



U.S. PRESIDENT'S MALARIA INITIATIVE



THE PMI VECTORLINK PROJECT ETHIOPIA

2020 END OF SPRAY REPORT

SPRAY CAMPAIGN: JUNE 2, 2020 – AUGUST 3, 2020

Recommended Citation: The PMI VectorLink Project. September 2020. *Ethiopia 2020 End of Spray Report. Spray Campaign: June 2 2020 – August 3, 2020.* Rockville, MD. The PMI VectorLink Project, Abt Associates Inc.

Contract: AID-OAA-I-17-00008

Task Order: AID-OAA-TO-17-00027

Submitted to: United States Agency for International Development/PMI

Submitted on: 17 September, 2020

Approved on: 4 November 2020

Abt Associates Inc. | 6130 Executive Blvd | Rockville, Maryland 20814
T. 301.347.5000 | F. 301.913.9061 | abtassociates.com

The views expressed in this document do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

CONTENTS

Acronyms	i
Executive Summary	2
1. Country Background	3
2. Implementation of IRS Activities	5
2.1 IRS Planning and Partner Collaboration	5
2.2 Training.....	6
2.3 Spray Operations and Supervision	6
2.3.1 Human Resources	7
2.3.2 Operations Sites and Logistics	8
2.3.3 IRS Supervision	9
2.4 Insecticide.....	10
2.5 Implementing IRS during the COVID-19 Pandemic	10
2.6 Security.....	12
2.7 Information, Education, and Communication.....	12
2.8 Capacity Building.....	13
2.9 Gender Mainstreaming.....	14
2.10 Overview of Pilots	15
3. Entomological Monitoring	17
4. Environmental Compliance	19
4.1 IRS Campaign Assessments	19
4.2 Incident Reports.....	19
4.3 Demobilization and Waste Management	20
5. Monitoring and Evaluation	21
5.1 Data Collection, Entry, and Quality Assurance	21
5.1 mHealth	22
5.2 IRS Campaign Results	22
6. Challenges and Lessons Learned	24
6.1 Challenges.....	24
6.2 Lessons Learned and Recommendations	25
Annex A: Procurement	26
Annex B: Dates and Duration of Spray Campaign by District	28
Annex C: Environmental Mitigation and Monitoring Report	30
Annex D: M&E Plan Matrix – 2020 Campaign Results	37
Annex E: Spray Progress and Coverage by District and by Region	52

LIST OF TABLES

Table ES-1: Summary of 2020 PMI VectorLink IRS Campaign	2
Table 1: PMI Support for IRS in Ethiopia, 2015 to 2020	4
Table 2: Number of Kebeles Targeted for IRS by VectorLink Ethiopia by Zone	5
Table 3: Number and Type of Seasonal Workers Trained, by Gender and Job Category.....	6
Table 4: Hiring by PMI VectorLink Ethiopia	8
Table 5: Kebeles that were Affected by Security Concerns	12
Table 6: Female Engagement in IRS Implementation by Region.....	15
Table 7: Environmental Incidents Reported During the IRS Campaign.....	20
Table 8: Summary of Type, Quantity, and Disposal Stream of Solid Waste.....	20
Table 9: Regional Spray Progress and Coverage.....	22
Table A-1: International Procurements.....	26
Table A-2: Local Procurements.....	26
Table B-1: Campaign Length by District	28
Table C-1: Environmental Mitigation and Monitoring Report	30
Table E-1: Spray Progress and Coverage by District.....	52

LIST OF FIGURES

Figure 1: Districts Receiving IRS through PMI VectorLink in 2020	3
Figure 2: Signs of Good Household Preparation: Personal Items Stored Outdoors and Completely Empty Structures	9
Figure 3: VectorLink Staff Being Tested for COVID 19 before Entering Benishangul-Gumuz Region.....	11
Figure 4: IEC Poster Used to Mobilize the Community for IRS.....	13
Figure 5: Female SOP Working in Assosa District	15
Figure 6: Mortality of <i>An. arabiensis</i> Tested against Actellic 300 CS in Cone Bioassays.....	17
Figure 7: Mortality of Mosquitoes in Cone Bioassays Tested against SumiShield, Fludora Fusion, and Actellic 300 CS in Menge	18
Figure 8: Reasons for Unsprayed Structures	23
Figure 9: Coping with Problems Related to Rain during the Spray Campaign.....	25
Figure E-1: Spray Progress, Gambela Region	55
Figure E-2: Spray Coverage, Gambela Region.....	55
Figure E-3: Spray Progress, Benishangul-Gumuz Region.....	56
Figure E-4: Spray Coverage, Benishangul-Gumuz Region	56
Figure E-5: Spray Progress, Oromia Region	57
Figure E-6: Spray Coverage, Oromia Region.....	57

