3 and 91% to 89% for MCV1. Despite overall immunization performance decline, the administrative coverage data for MCV2 showed progressing from 2019 to 2022 which was 65% to 87% respectively.

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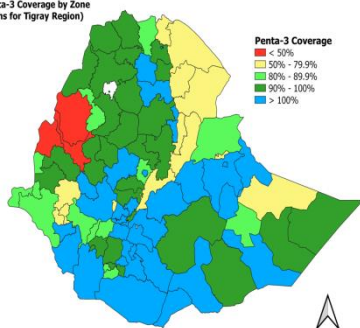
Table 1: Administrative vaccination coverage by region across the years 2019-2022

Region	2019				2020				2021				2022			
	Pent1	penta3	MCV1	MCV2	Pent1	penta3	MCV1	MCV2	Pent1	penta3	MCV1	MCV2	Pent1	penta3	MCV1	MCV2
Addis Ababa	154%	152%	142%	112%	154%	153%	146%	120%	155%	150%	142%	126%	167%	166%	157%	141%
Afar	82%	71%	65%	30%	80%	71%	66%	43%	66%	60%	54%	35%	73%	63%	63%	41%
Amhara	92%	88%	85%	77%	94%	90%	87%	68%	83%	80%	76%	62%	99%	95%	94%	93%

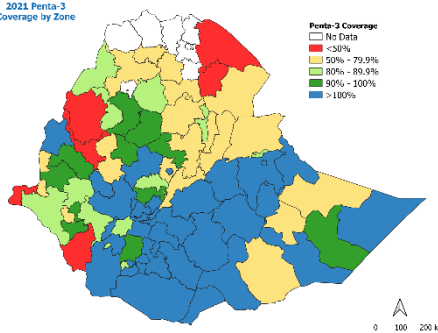
Benishangul Gumuz	97%	88%	84%	72%	94%	90%	84%	60%	70%	64%	60%	42%	64%	59%	63%	56%
Dire Dawa	85%	76%	69%	36%	83%	75%	67%	48%	104%	75%	70%	46%	80%	72%	68%	84%
Gambella	82%	72%	65%	34%	86%	77%	67%	38%	83%	72%	60%	37%	97%	88%	77%	62%
Harari	109%	90%	91%	77%	101%	96%	92%	63%	113%	103%	97%	75%	114%	104%	95%	73%
Oromia	113%	104%	98%	61%	113%	106%	100%	80%	114%	108%	101%	81%	106%	100%	95%	84%
Sidama					109%	104%	100%	81%	114%	111%	107%	97%	109%	107%	102%	95%
SNNP	94%	90%	87%	72%	101%	96%	92%	67%	108%	103%	98%	82%	106%	101%	99%	96%
Somali	105%	90%	80%	29%	110%	98%	87%	50%	103%	91%	84%	58%	97%	87%	78%	61%
Southwest Ethiopia									89%	84%	77%	58%	94%	88%	83%	72%
Tigray	92%	86%	84%	51%	72%	68%	64%	39%	-	-	-	-	-	-	-	-
National	102%	96%	91%	65%	104%	99%	93%	71%	102%	97%	91%	73%	104%	99%	95%	87%

Administrative coverage by map by zone

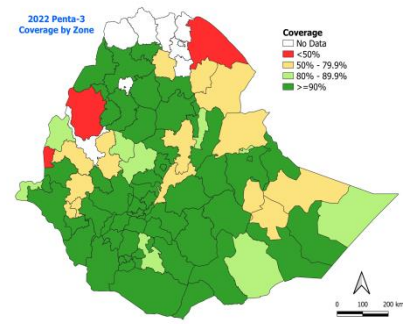
2020 Penta-3 Coverage by Zone
(9 Months for Tigray Region)



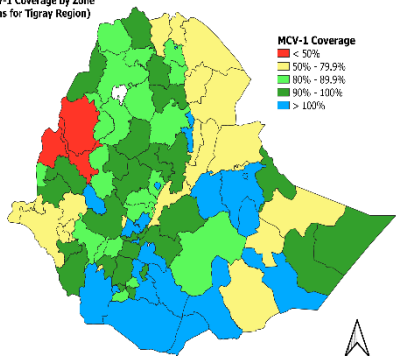
2021 Penta-3 Coverage by Zone



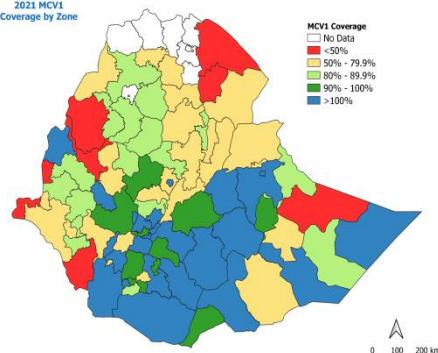
2022 Penta-3 Coverage by Zone



2020 MCV-1 Coverage by Zone
(9 Months for Tigray Region)



2021 MCV1 Coverage by Zone



2022 MCV1 Coverage by Zone

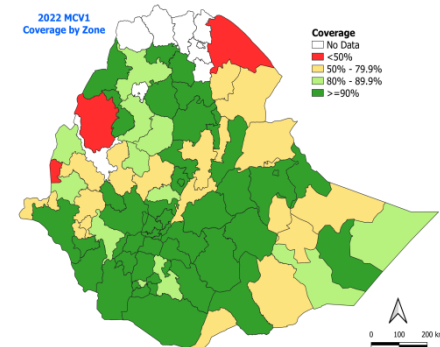


Figure1: Penta 3 and MCV1 performance map by zones

The WUENIC report has declined 71-68% to 65% for Penta 3 and 58% to 56% for MCV1. The WUENIC estimate for penta3 coverage during the last decade ranged from 59% in 2013 to 70% in 2022. Over the decade, the coverage seems to have improved but over the last 5 years, the coverage has declined slightly.

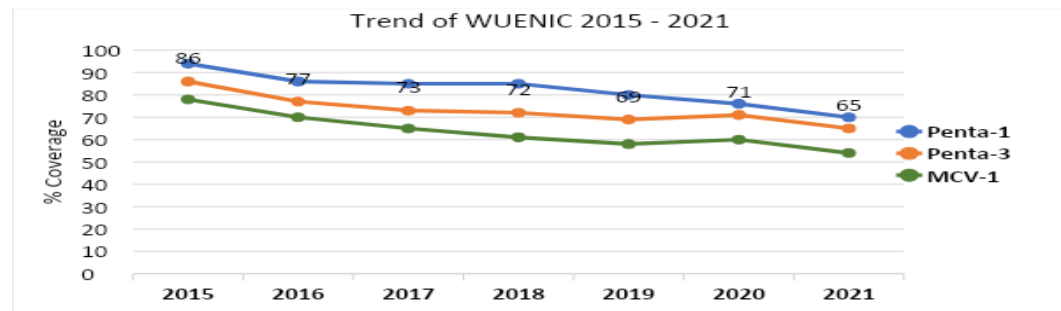


Figure 2: trends of Penta 1, Penta 3 and measles vaccination coverage based on WUENIC estimation from 2015 -2021

There is huge data discrepancy between administrative and WUENIC data. This linked with several factors such as inaccurate denominator, poor data quality, shortage of skilled staff and lack of accountability for reporting poor quality. However, both data sources confirmed there is immunization coverage decline in the last 3 years. This is due to the fact that immunisation program has been impacted by conflicts, political reforms, climate changes (drought and flooding), COVID19 pandemic, and other emergencies that have directly or indirectly affected the delivery of basic social services and health care.

The ministry has noted that there are discrepancies in performance coverage levels among subnational across regions, zones and woredas. Therefore, with the new Gavi funding support more than 534 priority woredas in country identified. Among 534 woredas 87 woredas have been supported by IRC and 447 woredas have been covered by EAF support.

Zero Dose Situation and vaccination in Ethiopia

Ethiopia is one of the top 10 countries with the highest number of zero-dose children globally; ranking 2nd with 1.146 million zero-dose children (using DPTCV1) and 3rd for children unvaccinated of with measles vaccine was 1.7 million based on WUENIC estimate 2022. The proportion of zero dose children increased from 24% in 2019 to 30% in 2022, an increase that

represents about 266,771 additional children who are unvaccinated. WUENIC also indicated Oromia, SNNP, Amhara, Tigray and Somali regional states have the highest zero dose children in the country.

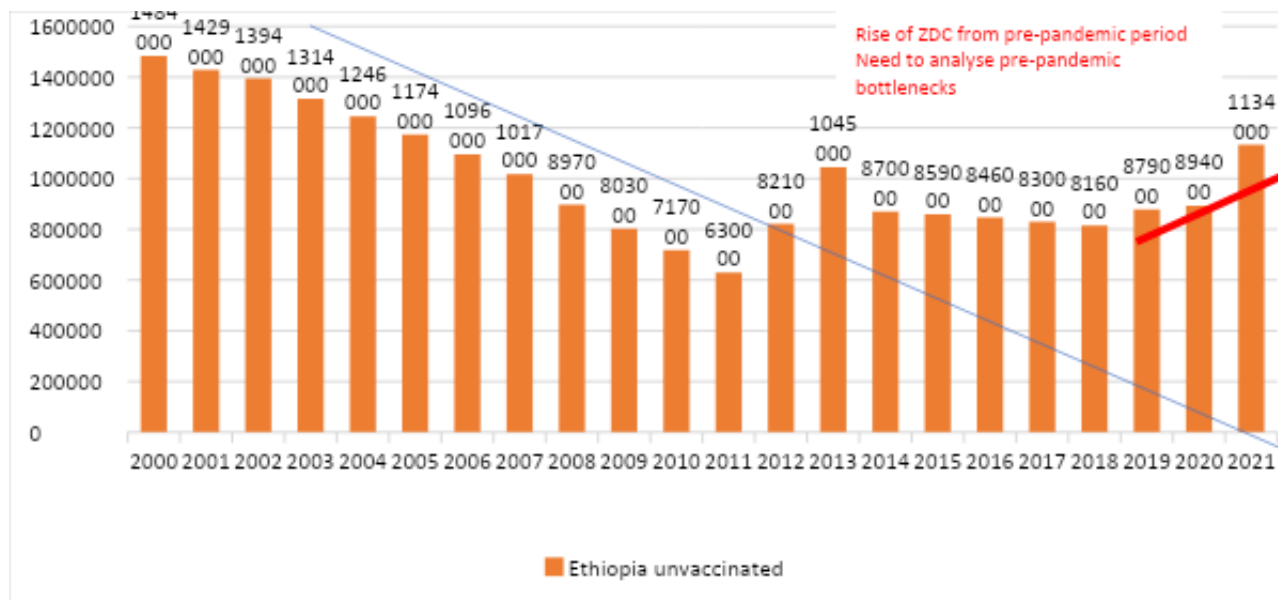


Figure 3: Zero dose children based on WUENIC estimation from 2000 -2021

The 2022 zero dose evaluation study in underserved context of the country showed more than 1.1 million children are zero dose among children 12-23 months of age. This study also analysed zero dose children by different context like conflict, geographic hard to reach, IDP and others.

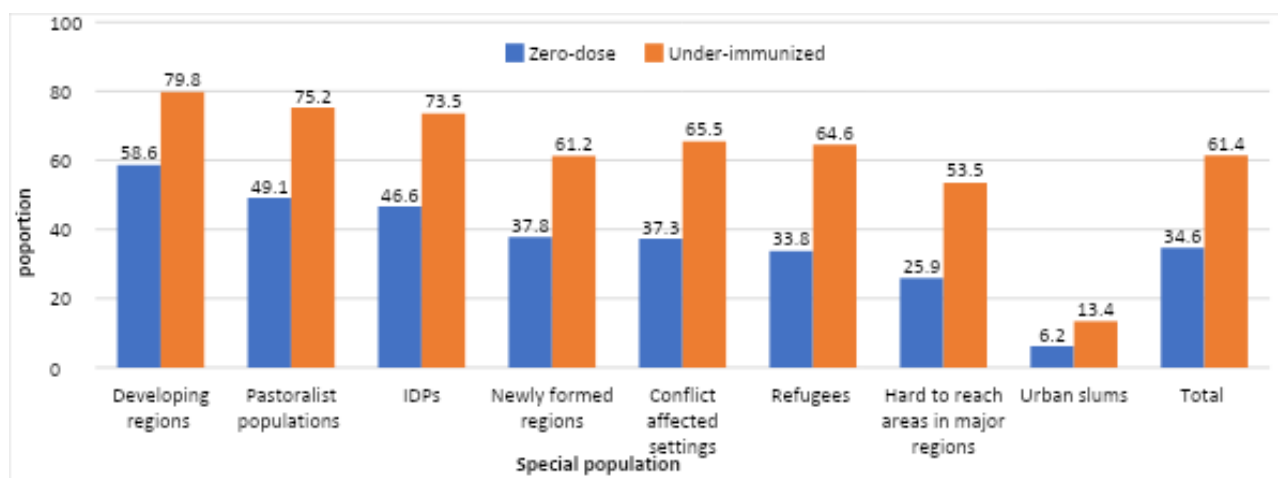


Figure 4: Prevalence of zero-dose and under-immunised children in underserved settings and special populations of Ethiopia, July 2022 (Source Project Hope, 2022)

The WUENIC and the zero-dose evaluation study almost the same result for zero dose children in the country. Ethiopia has also back logs of zero dose children which are not addressed through the immunization program. The Ministry of Health with its partners has endorsed catch up vaccination guideline in November 2022 to address though who missed the vaccination during their national schedule. Recently, 2023 the MoH also prepared big catch-up plan to address those back logs of zero dose and under vaccinated children in the country since 2019. This big catch-up moment is global initiative which many countries implementing to revert backslide of immunization coverage.

There have been efforts by the MoH with its partners to vaccinate zero dose children using different opportunities like measles SIA, COVID 19 campaigns, PIRI and others. With this so far Ethiopia has vaccinated more than 278,169 children.

Table 2: Zero-dose children vaccinated by regions.

S.no	Region	ZD during Measles SIA	ZD Addressed during 4th round	PIRI in August 2023	Total
1	Addis Ababa	76	12	-	88
2	Afar	5,196	4,465	9,320	18,981

3	Amhara	31,589	8,120	940	40,649
4	Benishangul Gumuz	1,070	696	4,211	5,977
5	Dire Dawa	208	121	445	774
6	Gambella	944	721	1,877	3,542
7	Harari	95	152	-	247
8	Oromia	46,613	22,557	13,354	82,524
9	Sidama	774	29	95	898
10	SNNP	12,342	6,126	-	18,468
11	Somali	12,866	10,205	45,098	68,169
12	SWE	3,075	1,695	515	5,285
13	Tigray	32,332	-	235	32,567
Total		147,180	54,899	76,090	278,169

Performance of 2022 Measles SIA, the integrated campaign

Ethiopia began implementing accelerated measles control in 1998 with the aim of reducing measles mortality and morbidity. Measles vaccination in the routine immunisation program was introduced in Ethiopia in 1980 with one dose of Measles containing vaccine (MCV1) for children at the age of 9 months and in 2019 introduced Measles second dose (MCV2) at the age of 15 months. Ethiopia conducted measles supplemental immunisation activity since 1998 targeting children under 5 years and goes up to 15 years age based on the epidemiology.

Measles is endemic in Ethiopia (WHO, 2023), with cases reported every year. From 2021, the annual number of confirmed measles cases has increased significantly, from 1953 in 2021 to 9291(>375%) in 2022. Thus, there was an almost five-fold increase in confirmed measles cases between 2021 and 2022. Low population immunity, combined with concurrent epidemics, conflict, drought, internally displaced population, and other humanitarian crises that disrupt essential health services including childhood vaccinations, which are major factors explained for the increase. To build the population immunity Ethiopia planned to vaccinate 15,464,614 age 9-59 months of children in 2022 through campaign and avert the recurrent measles epidemics.

As result of conflict and drought significant portion of the population disconnected from health services including immunization. Thus, the MoH decided to use the Measles SIA as big opportunity to integrate other essential health service that can easily integrated. The integration includes routine immunisation catch up vaccination, COVID-19 vaccination, Vitamin-A supplement, deworming, nutritional screening, identification and linkage of obstetric fistula and clubfoot, and other health services.

With the integrated measles SIA 15,070,279 (98.7%) vaccinated with measles vaccine. In addition, 147,180 zero dose vaccinated children were identified and vaccinated during the integrated measles campaign.

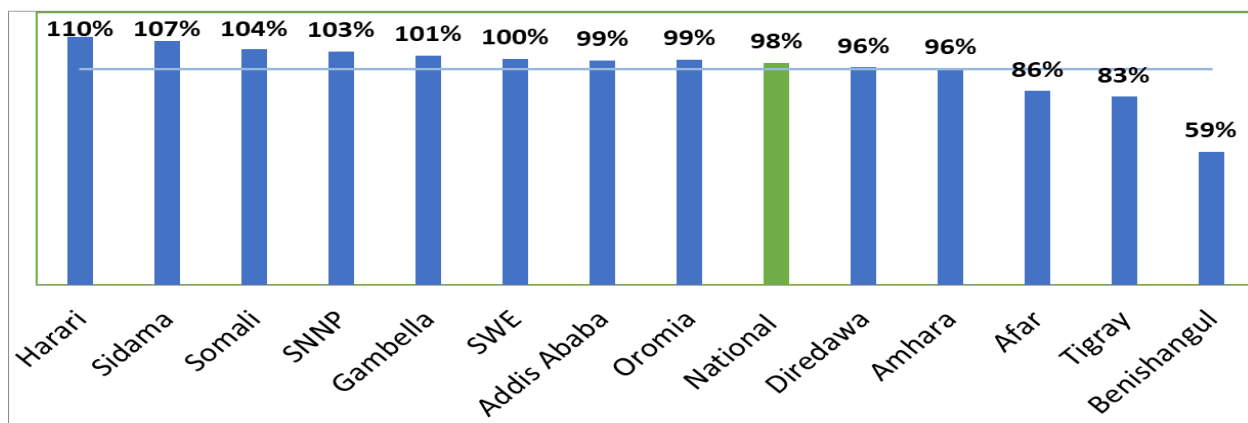


Figure 5: Measles SIA vaccination performance by regions in December 2022

A total of 1,309,190 COVID 19 vaccine doses were administered during the integrated campaign period. A total of 15,185,857 children were screened, and 88,733 children were identified as having severe acute malnutrition in which their MUAC was < 11.5 cm and a total of 739,830 (4.9%) children were found to have Global Acute Malnutrition (GAM). In addition, 13,196, 615 children aged 6-59 months were given Vitamin-A supplementation, and 8,815,976 children aged 24-59 months were given Albendazole supplementation. A total of 3,649 children of age below five years were identified as suspected club foot, out of which 1,144 clubfoot cases of under two children were identified which enables them for early treatment, and 2,505 cases in the age 24-59 months that need surgical intervention. Of the identified children with clubfoot 155 children

were linked and started treatment as of February 2023. More than 1 thousand suspected obstetric fistula cases were identified and linked for further confirmation and treatment.

Furthermore, cold chain equipment inventory was integrated with the measles SIA except certain regions of the country and orientation as well as national TOT, cascaded to lower levels. Then, integrated with the measles SIA, the cold chain inventory was conducted.

Table 3: Integrated Measles SIA Performance Report, December 2022, Ethiopia

#	Integrated Activities	Target	Performance	Coverage
1	Measles SIA (9-59 Months)	15,471,740	15,070,279	98.7%
2	Nutrition Screening	14,315,290	15,185,857	>100%
3	Vitamin A Supplementation	14,315,290	13,196,615	92%
4	Deworming	9,253,512	8,815,976	
5	Nutritional Screening	Total SAM Cases identified (MUAC 11.5cm-12.5cm)	651,097	
		Total SAM Cases identified (MUAC <11.5cm)	88,733	
		Total GAM	739,830	4.9%
6	Zero-dose Children Identification and vaccination		147,180	
7	COVID-19 Vaccination	Total doses Administered	1,309,190	
		No of people received at least one dose	872,022	
		No of people completed primary series	811,613	
8	Club foot suspected identification and linkage		1,144 (2-5 years) 2,505 (<2 Years)	
9	Obstetric Fistula suspected identification and linkage		1,324	

HPV Vaccination

Ethiopia has been vaccinating single age cohorts of 14-year-old girls since introduction. The country has been implementing a two-dose schedule with an interval between 6-12 months. Given the high proportion of school enrolment rate of adolescent girls in the country, school-based vaccination is the main strategy of vaccine delivery in a one-week campaign mode. School absences will be referred to the nearby health facility and out of schoolgirls will be reached

through temporary out-reach vaccination posts. In remote and hard to reach communities mobile teams will be used.

In 2022, a total of 1,170,860 were vaccinated for the first dose of HPV vaccination and 1,015,398 for the second dose showing administrative coverage of 99.5% and 83% respectively. Of the total vaccinated 6.3% were reached out of school. The 2023 HPV vaccination was integrated with Covid-19 vaccination and other MCH services. During this time 1,488,038 (99%) girls are vaccinated for the first dose and 1,158,745 (96%) for their last dose. Total of 1,926,821 doses of HPV vaccine were used in the 2022 campaign and 2,469,130 in 2023. Vaccine wastage rate in both years showed 0.4% and 3.9% respectively and no series AEFI was reported in both campaigns.

Several level integrated advocacy and familiarisation workshops were executed with different stakeholders including political leaders, community representatives, media professionals, CSOs and PR officers and communication directors of government ministries to gain support and solicit political commitment on cervical cancer prevention and HPV vaccination. Various media outlets were used to mobilise the community and strong partner support and monitoring mechanisms were laid down to maintain the quality of the campaign.

As of June 2023, more than 6.5 million target girls have been vaccinated for the first dose of HPV vaccination and 4.2 million for their second dose since the national roll out in 2018. In September 2023, the ministry of health and ICC approved single dose HPV vaccination following the NITAG recommendation. Currently, the country is preparing to execute the MAC vaccination for 9-14-year-old-girls in the first quarter of 2024 and HPV vaccine switch program from 2 dose to single dose program.

Table 4: HPV Vaccination performance from 2021-2022

Year	Target(14-year-old-girls)		Vaccinated		Coverage (%)	
	HPV 1	HPV 2	HPV 1	HPV 2	HPV 1	HPV 2
2021	1,176,286	1,213,224	1,170,860	1,015,398	99.5	83
2022	1,488,038	1,158,745	1,467,910	1,117,726	99	96

COVID 19 Vaccination

As part of the COVID-19 pandemic prevention and response strategy, Ethiopia has planned to introduce COVID-19 vaccine with the objective to reduce morbidity and mortality from the COVID-19 disease. Ethiopia joined the Global COVAX facility to access vaccines and financial support and introduced COVID-19 vaccine on March 13, 2021. During the rollout the service delivery strategy used was fixed, outreach and mobile strategy. The rollout process took a long time to administer 5.4 million doses of COVID-19 vaccine. The country revised the service delivery strategy and campaign to reach more target groups within a short period of time which ultimately reduce the transmission of COVID-19 disease in line with other COVID-19 prevention and control measures. So far, in addition to vaccination provided in the health facilities the country conducted four rounds of nationwide COVID-19 vaccination campaigns. The 3rd and 4th round campaigns were conducted integrating with catch up vaccination (identification of zero dose and under vaccinated and vaccinate), other MCAH and nutrition services. To maximizing the benefit of the campaign and leverage the resources. More than 52.8 million received at least one dose of COVID 19 vaccine and 45.7 million completed vaccination series. More than 76.4% of out target population for the COVID 19 was vaccinated and 66.1% of them completed the vaccination series.

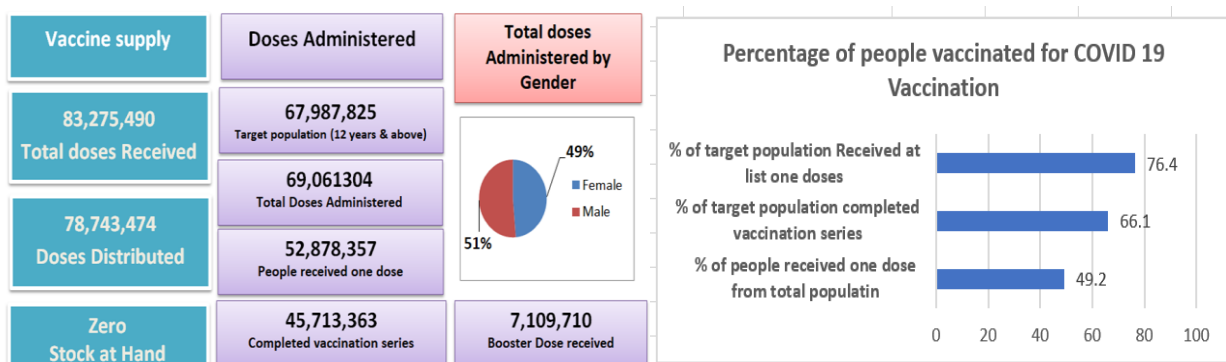


Figure 6: Covid 19 vaccination performance

Ethiopia also tried to vaccinate special priority population group since its introduction since 2021. With this more 378,738 health care workers were vaccinated at least one dose of COVID 19 vaccine.

Table 5: COVID 19 vaccination status by priority population group

Special Population	1st dose	2nd dose	Total
HCW	378,738	246,792	625,530
IDP	173,700	64,370	238,070
Essential Workers	1206	2987	4,193
Commorbid	649,010	499,780	1,148,790
Disability	15471	3546	19,017
Refugee	32330	7690	40,020
Total	1,250,455	825,165	2,075,620

Currently, the Ministry of Health is working to finalize and endorse the new COVID 19 vaccination guide per the global guidance of integration and new SAGE recommendation and country context. The new COVID 19 vaccination guide will focus on priority population vaccination and addressing those who did not get at least one dose of COVID 19 in conflict, IDP and drought affected population groups. The service delivery modality is significantly shifted to primary health care unit (PHCU) integration.

New Vaccine introduction status

Ethiopia has been working GAVI and other partners to introduce new vaccines in the country over the years. Since 2021 COVID 19 vaccines (Astra Zeneca, Jansen and Jansen, Pfizer and Sinopharm) introduced and used for the COVID 19 pandemic response. MoH has been working preparatory activities to introduce new vaccines such as IPV second dose, Hep B birth dose, Measles 5 dose, yellow fever, Men A, and malaria vaccines since 2021. The stage of preparation for introduction varies among vaccines.

1. IPV2 introduction

The Ethiopia has developed IPV2 introduction plan as the next step towards complete OPV withdrawal from routine immunisation programs, while providing a higher protection against cVDPV2, which are currently circulating and represent a risk in many areas of the world. The introduction plan goes through various consultation processes at immunisation technical working, received high level advice from eNITAG, approval at ICC and submitted to GAVI under the FPP. The overall budget for the introduction was 882, 440 USD approved by Gavi. The IPV second dose will be introduced with measles 1st dose at 9 months of age through the routine

immunisation system. The expected date of launching is planned on the 1st week of January, logistics and HWs training materials and guidelines were ready for rollout.

2. HPV single Dose Switch

Ethiopia has been implementing a two-dose schedule HPV vaccination for single age cohorts of 14-year-old-girls since the national roll out in 2018. However, from the point of view of public health and considering the recent scientific evidence and SAGE'S recommendation on single dose HPV vaccination the country approved the use of a single dose schedule for 9-year-old girls as of 2024. Ethiopia endorsed HPV single dose use to vaccinate adolescent girls 9-14 years of age after several consultation and approval process. To this end, the country is preparing to execute the MAC vaccination for 9–14-year-old girls with a single dose schedule followed by the routine cohort for 9-year-old girls in the years to follow.

3. Hep B birth dose

In Ethiopia, the prevalence of hepatitis B in pregnant women is estimated to be around 3.7 %, and there is no screening protocol for these mothers during their antenatal visits, The Pilot implementation was conducted from Jan 2021- May 2022 in 4 woredas of Afar, Addis Ababa, Amhara and Tigray regions with the aim of demonstrate strategies to achieve Hep B BD coverage, estimate Hepatitis B Birth dose coverage, evaluate community acceptance and identify barriers, identify and address programmatic and logistical challenges, draw lesson learned and document best practices to enhance wide scale vaccination. Post Introduction Evaluation/PIE was conducted and found out the feasibility of timely provision of HepB-BD in health facilities deliveries. A total of 15656 new -born received HepB-BD throughout the implementation period which is 79% of the total target. The target was reaching a minimum of 70% of the initial total target (19869) newborn. Out of the total vaccinated, 15 517(97%) were reached timely/vaccinated within 24 hours of delivery. The vaccine has got high acceptance by health workers and mothers/communities where the pilot was implemented. Moreover, a costing study has been conducted.

As next step the country will table the result of the study for ENITAG advice and ICC approval and apply to GAVI and other partners for an introduction grant as soon as the application window allows. The MOH has given high emphasis for the introduction of HepB birth dose vaccination in the routine immunisation system to be integrated with maternal, child and newborn programs in the country.

4. Rota vaccine switch

Ethiopia has introduced Rotavirus vaccine in 2013 with two doses of Rotarix vaccine at the age of 6 and 10 weeks for infants under one year with other routine vaccines. Ethiopia is planning to conduct a forced switch from Rotarix to RotaSILL vaccine beginning from late 2023 due to the prevailing risk that the production of Rotarix Vaccine is reduced to supply Ethiopia's demand. Therefore, the Rota vaccination for all children under the age of one year should be sustained without interruption of the program to sustain the gains of VPD control, elimination, and eradication.

The country has sent the switch confirmation to GAVI and all the preparatory activities done. Action plan developed with the proposal and cost activities. Training material developed and finalised. The RotaSILL vaccine registration/ authorization from EFDA is already done. We are preparing the required vaccine and supply forecasting and the pre-import permit (POP) request to receive the RotaSILL vaccine before the end of December. The national TOT and cascaded training activity chronogram developed.

5. Measles Five dose

Ethiopia conducted a pilot study to switch measles 10 dose to 5 dose in selected 60 woredas of Amhara and Oromia regions with the aim to see the effect on measles vaccination coverage, effect on measles vaccination timeliness, what is cost and cost effectiveness of each of the two interventions and to investigate what are health worker attitudes towards smaller multi-dose vials. the result of the study shows, there is significant coverage improvement on MCV2 coverage (17% coverage increment), MCV1 coverage did not show significant increase, timelines of vaccination improved significantly eligible children managed to receive there MCV1 at 9 month

of age and frequency to provide vaccination on daily basis improved in the intervention health facilities and similarly the cost analysis showed the use of measles five dose is much more cost-effective compared to the number of children expected to be vaccinated. The ministry is planning to table the evidence for NITAG recommendation and ICC approval. In the year 2024 the country expected to submit its interest to switch the 10 doses to 5 doses vaccine.

6. Yellow Fever vaccine

As part of yellow fever vaccine introduction preparation, the Ministry of Health in collaboration with the Research Advisory Council for MACH LEO, EYE secretariat and WHO conducted the below two assessments for evidence-based decision making by NITAG and ICC. The 1st study was Yellow Fever Risk Assessment in Ethiopia considering subnational regions disaggregation and the 2nd is Subnational introduction of yellow fever vaccine into routine immunisation is an appropriate strategy in the Ethiopian context. Both evidence was disseminated to the ministry of health partners. The ministry is working to table theses evidence to NITAG and ICC to for approval and endorsement of yellow fever vaccine.

7. Men A Vaccination

Ethiopia also indicated Men A vaccine introduction on strategic document cMYP 2021-2025, in Ethiopia, the inclusion of the Meningitis vaccine into the routine immunization programmes to sustain the population protection by immunizing new birth cohorts at 9 months with measles vaccination will have a paramount advantage. The introduction of Meningitis vaccine is considered as another opportunity to strengthen the overall routine immunisation (RI) service delivery. Ethiopia conducted mass preventive Men ACV campaigns from October 2013 to November 2015, vaccinating more than 60 million people aged 1-29 years old. Since 2015 there is backlogs of children who are not vaccinated, thus the preparation of Men A vaccine will consider both backlogs and routine introduction. As part of preparation the ministry planned to start discussion and consultation in this fiscal year for the introduction of Men A vaccine.

8. Malaria

GAVI has given advice to the FMOH/EPI to submit a letter of expression of interest/EoI for Malaria vaccine introduction to the country. The Ministry of health has been working with immunisation stakeholders, the Ministry of health has submitted its expression of interest (EOI) to Gavi to introduce Malaria vaccine, the ministry also identified woredas of high burden Malaria in the country. Based on WHO criteria of Annual Parasite Incidence (API) and under five mortalities woreda or districts are identified and categorised as category 1, category 2 and category 3 and 29, 12 and 17 woredas respectively. By the 2023/2024, the ministry has the plan to prepare documents for application to introduce malaria vaccine.

Table 5: Tentative schedule of new vaccine introduction

S.no	Vaccine type	Type	Period
1	IPV2	Routine	2023/24
2	RotaRix to Rota SIIL switch	Routine	2023/24
3	HPV two to single dose switch	Routine	2023/24
4	Malaria	Routine	2024
5	Hep B Birth dose	Routine	2024
6	Measles 10 to 5 doses switch	Routine	2024
7	Yellow fever	Campaign + Routine	2024/2025
8	Men A	Routine + Routine	2024/2025

Challenges of the immunization program

The immunization has been impacted by different factors like conflict, drought, and health emergencies including COVID 19 pandemic and health system challenge like data quality, service delivery bottlenecks, health workers capacity, overwhelmed health extension program, fatigued community platforms, vaccine stock out, and others. This pulled back the program does not implement and achieve its target objectives indicated in cMYP. New vaccine introduction delayed, coverage declined slightly, and zero doses' children increased. The Ministry of health tried to analyse the impacts of this different factors to act.

1. Impact of Conflict on the immunization performance

Ethiopia has been in faced internal conflict in different parts of the country, which interrupts the immunization and essential health services provisions. In Tigray, Amhara, Oromia, Benshangul, Afar regions the proportion of zero dose is high in conflicted woredas. The number of zero dose children is significantly higher in conflict affected woredas; which is 1 out 3 child is zero dose and while in non-conflict affected woreda 1 out of 4 child is zero dose (Table 7).

Table 7: Number of woreda affected conflict affected by region				Number of zero dose in conflict affected areas (2019-2022)	Remark
S.no	regions	# of woredas not conflict affected	# of woredas conflict affected		
1	Addis Ababa	11	0	0	
2	Afar	21	19	49,629	
3	Amhara	90	76	315,339	
4	Benshangul Gumuz	7	18	25,227	
5	Dire Dawa	9	0	0	
6	Gambela	11	3	2,690	
7	Harari	9	0	0	
8	Oromia	202	154	614,175	
9	Sidama	30	8	54,544	
10	SNNP	143	25	70,074	
11	Somali	34	65	330,451	
12	SWE	54	3	7,619	
13	Tigray		93	392,028	
	Grand Total	621	464	1,861,775	

2. Impact of Drought on the immunization performance

Ethiopia has also faced large scale of climate change like severe drought in pastoral areas and flooding also happening in some parts of the country, which disrupts essential service. With simple analysis conducted by comparing number of zero children in drought affected woredas versus not affected woredas, zero dose children is high in drought affected areas than the rest areas, which is 4 out of 10 children are zero dose in drought affected areas and 3 out of 10 are

zero dose in non-drought affected areas. The below shows number of woredas affected by climate change across the regions (Table 8).

Table 8: Number of woreda affected drought affected by region

S.no	Regions	Number of woreda not drought affected	Number of woreda drought affected	Number of zero dose in drought affected woreda
1	Addis Ababa	11	0	0
2	Afar	2	38	101,221
3	Amhara	166	0	0
4	Benshangul Gumuz	25	0	0
5	Dire Dawa	4	5	2,041
6	Gambela	13	1	1,506
7	Harari	8	1	1,187
8	Oromia	303	53	200,912
9	Sidama	25	13	70,893
10	SNNP	113	55	159,184
11	Somali	9	90	398,797
12	SWE	39	18	38,884
13	Tigray	93	0	0
	Grand Total	811	274	974,625

3. Impact of COVID 19 on the immunization performance

There are few studies and assessments conducted to see the impact of COVID19 pandemic on RI. A study conducted by ICAP, CDC and MoH in Addis Ababa and Oromia showed that the COVID19 pandemic has impacted substantially routine immunization services during the early phase (the 3 to 4 months) of pandemic.

A national Facility Assessment for Monitoring the Continuity of Essential RMNCAH Services during COVID-19 commissioned by UNICEF conducted by Development Research and Training (dab) in Amhara, Oromia, SNNP, and Somali Regions of the country” released in October 2020 showed that during the early phase of the pandemic vaccine coverage declined by 5 to 10 % especially in urban areas.

There was a comparison done by the MoH EPI team using DHIS 2 data, comparing 10 months of data before and after the COVID19 pandemic in 2019 and 2020, the result showed pandemic has minimal impact on RI.

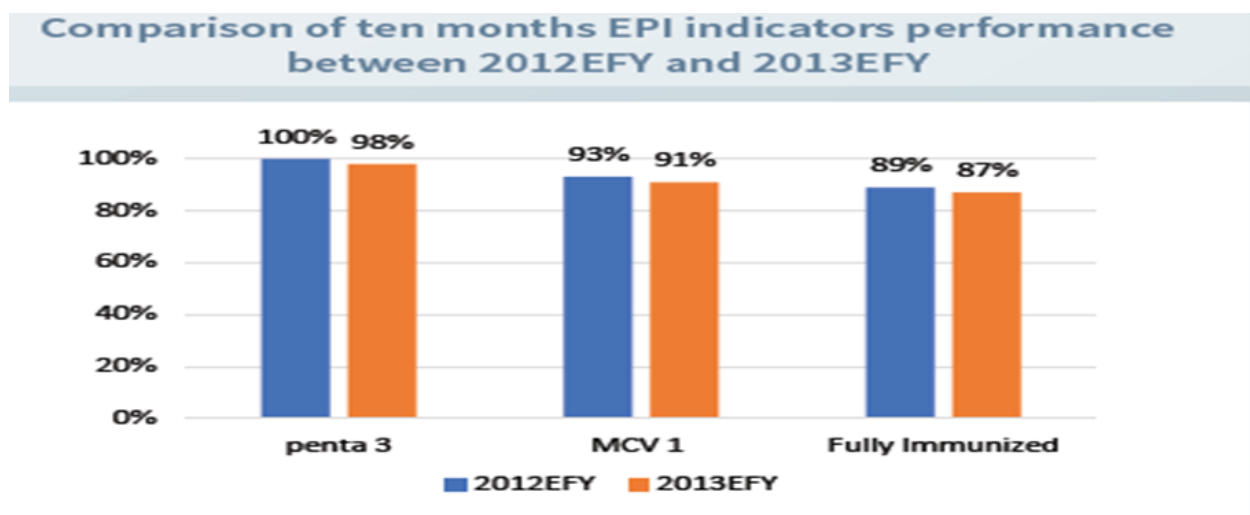


Figure 7: Comparison of ten months of EPI performance during COVID 19 and before.

There was strong effort made by MoH to mitigate the COVID 19 pandemic, the MoH established an essential health service coordinating task force led by the state minister during the pandemic to minimise the pandemic impact on essential health service provision. The taskforce decided Ethiopia to conduct the nation-wide measles SIA campaign in the midst of the pandemic in June 2020 to abort protracted measles outbreaks at the time. Another big decision made by the MoH was COVID 19 vaccination response activities led by the vaccine program itself and these allowed the program to coordinate both COVID19 vaccination and RI together. Both COVID19 vaccination and RI has benefited from each like human resources, technical assistance, logistics management monitoring of the program. In conclusion the impact of COVID19 pandemic on the RI is there but it is not the only one.

Overall, conflict, climate change and other health emergencies induced problem like displacement, destruction of health facilities, and damage infrastructures and other have also exacerbated the situation. The Ministry of health clearly aware of the challenges of immunization program and other health programs. For this, has developed different policy like catchup vaccination, plan to address backlogs of zero dose, and recovery and rehabilitation plan. The implementation of new policy and new plans has been threatened by finance shortage.

VPD surveillance and outbreak response campaign 2021 and 2022

1. Measles surveillance and outbreak response

Ethiopia initiated measles case-based surveillance in 2003 integrated with the AFP surveillance which was supported by laboratory investigation starting from 2004. Measles case-based surveillance has been established to ensure that any area where the measles virus may be circulating is detected in a timely manner. Blood specimens with case-based report for testing laboratory for each suspected case. All cases reported through case-based form/line list should also be included in the weekly based aggregate PHEM report. National Measles incidence rate per million population is 17.6 and 73.3 in 2021 and 2022 respectively.

Despite several preventive SIAs implemented at recommended schedules, measles outbreak has been widely occurring in the country. The highest episode of outbreaks was recorded in 2015 in the last decade. A total of 61 and 32 episodes of outbreaks were reported in 2021 and 2022. More than two-thirds of the outbreaks were detected in Oromia, Amhara and SNNPR regions. In the period from 2015 to April 30, 2022, 87% of outbreaks were occurred in Oromia with 41%, Amhara with 21%, SNNP 14% and Somali regions with 11%.