ACRONYMS

BMP	Best Management Practices
CB-IRS	Community-Based Indoor Residual Spraying
COP	Chief of Party
DB-IRS	District-Based Indoor Residual Spraying
DEC	Data Entry Clerk
DHIS	District Health Information Software 2
DHO	District Health Office
ECO	Environmental Compliance Officer
FMOH	Federal Ministry of Health
HEW	Health Extension Worker
IEC	Information, Education and Communication
IRS	Indoor Residual Spraying
M&E	Monitoring and Evaluation
MEP	Monitoring and Evaluation Plan
MFP	Malaria Focal Person
MSP	Mobile Soak Pits
NMCP	National Malaria Control Program
PMI	President's Malaria Initiative
PPE	Personal Protective Equipment
RHB	Regional Health Bureau
SEA	Supplementary Environmental Assessment
SOP	Spray Operator
SQL	Squad Leader
TOT	Training of Trainers
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

Abt Associates supports the implementation of indoor residual spraying (IRS) in Ethiopia through the PMI VectorLink Project funded by the United States Agency for International Development (USAID) under the U.S. President’s Malaria Initiative (PMI). VectorLink Ethiopia, in collaboration with the Federal Government of Ethiopia, conducted the 2020 IRS campaign from June 2 (three weeks later than planned, due to COVID-19 restrictions) to August 3. The project initially targeted 540,588 structures across 44 districts, which was later revised to 535,164 structures because of security issues. The first phase of the spray campaign began on June 2 in Gambela Region and in three of 10 districts in West Guji Zone of Oromia Region. Gambela completed IRS on June 20 (13–16 operational days per district) and West Guji did so on July 5 (29 operational days). The second phase of the campaign started on June 23 in Benishangul-Gumuz and the other seven districts in Oromia. It ended in Benishangul-Gumuz on July 27 (27–30 operational days per district) and in the seven Oromia districts on August 3 (27-30 operational days per district) after a protracted interruption due to widespread unrest. The campaign results are summarized in Table ES-1.

Table ES-1: Summary of 2020 PMI VectorLink IRS Campaign

Dates of PMI-supported IRS campaign	June 2–August 3, 2020
Total calendar days	63*
Insecticides used	Actellic 300CS (organophosphate)
Number of regions	3 (Benishangul-Gumuz, Gambela, Oromia)
Number of districts	44
Number of structures found by spray operators (SOPs)	551,504
Number of structures sprayed by SOPs	527,375
2020 spray coverage	95.6%
Population protected	Total population: 1,511,728 Children under 5 years: 226,996 (15.0%) Pregnant women: 43,747 (2.9%)
Number of people trained with U.S. Government funds to deliver IRS**	2,350

* This is the total number of calendar days for the 2020 campaign. The exact number of operational days for each district is in Annex B.

** Based on the definition of the indicator “Number of people trained with USG funds to deliver IRS,” spray personnel trained to deliver IRS only included spray personnel such as SOPs, porters, squad leaders, and supervisors. Clinicians, data clerks, information, education and communication (IEC) mobilizers, drivers, washers, pump technicians, and security guards were excluded. Women accounted for 31.5% of the 2,350 people trained.

Ultimately, the project sprayed 527,375 of 551,504 structures found by SOPs, for a spray coverage of 95.6%. This represents 97.6% spray progress relative to the original target of 540,588 structures and 98.5% spray progress compared with the adjusted target of 535,164. In total, 1,511,728 residents were protected, including 226,996 children under 5 years old (15.0% of residents protected) and 43,747 pregnant women (2.9%). The project achieved these results despite facing significant challenges posed by the COVID-19 pandemic and unrest.