Table 9: Suspected Cases Vs Confirmed Cases Notification 2021 and 2022

Year	Number of suspected cases	Number of confirmed cases	# of outbreak episodes	
2021	3518	3386	2021	2022
2022	5123	1933		
2023			NATIONAL	
			61	32

Table 10: Distribution of confirmed measles cases reported through case-based surveillance, Ethiopia, 2021-2022

Year	Age					Total
	<9 mo	9-11 mo	1 - 5 year	6 - 10 year	11+year	
2021	97	63	771	438	564	1933
2022	191	68	1453	736	938	3386

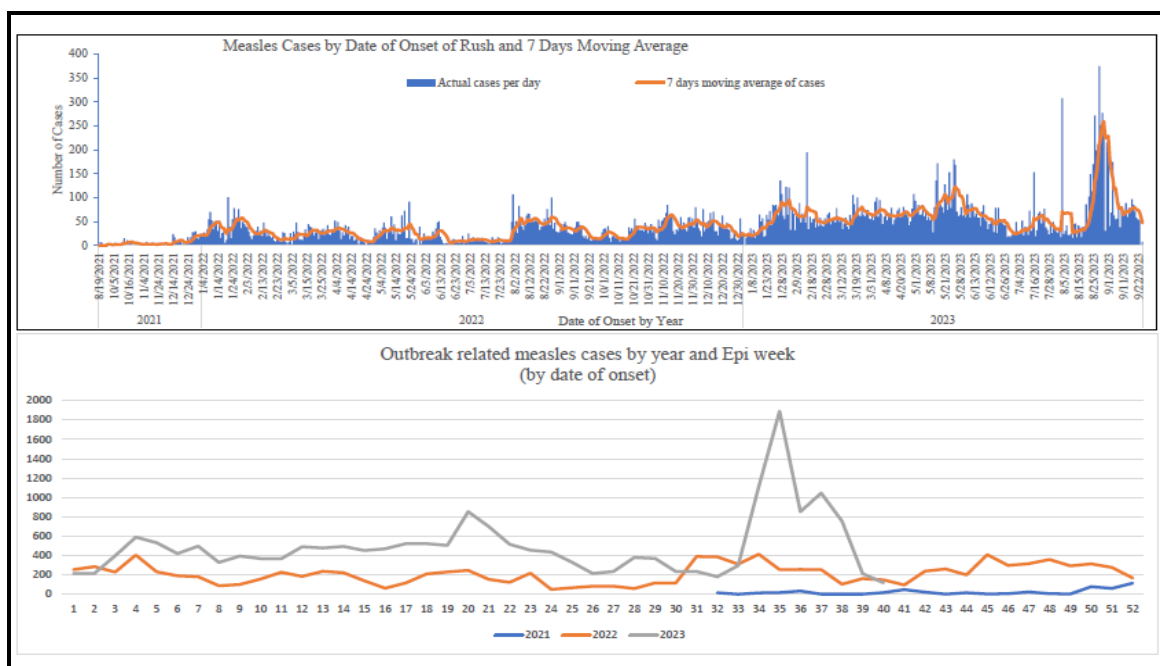


Figure 8: Measles Cases by Date of Onset of Rush and 7 Days Moving Average, Outbreak related measles cases by year and Epi week (by date of onset)

Ministry of health, through its implementing agency EPHI Measles outbreak response has been conducted in different parts of the country. Enhanced surveillance and case management activities were dispatched from national as well as the regional level to outbreak affected areas. School students were used to mobilize the community both for immunization and early care seeking. Reactive campaign (SIAs) was conducted in SNNP, Somali and Oromia regions within the most affected & vulnerable woredas and IDPs sites in Nov 2021 and in Feb to Mar 2022 targeting 1,483,114 (from 6 to 59 & 6 to 120 months of age) and reported coverage of 98%. The campaigns took seven days in each area.

Table 11: Reactive Vaccination Campaign and its effect on the measles outbreak, late 2021 and early 2022, May 27, 2022

Region	Total target	Cov. %	SIA type
Somali	364,847	98	OR
SNNP	297,690	104	OR
Oromia	52,849	95	OR
Total	715,386	99	OR

2. Polio surveillance and outbreak response, Ethiopia, 2021 - 2022

Reliable AFP surveillance data guide targeted immunization activities in areas with continued poliovirus circulation or at risk for importation. Surveillance data is used to monitor how effectively routine and supplementary OPV immunization programs have succeeded in decreasing poliovirus transmission. In Ethiopia maintained wild free status since 2014 but there are several cVDPV Cases reported in in 2021 and 2022.

The first vaccine derived polio virus type 2 (cVDPV2) case with onset of paralysis on 27 May 2019 was reported in Dollo Zone. Since then, a total of 63 type 2 circulating vaccine derived polio viruses were reported with onsets between May 2019 and September 2021 from seven clusters of outbreaks.

To respond the ongoing cVDPV2 outbreak two rounds of mOPV2 campaigns were conducted in four regions (Oromia, SNNP, Somali and Harari) and two city administrations (Addis Ababa & Dire Dawa) in 2020. In the same year two rounds mOPV2 were conducted in Amhara, Afar and Oromia regions.

The country also fulfilled all the requirements for the introduction of nOPV2 and implemented two successful rounds of campaign in October 2021 and April 2022. Both rounds of nOPV2 SIA campaign was conducted in eight regions and two city administrations. However, due to an ongoing conflict in some parts of the country, which didn't implement nOPV2 campaign.

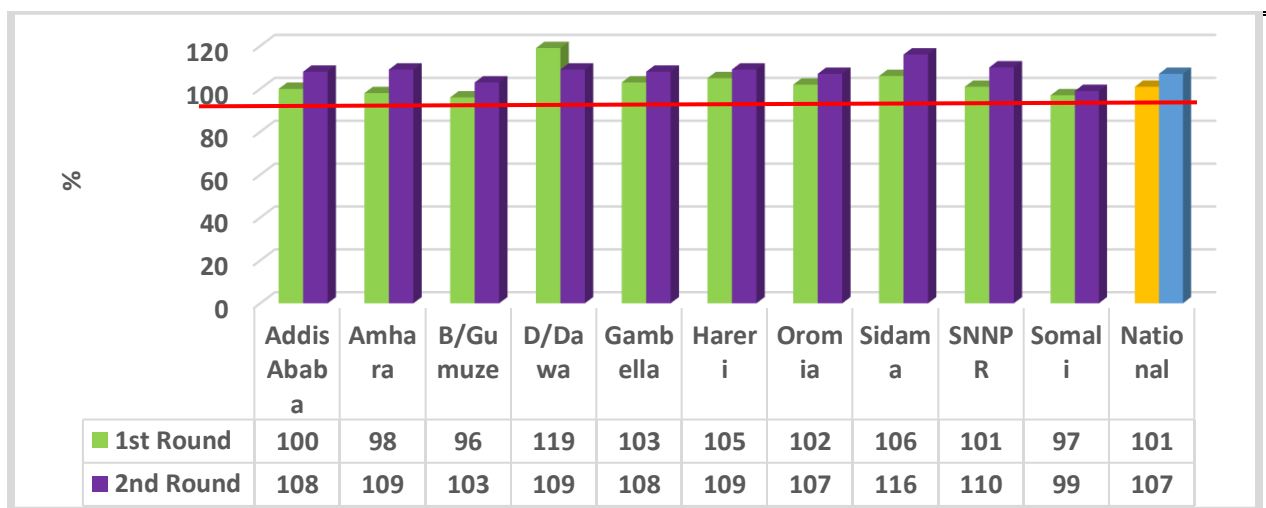


Figure XX First and second round national nOPV2 campaign admin coverage, October 2021 & April 2022

3. Yellow Fever Surveillance

Yellow fever is a fatal viral hemorrhagic fever that has caused many outbreaks in the southern and western part of Ethiopia since 1959. In 2018, a confirmed YF outbreak has occurred in Wolaita Zone, where a total of 35 cases and 10 deaths (CFR =28.6%) were reported and outbreak response vaccination was conducted. A yellow fever outbreak also occurred in March 2020 in the Gurage Zone, where a total of 86 cases and 4 deaths (CF= 4.7%) were reported. EPHI is developing yellow fever surveillance and response guidelines in 2022.

Table 9: Yellow fever surveillance data, the year 2021/22

Year	No. of YF Suspected	No. of YF sample received for testing	No. of YF sample tested	No of sample positive for the initial test	No of sample positive for confirmatory
2021	20	20	20	1	0
2022	16	16	16	0	0
2023					

Challenges for VPD surveillance and outbreak response

There have been gaps reaching areas which are in secured, IDPs, mobile populations, underserved areas such as borders. There is also delay in outbreak response because of supply issues and lack support, insecurity, and other factors. Inconsistent active surveillance compounded by knowledge gap, weak documentation and use of outdated data collection tools and guidelines. Insufficient number of ES sites for AFP surveillance and distribution in the country: 3 sites in Addis Ababa and one newly established in Amhara region. Inadequate monitoring and feedback mechanisms to improve performance are some of them.

Immunization Supply chain management

The national immunization program in collaboration with the EPSS and partners have been working on strengthening the immunization supply chain of the country. The following are the main activities and accomplishments in the last three years.

1. Planning and Coordination (M & E)

- The national vaccine logistics technical working group are composed of different stake holder immunization supply chain expertise, who are act as an advisory role for the ministry and EPSS regarding iSC, which are conducted regular meeting and discussion on the priority immunization supply chain management areas, this technical team oversee the overall immunization supply chain system including the cold chain equipment infrastructure, LMIS, HR and capacity building and development, temperature monitoring, stock management and distribution and waste management activities,
- The country has prepared a five-year costed immunization Supply Chain Management (iSCM) strategic plan (2018–2023) with the overall goal to strengthen the iSCM and ensure the availability of quality vaccines and related supplies for effective program delivery.
- The strategic document was developed by considering the previous five Gavi fundamentals of iSC; system design; cold chain equipment (CCE), Leadership & Human Resource, continuous improvement & planning, and data for management. The fundamental activities are planned, and cost based on the global and country context. In the planned improvement of the cold chain infrastructure and transportation capacity, expanding last-mile vaccine delivery to hospitals and HCs is among the major goals.
- Each year (May-June renewal window) the country receives vaccine renewal allocated doses for antigens, namely Penta, PCV, Rota, HPV, Measles and IPV from GAVI. Target coverage, wastage rates, buffer, target population, in-country stock balances and past shipment history are the major parameters used for vaccine forecasting. The traditional vaccines BOPV, Td, BCG and other supplies are quantified using similar parameters and procured by government budget sources. Though regular stock status follow-up exercises are undertaken, there are still gaps on regular shipment follow up and review (Supply Planning), availability and usage of country specific wastage rate data and regular triangulation of logistics and program data.
- WHO recommended the country to have specific country-specific wastage rate data. So far, the wastage rate study has not conducted and will be one of the priority activities in the coming period and included in the FPP. There is an irregular LMIS-Program data

triangulation exercise using customized tools. In previous years, the triangulation using program and logistics data sources was exercised nationally and significant disparity identified between the distributed vaccines and available program data. Woredas with higher discrepancies are identified and prioritized for support. There are efforts to exercise the triangulation on a regular basis and draft job aid has been developed to guide sub national teams to perform this exercise on a regular basis.

2. Logistics Management Information System (LMIS)

- Availability of quality, real-time data on vaccine supply and demand at the national, sub national and service delivery level are critical to improve efficiencies. To improve the data visibility and efficiency of the vaccine management, the MoH, in collaboration with partners, has developed technologies such as Vitas, Dagu, and Fanos that have been implemented and used at various levels of the iSC system. DHIS2 also captures some components including the vaccine utilization reports on which wastage rates for each antigen can be easily calculated.
- Vitas is a warehouse and inventory management information system that directs supply operations at the warehouse level, while Dagu is an inventory management system designed to manage daily transactions at HFs.
- One of the challenges facing the Ministry of Health is the lack of a reliable digital system to monitor the logistics data of health commodities at the district and health facility level. The Ministry is working to restore the functionality of the mBrana system, which was designed to address this issue. However, until the mBrana system is fully operational, the Ministry is using temporary solutions such as google sheets to collect and analyze the stock status data of vaccines and supplies.
- UNICEF and Health Enabled, supported by Gavi, provided technical assistance to the EPI team has prepared a Draft National Roadmap on the Digital Health Information (DHI) for Immunization. In the document existing tools evaluated based on the WHO MAPS assessment and integration are prioritized in this roadmap. On the roadmap, revitalize, integrate, and mainstream mBrana mobile application used at Woreda levels with DHIS2 at facility, and Vitas; set up DHIS2 Logistics Module; integrate Cold Chain Equipment

Inventory (CCEI) into the existing MEMIs and DHIS2; integrate all logistics information for immunization as another use case of eHealth architecture implementation are prioritized and costed.

- The web-based cold chain equipment inventory tool designed by CHAI and handover by MOH, which was deployed at all regions to track and manage the national CCEs inventory data. National and sub-national level orientation was given and cascaded training for all regional, zonal and woredas during the initial phase of deployment. All woredas during the deployment started updating their data through the system and currently the utilization is compromised due to lack of updating the data on a regular basis and delay in the handover to the MoH system. There is an effort to revitalize the system and discussion is ongoing with MoH for the tool handover. Based on the recommendations given by the Health Enabled study, the cold chain inventory data integrated and added the cold chain module in the already available medical equipment management information system (MEMIS) database registered under the Ministry Health Information Technology directorate. Integration of Cold Chain Equipment Inventory (CCEI) into the existing MEMIs is completed, training manual prepared and approved by MOH HR CDP and two testing training sessions for biomedical engineers were conducted, and comments from training sessions incorporated. Deploying the system through the cascaded trainings for Regional, Zonal, Woreda and Health facilities with leadership of MOH and partners support is going on.
- There is also an effort to use Visibility for Vaccine (ViVA), a platform that is designed to monitor and visualize vaccine stock pipelines, vaccine stock level projections at EPSS center and hubs, and quickly identify and anticipate potential stock issues. The tool projects stock status using multiple data sources; from country stock inputs and UNICEF Supply Division (SD): annual vaccine consumption; confirmed vaccine deliveries from UNICEF, unconfirmed forecasts, campaign requirements; and national and regional stock levels. The National vaccine LTWG has been oriented on how to use ViVA, user accounts were created, stock data regularly shared with UNICEF for system update and currently shipment follow up is practiced through the system.

3. iSCM Human Resource Capacity & Development

- The country has deployed supply chain experts including technical advisors, vaccine supply chain focal, cold chain technicians to strengthen the immunization supply chain systems. Comprehensive training on vaccines and cold chain management was organized for cold store managers, vaccine deliverers, and cold van drivers; and training on CCE maintenance was also given to 28 Biomedical and cold chain technicians working at national and sub-national levels by MOH/RHBs and partners. EVM 2.0 managers training also provided for the 10 members of National vaccine TWG, and EVM 2.0 assessor training provided for 61 participants who represented from MOH, EPSS, and various iSCM partners. Vaccine and cold chain management training manual revised by considering the new development such as COVID-19 vaccines and other new vaccines and provided training of trainers for 54 trainees with the revised manual, then the cascaded training was conducted to health professionals working on immunization supply chain management.
- To enhance cold chain functionality at national , sub national stores and service delivery point, senior level cold chain managers training was provided for 28 technicians (Biomedical engineers) representative from MOH, RHB, ZHD and national blood bank on basic CCE maintenance, walk-in cold room installation and maintenance and back generators troubleshooting, and installation of SDDs and maintenance of Oxygen plant/pipeline. As part of ensuring optimal cold chain capacity and understating the temperature distribution in cold rooms, cold room temperature mapping was conducted at 11 EPSS hubs for a total of 23 walk-in cold rooms of different sizes. Major critical areas were identified, and cold room managers were oriented on corrective actions. The mapping result has also been presented for the EPSS management team to address issues related to performance gaps in the walk-in cold rooms. To understand the temperature monitoring practice across the supply chain system, the national temperature monitoring study (TMS) was officially launched on the 8th of June 2023. The study is being conducted in 10 EPSS hubs, 20 woredas, 20 health centers, and 20 health posts. The study will be completed by the end of October 2023. Regular supportive supervision on vaccine and

cold chain management was conducted at EPSS and health facilities. However, high turnover rate, skilled manpower, weak post-training follow-up, developing and using training database/tracker were the major challenges that needed due attention in the future.

4. Fundamental Cold chain equipment Infrastructure

- The vaccine cold chain is the backbone of an immunization program. It is a system for storing and transporting vaccines at recommended temperatures from the point of manufacture to the point of use, thus ensuring the potency and safety of vaccines throughout the transport and storage phases. Both static and outreach immunization service delivery depends on a reliable, adequate, and functional cold chain system.
- The cold chain infrastructure was enhanced with substantial investments from various sources. Cold rooms, freezer rooms, ultra-low freezers (UCC), cold van trucks, and passive containers were set up for national and sub national stores. Solar direct drive (SDD), On Grid refrigerators, Ice Pack freezers and passive devices and temperature monitoring devices were deployed at district and service delivery points through SDG-PF, GAVI CCEOP, World bank.....etc. There has been a growing demand for cold chain equipment in Ethiopia because of population growth, expansion of health services, an increase in immunization coverage, introduction of new vaccines and revised vaccination schedule.
- The MOH has stepped up its efforts over the last decade to upgrade and expand the existing cold chain through a comprehensive cold chain rehabilitation plan following an initial cold chain inventory in 2002, six times the number of cold chain equipment in the country between 2002 and 2023, from 4,835 to 29,294. At the EPSS central level, the cold chain storage capacity increased from 75 m3 in 2,004 to 509 m3 in 2023. Similarly, the Cold chain capacity at EPSS Hubs is significantly improved (2,753M3).
- As per updated cold chain equipment inventory 2023, the country has a total of 29,294 cold chain equipment, of which 23,229 (79%) functioning well, or waiting for installation (5,938 on the pipeline), 1,627 (6%) are not functional which needs repair. Major reasons for non-functionality of CCEs are shortage of spare parts and responsibility assignment of

the technicians at lower supply chain levels. In addition, a total of 3,155 refrigerators and freezers have been identified as completely damaged in five regions of the country namely Tigray, Amhara, Afar, Oromia and Benishangul due to war/conflict. From the total equipment inventoried 4,438 (15%) are obsolete which will be removed from the system.

- As per the 2023 inventory data there are a total of 19,434 and 47,893 Cold boxes and vaccine carriers, respectively cold boxes are available to support vaccine storage and distribution in hard-to-reach areas during SIA campaigns and for routine immunization service delivery post-campaigns (e.g., mobile and outreach teams).
- To improve the cold chain equipment management system and data visibility, cold chain equipment inventory was integrated with MOH medical equipment management information system (MEMIS). However, several challenges, such as improper handling of cold chain equipment, inadequate curative maintenance, shortage of spare parts, and CCE damage due to conflict, which needs a coordinated effort to overcome.

5. Temperature Monitoring

- As temperature monitoring is a critical part of the cold chain system, it is necessary to have proper temperature monitoring devices and good temperature monitoring practices including cold room mapping and periodic calibration of CCEs and refrigerated vehicles. To maintain proper temperature monitoring at lower levels, fridge tags were procured and distributed.
- Remote Temperature Monitoring Device (RTMD) was installed for cold rooms in 90% of EPSS hubs and temperature monitoring feedback is being shared from the center to all hubs. Poor connectivity, shortage of recording tools, technical skill gaps, and poor monitoring and evaluation system and limited data use practice at all levels.
- RTMDs are currently used for temperature monitoring at national and sub national cold rooms. The data utilization from these devices is compromised due to lack of continuous functionality because of connectivity; poor follow-up and sub-optimal coordination with the suppliers. To revitalize the RTMD functionality at EPSS, there are efforts and collaborative works ongoing with suppliers and supporting partners. Regarding the

visibility of SDDs (for BMedical systems), user training, access (username and password) is given for the responsible personnel at each structure where CCE are deployed. But the utilization is sub-optimal and requires strong follow up.

6. Vaccine distribution and stock management

- Ethiopia is employing a mix of four and three supply chain tier systems for the delivery of immunization supplies. In the four-tier system, products are delivered from the EPSS center to EPSS hubs, then to woredas, and finally to HFs. In the three-tier system, products are delivered from central to EPSS hubs, and then directly to health facilities. HCs are responsible for transporting vaccines and supplies to their catchment HPs for the fixed and outreach services delivery points. Health facilities use motorbikes, animal transportation, volunteers, and other locally available modalities to transport vaccines and supplies to service delivery points. However, there is a shortage of vehicles and motorbikes that hinders transporting vaccine and other supplies, especially from HC to HP and outreach sites. Previously motor bikes were given to HFs to facilitate the immunization performance with different donor's support. The motorbike has been around for a long time and are too old to use.
- The distribution of vaccines and related supplies is carried out quarterly from the center to hubs, and woredas and HFs are refilled monthly from respective catchment EPSS hubs. Refrigerated trucks are used for the distribution of vaccines from the center to the hubs, while EPSS hubs are using non-refrigerated vehicles with cold boxes to deliver vaccines to woredas and HFs. Currently 11 min sized refrigerator truck is functional for vaccine distribution throughout the system out of 20 deployed trucks but 39 refrigerator truck is required to deliver health facilities in addition to the available functional refrigerated trucks, occasionally, airlift distribution also used for conflict affected and inaccessible area during emergency time, as of October 2023, the vaccine last mile delivery performance had been improved from 1,251(30%) to 1,846 (46%) health facilities the remaining 54 % of HFs are receiving vaccines and related supplies through woreda health office ,Low performance of last-mile delivery is due to capacity limitations, including a

shortage of cold vans, small vehicles to transport to hard-to-reach areas, and poor road infrastructure while the country cMYP (2021 -2025) plan indicate to reach 90% last mile delivery for health centers and hospitals by the end of 2025.

- The last mile vaccine delivery will be prioritized for woredas with high number of zero doses (447) and hubs serving those woredas will be capacitated by deploying additional vehicles to support the last mile delivery.
- As part of ensuring last mile delivery expansion, a pilot project is being implemented in Hawassa EPSS hub catchment, at Sidama region, Wolayita (SNNPR), and West Arsi (Oromia). This integrated last mile delivery project is being implemented by commissioning a private company and is directly delivering vaccine and dry supplies to 285 HFs monthly. As indicated in the FPP, the last mile delivery will be extended piloting to additional two EPSS hubs, namely Negele Borena and Jijiga hubs, serving woredas with a high number of zero doses. The other EPSS hubs expected to expand LMD by mobilizing resources from their own and others with some technical support from different partners.
- In Ethiopia, the outsourcing of health Commodity distribution including vaccines is found at the infant stage and there are few private companies with limited resources. To encourage this Public Private Partnership, MOH and EPSS have already piloted the Last-Mile Delivery. The actual practice of this piloted initiative has been conducted by resource sharing between EPSS and the Private Company. These resource sharing includes LMIS tools and Technology, Vehicles and Fleet management, Human resource, and different related Operational Costs.
- There was low engagement of humanitarian organizations in logistics delivery. Currently humanitarian organizations like IRC, WFP, UNICEF, and others are supporting the health system by delivering health commodities to districts with security problems. There is a need to strengthen the partnership and collaboration with these humanitarian actors to maximize efficiency and improve access to service delivery and reach underserved populations.

7. Waste management

- The waste management system broadly encompasses three areas: availability of policy guidance (directive or manual or SOPs) for safe waste disposal, infrastructure for safe disposal and capacity building (awareness, training & supportive supervision) of individuals responsible for handling immunization waste.
- Currently, there is no well-established waste management system to properly dispose of waste of vaccines and related supplies in an environmentally friendly manner. As access to safe disposal facilities is not available, those institutions which are practicing disposal are being forced to use unsafe disposal methods (low temperature incineration, burial) to destroy waste which have a potential impact on public health and the environment, nonfunctional of locally available low temperature incinerators. Skill gaps on waste management are also another reason for improper waste management at HFs.
- To address the gap, MoH and EPSS installed eight modern incinerators in 2019 at Adama, Bahir Dar, Dessie, Hawassa, Mekele, and Nekemte hubs, whereas Jimma and Jigjiga sites are waiting for installation. These incinerators are supposed to be used to dispose of waste which can be incinerated (e.g., needles from vaccines and related supplies waste) and they are accessible for EPSS hubs and big hospitals in cities, but not accessible for most HCs in the country. Tools and required inputs for encapsulation/energization methods which are appropriate disposal methods for ampules, vials of vaccines are not yet available.
- According to the national CCE inventory report (2020), most of the HFs do not have a proper incineration system. This will certainly affect the waste disposal system in HFs. To address this, a proper waste management system needs to be in place at national (model disposal facility) and sub-national levels. This will include the incineration equipment, tools for encapsulation/ energization, mechanisms to separate the waste, reverse logistics, personal Protective Equipment (PPE) for waste handling, operational and maintenance costs, training, and supervision of personnel involved in handling of wastes. In addition, benchmarking against other countries experiences will provide more insights for establishing well-functioning waste disposal system.

Vaccine stockout: The country has a strong LTWG tasked to oversee and monitor the management of vaccine stock status at all levels. The above table indicated, the closed vial wastage rate of DTP containing vaccine for year 2021, 2022 and 2023 was 0.55%, 0.38% and 0.21% respectively. Along with the good stock management and inventory accuracy, the closed vial wastage rate is persistently below 1%, which is far below WHO unavoidable recommended wastage rate of 2%.

Regarding the number of health facilities that reported no stock-outs of DTP and Measles containing vaccine; there was no system for data collection before 2023, however in 2023 onwards, the country started 3rd level logistics data collection using google sheet to improve the vaccine stock monitoring and data visibility, but there is still data quality issue at district and HF level.

Vaccine stockout reports	
Indicator(s): ● #of health facilities that reported no stock-outs of DTP containing vaccine ● # of health facilities that reported no stock-outs of Measles containing vaccines. ● Closed vial wastage of Penta	

		Year	# of HFs that reported no stock-outs of Penta		# of HFs that reported no stock-outs of Measles		
		2021	NA		NA		
		2022	NA		NA		
		2023	92% ¹		93%		
	Years	Closed vial wastage rate of DTP-containing vaccine					
		At EPSS hubs ²	At HFs ³	Total Unopen	Total Managed Doses	Closed vial Wastage Rate	
		2021	181,987 ⁴	39,310	40,269	7305250	0.55%
		2022	4,114	30,128	34,242	9043350	0.38%
		2023	47	17,152	17,199	8154140	0.21%

Vaccine forecast and shipments: Every year, the country conducts a vaccine and related supplies forecast exercise considering the following parameters such target population and coverage, wastage rates (WHO estimate), buffer stock, min-max inventory level, in-country stock balances including pipeline, past shipment data and other relevant variables. Furthermore, the forecast exercise also considers GAVI approved doses with the forecast for GAVI financed vaccines such as Penta, PCV, Rota, HPV, Measles and IPV.

Regularly conduct vaccine and dry supplies stock status analysis and discussed by the national vaccine logistics technical group on monthly base, those analysis are used to trigger and/or stager additional and subsequent shipments, adjust quantity order and time of shipments; Similarly, stock status analysis conducted at subnational level by the sub national level technical working group.

¹ Data source is the manual google sheet collected from health facilities.

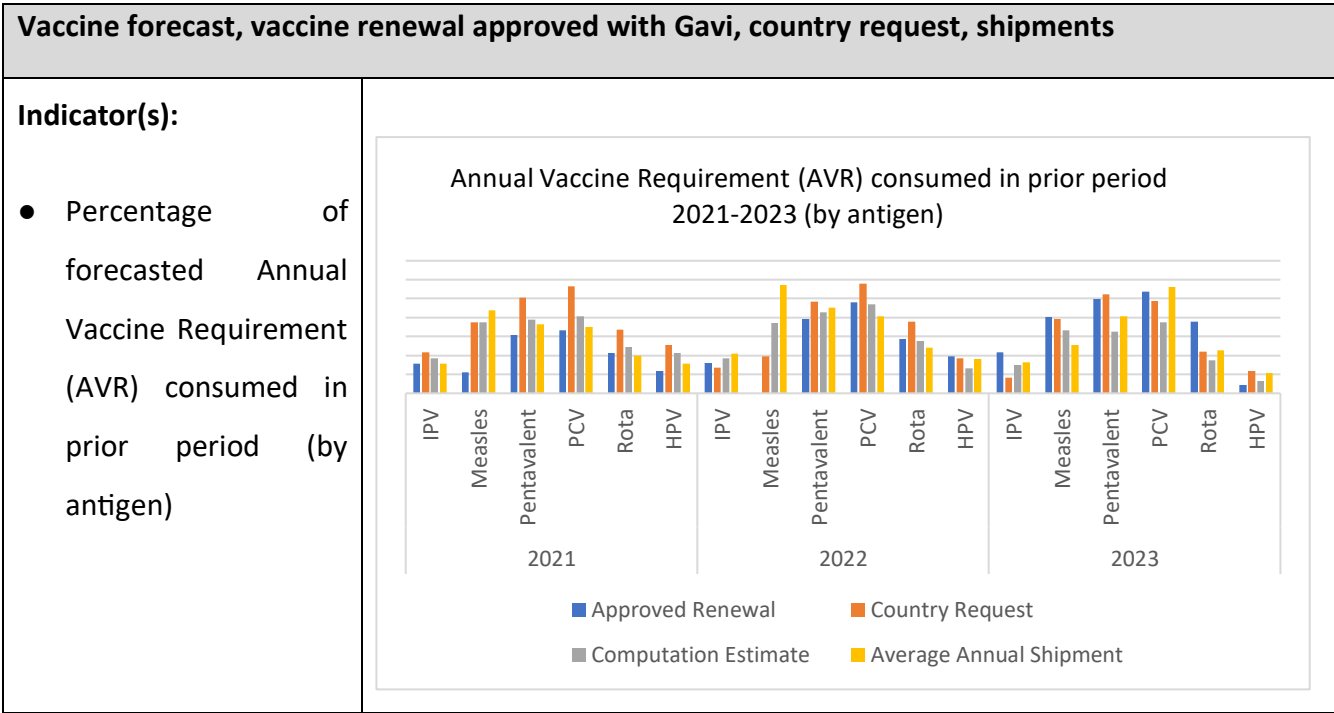
² Data source HCMIS/VITAS

³ Data source DHIS2

⁴ A total of 181,028 doses was damaged at Dessie hub during the conflict.

As a result, the country did not experience significant stock out, overstock and wastage due to forecasting accuracy.

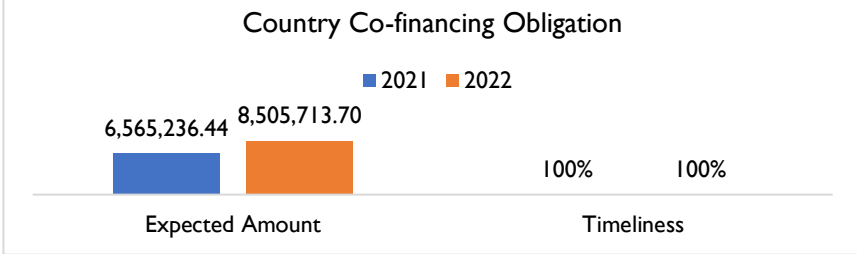
Despite the regular exercises on the stock status, there are still gaps on usage of country specific wastage data, conducting vaccine forecast accuracy assessment, data visibility at woreda and service delivery points, regular logistics versus program data triangulation, stock imbalance.



Government financing: Regarding, the government of Ethiopia is committed to fulfilling co financing obligations. As of date, there has been no incidence of defaulting on fulfilling co financing obligations.

Co-financing payments for the years 2021 and 2022 were fully met according to the expected obligations. The amount paid in 2021 was 6,565,236.44\$, while the amount paid in 2022 was 8,505,713.7\$. The Ministry of health has confirmed that the co-financing obligation for the year 2023 will be met according to the planned schedule (before the end of June 2024). In addition to the budget committed for the procurement of traditional vaccines, adequate budget has been allocated to fulfil 2023.

Ethiopia co-financing

Indicator(s): Country co-financing obligation met in a timely manner.	Country Co-financing Obligation <table><thead><tr><th>Category</th><th>2021</th><th>2022</th></tr></thead><tbody><tr><td>Expected Amount</td><td>6,565,236.44</td><td>8,505,713.70</td></tr><tr><td>Timeliness</td><td>100%</td><td>100%</td></tr></tbody></table>	Category	2021	2022	Expected Amount	6,565,236.44	8,505,713.70	Timeliness	100%	100%
Category	2021	2022								
Expected Amount	6,565,236.44	8,505,713.70								
Timeliness	100%	100%								

Adverse event following immunization performance

The ministry of health, through its independent implementing agency Ethiopian Food and Drug Authority (EFDA) has been working on product registration and licencing, safety monitoring and others. There are several remarkable performances achieved over last years with support of different organizations including Gavi.

- Pharmacovigilance system stretched strong system of vaccine safety and adverse event following immunization monitoring. National AEFI monitoring system assessment conducted provision of basic trainings, continuous supportive supervision, monitoring and evaluation done. Through this and other activities the pharmacovigilance department of Ethiopian FDA achieved maturity Level 3 (ML-3) by World Health Organization (WHO) global bench marking tool (GBT) audit.
- EFDA to enhance detection, collection and reporting of AEFI s from Covid-19 vaccines and routine immunization. EFDA has detected, collected, analyzed and reported thousands of AEFIs from routine immunization as well as supplementary immunization activities (SIAs). Standard reporting forms of paper based and electronic, AEFI line list used to collect and report these cases. Those AEFIs reported to Ethiopian FDA are encoded in to Vigiflow mainly by routine activities and by organizing workshop intermittently. Data vigilization is the last step of AEFI data management in which thousands of ICSRs are committed and shared to global community. Uppsala monitoring centre report (Dec 2022) shows Ethiopia has ranked third level from Africa and 37th from world by vigilization/shared ICSRs.
- EFDA has established six regionals decentralized pharmacovigilance centres to further widen and strengthening the existing AEFI monitoring and pharmacovigilance system.

- Fast track vaccine registration system developed and integrated with national electronic regulatory information system (eRIS) for quick port clearance procedure and market authorization.
- Established of regional Adverse Event Following Immunization (AEFI) task force (TF) at twelve regions. Regional AEFI TF is composed of multiple experts from public health emergency management, EPI program, Pharmacy service, regional regulator bodies, and EFDA branches to facilitate and investigate the eligible cases in consultation with national pharmacovigilance center.
- Established strong and dedicated national pharmacovigilance advisory committee (NPAC) in which the members are highly expertise senior physicians, senior pharmacists and academicians. The NPAC meets on regular basis, classify investigated serious AEFI cases and other serious adverse drug reactions (ADRs) by using WHO causality assessment algorithm software. Thus, for two persons, one male (serious case from Johnson and Johnson covid-19 vaccine) and one female (serious case from Pfizer covid-19 vaccine) based on NPAC classification no fault compensation was paid by COVAX.

With support of Gavi the following activities were implemented;

S.No	Thematic area	Achievement
1	Enhanced Covid-19 and Routine immunization Adverse Event Following Immunization (AEFI) detection, collection, and reporting	• 38,773 Individual case Safety reports (ICSRs) from AstraZeneca, Sino pharm, Johnson and Johnson, Pfizer and other routine immunization detected and reported using AEFI line list, med safety app, vigilance hub and other reporting mechanisms
2	Strengthened Covid-19 vaccine and RI pharmacovigilance system	• Established 12 AEFI Task force at twelve regions, • Trained 1,250 health care professionals (HCPs) and regulatory experts in eight regions. • Supportive supervision conducted in 12 regions with three rounds. • Conducted regular AEFI review meetings in every six months. • Hired two senior technical assistants at central EFDA to support AEFI monitoring system
3	Enhanced serious AEFI case detection and reporting system	• 53 serious AEFI cases are detected and investigated by head office and regional investigation task force within 24 months

	Conducted serious AEFI case investigation	At national level 52 serious AEFI cases investigation conducted within 24 project months
	Conducted serious case causality assessment	For 52 national level investigated cases causality assessment and classification done with GAVI support
4	Boosted individual cases safety report/AEFI data entry	38,773 ICSRs entered in to vigiflow by routine AEFI planned activities and home based
	Boosted individual cases safety report/AEFI data vigilization	13,822 ICSRs committed home based and by routine planned activities
5	Vaccine Quality laboratory renovation construction	- A vaccine lab building after bidding the list of contractors and evaluation by engineering parameters the new vaccine laboratory building has been started construction in 2022, - Currently Hawassa vaccine laboratory building renovation completed 92%
6	Vaccine safety and AEFI monitoring training provided for healthcare professionals and regulatory experts	- Provided ToT training for a total number of 170 regulatory experts from two city administrations and nine regions about Covid 19 and routine immunization vaccine safety and AEFI monitoring. - About 5,235 HCPs trained regarding Covid-19 vaccine safety and AEFI monitoring
7	Vaccine fast track registration system strengthened	Fast track vaccine registration system developed and integrated with national electronic regulatory information system (eRIS)
8	Vaccine cold chain management functionality and quality assurance performed	Post marketing surveillance program implemented for vaccine cold chain evaluation at 12 Ethiopian pharmaceutical supply service (EPSS) hubs and EPSS central and its quality was approved
9	Conducted national AEFI monitoring system assessment	National AEFI monitoring assessment conducted at regional, zonal, woreda and health facility level
10	Completed active vaccine safety surveillance study for Covid 19 vaccines (AstraZeneca (AZ), Johnson and Johnson (JJ), Pfizer (PF)) and under analysis for Sino pharm (SP) Covid-19 vaccine	Active safety surveillance conducted by developing protocols and necessary data collection tools for AZ, PF, JJ Covid-19 vaccines
11	Advocacy and Vaccine Safety risk communication meeting conducted with different stake holders	Four times national advocacy and Covid-19 vaccine safety/AEFI risk communication conducted

12	Procured 4 x 4 hard top vehicles and motor bikes	• Procured 36 vehicles and 22 motor bikes for vaccine safety and AEFI monitoring system strengthening. • Twenty-two vehicles distributed to EFDA branch Offices and regional health regulatory bodies. • Fourteen vehicles deployed to EFDA central offices. • Twenty-two motor bikes distributed to EFDA central and branch offices for strengthening of AEFI monitoring system
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Despite all the progress achieved by the Ministry of health and EFDA on vaccine safety monitoring there are still missing AEFI reports, there is knowledge gap on basic and advanced AEFI monitoring system as well as intermittent delays in serious case investigation.

Immunization program Demand creation and communication

Immunization program Demand creation and communication

The immunization program organized communication technical working group with participation of partners to coordinate, plan, implement and monitor immunization demand creation and communication activities. The working group, under the guidance the EPI team, produced and facilitated several interventions and guiding documents for the demand creation and communication.

- COVID 19 vaccination demand creation communication training materials and communication materials in different languages and formats produced.
- Routine immunization demand creation communication plan of action at national level, training materials and communication materials produced.
- Different and multiple advocacy and sensitization workshops, social mobilization and community engagement and program communication activities have been conducted.
- National, regional and subnational level advocacy workshops with the decision makers, influencers like religious leaders, stake holders like professional associations, Ethiopian federation of People with disability associations, and sensitization workshops for media professionals, hotline counsellors, and social mobilizers have been done.

- Panel discussion and expert interview have been conducted.
- Social media messages and SMS messages have been transmitted through social media outlets and Ethio telecom.
- TV and Radio spot messages have been produced and broadcasted through different media outlets. Repeated media briefing, press release and synchronized launching of the vaccine at national and subnational level with engagement of higher officials, religious leaders and all Medias have been done.
- Community conversation has been conducted to increase awareness and manage misinformation and disinformation's circulating in the community.
- Tailored communication campaign among IDP, refugees and youth population were conducted.

Despite all the efforts, there are challenges on demand creation works such as limitation of budgets and evolving nature of COVID 19 require continues work. Absences of trained staff on demand creation and communication at subnational levels and structural limitations affects full implementation of demand creation and communication activities at subnational and community levels.

Immunization program management

1. Immunization program Leadership, management, and coordination

The immunization program has clear leadership, management, and coordination (LMC) platforms to provide guidance and support on the EPI tasks. The ministry of health recently reformed its structure and re-organized the departments. The former Expanded immunization program case team is now changed into immunization service desk. The immunization service desk is one the desk under the maternal child adolescent health service lead office (MCAH-LEO). MCAH-LEO is under the state minister program and service wing. At the region, zonal, woreda and PHCU level the coordination structure continued as it is. Each level has its own administrative structure and decision-making power for its catchment population.

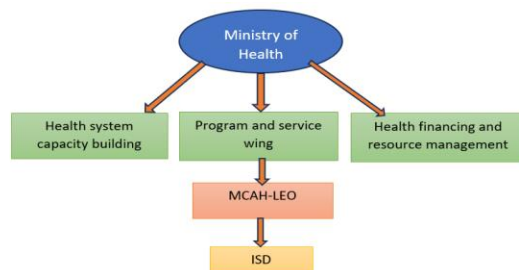


Figure: Immunization Service Desk (ISD) structure under the MoH.

There are two coordination platforms of the immunization program, the first one is Pure government structure coordination platform, which is only the government decision making body take part. These platforms are Executive Committee (EC) forum, MoH Management forum, Lead Executive Office forum, Transformation Forum (TF) and Service Desk forum. In this platform at different level immunization will be coordinated, monitored, reviewed, and guided. Second one is coordination platform involves donors, partners, and stakeholders, among these Interagency Coordinating Committee (ICC), National Immunization Technical Advisory Group (E-NITAG), immunization task force and the technical sub-working groups (TWGs). Each coordination platform has its own term of reference and managed accordingly. In addition to immunization specific coordination platforms there are other platforms where immunization is also considered as one program with others program. Joint Steering Committee (JSC), Joint Consultative Forum (JCF), The Joint Core Coordinating Committee (JCCC) coordination platforms were useful to mobilize resources for the program.

i. Interagency Coordinating Committee (ICC)

The ICC is the highest coordination platform for immunization program assisting the MOH in technically and resource mobilization. It is chaired by the state minister program and service wing but during COVID 19 it is also led by the Minister. As member MoH agency heads, departments, and head of CSO within the country working on Immunization. The last to 2-3 years the ICC made several key decisions to implemented by the immunization program.

Table 1: ICC decisions and implementation status of each activity

S.no	Recommendation	Date	Implementation status
1	ICC endorsed the Measles SIA 2022 application	30 June 2021	Measles SIA was Fully implemented in December 2022 in integration manner

4	ICC endorsed National Covid 19 deployment and vaccination plan (NDVP), Gavi TCA 2021 application, and nOPV2 vaccine utilization for CVDP2 outbreak response utilization	04 March 2021	COVID 19 vaccination has been guided with NDVP and implemented the plan and then revised, TCA was implemented according to the plan with partners and completed, and fully implemented Ethiopia introduced used nOPV2 vaccine for the CVDPV2 outbreak response
7	ICC endorsed the Catch-up vaccination guideline, the revised NDVP-3, ICC endorsed the IPV2 vaccine introduction application, the Gavi CDS3 application and Gavi Full portfolio plan (FPP)	09 Nov 2022	Catch up is under implementation per the policy to reach zero dose and under vaccinated children, Currently Revised NDVP is under implementation and implemented based on revised context, IPV2 application was approved by Gavi, and fund is under disbursement to MoH implementation will be in 2016 EFY, Gavi FPP application was approved by Gavi and decision letter from Gavi was received, and fund disbursed for implementation and Gavi FPP application was approved by Gavi and decision letter from Gavi was received, and fund disbursed for implementation.
12	ICC endorsed the HPV single dose Switch, HPV MAC implementation, CCEOP 2 plan, and Accelerated plan to address zero dose and under vaccinated children on	31 August 2023	The implementation is started following the ICC endorsement of the plans.

The ICC also supported by the technical arm of national immunization technical advisory group (NITAG) and Immunization task force.

ii. Ethiopian- National Immunization Technical Advisory Group (E-NITAG)

The E-NITAG established in 2016 is composed of national independent multidisciplinary professionals to advise the MOH on policies, scientific and technical matters related to immunization and vaccines. The MoH will review, prioritize, and make final decisions on all

recommendations provided by the NITAG. NITAG has made several key recommendations for the national immunization program and the program has been working based on the recommendation. The EPI team has a close working relationship and an excellent track record of implementing NITAG recommendations.