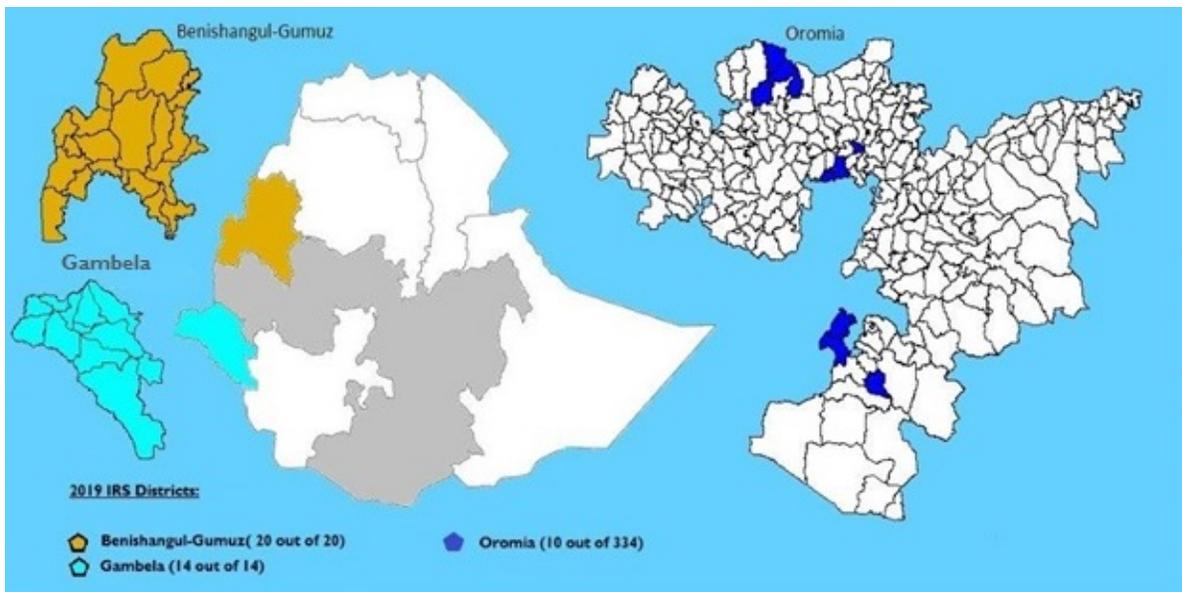
A total of 132,194 bottles of Actellic 300CS, 480 sachets of SumiShield 50 WG, and 260 sachets of Fludora Fusion of insecticide were used to spray 527,375 structures. Only 1,814 bottles of Actellic 300CS remained at the conclusion of the campaign.

The project conducted wall bioassays within a week of spraying in all three regions. All three insecticides achieved 100% mortality of *An. arabiensis* after the appropriate holding period.

I. COUNTRY BACKGROUND

Since 2008, the U.S. President’s Malaria Initiative (PMI) has funded indoor residual spraying (IRS) in Ethiopia, with the aim of reducing the malaria burden, especially among children less than 5 years old and pregnant women. Under the PMI Africa Indoor Residual Spraying projects (2012–2017), Ethiopia successfully implemented six IRS campaigns. In each campaign, 36 districts in Oromia Regional State were sprayed. In 2017, the project conducted IRS in an additional eight districts in the Benishangul-Gumuz Region. In 2018, 26 of 36 districts in Oromia Region graduated and were replaced with 26 districts in Benishangul-Gumuz and Gambela regions. The same 44 target districts – 20 out of 20 districts in Benishangul-Gumuz, 14 out of 14 districts in Gambela, and 10 out of 334 districts Oromia, shown in Figure 1 – received PMI-supported IRS from 2018 to 2020. The number of targeted structures (Table 1) was determined in collaboration with government counterparts using population estimates, available historical data, and, in the case of Gambela Region, digital enumeration conducted in early 2019. The structures found in 2019 were used as the target for the 2020 operation in all the three regions.

Figure 1: Districts Receiving IRS through PMI VectorLink in 2020



Malaria transmission in Ethiopia occurs up to 2,000 meters above sea level but has been recorded in areas up to 2,300 meters under abnormal weather conditions. The country’s diverse ecology supports a wide range of transmission intensities. At least 75% of the country is malarious with about 52% (more than 53 million people) of the total population living in areas at risk of malaria. Currently, malaria affects 2–3 million people annually in Ethiopia, primarily by *Plasmodium falciparum* and *Plasmodium vivax* parasites. Malaria transmission peaks twice per year, from September to December, after the long rainy season, and from April to May, after a shorter rainy season. *An. arabiensis* is the predominant malaria vector; *An. pharoensis*, *An. funestus*, and *An. nili* play a much lesser role in transmission.