Table 2: NITAG recommendations and implementation status

E-NITAG Recommendation	Dated on	Status
1) Endorsed Ethiopian National Deployment and Vaccination Plan (NDVP) for COVID-19 Vaccines. 2) Endorsed using the Oxford AstraZeneca COVID 19 vaccine under EUL Authorization to fight the COVID 19 Pandemic in Ethiopia for adults 18 years and above, and for special population groups. 3) The NITAG endorsed the use of multiple vaccines as long as approved by EFDA. 4) Endorsed the WHO SAGE recommendations guidance on vaccination for special population and feasibility of implementation of particular vaccine in Ethiopia.	23 Feb 2021	Implementation on-going.
1) Endorsed the Pfizer vaccine to be administered to above 12 years. 2) Recommended to maintain high priority for primary vaccination coverage. 3) Endorsed booster and/or additional doses administration for special population groups with special risk or health condition as well as to meet mandatory requirements for travelers. 4) Recommended to apply 'Mix and Match' schedule (heterologous priming) only during vaccine shortage. The vaccine interval shall be according to the interval recommended for first vaccine taken. Routinely, the same vaccine doses are recommended unless shortage is encountered. 5) Strongly advised not to make COVID vaccination mandatory to any pregnant or lactating or women who are not sure about their pregnancy status. However, when necessary, the Pfizer vaccine should be used for these group.	02 Nov, 2021	Integrated into the vaccination plan
1) 2022 Measles SIAs Application is unanimously endorsed by the NITAG members.	29 June, 2021	Implemented on Dec 2022

1) E-NITAG recommended the introduction of a booster dose to fight the expected Omicron wave in advance. Priority target population for the booster shall include health workers, persons with comorbidity, older age groups (40+), special needs population, travelers required to be vaccinated, and any other groups considered high priority by the MOH including lowering the age cut off, if vaccine is sufficiently available	14 Dec 2021	It has been under implementation
1) Technical guidance of second dose of Inactivated polio virus vaccine (IPV) introduction into the immunization and the schedule for the IPV2 Vaccination time	15 June 2022,	Under implementation
1) After thorough deliberation, the E-NITAG recommended delaying introducing a single-dose HPV vaccine until sufficient evidence is available. The E-NITAG also agreed to re-examine its recommendation after additional review of evidence on the single-dose schedule of the HPV vaccine in its next meeting.	09 Mar 2023,	Evidence reviewed and presented again
1) NITAG recommends Switching to a single dose HPV vaccination. After thorough revision of evidence.	1 June 2023	Implementation undergoing on

The NITAG performance was assessed by external team by WHO in June, 2023. Ethiopian NITAG achieved more than 88% overall achievement. The immunization program is working to sustain the achievement and working to address the gaps observed by the independent assessment like allocating resources, capacity building for the NITAG members, assigning dedicated secretary for NITAG. NITAG work is also available on MoH website and NITAG also working to publish its work for wider dissemination. Despite excellent performance of NITAG, there are challenges to further strengthen the NITAG, majorly financial constraints to avail at least one dedicated NITAG secretary, to facilitate trainings for NITAG members and to convene workshops, dedicated office, and others. The NITAG is also working to revise its ToR and add new members in different positions to expand diversity of expertise.

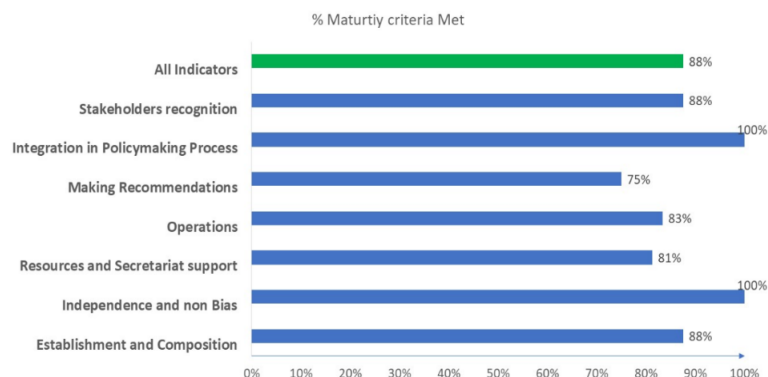


Figure 1: Overall rating of maturity criteria, E-NITAG External Assessment, June 2023

Gavi has also contributed in the NITAG effort through its LMC and TCA and LMC support, the technical assistants deployed at national level has been supporting NITAG in evidence collection, preparing minutes, and arranging the meetings and others in addition to their work.

iii. The Immunization Taskforce

The national immunization task force is the other coordination platform which is the technical arm of Interagency Coordinating Committee (ICC) and lead by the EPI manager. Under the task force there supporting sub working groups like monitoring and evaluation team, communication, logistics and others. These working groups have members of related subject experts and specialists who facilitate the actualization of key and specialized activities of immunization program and reports back to the taskforce.

Immunization service desk head organizes the regular monthly taskforce meetings to ensure the relevant stakeholders are informed of the action points in due time. There is good practice that the task force meeting held virtually, in some case the task force meeting also engages the subnational team to participate in the meeting. During the campaign the task force also engages higher officials to lead the meeting and provide directions on the work. The virtual platform is an excellent platform for the EPI team to review, monitor and provide short orientation to the subnational team. The challenge is internet cost for most government staff is challenge. As promising practice virtual platform utilization to be regular. The MoH also revised the Taskforce ToR to effectively coordinate the immunization program considering the current context.

The technical assistance deployed at the ministry of health and regions through partners by the Gavi support has been contributing significantly to support the immunization taskforce on preparing technical documents, financial proposal, facilitating the taskforce meeting, capacity building, evidence synthesis and others to strengthen the program.

iv. Immunization service desk and subnational (Region) coordination

The immunization desk has been closely working with subnational (Regions) counterpart on immunization activities has coordination modality. The ministry Immunization service desk shares its key priority activities of the year during the planning period. During implementation the ministry team close monitoring through supervision, review, and capacity building. The Ministry also coordinates initiatives that are planned by the ministry with its regional counterpart. During the campaign virtual platform is arranged with regions to discuss the on the implementation and act on time on things to be corrected. The Ministry has very promising practice on coordination with subnational during the campaign time, but this must be scaled used for the routine program regularly. Because of the challenges of the staff number regular meetings have been cancelled because of other priority. Gavi also contributing to strengthening MoH and MoH EPI coordination platform through LMC support on COVAX and TCA.

2. Human Resource and Capacity building

i. Human Resources

The human resources positions along with structures of EPI is insufficient to run the immunization program across the country. The program is expanding from time to time, but the government positions did not revise based on the workload and contexts. COVID 19 pandemic response, new vaccine's introductions, campaigns and others have been demanding to have additional staffs however the government were not able to expand because of multiple priority. Thus, the ministry worked out with donors, partners to have technical assistants at national and subnational level with significant numbers to execute the tasks. The technical assistant support has been impactful and result oriented.

Technical assistants recruited through COVID-19 pandemic response and TCA support has brought an opportunity to recruit technical assistants to support the national and sub-national level overall prevention and control of COVID-19 pandemic by increasing the human resource surge team. The technical assistants with the existing government system strongly working on COVID-19 vaccination program planning and coordination, capacity building, logistics, demand promotion activities, AEFI and VPD surveillance and the monitoring and evaluation activities. The

technical assistants support is not limited to COVID related activities, rather they are supporting the routine immunisation system by closely working with the EPI program such as during the organization, implementation and monitoring and evaluation of routine immunization, campaigns/ SIA, catch up, new vaccine introduction and vaccine switch processes.

There are challenges in technical assistant supports there has been short contract period and delay in fund disbursement by donors this result contract termination and difficulty to sustain their technical support.

ii. Capacity Building

The ministry of health has been working to capacitate the immunization workforce through the pre-service and in service training programs.

Pre-service training: with support of GAVI-HSS3 project for the preservice education of Health extension workers to upgrade from Level III to Level IV: Human Resource for Health Development and Improvement Lead Executive office trained 5,351 Health extension workers on immunization program in different parts of country.

S/No	Region	HEWs enrolled to upgrade Level 4	No of students graduated	Remark
1	Tigray	322	322	
2	Afar	162	162	
3	Amhara	1,156	1,156	
4	Oromia	1,844	1,844	
5	Somali	534	534	
6	B/Gumuz	98	98	
7	SNNPR	861	861	
8	Gambela	71	71	
9	Hareri	41	41	
10	Dire Dawa	47	47	
11	Sidama	215	215	
	Total	5,351	5,351	

Pre-service training: With support of Gavi HSS3, Covid 19 pandemic support several health workers, program managers have been capacitated on different immunization areas. Mid-level managers training, immunization in practice, COVID 19 vaccination, immunization refreshment training, vaccinology, vaccine management training, AEFI training, and others were provided.

No	Trainings	Regions								Total
		Amhara	Oromia	SNNP	BG	<u>Gambella</u>	<u>Sidama</u>	Somali	Afar	
1	MLM	66	83	0	0	33	66	0	96	344
2	IIP	496	163	0	264	86	54	0	975	2,038
3	IRT	1585	2261	80	769	160	150	1477	1053	7,535
4	DQS	360	408	0						768

Despite several efforts to capacitate the health workers and managers, there is still challenge of high turnover, attritions of staffs. This requires continues capacity building work from the program to fill the gaps.

3. Financial management

Grant	Recipient	Status as of <7, July 2023>						Compliance**	
		Disbursed	Expenditure	Utilization (%)	Advance and cash balance	Cash committed balance	Fin. Rep	Audit	
CDS 1	MOH	14,599,670.00	12,311,229.29	70%	2,243,446.86		7/7/2023	7/7/2023	
CDS 2	MOH	8,182,845.71	7,284,493.53	100%	261,143.96		7/8/2023	7/8/2023	
CDS 2	MOH	5,485,070.00		100%	5,485,070.00		7/8/2023	7/8/2023	
HSS 2	MOH	11,639,725.00	13,646,965.00	100%	418,858.24		7/9/2023	7/9/2023	
HSS 3	MOH	23,499,964.00	22,614,832.00	100%	786,329.79	Committed for procurement in advance payment	7/10/2023	7/10/2023	
MESELES 22	MOH	9,682,401.00	5,249,908.00	100%	36,948.16		7/11/2023	7/11/2023	
MESELES 20	MOH	9,717,537.00	8,128,540.00	100%			7/12/2023	7/12/2023	
PIRI	MOH	2,477,773.70		100%	2,477,773.70		11/10/2023	11/10/2023	
	MOH								

Remark

Under the grant of GAVI HSS3 showed committed cash balance in EPSS procurement budget Among 17 items under procurement of UNOPS 13 items are received at EPSS warehouse. According to UNOPS Oct.10, 2023 procurement status update the remains 4 vehicles expected delivery. So, the balance will be settled after delivery of the following vehicles.

1. Big refrigerators truck, - Nov/2023
2. Mid refrigerators trucks – -NOV/2023
3. Mid Van Dry- -Oct 24/2023
4. Mini Van Dry -Nov/ 2023

Regarding, the ability of Ethiopia to effectively absorb GAVI and other funding depends on several factors, often referred to as drivers. There are challenges at the ministry of health in fund absorption because of delay in program implementation due to different reasons (Insecurity, priority change, supply issues and others), there is also delay in liquidation, noncompliance to reporting formats, and others. Sometimes there are delay in fund disbursement from donors to implement the activities. Thus, the ministry of health is working with supporting partners like Gavi to improve absorption of finance and effectively manage the finance. These drivers can impact the country's capacity to utilize the funds efficiently and effectively.

Here are a few key drivers that ministry is working for to improve the absorption of GAVI and others funds:

1. **Health System Capacity:** The strength and capacity of a country's health system play a critical role in absorbing and effectively utilizing GAVI funding. This includes factors such as the availability of trained healthcare workers, infrastructure, supply chain management, and information systems, in this case the Ministry of Health with GAVI and other partners support avail the trained health workers with financial experts, infrastructure and the management vaccine and cold chain management prepared and provided training of trainer (TOT) for health professionals with cascading to Woredas level.
2. **Governance and Accountability:** Government has its own structure from national, Regional, Zonal and Woreda level that enhance transparent and accountable governance systems are essential for effective fund absorption and ensuring that it reaches the intended beneficiaries.
3. **Financial Management** is the process of managing funds that provided by GAVI and other partners after receiving the fund as MOH and disbursing to national level, agencies, and regions based on financial management guideline, Grant management manual and Project management implementation manual with respect to budget break down activates that enhance effective financial management practices, including budgeting, financial reporting, and auditing, are vital for absorbing GAVI funding.

4. Procurement and Supply Chain Management and cold room maintenance services: MOH has its own procurement Executive Office that implemented the procurement system based on government and donor's terms and regulations. In addition any drug and supplies are procured through Ethiopian pharmaceuticals Supply Service (EPSS) like procurement of vehicles generators various cold chain equipment (CCEs), material equipment handling (MHE) and others UNICEF and UNOPS, well-functioning procurement and supply chain system is crucial for the efficient delivery of vaccines and other health commodities and which have systems in place to procure, store, and distribute vaccines effectively, minimizing wastage and ensuring a reliable supply to healthcare facilities and Installation renovation and relocation of cold room and warehouse.
5. Monitoring and Evaluation: MOH has monitoring and evaluation systems from national to facility level how to implement the program and tracking budget utilization and liquidation status of the grants with in the given period of time through Integrated supportive supervision, review meeting, capacity building and mentoring, that enable Ministry to track the progress and allows for the identification of challenges and way forward, timely course corrections and ensuring that the funding is being utilized effectively

The ministry of health has been working to progress on grant implementation requirements the Strategic Affairs Executive Office Lead the grants from pre-award, post-award and close out whose responsibilities in MOH to liaise the development partners, implementing Executive Offices and Finance Executive office, particularly tracking and monitoring the budget, coordination and preparing the financial and programme narrative reports; in this case GAVI grant implementation has been provided big attention and working with implementing programme integrative way. And try to develop the guidelines and implementation from the plans.

Regarding implementation of audit recommendations, the Ministry of Health has been working stringently to address the gaps. The ministry of health developed an action plan to address those recommendation and gaps observed. The ministry prepared financial manual

in 2022 to mitigate all the gaps observed under the audits. This manual is endorsed and under implementation.

Regarding, the financial management and risk assurance activities with support of assurance providers (e.g., Fiscal Agents, Monitoring Agents, and Financial Management Technical Assistance)?

- As Fiscal Agents- Fund management, a fiscal agent is responsible for managing the financial assets of a fund with segregation of Duty. The agent's function is to act in the best interest of the funds are aligned with its objectives of donors and the governments to assure the quality of utilization for grants.
- As Monitoring Agents- Establish team that organize data, analyse data and prepare report of the immunization program Finalisation of a report and relevant deliberation outcomes and follow-up actions that Requires involvement of key Stakeholders who received the Gavi Grants and not Convene one face to face or virtual discussion and review with crown agents.
- As Financial Managements Technical Assistance: -The GAVI recurring of TA helps to organized and managing each and every Supply chain managements and Financial managements processing in Ministry ,Agencies and RHBs that enhanced the liquidation and appropriate utilization of the fund with following the Fixed Asset procurements process and participating in bidding process preparations and specifications

GAVI supported Targeted Country Assistance (TCA)

i. Data and M&E

TCA contribution towards the achievement of immunization data quality improvement and use for action.

- Acasus Established a digital HF monitoring framework, visited over 4,000 health facilities and collected more than 300,000 data points in four regions of Ethiopia (Oromia, Amhara, Afar and Addis Ababa). This was augmented with the Launching of new and improved data-packs and 'real-time' dashboards to monitor immunization data and also , simple trackers to monitor availability of critical inputs (e.g., vaccines and supplies, cold chain)

- Acasus piloted the use of digital monitoring tools to monitor and improve outreach sessions in select woredas in Amhara with the goal of increasing reach as well as quality of outreach sessions.
- 1705 health data focal persons (HMIS, MCH & EPI focal) from 553 Woreda health offices, Zonal departments, and Regional health bureaus of seven regions (Amhara, Oromia, SNNP, SWER, B.Gumuz, Somali and Afar regions) were trained on DHIS2 and customized electronic digital COVID-19 vaccination tool by WHO. Similar trainings were provided by PATH for 50 EPI and HMIS, PPD focal sl on how to design and use EPI specific DHIS2 dashboards for monitoring of EPI performance.
- Data quality self-assessment training was provided for 24 health workers (MCH & EPI focal) who are working in Dire-Dawa city administration health facilities by WHO, 64 data validation team members from Somali and Afar by CCRDA/CGPP and 27 EPI- HMIS focal persons from Benishangul Gumuz regions by PATH . The training enabled the health workers to regularly conduct the vaccination data quality assessment to improve the data quality and data use for decision-making. Partners regularly conduct follow-ups to ensure report completeness, timeliness, accuracy and quality.
- Following the training Data quality self-assessment conducted in 84 health facilities and 16 woreda health offices in Afar and Somali regions by PATH and CCRDA and improved data consistency among different tools, and across the reporting channel. There was also improvement in documentation, reporting completeness and timeliness.
- Technical support provided to help the data triangulation exercise for all woredas- which enabled comparison of coverage data with logistics, as a result, more than 312 woredas that had data discrepancy were identified and supported to improve their data quality.
- Data driven annual integrated EPI, RMNCH & COVID -19 review meeting conducted by PATH in Afar and Somali regions which enabled the identification of challenges, and also priority intervention areas for the next fiscal years.
- Regular Joint Supportive Supervision (JSS) activities conducted in 89 HPs 49 HC of 31 woredas with low EPI performance in Afar and Somali regions by PATH, JSI, &

CCRDA/CGPP to identify challenges, provide on job training for health workers that will enable them provide solution, identify challenges, and draw action plans to improve immunization performance.

- CRDA/CGPP organized Gavi TCA Expanded partners coordination and performance review meeting annually to share experience and to promote collaboration among stakeholders.
- In 2021 UNICEF deployed consultants to supervise 345 (33.7%) health centers and 345 (7%) Health posts in the target zones. The consultants also conducted data quality verification in 266 health posts and monitored 117 immunization sessions at static and outreach sites.
- A rapid community survey was conducted in 311 villages to check vaccination status among 3420 children aged 12 to 23 months. The data verification findings showed that only 67% reported within acceptable range- while 21% over-reported and 12% were under-reporting. The overreporting increased for the later doses of penta3- MCV1 and MCV2. The session monitoring results indicated that among the 35 outreach sessions, only 30% were supported by community members (HAD) which indicated fatigue with the community platform. Home based registration cards were provided in 77% of visited sessions. Regarding key messages- about 82%, 64%, 55% and 54% communicated about when to return or the appointment date, possible side effects, keeping the vaccination card, and the vaccine type. The rapid community survey results showed that 95.6%- 89.8%- 80.4% coverage for penta1- penta3 and MCV1 respectively. The dropout rate from penta1 to penta3 and penta1 to MCV1 was 7 and 16.8% respectively.
- UNICEF supported immunization session monitoring in 153 woreda health offices and 570 health centers in Sidama SNNP and Oromia region. A total of 8594 sessions (5190 in Oromia and 3378 in SNNP) were conducted of which 2799 were fixed and 5795 outreaches. A total of 1849 children aged 12 to 23 months were checked for their vaccination status through a rapid community survey. The result showed 88, 78, and 36 percent coverage for penta3- MCV1 and MCV2 respectively. A considerable gap between administrative and community survey data where administrative data is higher, often

100+, for the first dose of penta1 and penta3. Feedback was provided to take corrective actions with a close follow with UNICEF consultants and staff in field offices in Amhara, SNNP, and Oromia regions.

- During the first half of 2022, a total of 1919 children aged 12 to 23 months were assessed for vaccination status in UNICEF-supported zones of 173 villages which cover 100 woredas. The result showed that about 85 % were delivered at Health facilities, 76% of mothers provided Vaccination card from HFs among those who received HBR, and 80 % of caregivers showed during Survey time. About 97 and 94 percent received penta1 and penta3 while 86 and 71 percent received MCV1 and MCV2 respectively.
- During the second half of 2022, UNICEF supported local surveys to understand the true picture and estimate zero doses and under vaccinated eligible children. UNICEF through its consultants and Government counterparts conducted a local survey to assess the vaccination status of children in 75 villages. A total of 932 children aged 0 to 23 were surveyed. The result showed that a home-based registration card (HBR) was found only for 63% and 58% of 0 to 11 and 12 to 23 months age children respectively. Community surveys revealed a shortage and unavailability of HBR cards in many health facilities, particularly in health posts. The rapid community survey coverage among surveyed children for tracer antigens was 96%, 87%, and 77% for Penta 1- Penta 3 and MCV1 respectively. Out of 615 children aged 12 to 23 months- about 77% were fully vaccinated- ,20% were defaulters and 3% were never vaccinated. Penta1 coverage is high in line with administrative coverage whereas the latter doses were low which indicated a considerable proportion of under-immunized children. Caregivers were asked why they dropped out from vaccination and the main responses were lack of information on the date of vaccination, absence of vaccinator, computing priorities, and fear of multiple injections and adverse events following immunization. Despite community health workers being there, only 29% of outreach sessions were supported by volunteer community health workers.

- CDC conducted Measles 5 dose Vial study to support the ministry of health to make evidence-based decision making on M5D switch. The study was completed, and result disseminated. The study recommends M5D shifts out way the benefits to increase continued technical assistance in support of increasing MCV2 uptake in Ethiopia in Oromia Region
- CDC also conducted MCV2 coverage barriers evaluation study conducted in Oromia region to support the Oromia region and ministry, the study identified the main factors and barriers for innervations and the region improved of MCV2 coverage by taking actions on major recommendations and results disseminated to stakeholders as well.

ii. **Demand promotion and communication**

- On 5-8 April 2021, UNICEF Ethiopia Country Office (ECO) facilitated a three-day Human-Centered Design (HCD) Approach virtual TOT workshop and one-day introduction to HCD with the support of UNICEF HQ, EASRO, and The Nucleus. About (35) participants attended the TOT and about (46) participants including representatives from the Federal Ministry of Health and partner agencies joined the introduction session. A training package on application of HCD for immunization demand has been developed for subnational EPI officers/health promotion officers. UNICEF ECO contracted a national consultant for the development and implementation of tailored immunization strategies in Oromia and SNNP regions by using HCD. With the support and mentoring by The Nucleus, a rapid inquiry into routine immunization practices was conducted among the urban-poor community in Oromia region⁵ and among the rural-poor community in the SNNP region⁶.
- The National Guideline for Vaccine Safety, Risk and Crisis Communication on routine immunization has been drafted and a workshop on fine-tuning of guidelines was

⁵ Summary of the report is available [HERE](#) and detail assessment report is available [HERE](#)

⁶ Detail assessment report is available [HERE](#)

conducted in October 2021. This guideline will also be complementary to the national demand promotion plan of action.

- A total of 118 participants from 20 zones of Oromia Region were trained in HCD for immunization and MCH. 10 participants are from Oromia Regional Health Bureau, 56 from Zonal Health Offices and 52 from major Town Health Offices of the region. Among those participants, 42 are EPI technical officers, 40 are Health Promotion officers, and 36 are Maternal and Child Health experts. Before the training about 88% of the participants reported they did not have any kind of knowledge and skills to HCD and about 12% of the participants had little knowledge and skills of the HCD components. After the training, about 92% of participants perceived that they had adequate knowledge and skill in the HCD approach. The documentary can be found on this link (<https://bit.ly/3s72Avo>). The training report is also available on this link (<https://bit.ly/3990vp1>).
- UNICEF is supporting the Immunization Service Desk of the Ministry of Health in developing a Plan of Action on Strengthening Demand of Immunization Services (2023-2027) based on the currently available behaviours and social data. Through consultation and discussion with the national communication & community engagement technical working group, the plan of action has been submitted to the FMOH for final review and endorsement. Once the FMOH finalizes the plan of action, UNICEF will support the Regional Health Bureaus for further contextualizing and development at the subnational/regional level. (Attachment of the demand generation plan of action final draft submitted to FMOH for review & endorsement)
- In partnership with local organizations such as Ethiopian Health Education Promotion Association (EHEPA), Inter-Religious Council of Ethiopia (IRCE), Mums for Mums, and Federation of Ethiopian Associations of Persons with Disabilities, UNICEF has been supporting the Ministry of Health in evidence generation around behavioural and social drivers of routine immunization, tailoring demand promotion interventions among the conflict-affected communities and host communities integrated with MNCH practices and COVID-19 vaccination. The assessment will also utilize different tools such as journey to

immunization/health mapping, in-depth interview, focus group discussions, card sorting, and observation. Regarding the quantitative data collection on routine immunization, UNICEF is collaborating with VIAMO to apply Interactive Voice Recording/Random Digit Dial survey methodology. The data collection will be initiated by mid-November 2023. In the community rapid assessment, social and behavioural data around immunization, Covid-19 vaccination, and key MCH practices have been integrated.

- In partnership with IRCE, UNICEF supported the development of religious leaders' manual on immunization, nutrition, and sanitation practices while communicating with community members. The manual is for Christian and Islam religious and it was endorsed by the FMOH with a forward of Her Excellency, the minister of health. UNICEF is currently supporting the training of religious leaders in promoting supportive social norms around vaccination, nutrition, and sanitation practices. In Tigray region, UNICEF is also supporting exploration the BeSD of immunization practices among the conflict affected communities as well as the implementation of integrated social & behaviour change interventions on key practices in partnership with Mums for Mums and Mekelle University. The qualitative assessment on BeSD of immunization and key MNCH practices among IDP, refugees, and rural/pastoralist communities in partnership with EHEPA/Addis Ababa University is at the stage of the ethical review process after pretesting of the tools with Ethiopia's BIRD LAB team and stakeholder consultation workshop with TWG and MOH. (Attachment of the religious leader's manual and the protocol of qualitative assessment)
- 260 (100%) woredas in 14 UNICEF targeted zones conducted one review and REC/RED micro-plan development meetings focusing on reaching zero-dose in missed communities with the support of health extension workers and the women development army. One national-level review and planning meeting was conducted to identify immunization service bottlenecks to reach zero-dose communities. A total of 70 participants consisted of a representative from the MOH EPI desk- MCH directors- EPI focal persons- and vaccine management officers from 14 zones and four regions- including 16 UNICEF technical assistants. Evidence generated from the ground- regional experiences- and approaches

were shared among the regions- and each region developed a context-specific action plan that was required to address the bottlenecks and reach zero-dose children.

- 240 social mobilization committee members from Afar and Somali regions and 80 women cooperation members from Benishangul Gumuz of the existing Government structure at the community level were trained on basic health communication, social mobilization, zero dose and defaulter identification and linkage to health facilities which contributed to the increased immunization coverage and reduced dropout rate.
- Two Zonal immunization advocacy meeting and project launching workshop were held at Degahbur and Awash town in the presence of senior government officials, Zonal and woreda administrators, woreda health office directors, woreda women and children office representatives, woreda EPI coordinators and health facility heads. A total of 51 people participated in this advocacy workshop to increase higher officials' commitment on immunization program, particularly on zero dose and under immunized children.
- A total of 84 religious leaders were trained on immunization religious mainstreaming. The purpose of EPI mainstreaming training is to provide religious leaders with knowledge and skills related to VPDs, EPI, basic communication and how to develop and deliver key messages.
- 62 HEWs/HWs were trained on community conversation facilitation. This facilitation training was one of the strategies to increase the awareness level of the society on immunization and vaccine preventable diseases in low performing kebeles.
- A total of 110 community conversation sessions were conducted in places where high number of zero dose and under immunized children from specific communities were present. These activities made a significant contribution to advancing the national objectives for demand promotion and communication.
- Technical support and follow up provided to strengthen the engagement of social mobilizers to identify and link zero dose children and missed community including defaulters.

iii. Service delivery

Equity assessment and mapping of zero-dose communities was conducted in GAVI TCA partners supported woredas

- Conducted refresher training on RED-Microplanning to 1561 EPI focal, woreda health office head, woreda MCH head, and PHCU head for 3 days in Amhara, Oromia, SNNP, Sidama, Afar, and Somali regions by JSI & PATH, WHO, and UNICEF, in partnership with RHBs as part of TCA 2021. The training enabled health workers to plan routine vaccination using the RED approach for their catchment areas to identify resources (supplies, HR) and other requirements. The training helped health workers monitor immunization performance and categorize and prioritize woredas and health facilities for better support.
- Identification of underserved communities, mapping, and targeting for immunization services are critical to ensuring equitable access and use of services. Each PHCU in GAVI TCA-supported woredas used the simple, customized, and translated RED micro-planning tool and health facility data of the past three to five years, such as coverage, dropout, and VDP outbreak status, for technical discussions, identification, targeting high-risk communities, and developing detailed context-specific strategies through a three-day workshop that was facilitated by TCA partners. The tool helped to explore barriers and suggest local solutions to remove supply- and demand-side constraints.
- WHO, UNICEF PATH, JSI, and CCRDA/CGPP facilitated and coordinated 3-5 days of refresher training and orientation on the catch-up guideline for a total of 1322 HEWs and health workers in the Amhara, Oromia, SNNPR, Sidama Afar, Benishangul Gumuz, and Somali regions. Additionally, 347 community volunteers were trained on zero-dose identification, registration, and zero-dose mapping in the same regions. The knowledge and skills gained from the training helped develop micro-plans and identify and map zero-dose under-immunized children in 3811 missed communities in their respective catchment areas, of which immunization service delivery points were established in 3597 (98%) communities.

- Integrated supportive supervision conducted by all TCA partners in the GAVI TCA working priority zones to assess the challenges observed in the immunization program. Over the last 2–3 years, UNICEF has supported the assessment of vaccination service availability in all health facilities in 14 zones. The major reasons or bottlenecks for not providing immunization services were multiple, including the availability of health posts and health centers in the same compound so that HC does not provide immunization, the non-functionality of refrigerators, shortages of vaccines and trained human resources, conflict, and negligence.. The findings of the assessment were presented and discussed during the review and advocacy meeting where zonal and woreda health managers participated. One of the key actions following the meeting was to expand immunization services in health facilities where there was no immunization service. As a result, in the current reporting period, the total number of HFs providing EPI service increased from 6,149 in 2020 to 6286 in 2023 EFY (an increment of 122 HFs over the last 3 years). Similarly, the outreach service delivery points increased from 12,696 in 2020 to 19,845 in 2023 (an increment of 7149 new service delivery points in 14 priority zones). This has improved access to and utilization of immunization services in zero-dose communities.
- Following the training in conflict affected and zero dose communities identified and registered zero dose and under-immunized children in their respective woredas. A total of 54,385 children with zero dose and 2,571 under-immunized children in Amhara, 4,555 zero dose and 2,366 under-immunized children in Afar and Somali regions while 47,873 zero-dose children and 4080 in Oromia, SNNP, Sidama have been found and mapped to conduct catch-up vaccination integrated with other life-saving interventions
- Over the last to 2-3 years, TCA immunization partners has significantly contributed to the development of Catch-up vaccination guideline, National COVID-19 deployment and vaccination plans (NDVP), all Gavi CDS applications, IPV2 vaccine introduction application, and Gavi Full portfolio plan (FPP) which were endorsed by ICC. The support includes evidence generation and synthesis, development of the documents, preparation of the presentation for ICC and E-NITAG (as needed), and implementation of the

recommendations. Besides, these partners are supporting preparation of application of Rotasiil switch to GAVI by MOH

- The catch-up guideline dissemination workshop was supported by WHO & JSI at national level for 3 days. The workshop was attended by 38 participants from all regions and city administration and EPI partners. The aim of the workshop was to familiarize participants on the catch-up guide and how to use the document to prepare, implement and monitor catch up vaccination to address zero dose and under immunized children. Additionally, the guideline was printed and disseminated by JSI during RMNCH biannual review meeting of MOH.
- Additional documents were prepared with support of GAVI TCA partners ; IIP training materials revision conducted to include (Vaccine management, COVID and other new vaccines) and accredited to use for continuous professional development (CPD). The training manual includes all new developments in the immunization space which will help trainees capture new updates and use already existing COVAX assets with integration approach.
- GAVI TCA partners supported the development of a TOR for immunization partners coordination platform, EPI program technical assistance coordination and management guide, revision of ICC TOR, integrated campaign (COVID, Measles and HPV) field guides and demand promotion plan of action on immunization. These documents helped to clearly define the role and responsibility of partners to strengthen the coordination mechanism and to guide partners to support campaigns execution.
- Consultative workshops were conducted (by WHO in Amhara and by JSI in Afar and Somali) to have a common understanding on GAVI TCA support in identifying and reaching zero dose and under immunized children that have been impacted due to the ongoing conflict, flooding, and presence of high number of zero dose children. The meeting helped to reach consensus on the need to prepare a plan and draft activities which addresses zero dose and under immunized children and how to reach and vaccinate children who missed their routine schedule. Moreover, the workshop also enabled the teething of out

possible risks to carry out the activities, how to document best practices and the lessons learned to scale up and use for the expansion of the project with a similar setup.

- WHO recruited three TAs for 6 months and JSI recruited 2 TAs for Afar and Somali regions with the objective to coordinate planned zonal-level activities, to address zero dose and under immunized children with vaccines eligible for their age and also to build capacity as well as transfer knowledge to Identify, Reach, Measure, Monitor and Advocate.
- WHO, PATH, JSI and CCRDA/CGPP has supported micro-planning exercises based on the house to house (HTH) registration in 32 woredas with high number of zero dose, conflict affected woredas of Amhara, Afar, Benishangul Gumuz and Somali region. The exercises enable to quantify the required resources (HR to conduct catch up vaccination, supplies and other logistics forecasted for consecutive vaccination and financial need to conduct catch up vaccination which ultimately reach and improve vaccination coverage, reduce dropout rate and possible outbreaks.
- Catch up vaccination started in Amhara, Afar, and Somali regions in areas where identified and mapped zero dose and under immunized children. A total of 2,206 zero dose children and 1,282 under immunized children vaccinated as of the end of October ,2023. The support will continue to the complete series of vaccines required.
- With UNICEF support to catch up vaccination, 47,873 (0-11month) zero-dose children were identified in missed /underserved communities, and all (100) received Penta 1 and 42,622 (89%) received Penta 3 while 4,080 and 11,103 children (12-23 months) received Penta 1 and Penta 3 vaccines respectively

Region	# of woredas with updated Microplan	# of zero dose identified		# of children vaccinated (0-11 months)				# of children vaccinated (12-23 months)			
		0-11 months	12-23 months	Penta 1	%	Penta 3	%	Penta 1	%	Penta 3	%
Amhara	101	35679	3105	35679	100	25823	72	0	0	0	0
Oromia	73	3996	3110	3996	100	8012	201	3110	100	10179	327
Sidama	37	1331	815	1331	100	2646	199	815	100	784	96
SNNP	54	6,867	155	6,867	100	6,141	89	155	100	140	90
G total	265	47873	7185	47873	100%	42622	89%	4080	57%	11103	155%

- WHO, PATH, JSI, CHAI and CCRDA/CGPP had deployed 136 TAs and staff at national and subnational level to facilitate planning, coordination, implementation, and monitoring of the 2022 Integrated Measles SIA. The support provided during the pre, intra and post-integrated Measles campaign contributed to nationwide integrated measles campaign achievements.
- WHO has supported technically in the training of health workers, supportive supervision, and monitoring of Routine immunization catch-up vaccination conducted in the Tigray region, which is one of the conflict-affected regions, and contributed to the achievements gained and vaccinated 32,332 zero-dose children with Penta-1 and reached 12,490 under-vaccinated children with Penta-3.
- WHO, JSI, CHAI and PATH had supported technically HPV vaccination and deployed more than 121 TAs and staff throughout the country to train health workers, to supervise and monitor an integrated 4th round of COVID-19 and HPV vaccination campaign in May, 2023. Contributed to the achievements gained in all regions. The campaign reached 1,441,471 both in and out of school 14-year girls, which is 95% of the target, received the first dose. Besides 1,052,296 girls received the second dose of the vaccine, which is 91% of girls who received the first dose of the vaccine 6 months before the period of the campaign. A total of 54,987 zero-dose children were identified and vaccinated for Penta1. In addition, among the identified under-vaccinated children 35,157 received Penta3 and 34,302 vaccinated MCV1.
- WHO also supported COVID-19 vaccination activities financially and technically, from July 2022- up to June 2023, the country conducted an integrated COVID-19 and measles vaccination campaigns, integrated 4th round COVID-19 vaccination campaigns and campaigns in conflict-affected areas of the country including the Tigray region; and administered a total of 18 million doses of COVID-19 vaccines.
- Conducted a 2YL (second year of life) workshop with RMNCH staff and partners at the national level to propose a package of interventions and outline a strategic plan to implement a 2YL platform in Ethiopia: A consultative workshop to establish an integrated second year of life (2YL) platform in Ethiopia. A total of 20 people attended the workshop,

from different departments of MoH (immunization, child health, nutrition, maternal health, family planning and Sequota declaration case teams) and key RMNCH partners. The workshop enabled the identification of challenges and opportunities for integrating RMNCH services during the second year of life. Indicated which interventions to be integrated at what level of the health system. Using the recommendations of the consultative meeting as input, JSI with other partners provided technical support to MoH to develop a draft Immunization and RMNCH integration guide. The guide is under revision and is expected to be finalized soon.

- Two national and 4 subnational level (Oromia, Amhara, Somali and Afar) HPV advisers deployed from CHAI and PATH to facilitate the overall coordination for HPV roll out, development of bottom-up micro-planning activities, and compilation of data both at central and regional level.
- In addition to support provided by all TCA partners to national level and all regions, facilitated the coordination with Education and other sector for successful implementation of HPV vaccination, to reach a high proportion of schoolgirls with the HPV Vaccine and contributed for achievement gained in 2021 and 2022
- CHAI and PATH jointly supported facilitation of various integrated advocacy, sensitization, social mobilization & communication activities with different stakeholders including integrated sensitization workshop with public relation and communication directors of different sector ministries (42), government and media professionals (45) Health professional associations (36), Disability association (68), national youth league (84), Hot line counsellors (24). PATH also facilitated capacity building trainings for 80 HCWs from four Woredas of Afar and Somali regions. The training helped the health workers to improve their communication skill to convey essential immunization messages during HPV vaccination.
- As part of TCA 2021 to improve the engagement of private health facilities in provision of quality immunization service in Addis Ababa, CHAI supported MOH in revising the national RI implementation guideline to include the role and responsibilities of private health

facilities (PHFs) in immunization service delivery (June 2021). The revised guideline helped to strengthen implementation of immunization service by private health facilities.

- Strengthen public-private partnership for immunization in Addis Ababa, CHAI supported establishment of functional coordination mechanism, Public-private forum (TWG), composed of representatives from MOH, FDA, Addis Ababa RHB, private association and Private HFs. The aim of this forum was to establish strong functional partnership between public and private health facilities to improve complementarity of services among the public and private partners.
- CHAI, in collaboration with Addis Ababa health bureau, conducted a baseline assessment in private health facilities in (2021) and following the assessment workplan developed based on the findings: The baseline assessment conducted in 35 health facilities helped to understand the quality of RI service delivery practices and identify gaps that require interventions. Following the dissemination of baseline assessment results, interventionists (like training, advocacy for pre-qualified refrigerators, mentoring, establishing reporting systems, etc.) were designed to address the identified gaps and implemented throughout the project period to improve the quality of immunization service at private health facilities.
- CHAI supported Addis Ababa regional health bureau to build the capacity of HCWs at private health facilities were through provision of IIP to 48 vaccinator from private health facilities, facilitation of experience sharing visit to public health centers with high-performing of routine immunization services to enable peer-to-peer learning, sharing of best practices and provision of regular supportive supervision including mentoring of private health facilities providing routine immunization services in Addis Ababa. CHAI supported RHB in improving routine immunization data reporting systems at private health facilities: Reporting immunization data either through DHIS-2 or standard format was the major problem identified at the baseline assessment. CHAI facilitated availability of standard recording and reporting tools at PHFs and provided technical support to PHFs to start reporting immunization data using standard reporting mechanisms. Currently, 50 Private health facilities providing immunization services in Addis Ababa are reporting their

monthly performance through DHIS-2 system. Conduct review meeting to evaluate outcomes and share lessons: One round of private health facility immunization performance review was conducted in September 2021 where 34 private health facilities participated, and lessons were shared. CHAI supported endline Assessment and dissemination of findings: The findings of follow-up (endline) assessment conducted in July 2022 revealed that were indications of improved immunization service quality as compared to the baseline assessment. The number of PHF providing immunization service in Addis Ababa increased from 34 to 56. and all started to use WHO standard refrigerators procured by themselves. Scale up of Private health facilities immunization interventions to regional towns (TCA 2022) has started with CHAI support: Mapping of private health facilities providing immunization and potential PHFs to provide immunization was done in January 2023 to identify potential PHFs for scale of PHF intervention. Besides, consultative workshop on scale up with the purpose of experience sharing of Addis Ababa health facilities was conducted in the presence of MOH RHBs, Ministry agencies, private health facilities, immunization partners, Private HFs associations etc. on 17 October 2023 in Addis Ababa. Experiences from Addis Ababa private health facility interventions and other regions were presented and discussed during the workshop.

- Acasus Piloted the use of reminder bracelets for mothers. The bracelet helps to remind the caretakers not to miss the date scheduled for the child vaccination. This also helps to improve the coverage and reduce the dropout rates in select health centres in Oromia

iv. Leadership Management Coordination

- Regular and ad-hoc ENITAG meetings facilitated. WHO supported capacity-building training for ENITAG members in Cape town South Africa. The training was attended by 5 ENITAG members, which enabled them to share experiences and to have updated current global knowledge on immunization.
- Ethiopia NITAG external assessment conducted in the country helped to determine the level of NITAG functional maturity and helped to identify best practices, strengths, the

challenges for improvement and provided recommendations to be addressed for the future.

- Based on one of the recommendations from the external assessment, WHO started preparation for next round capacity building workshop which will be held in Addis Ababa from December 10-15,2023 for ENITAG and 4 other African countries NITAG member

v. Supply & logistics

- The GAVI CCEOP 1.0 was commenced in 2018 and is still ongoing in some of the regions. The refrigerators are installed by the Local service agents of the respective suppliers (Haier, Vest Frost, Dulas and Bmedical) Company. These suppliers conducted central and regional-level training before the start of the installations. As of now, through the GAVI CCEOP project- a total of 3,432 refrigerators were installed throughout the country.
- The deployment has been executed in three phases as year one in 2018, year 2 in 2020 onwards, and year 3 in 2023. The overall implementation as of now is 63.8%. The detailed implementation status by year and respective suppliers is described in the table below.