Under the National Malaria Strategic Plan 2017–2020, the Federal Ministry of Health (FMOH) lists IRS as one of the primary vector control interventions, prioritizing areas where the malaria burden is high, and highland fringe areas at risk of epidemic.

In 2020, the VectorLink Ethiopia project worked with the FMOH; the Benishangul-Gumuz, Gambela, and Oromia regional health bureaus (RHBs); and the district health offices (DHOs) to conduct IRS in the 44 target districts, originally targeting 540,588 structures.

Table 1 provides a summary of United States Agency for International Development (USAID) and PMI support to IRS in Ethiopia since 2015.

Table 1: PMI Support for IRS in Ethiopia, 2015 to 2020

	2015	2016	2017	2018	2019	2020
Number of districts covered by PMI-supported IRS	36 (Oromia)	36 (Oromia)	44 (36 in Oromia, 8 in Benishangul-Gumuz)	44 (10 in Oromia, 20 in Benishangul-Gumuz, and 14 in Gambela)	44 (10 in Oromia, 20 in Benishangul-Gumuz, and 14 in Gambela)	44 (10 in Oromia, 20 in Benishangul-Gumuz, and 14 in Gambela)
Number of structures targeted	670,303	708,258	787,658	Original: 595,618 Adjusted: 574,042	Original: 542,148 Adjusted: 509,594	Original: 540,588 Adjusted: 535,164
Number of structures found by spray operators (SOPs)	708,258	717,396	748,917	485,358	510,449	551,504
Number of structures sprayed	704,945	715,541	738,810	472,569	487,746	527,375
Spray coverage (%)	99.5	99.7	98.7	97.4	95.5	95.6
Population protected	1,655,997	1,688,745	1,877,154	1,264,189	1,334,868	1,511,728
Children under 5	230,366	230,690	269,299	213,459	228,262	226,996
Pregnant women	23,084	23,011	29,271	28,944	33,245	43,747
Spray dates and insecticide used	July–Aug: Actellic 300CS Aug–Sep: Bendiocarb 80 WP	Jun–Aug: Actellic 300CS	Jun–Jul: Actellic 300CS	May–Jul: Actellic 300CS	May–Jul: Actellic 300CS	Jun–Aug Actellic 300CS, Fludora Fusion and SumiShield 50WG
Number of people trained with U.S. Government funds to deliver IRS	2,845	2,749	3,199	2,413	2,675	2,350

2. IMPLEMENTATION OF IRS ACTIVITIES

The VectorLink Ethiopia project and the Benishangul-Gumuz, Gambela, and Oromia regional states worked together systematically to plan the 2020 IRS campaign. The team used the existing government structure and systems to implement IRS activities and promote sustainability of the program. District health office heads and district malaria focal persons (MFPs) led IRS implementation and management in their districts with support and leadership from the regional experts (Regional MFP and Malaria Technical Advisor).

Health Extension Workers and local community leaders carried out community mobilization activities. Health professionals at various district health system levels served as squad leaders (SQLs) and team leaders, supervisors, and trainers of SOPs. The project recruited all SOPs and 32% of SQLs from within the target areas using IRS actor selection criteria and guidelines.

2.1 IRS PLANNING AND PARTNER COLLABORATION

In 2020, the VectorLink Ethiopia project implemented IRS in 896 out of 996 kebeles across the 44 targeted districts. VectorLink Ethiopia targeted 540,588 structures for spraying based on the number of structures SOPs found in 2019, as well as any eligible structures that were not reached in 2019 due to security concerns. During the micro-planning meeting, the stakeholders agreed to exclude 100 kebeles either because they were located at an altitude above 2,000 meters.

In March 2020, VectorLink Ethiopia, in collaboration with the three RHBs, and zonal and district health offices, organized a two-day planning meeting in each region. These meetings facilitated the planning and preparation of trainings, with particular attention paid to structures or villages excluded in 2019, determined the appropriate IRS implementation model for each district, and identified commodity and human resources as well as infrastructure, transportation, and management support needs. Table 2 shows the number of kebeles targeted for the 2020 campaign.