Table : Ethiopia GAVI CCEOP 1.0 project implementation update - 16 Oct.2023						
● Project	Supplier	# Of units delivered	# Of units Installed	% Installation	Remark	
● CCEOP Y1	B Medical	718	678	94.40%	* 36 units delivered but damaged before installation at BG (declared by H4the RHB - with an official letter * 1 unit is stored at the supplier's warehouse (initially allocated for BG) *3 units were delivered at Gambella, but the HF is not ready for installation	
● CCEOP Y1	Dulas	194	194	100.00%	Completed	
● CCEOP Y1	Haier	22	22	100.00%	Completed	
● CCEOP Y2	B Medical	359	353	98.30 %	* 4 units are stored at the supplier's warehouse and 2 units are delivered at the HF but not accessible due to security situation.	
● CCEOP Y2	Vest frost	2203	2185	99.20%	*A total of 18 Units were Damaged in transit	
● CCEOP Y3	B Medical	629	0	0.00%	CCEs are stored in the LSP warehouse; the ODP verification workshop is planned for the end of October or the beginning of November	

•	CCEOP Y3	Haier	627	0	0.00%	CCEs are stored in the LSP warehouse, ODP verification workshop is planned for the end of October or the beginning of November
•	CCEOP Y3	Vest frost	627	0	0.00%	CCEs are stored in the LSP warehouse, ODP verification workshop is planned for end of October or the beginning of November 2023
•	Total		5379	3432	63.80%	

- UNICEF provided technical support for the deployment of optimal cold chain equipment at service points and enhanced the technical skill of health workers on the vaccine and cold chain management practices to ensure adequate vaccine availability, potency, and efficiency of the supply chain, especially at the last mile. With UNICEF support, a total of 2,144 SDDS were deployed and installed for HFs to ensure optimal cold chain capacity in place and ensure restoration of EPI service in conflict-affected areas. Out of 293 HFs reported for CCE maintenance (through the LSPs) in Oromia, Benishangul Gumuz, Somali, SNNP, and Amhara regions of which 225 of them were fixed (77%) within a two-week period. Remote Temperature Monitoring Device (RTMD) was installed for cold rooms in 90% of EPSS hubs and temperature monitoring feedback is being shared from the center to all hubs.
- UNICEF supported, EVM 2.0 managers training for 10 members from the National Vaccine TWG (representatives from MOH, EPSS, and various iSCM partners) 61 experts from UNICEF regional and zonal level and CHAI TAs received a five-day training to become EVM 2.0 assessors. The training was organized in coordination with the UNICEF ESARO team.
- UNICEF supported EVM self-assessment in 100% of EPSA hubs except for Mekele and Shire Hubs and the result was found to be more than 85%. In the Amhara region, EVM Self-assessment initiatives have been started in April 2022. Of all Woredas in the region, 82 woredas started the EVM-Self assessments and reported to the region, and 49 woredas scored EVM >80%. In the Oromia region, the EVM Self-Assessment Initiatives were conducted on 44 woredas and the average score was 75%. In the SNNP- of the 63 Woredas supervised for the last six months- 38 Woredas Conducted EVM Self assessments and of 38 Woredas- 21 Woredas scored EVM >80%. As part of local

capacity improvement on effective cold chain and vaccine management, woreda and the health center conducted an Effective Vaccine Management Self-Assessment (EVMA). Based on self-assessment findings, woreda and health facility vaccine and cold chain focal points are encouraged to prepare improvement plans and monitor progress monthly. In UNICEF assisted zones about 103(81%) of woredas and 524 (77%) of health centers were supported to conduct EVM self-assessment using 24 and 25-item checklists. Among the woredas conducted self-assessment 61% of woredas and 67.4% of health centers scored 80% and above. During the reporting period, no stock out and overstock of antigens were reported from the woredas and health facilities that conducted self-assessment. UNICEF staff also supported six EPSA hubs on the implementation of the EVMA improvement plan.

- Data triangulation and taking remedial action are critical in areas where inflated administrative coverage data are reported. TCA partners -supported data triangulation for vaccine distribution and doses given was conducted by desk review. Four years of data (Ethiopian budget year 2009, 2010, 2011, and 2012) doses given from HMIS and doses distributed from LMIS were analysed. Besides survey data, mDHS data was made for three antigens (Pentavalent- PCV and Rota vaccines) for the corresponding Ethiopia budget year. The analysis was conducted for 828 Woreda health offices for HMIS and LMIS data. Almost in all regions, HMIS data reported coverage compared to LMIS Among regions Tigray and Benishangul Gumuz had relatively better data consistency while Oromia data was the most inconsistent. When mini-demographic and Health Survey data was equated with LMIS and HMIS- the DHS data showed the lowest across the analysed years. The findings of data triangulation were presented to EPSS and EPI managers at national and sub-national levels. Actions were drawn to improve data quality, particularly DHIS2 reporting. Job aid for LMIS-HMIS triangulation is drafted and shared for the regions to exercise similar data triangulation activities. UNICEF is supporting monthly vaccine stock status (at national and sub-national levels) improving the data visibility and reporting trends for ESARO.

- GAVI TCA partners support in data quality self- assessment in quarterly base to identify data quality issues , Immunization data from small-scale surveys and administrative data were reviewed from the facility catchment. Feedback from both data sources was provided to respective health managers. In most areas, administrative coverage is higher than survey data. Small-scale local surveys are conducted to verify dropouts and zero-dose children in specific health capacity catchments where 100+ coverage is reported. During the last six months, data quality verification was conducted in 106 health facilities, particularly at the health post level in 78 woredas. The result showed that, about 67% of health posts reported within the acceptable range while about one-third over or under-reported. Many health posts tend to over-report. The reason for over and under-reporting might be due to a lack of source documents at health posts and to align with plans. Feedback is provided for respective health facilities and health managers. Data triangulation with vaccine issues is being conducted on a regular basis.
- After the piloted mBrana system used to monitor stock data was interrupted following the shifting of ownership from partner to Government system, the Digitalizing Health Activity Project (DHA) has been working with EPI and IT team to recommence the system. The consultant recruited with financial support from GAVI TCA is a focal person who follows revitalization stock monitoring. An advocacy meeting was held with decision-makers among key stakeholders for ownership and sustainability.
- While mBrana revitalization is ongoing, google Sheets has been used to collect stock status data from 100% of UNICEF-supported woredas. Analysis has been made and feedback has been submitted for the regions accordingly. Utilization of mBrana is now one of the MOH priorities and an MOU is drafted to be signed between the Implementing partner and MOH for better ownership- accountability and sustainability of the tool.
- As part of ensuring optimal cold chain capacity and understating the temperature distribution in cold rooms, UNICEF has supported cold room temperature mapping at 11 EPSS hubs for a total of 23 walk-in cold rooms of different sizes. Major critical areas were identified, and cold room managers were oriented on corrective actions. The mapping

result has also been presented for the EPSS management team to address issues related to performance gaps in the walk-in cold rooms. UNICEF is also coordinating the national temperature monitoring study (TMS) which was officially launched on the 8th of June 2023. The study is being conducted in 10 EPSS hubs, 20 woredas, 20 health centers, and 20 health posts. The study will be concluded by the end of October 2023.

- Last Mile Vaccine Delivery Support: TCA partners have significantly contributed to last-mile delivery expansion from 30% to 44% through support in planning, advocacy, training review meeting of delivery performance and resource mobilization from local partners.

vi. [Capacity building](#)

- Acasus piloted the use of digitised video trainings on smart phones in Addis Ababa to improve front-line capacity of healthcare workers.
- CHAI trained 19 biomedical technicians from 17 EPSS hubs on basic and preventive WICR maintenance and provided Mentoring to EPSS staff to institutionalize Regular preventive and corrective maintenance activities by CHAI senior cold chain technician. Supported the provision of senior level CCE technicians' training for 26 biomedical engineers and technicians who came from all regions and EPSS. CHAI provided cold chain maintenance equipment to Addis Ababa and Gondar universities biomedical engineering departments with the aim of strengthening the pre-service training on cold chain maintenance
- UNICEF supported training for 126 woreda and health facility cold chain technicians trained on cold chain maintenance and a total of 192 non-functional refrigerators which helped to reduce session interruption and improved access to vaccination service. 165 HWs were trained by UNICEF on CCE operation and maintenance. [Female=37% (n=61) and Male=63% (n=104). 1-107 healthcare facility staff [Female =43% (n=476) and Male % (n=631)] trained on the use and monitoring of the vaccines and new CCE.
- Acasus leveraged geospatial analysis to improve microplanning in select woredas in Amhara. This geospatially enhanced planning preparation has enabled prioritization of

underserved and missed communities and have leveraged different data sources to conduct this exercise.

- (UNICEF) in collaboration with MoH and CHAI has supported the capacity building of 25 senior technicians. The cold chain technicians were trained on basic CCE maintenance, walk-in cold room and back generators troubleshooting, and installation of SDDs.

COVAX Technical Assistance

i. Data and M&E

- TAs Supported at national and regional level to scale up COVAX DHIS2 for COVID-19 data reporting and transition from Google sheet to COVAX DHIS2 in all rounds of COVID vaccination.
- TAs engaged in supportive supervisions during campaigns using ODK platform to monitor campaign performance, provide onsite support to vaccination teams, and get input for daily EPI task force meetings. Supported data aggregation, analysis and post campaign review meetings at national, regional and zonal levels.
- TAs deployed at regional and zonal levels supported data entry to COVAX DHIS2 daily during the campaign, backlog data entry and preparation of admin and technical report.
- (UNICEF) Through the CDS 2 fund support, M&E officers were recruited to support the immunization system for Amhara and Oromia. These consultants will support the monitoring and evaluation of the overall immunization system in the region.

ii. Demand promotion and communication

- All EPI partners provided technical support through deployed TAs around demand creation, promotion, advocacy, program communication, risk communication and mitigation as part of COVID-19 vaccination roll out support. These includes: Design demand-creation strategy (including advocacy, communications, social mobilization) to generate confidence, acceptance, and to demand for COVID-19 vaccines. Conduct demand creation activities (community mobilization, advocacy, risk and safety

communications, program communication) conducted in all regions using existing government structure and opportunities like markets, places of worship, festivals, schools, universities, industry parks and large factories to increase vaccination coverage during pre and intra campaign times. Supported development of key messages, advocacy and communication materials and tools including radio and TV spot messages. Regularly participated in the National and sub-national communication technical working group and provide support. Media briefing given to medial agency and medical expertise about COVID 19 vaccine rollout

- PATH conducted social mobilization on COVID-19 in IDPs, people with disabilities and refugee camps and with this social mobilization, 50 IDP sites and 14 refugee camps were reached, and more than 4350 individuals participated.
- Acasus deployed mass community demand surveys collecting over 150,000 data points on C-19, HPV and other RI related issues to inform and design targeted demand interventions and documented accordingly. This data is stored in a dynamic dataset for any future analysis as required.
- WHO supported the vaccine hesitancy survey conducted in 8 towns identified reasons and recommended possible solution
- CHAI developed frequently asked question, translated to local language (Amharic) and distributed to all vaccinator to use it when they do the social mobilization activity at community level and provided training on COVID 19 vaccine promotion to 27 Communication officers from all the 11 sub cities and strongly supported the awareness activity using their Sub City communication platform.
- UNICEF supported a tailored communication campaign for COVID-19 vaccination among IDP and refugee communities in Amhara, Afar, Gambella and Somali regions. UNICEF supported a qualitative rapid assessment among the health workers and community members (total 10 interviewees) of Oromia and SNNP regions by utilizing Behaviour and

Social Drivers (BeSD) tools for COVID-19 vaccination. According to the findings⁷, there has been a significant level of COVID-19 vaccine hesitancy among the health workers. UNICEF ECO supported the Ministry of Health to facilitate ideation sessions by using HCD approach with health workers and then developed tailored strategies, particularly for the acceptance and demand among the health workers. UNICEF also supported three rounds of nationally representative BeSD surveys on COVID-19 vaccination among general population and health workers by utilising Random Digit Dial/Interactive Voice Recording methods in collaboration with VIAMO. The findings from these surveys guided for tailoring demand promotion interventions for COVID-19 vaccination at national and subnational levels.

iii. Service delivery COVAX

- Supported MoH to revise NDVP in July 2021 and September 2022 to include recent developments, update national targets, align with the SAGE recommendation and Gavi guidance. The revised NDVPs were used as the basis for planning of the second, third, and fourth round of COVID-19 vaccination campaigns.
- Supported MoH in updating planning and M&E tools: as part of the preparation of the campaign, EPI partners supported MOH through updating, adapting and developing campaign M&E tools used for campaigns. The updated/developed tools include micro plan template, campaign readiness assessment tool (RAT) template, supervisory checklists, reporting formats for all the integrated activities, service linkage referral sheets, tally sheets and other M&E tools needed for the campaigns. All RHBs and supervisors were provided with orientation on the updated tools, which were used during the campaign.
- Supported MOH in preparation of standardized COVID-19 vaccination training materials and its orientation. National level TAs provided technical support during revision and standardization of COVID-19 vaccination training manual for health workers prior to the

⁷ Notes on interviews with health workers

fourth round of COVID-19 vaccination campaign. Using this standardized training material, MoH in collaboration with EPI partners provided training of trainers from Nov 21-22, 2022, to all RHBs where the TAs at national level worked as a co-facilitator of the training. The regional and zonal TAs provided support for the ZHDs and WoHOs during the COVID-19 vaccination and measles campaigns by co-facilitating sessions of training and orientations for supervisors, vaccinators, and social mobilizers organized at regional and zonal level prior to the campaigns.

- Provided technical support in planning, coordination and implementation during pre, intra and post campaigns for three rounds of COVID-19 vaccination campaigns- second round in Feb 2022, third round in June 2022 and fourth round in May 2023.
- Supported in ensuring distribution of vaccines and supplies in time: All TAs at all levels closely followed up on the distribution status of vaccines and other logistics jointly with logistics TWG members in the assigned regions and zones. In areas/woredas where there was a gap in timely delivery of the vaccines, the TAs closely worked with the respective regional and zonal immunization team to ensure timely delivery of the supplies. The TAs supported distribution/redistribution of vaccines at lower levels using vehicles deployed for demand creation and supportive supervision.
- Actively engaged in coordination meetings: MoH/EPI team organized and led several coordination meetings with the national and regional TWGs during the pre, intra and post campaigns with immunization partners. During these meetings, immunization partners actively participated in setting the agenda for some of the meetings, taking minutes of discussions, and following up on the status of implementation of action points.
- Supported planning workshop to identify activities and programs to be integrated with the 4th round of COVID-19 vaccination campaign, which was held in Addis Ababa on January 30, 2023, where JSI provided financial support to organize the meeting in addition to its technical support. A total of 40 participants from MoH and partners of immunization and MCH attended the meeting. The meeting enabled the identification of a list of potential activities that can be integrated, and recommendations were made for MoH to

make the final decision. Based on those action points, MoH decided to integrate HPV, malnutrition screening, zero-dose identification and vaccination, and obstetric fistula detection together with the 4th round COVID-19 vaccination campaign.

- Regional and Zonal level TAs provided day-to-day support to the respective RHBs and Zonal health departments (ZHD) on COVID-19 vaccination planning, coordination, data use for decision-making and monitoring progress based on the needs identified in each region. During the campaigns, extensive technical support was provided to RHBs and ZHD to develop woreda microplans, coordination with logistics on timely and appropriate delivery of campaign supplies, identifying priority areas for communication and demand creation, and attending coordination meetings organized by MoH/RHB. Support was provided in preparation of budget proposal, budget deficit analysis and resource mapping, preparation of presentation and facilitating training to health workers and other preparatory activities as needed.
- Logistical and technical support during the campaigns: For each of the campaigns, TAs and staff of all EPI partners participated as supervisor and coordinator to the assigned regions and woredas across the country. PATH deployed 15 TAs and 10 vehicles for the 2nd round, 25 TAs and 18 vehicles for 3rd and 4th rounds of COVID-19 campaigns for demand generation, supportive supervision and monitoring. Additionally, JSI hired and deployed 8-10 vehicles for each round of the campaign for supervision, coordination and distribution of supplies which contributed to the success of the campaigns.
- Supportive supervision on routine immunization and COVID-19 vaccination: In months when there was no COVID-19 vaccination campaign, the TAs hired at regional and zonal level continued to provide technical assistance to strengthen routine immunization. All the supportive supervisions were made together with regional or zonal immunization focal persons to facilitate skill transfer. During the project period of CDS1 and CDS2, supportive supervision was done to 97 woreda health offices, 5 hospitals, 153 health centres and 120 health posts by regional and zonal level TAs hired by EPI partners. [CHAI] Conducted program integrated supportive supervision at 13 woreda and 56 health

facilities of Gambella region. More than 90 health workers have participated for the onsite on Job orientation or capacity building activities in 2021.

- All TAs at regional and zonal level were used as resource persons to co-facilitate various immunization-related trainings within each of the region including IIP, COVID-19 vaccination to health workers, COVAX DHIS2, etc.
- The coverage indicates that around 52 million (78%) of the target population received at least one vaccine dose and around 43 million (65%) target population has completed the vaccination series. during the consecutive 4 round campaigns, special population groups like HW, IDPs, refugees, co-morbidity, and older age groups were prioritized and addressed.
- To leverage C-19 support, the country has finalized the development of national COVID-19 vaccination service integration implementation guidelines and is waiting for endorsement by the ICC. UNICEF provided technical and financial support to develop the guideline that will help standardize the primary healthcare service integration activity.
- In 2022, UNICEF has supported the implementation of the integrated national measles SIA in the Tigray region. One of these supports was the printing of M&E tools, vaccination cards, recording and reporting tools, and IEC materials. The supplies have been printed timely, delivered to EPSS, and distributed along with other supplies during the campaign.

iv. Immunization Leadership management and coordination (LMC)

- PATH conducted baseline assessment to know the current status of EPI leadership and to identify major gaps in the area of LMC that need technical support.
- Acasus establishing regular performance management routines to enable coordination and accountability by leveraging the data collected
- Supported and strategically advised MCAH LEO and EPI manager to establish Immunization Research Advisory Committee (I-RAC) under MCAH LEO.
- All TCA partners provided technical support, on COVID-19 vaccination planning and coordination and CDS grant management at all levels. The support includes strengthening

the national-level COVID-19 task force and TWGs, supporting regions to ensure utilization of granted financial support effectively and efficiently. Monthly, RHBs were provided with a report that shows progress of their grant utilization and liquidation status by funding source and duration since MoH released the budget to the respective region. Ongoing technical support was provided to the regions to timely utilize their allocated financial resources.

- Existing and additional coordination opportunities were utilized to facilitate liquidation of allocated resources to regions. Agenda of liquidation was included during review meetings where status of each region was presented and discussed. Meetings were facilitated with the grant, finance and EPI team within the ministry to identify challenges and provide feedback to regions on the budget and liquidation status. During virtual meetings with RHBs, the issue of timely liquidation was included to give priority for timely utilization and accounting expenditures.
- As part of its LMC support nationally, JSI and other TCA partners supported the grant management team under the strategic affairs department within the MoH to organize a review meeting on grant management and budget audit from April 7 to 9, 2023 at Dire dawa- in Adane International Hotel. JSI provided technical and financial support to the review meeting. Using the opportunity, MoH provided guidance and orientation on the need for timely liquidation of budget allocated to RHBs finance and grant related officers. TCA Partners also presented their experience on how to facilitate timely utilization and liquidation of allocated resources from regions.
- Four immunization grant specialists were recruited and assigned to four RHBs (Oromia, Amhara, SNNP and SWE regions) to provide ongoing technical assistance on leadership, management, and coordination (LMC) of COVID-19 and routine immunization activities at regional level, with a particular focus on technical assistance on efficient utilization of grants allocated to the regions for COVID-19 vaccination and support in proper documentation of expenditures.

- In all the four regions, the TAs conducted regional level partner mapping on RI and COVID-19 vaccination. The mapping enabled TCA partners to align plans, reduce duplication of resources/efforts, and create a smooth working environment.
- Identification/mapping of allocated, disbursed, and unliquidated immunization and COVID-19 vaccination related budgets were conducted with the RHBs in the four regions. Using this mapping, the project supported the RHBs to prioritize zones, woredas and/or town administration for a focused technical assistance to utilize and liquidate their financial resources timely.
- To monitor the performance of grant management at RHB level, existing TWGs were reoriented to provide support and follow up to grant management related issues. The four TAs regularly presented the liquidation status of each region, achievements, challenges, gaps, and suggested action points to the regional immunization TWGs and RHB management team.
- Gavi LMC grant TAs together with finance and grant experts of the RHBs provided supportive supervision for 39 ZHDs (10 in Oromia, 10 in Amhara, 6 in South West Ethiopia and 13 in SNNPR) and woredas having challenges in resource utilization and timely liquidation. Each region developed a context-specific checklist jointly with RHB-EPI and the finance directorate. After each supportive supervision session, written feedback was provided and findings were presented during review meetings.
- During Gavi/LMC project implementation period, regions like Oromia conducted two rounds of quarterly review meetings on grant management where the zonal finance department head, zonal grant and finance officers and all regional grant officers participated. During the review meetings, the LMC regional TA presented the status of regional level liquidation status and challenges. The TA also facilitated the discussions to find solutions and develop action plans to facilitate liquidation and timely utilization of allocated resources.
- The regional grant management TAs supported creating Telegram channels to facilitate a smooth liquidation process. Regional, zonal and woreda grant, finance and EPI teams are

members to the channel and discuss points mainly related to liquidation status. Through these channels different grantees liquidated their budget especially those from remote rural and security affected woredas.

- One of the major gaps identified before the implementation of the project was poor documentation of grant related documents. Regional grant management TAs provided regular support to the four RHBs and ZHDs on financial and technical documents archiving. A checklist with a potential list of documents to be archived at each level developed jointly with RHB and distributed to all levels. By using this standard checklist ZHD and Woredas are archiving their technical and financial reports which will be used as a resource for the technical team and evidence of activities completed during future audits by government and donors.
- Technical support focused on grant management and liquidation, the four RHBs were able to facilitate liquidation of their allocated resources from various donors through MoH for supporting routine immunization and COVID-19 vaccination. When we compare the liquidation status of Gavi funds with the beginning of project implementation (Oct-Nov 2022) the changes were significant. For example, the unliquidated budget in SNNPR reduced to 42.5% of the allocated amount from 92%, Amhara reduced to 7% from 42%, Oromia reduced to 8% from 68% and SWE reduced to 12% from 35% at the end of April 2023. For example, Oromia region reduced its unliquidated budget allocated from UNICEF, WHO, Gavi and World bank from 435,866,467 birr at the beginning of the project support to 5,9613,799 birr at end of April 2023 which shows 46 % decrease in amount of unliquidated budget. Similar results were observed in other regions

v. VPD

- WHO in collaboration with AFRO has provided training for more than 18 AEFI committee members at the national level. Following this 4 AEFI committee meetings were conducted, and 10 serious COVID AEFI cases were investigated and classified. 12 serious n OPV AEFI cases were investigated and classified throughout the reporting period

- WHO has supported the national AEFI committees and national stakeholders meetings and also helped in the causality assessment and classification of more than 10 COVID-related serious AEFI cases.
- WHO Developed training materials for AEFI and shared following the development of Training material training given for health workers on AEFI recording and reporting & Supported COVID-19 AEFI surveillance and classification including supportive supervision for an integrated campaign during HPV, measles, and COVID-19 vaccination

vi. Supply & logistics

- CHAI supported installation of additional cold storage equipment (2 to 80C and -15 to -250C) at EPSS that contributed to additional 400m3 at center & 40 m3 at hub, and instalment of 12 ULT freezers total capacity of 10,230L for Pfizer vaccine.
- TCA partners in collaboration with MoH, EPSA and other partners organize a comprehensive consultative workshop and identify challenges and possible area of improvements at all supply chain nodes, including port of entry/port clearance, EPSA central warehouse, EPSA hubs, districts and at service delivery points/HFs National and Sub-National logistics TWG revitalized, TOR developed, regular meeting has been conducted and used this forum as a key for partners' alignment and engagement and to get vaccine focal assigned at all EPSA hubs.
- All GAVI TCA partners supported the management of national COVID-19 Vaccine logistics for all rounds nationwide COVID campaigns. Support EPSS and MoH on port clearance, storage & transportation in appropriate temperature condition, preparation of distribution plan, managed and tracked vaccines distribution timeliness and accuracy. Through this support the country was able to manage distribution of more than 83mil doses of COVID vaccines of different types.
- All GAVI TCA partners supported the preliminary functionality status assessment and how to implement continuous maintenance of refrigerated trucks at EPSA central and hubs, identifying support areas on maintenance of these refrigerated trucks, identifying gaps in EPSA cold chain transport capacity and fleet management.

vii. Capacity building

- All GAVI TCA partners participated on revision of COVID-19 vaccination training manual, and training power point, in the development of supervision checklist, campaign guide development and in the development of document for Integrating COVID-19 vaccination with RI and PHC
- All GAVI TCA partners Supported face-to-face and virtual TOTs, and cascaded training for health workers and EPI leads at different levels to improve the knowledge and skill to provide quality COVID vaccination services.
- All GAVI TCA partners Supported sensitization and advocacy workshops with different stakeholders, example; religious leaders, professional associations, media professionals and officials at all level, to create awareness and to enhance their level of commitment during COVID vaccination

viii. Planning and coordination

- Established a digital method of collecting woreda level campaign readiness assessment data using smartphones with real time dashboards in Tigray during the integrated C-19/HPV campaign Coordinated the deployment of staffs to support the pre campaign readiness assessment and for supportive supervision (WHO, ACASUS)
- Actively engaged in the strengthening of coordination through revitalization of the regional -logistics TWG which contributed to COVID-19 vaccine introduction/rollout activities including Covid-19 vaccine forecast and microplanning CHAI also establishment of Regional level COVID-19 vaccine access and delivery task force.
- CHAI Facilitated Gambella regional level ToT and cascade trainings and trained a total of 220 Health workers and supported the orientation of 126 kebele level key informants in 2021.following the training conducted program integrated supportive supervision at 13 woreda and 56 health facilities of Gambella region. More than 90 health workers have participated in on-job orientation/capacity building activities in 2021.

- CHAI Collect and update COVID-19 Vaccination data regularly from lower level, analysed, narrated report and shared with relevant stakeholders for timely action.

TCA milestones implementation status ,2022

	Organization	Total milestones	Completed	On truck	Major delay	Minor delay	Reprogramed
GAVI TCA	WHO	16	15		1		
	UNICEF	49	23	25	0	1	0
	CHAI	24	23			2	
	PATH	20	20				
	<u>JSI</u>	10	8	2		-	
	<u>CDC</u>	4	2	2			
	<u>CCRDA/CORE GROUP</u>	19	17	2			
	Acasus	6	6				

COVAX milestones implementation status, 2022

	Organization	Total milestones	Completed	On truck	Major delay	Minor delay	Reprogramed
GAVI CDS	WHO	15	15	0	0	0	
	UNICEF	21	17	4	0	0	0
	CHAI	12	11	1			
	PATH	15	13			1	1
	<u>JSI</u>	<u>7</u>	<u>6</u>	<u>1</u>	-	-	
	Core Group/ CCRDA						
	Acasus	3	3				

[Gavi-Project Based Support](#)

There are other Gavi support for immunization through projects-based modality through partners like Girl effect, IRC, and other. In this section we summarised partners performance as follows.

i. Girl effect

- Completed a literature review and KII on the behavioural and structural barriers and facilitators of HPV vaccine uptake and routine childhood immunization (RI) in urban and peri-urban areas of Ethiopia.
- Executed Human Centered Design to co design messaging and other interventions with targeted girls and young people by applying evidence-based behaviour change tactics (BCTs) for girls and young mothers in zero-dose and missed communities.
- Conducted low-fi testing of 8 prototype concepts with priority communities (4 woredas in Somali and Amhara with 12 FGDs in each woreda) with in-school and out-of-school girls, parents of adolescents, teachers & HEWs, young mothers & expectant mothers, young fathers, in-laws, community influential leaders including religious leaders.
- Created and distributed new HPV content and repurposed two of the existing PSAs to support the ministry with effective SBCC during the HPV campaign held nationally.
- In all three intervention regions (Somali, SNNP, and Amhara), youth groups were formed, and training was completed to co-design and test our products.
- Demand creation Messages production is in progress: Designed the SBC strategy, designed key messages, Production, and pretesting of materials in progress.
- Supported the MoH in organizing a national level advocacy workshop on Africa.

Vaccination Week celebration commemorated in the Somali region. The event's objectives included reviving the local vaccination program and evaluating the performance of the recent integrated COVID/HPV campaign.

- Gender mainstreaming in programming- gender considerations have been mainstreamed in program design since the initial stage of literature review and primary data collection. We reviewed resources and collected primary data that revealed gender-related barriers/enablers. We have finalized gender scoping related to RCI and HPV

immunization and outlined recommendations to incorporate Gender Transformative Approach across all products.

- Project setup completed-signed MoU, kick off meeting with partners, regional and woreda setup.

ii. IRC support

1.1. Identification, mapping and microplanning of zero dose

i. Identification

During the reporting period, in collaboration RHB, the district-level of health office, and the district Disaster Risk Management Commission (DRMC) effort has been made to identify ZDC and UIC across GAVI REACH implementation locations of the six Regions (Afar, Amhara, Tigray, BGRS, Oromia and SWNNP).

Country	Region	Identified ZDC 1-5 y/o	Targeted ZDC 1-5 y/o to	Identified UIC 1-5 y/o	Targeted UIC 1-5 y/o
Ethiopia	Tigray	285,207	87,273	22,815	5,704
	Afar	31,158	9,534	8,044	2,011
	Amhara	100,207	30,663	8,814	2,203
	SNNPR	16,031	4,905	8,915	2,229
	BGRS	11,527	3,527	2,140	535
	Oromia	143,098	43,788	31,574	7,894
	Total	587,226	179,691	82,302	20,575

ii. Mapping

Approximately 98% of this population would live within 5km of a site if 747 optimally placed mobile and outreach sites were added in Ethiopia.

1.1.1. Microplanning

REACH collaborated with Regional Health Bureaus (RHB) and local health authorities, to develop micro-plan for 117 (out of targeted 117) health facilities in Tigray area, 14 (out of 85) in Amhara, and all (26) in Afar (see table below). During the planning phase, data on socio demographic and previous year performance was collected, followed by a three days' microplanning workshop. Developed health facility micro plans were then consolidated at district/ woreda level. Conflict/fighting delayed microplanning in Amhara. Remaining sites will finalize microplanning within July-September 2023 quarter.

Table 3: Microplanning completion in Ethiopia

Region	Number of HF targeted for microplanning	Number that has completed microplanning as at end of June 2023
Tigray	117	117 (100%)
Afar	26	26 (100%)
Amhara	85	14 (16%)

EACH collaborated with Regional Health Bureaus (RHB) and local health authorities, to develop micro-plans for 117 (out of targeted 117) health facilities in Tigray area, 14 (out of 85) in Amhara, and all (26) in Afar (see table below). During the planning phase, data on socio demographic and previous year performance was collected, followed by a three days' microplanning workshop. Developed health facility micro plans were then consolidated at district/ woreda level. Conflict/fighting delayed microplanning in Amhara. Remaining sites will finalize microplanning within July-September 2023 quarter.

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1.2. Service delivery

To deliver contextualized vaccine services - (January to September 2023), the project rolled out vaccination service through a phased approach, conducted microplanning, established cold chain and vaccine access pathways, set up data management systems, engaging the community and built the capacity of the vaccination workforce across the various locations in Ethiopia.

During the period from January to September 2023, significant efforts were made to ensure humanitarian access in various regions and districts. However, East Tselemti in Amhara and Raya Azebo, Alamata, Zata, Chercher, and Emba Alajei in Tigray remain inaccessible for rolling out immunization services. Access team closely work with different actors to address the ZDC and missed community on those locations.

GAVI REACH Ethiopia reached a total of 76, 817 under five children vaccinated DPT1 of this 17,623(23%) were children >12m and 67,955, U5 children were received DPT3 of this 16,497 (24%) were above 12months. Similarly, the consortia reached 39,376 children

above one year received Measle vaccine.

Table : Zero dose children addressed through the REACH program

Indicator	Target	No. Reached Jan-Sep 2023			
		Afar	Amhara	Tigray	Total
Number of children immunized with DTP1	# Infants (0-11) for DPT1	5,427	11,139	42,628	59,194
	ZDC (12-23) DPT1	922	4,929	6,893	12,744
	ZDC (24-59) DPT1	1,585	2,028	1,266	4,879
	Total DPT-1	7,934	18,096	50,787	76,817
Number of children immunized with DTP3	# Infants (0-11) for DPT3	4,063	8,233	39,162	51,458
	(12-23) DPT3	731	2,102	10,099	12,932
	(24-59) DPT3	735	990	1,840	3,565
	Total DPT-3	5,529	11,325	51,101	67,955
Number of children immunized with MCV1	# Infants (0-11) for MCV1	3,741	6,549	26,784	37,074
	ZDC (12-23) MCV1	1,420	2,041	9,624	13,085
	ZDC (24-59) MCV1	737	1,826	3,967	6,530
	Total MCV1	5,898	10,416	40,375	56,689
Number of children immunized with MCV2	# Infants (0-11) for MCV2				
	(12-23) MCV2	3,257	3,909	18,900	26,066
	(24-59) MCV2	433	2,776	10,101	13,310
	Total MCV2	3,690	6,685	29,001	39,376

Mass Immunization Campaign

Integrated COVID and ZDC campaign: The Tigray RHB conducted an integrated COVID and HPV campaign in the region from 15th - 24th August 2023 and IRC coordinated with the RHB support the campaigns through allocating resources such as deployed 6 rental vehicles and assigned 11 technical staff to support the campaign.

In Afar, one mass ZIP campaign was conducted in the target woredas from 8th –14th August 2023 and coordinated by four assigned Zonal immunization program technical assistants from the RHB. The campaign session had a pre campaign session in which the estimated number of ZDCs were 21,029 and 31,664 UIC were identified from the DHIS II data (2021-2023).

A one day prior to the campaign, health workers and mobilizers taken a refresher orientation by the Zonal EPI experts and woreda EPI coordinators.

A total of 108 health workers and community mobilizers along with 4 Zonal technical assistants from the RHB engaged and 9 vehicles (8 rental) were mobilized for the campaign to cover 53 immunization sites in nine targeted districts.

This first round mass immunization campaign was able to reach 1,467 ZDCs (712 F and 755 M) of age 12-59 months with Penta-1 vaccination and 1,466 children (693 F and 773 M) took Penta-2.

Besides, 547 under 12 months children (256 Female & 291 Male) received Penta-1 and 181 (82 Female & 99 Male) took Penta-3 vaccination.

1.3. Capacity building

In the reporting period, REACH in collaboration with regional health bureau (RHB) different trainings conducted at Amhara, Afar and Tigray Regions. Here is below the type of trainings and number of trainees.

Table 4: List of training or capacity building provided.

#	Training types	session	Duration	Participants		
				F	M	Total
1	Immunization in Practice (IIP) trainings for (HWs)	01	March 4-10, 2023	16	9	25
2	Immunization in Practice (IIP) trainings for (HWs)	01	June 17- 23, 2023	17	14	31
3	Vaccine and Cold chain management training for HWs	01	March 13-17, 2023	18	7	25
4	Vaccine and Cold chain management training for HWs	01	June 19-23, 2023	5	17	22
5	HEWs supervisor's refresher training on immunization.	01	March 16, 2023	13	28	41
6	IIP refresher training for HEWs in NWT at the district level	12	April 30 – May 2, 2023	302	0	302
7	Orientation for Community Gatekeepers	01	May 24 - 30, 2023	0	101	101
8	Immunization in Practice (IIP) trainings for (HWs)	01	June 2-6, 2023	17	31	48
9	DQAS training for EPI coordinators	01	June 7-9, 2023	37	9	46
10	Facility base Micro-planning	01	June 10-11, 2023	37	9	46
11	Integrated immunization in practice and cold chain management Training	01	June 5-10, 2023	33	12	45

1.4. Cold chain and supply chain management

i. Cold chain

In Afar CCE inventory was carried out in nine health facilities at four districts and three solar refrigerators not functioning and identified in Koneba, Megale, Awura, and Gulina

woredas.

For a better cold chain and vaccine management, the IRC provided Cold Chain and vaccine Management (CCM) basic training for EPI managers and experts for a total of 28HWs (12F, 16M) for 5 days at zonal level from July 16- 20,2023 in Southern zone of Tigray.

In this reporting period, the IRC with RHB biomedical technicians, 21 different electrical, one Kerosene type and one Solar refrigerator were maintained in central zone of Tigray. Similarly, in the North-western zone (Tigray), 19 electrical refrigerators were also maintained during the reporting period. One of the major activities conducted during the reporting period was installment of new refrigerators. Most of the health posts received solar refrigerators funded by GAVI CCEOP Y 2 and 3-Vestfrost.

In Northwest zone of Tigray region, 72 solar refrigerators were installed for nine Health centers. The installation was also conducted in the central zone for 121 health posts. Moreover, 24 solar refrigerators were installed in Southern zone health posts. The IRC assigned medical logistician from IRC Addis and senior GAVI Reach officers from Shire Field Office (FO) project implementing zones for their follow ups during the installation of those solar refrigerators.

ii. Vaccine & Supplies, Management & Related Logistics

To ensure the vaccine supplies and cold chain equipment, the consortia REACH team closely coordinated with Ethiopian Pharmaceuticals Supply Service (EPSS) across the regions where GAVI REACH project implemented locations.

Vaccine and immunization supplies were distributed to ZIP target districts and to the selected health facilities supplied by regional EPSS. In consultation with regional health office EPI team and EPSS vaccine Hub led, the project received antigens based on the completed vaccine request form considering the estimated number of children available per each functional vaccine services provider health facilities catchment population.

In the reporting period, shortage of Bacille Calmette-Guérin (BCG) and Rota vaccines were reported stock out in Aba'ala City, Aba'ala/Afar and in Machew/Tigray districts. IRC has communicated with RHBs and EPSS concerning the shortage of antigens and EPSS has already aware of the stock out and has ready to communicate with Addis EPSS hub to refill and solve the rupture of antigen in the two districts.

1.5. Demand Creation/Community Engagement

Familiarization and Demand creation workshop was conducted, and 204 participants attended the workshop from northwest zone woredas (Sheraro, Endabaguna, Adidaero and Zana). The participants were selected from different sector such as Woreda Health

Office, HEWs, Women and Children Affairs Office etc., RHB representatives' part of the workshop carried out for four days (i.e., on Sep 24, 25, 29 & 30, 2023). Demand side barriers were identified in the workshop by each woreda, and discussion conducted by the lead of zone health representatives.

In Afar, 26 new CC groups were established making the total community dialogue groups 27 (1 CC group was established in Aba'ala City in the previous quarter). All CC groups have a total of 20 (10F,10 M) participants and facilitated by a health extension worker.

As each CC group planned to meet every month, the total planned sessions were 81, but conducted only 27 sessions with a total number of 421 participants (224 F & 197 M) attended on the CC dialog. The main purpose of these community dialogues is to make aware the community and boost the immunization uptake among ZDC and missed communities.

1.6. Data, monitoring, and supervision

i. Strengthening Data Management System

GAVI-REACH Ethiopia provided data management training to 26 (2F and 24M) HIT professionals from August 2-4,2023 and conducted routine data quality assessment from August 21-30, 2023, in selected health facilities of target woredas in Afar. Similarly, Health Data Quality training was provided to 92 (51F,41M) EPI focal and Health information technicians from September 14-16, 2023, in Tigray in collaboration with Regional HMIS to strengthen GAVI REACH and government HMIS data management system. The training covered immunization data quality, recording, archiving, demographics output analysis and reporting that enhanced utilization of immunization data for action. In addition, 264 EPI registration books, 74 tally sheets, 78 ledger book and 127 vaccine forecast formats were distributed to health facilities that have shortage of EPI tools.

The RHB assigned trainers with TOT certificate on DQA and took responsibility for the on service follow up of the trainees.

ii. Supervision

GAVI REACH Ethiopia conducted integrated Joint Supportive Supervision (JSS) with Tigray RHB and WHO in central zone for five primary hospitals and three health centers. The supervision was conducted in six woredas of central Tigray from September 4 to 11, 2023. The purpose of the assessment was to obtain firsthand information that mainly focuses on EPI and diseases surveillance in selected health facilities. The team also evaluated the EPI integration with Nutrition and WASH and other essential health services were part of the JSS mission. Here below some of the

findings identified during the JSS.

1. Shortage of EPI monitoring chart.
2. Lack of updated defaulter tracing system in place.
3. Staff shortage at HFs/Small number of vaccinators.
4. Report incompleteness

IRC has taken action to narrow the identifying gaps on producing and dispatching the EPI monitoring chart, engaging HEWs on defaulter tracing, use other humanitarian health care workers and on job feedback and guidance were provide by RHB and WHO expertise to the frontline EPI staff.

iii. Crown agent

With support of Gavi crown agent supported the ministry of health in monitoring COVID 19 vaccination programs. With monitoring the ministry and regions and the subnational lower level. The monitoring identified best practice and areas of improvement on the COVID 19 vaccination program including finance management. The monitoring agent presented the findings of the assessment to the ministry and regional to team to take actions and corrections and capitalize on the best practices.

Section 2: Looking forward: Summary of key discussion points and follow up actions.

The ministry of health and partners working on the immunization program has identified the following key priority areas for the future improvement or work.

- i. Restoration of immunization and other services in conflict affected areas, strengthening, and maintaining of routine immunization.
- ii. Implementation of the BIG CATCH UP/ Accelerated plan to address ZDC, UVC and missed communities to address the backlogs of children missed the routine vaccination schedule.
- iii. Conduct HPV multi age cohort campaign and single dose switch for adolescent girls of 9-14 years
- iv. COVID 19 vaccination integration with primary care unit and regular system.
- v. Strengthen service integration and reduce missed opportunities. Integration of services (such as EPI-Nutrition nexus, RI with SIAs)

- vi. Promote Private Health Facilities to provided vaccination services regularly.
- vii. Enhance immunization leadership capacity, partnership, and coordination at all levels.
- viii. Digitalization of immunization data systems and data quality strengthening capacity building activities
- ix. Strengthen vaccine preventable disease surveillance and Outbreak response.
- x. Strengthen partnership and mobilization at all levels.
- xi. Demand creation of immunization program and implementing tailored approach of demand creation modalities.
- xii. Expanding and strengthening last mile delivery, reduce stock out of health facilities.
- xiii. Expansion of cold chain capacity at the lower level and strengthen cold chain maintenance capacity.
- xiv. Capacity building of health workers and program managers on IIP, MLM and vaccinology.
- xv. Introducing new vaccines and switch programs.
- xvi. Strengthening finance management systems and finance absorptions and liquidation
- xvii. Strengthen vaccine pharmacovigilance system.