Table 2: Number of Kebeles Targeted for IRS by VectorLink Ethiopia by Zone

Region	Zones	Total Number of Kebeles	Number of Kebeles Targeted to Receive IRS
Benishangul-Gumuz	Kamashi	67	67
	Assosa	233	233
	Metekel	170	154
	Maokomo Special	33	33
Gambala	Agnuwa	84	84
	Nuer	118	118
	Majang	32	32
	Itang Special	23	23
	Gambela Town	5	5
Oromia	Horo Guduru Wollega	94	57
	South West Shewa	74	46
	West Guji	63	44
Total		996	896

VectorLink Ethiopia conducted a comprehensive logistics needs assessment in August 2019, the results of which were used to procure IRS commodities for the 2020 IRS season. Of particular note is that the project selected the Goizper sprayer model for the 642 new sprayers needed, following the successful pilot test conducted during the 2019 IRS campaign. Since the 2019 assessment preceded the outbreak of COVID-19, the project updated implementation logistics plan to incorporate COVID-19 guidelines. See Annex A for the details on international and local procurements. The project conducted all local procurements based on USAID and Abt’s standard procedures.

2.2 TRAINING

Before spray operations began, VectorLink Ethiopia collaborated with the RHBs and DHOs to train personnel involved in IRS. Training on IRS implementation and supervision is central to the overall capacity-building strategy of the PMI VectorLink project. The project conducted a variety of trainings to develop and/or refresh skills of IRS personnel on IRS implementation for the 2020 IRS campaign. As described in the opening paragraph of Section 2.5, the project implemented mitigation factors to protect the teams against COVID-19. Table 3 shows the number and type of seasonal workers by gender and job category.

Table 3: Number and Type of Seasonal Workers Trained, by Gender and Job Category

Category of Persons Trained	Training of Trainers		Spraying Operations		Data entry clerks		Logistic Training		Spray pump technicians / Store assistants		Driver Training		Washing Training		Store security Training		Poisoning case management Training		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
Supervisors	101	3																		104
Team leaders	92	4																		96
Squad leaders			351	93																444
Spray operators/ Porters			1,238	468																1,706
Data entry clerks					54	8														62
District storekeepers							39	4												43
Assistant storekeepers/ Pump technicians									44	0										44
Clinicians																	67	21		88
Drivers											211	0								211
Washers													9	106						115
Security guards															97	3				100
Subtotal M/F	193	7	1,589	561	54	8	39	4	44	0	211	0	9	106	97	3	67	21		3,013
Total Trained	200		2,150		62		43		44		211		115		100		88			3,013

2.3 SPRAY OPERATIONS AND SUPERVISION

IRS was implemented in close collaboration with the FMOH, the three RHBs, and zonal and district health offices. The project implemented the district-based (DB-IRS) model in 41 targeted districts and community-based (CB-IRS) model in three very remote districts (Akobo in Gambela, and Guba and Wombera in

Benishangul-Gumuz). The project provided technical oversight of training, logistics, supervision, and monitoring and evaluation (M&E) in all 44 districts. DHO staff served as supervisors, district IRS MFPs, team leaders, and some SQLs.

Spray teams departed from the sites every morning at approximately 7:30am and returned after completing their daily spray assignments at around 3:30pm. Spray operations ran six days per week; the rest day typically corresponded to the local market day. The project designed the spray calendar to spray remote and hard-to-reach kebeles first, in the event that rain resulted in roads becoming impassable.

The IRS campaign started three weeks later than originally planned because of the national lockdown due to COVID-19. The first phase of the spray campaign began on June 2 in Gambela region and three of 10 districts in West Guji Zone of Oromia Region; and ended on June 20 in Gambela and on July 5 in West Guji. The second phase started on June 23 in Benishangul-Gumuz and the other seven districts in Oromia (four in Horo Guduru Zone and three South West Shoa). It ended on July 27 in Benishangul-Gumuz but lasted until August 3 in Oromia after a week-long suspension due to widespread unrest throughout the region. Despite the extension, the campaign was completed within the targeted number of operational days. The campaign start dates were staggered to allow early spraying in communities of Gambela Region and West Guji Zone that usually become inaccessible during the rainy season. Staggering also allowed project staff to supervise fewer districts at a time. The spray campaign took place over 21–30 operational days in the various sites in Benishangul-Gumuz, 12–16 operational days in Gambela sites, and 27–30 operational days in Oromia sites. Annex B shows campaign start and end dates for each district. The CB-IRS districts completed spraying early because the model requires more SOPs and therefore the number of operational days is fewer than in DB-IRS.

2.3.1 HUMAN RESOURCES

The VectorLink Ethiopia team worked with each district to recruit seasonal spray actors based on the recruitment criteria developed by the VectorLink project in partnership with the three RHBs. As in previous IRS campaigns, team leaders, SQLs, and other supervisors were recruited from health professionals working in the IRS target districts and zones. In 2020, recruitment criteria was revised to include education status of SOPs to ensure all recruited SOPs would be able to collect IRS data in Benishangul-Gumuz and Oromia regions. Of the 541 SOPs/porters who submitted their education status in Gambela, 88.4% had completed the 10th grade and therefore were presumed to be able to write and read in Amharic.

The district leadership teams comprised one MFP, one district environmental compliance officer (ECO), one vice head, and one district information, education, and communication (IEC) officer, all of whom were full-time DHO employees. In addition to the DHO staff, VectorLink Ethiopia hired one additional seasonal supervisor to strengthen the quality of supervision in Benishangul-Gumuz and Gambela regions. In Benishangul-Gumuz and Oromia regions, each district spray team included at least one team leader, who was in charge of 4–5 squads each composed of one SQL, four SOPs, and one porter, the latter of which served two squads. In Gambela Region, there were two SQLs per squad (one SQL was responsible for ensuring spray quality and the other recorded IRS data). The project hired M&E assistants whose primary responsibility was to conduct data quality verification on the SOP forms and transport the forms from the districts to the data centers. The nine VectorLink zonal IRS coordinators, who are full-time Abt staff, were each responsible for 3–4 districts. The project also hired nine zonal finance/administrative officers on a seasonal basis to improve logistical and financial management during the campaign.

In total, VectorLink Ethiopia recruited and hired 4,147 individuals to support IRS operations in all 44 targeted districts. Table 4 shows the staff that implemented IRS in the operations sites.

Of these 4,114 seasonal staff, 31.5% were women in 2020, compared with 27.9% in 2019. Out of the 1,728 individuals hired as SOPs/porters, 26.4% were women in 2020, compared with 13.2% in 2019.

Table 4: Hiring by PMI VectorLink Ethiopia

Category	Number of Staff Hired to Support IRS*						Total (% Female)
	Spray Ops		Data Capture		Other		
	M	F	M	F	M	F	
Supervisors	256	11	–	–	–	–	267 (4.1%)
Seasonal supervisors	27	1					28 (3.6%)
Squad leaders	352	90	–	–	–	–	442 (20.4%)
Spray operators/Porter	1,271	457	–	–	–	–	1,728 (26.4%)
Data entry clerks	–	–	57	8	–	–	65 (12.3%)
M&E assistants	–	–	54	3	–	–	57 (5.2%)
Storekeepers	–	–	–	–	40	4	44 (9.0%)
Store assistants/Pump technicians	–	–	–	–	44	0	44 (0.0%)
Washers					9	106	115 (92.2%)
Water fetchers					38	44	82 (53.7%)
Security guards					97	3	100 (3.0%)
Mobilizers	–	–	–	–	607	568	1,175 (48.3%)
TOTAL M/F	1,906	559	111	11	835	725	4,147 (31.5%)
TOTAL	2,465		122		1,560		

* Supervisors and storekeepers are Government of Ethiopia staff.

2.3.2 OPERATIONS SITES AND LOGISTICS

Based on the dispersion of the targeted kebeles, all districts had at least one operations site: 14 districts had one operations site, 21 districts had two operations sites, and the rest had more than two operations sites, particularly in the three CB-IRS districts (Akobo and Wombera districts each had five operations sites while Guba district had 18). Forty-four of the 108 operational sites had a permanent storeroom, wash area, and fixed soak pit; the rest used a temporary storeroom at a local health post or health center and mobile soak pits.

In 2020, VectorLink Ethiopia used the same approach of vehicle procurement as in 2019 to ensure vehicles of the highest quality were hired for the IRS campaign. A total of 211 vehicles were contracted: 81 were buses and 130 were long-based 4X4 vehicles. During IRS implementation, all the vehicles were dispatched on time, immediately after being inspected by the VectorLink Ethiopia team. The team used the documentation system that was developed in 2019, by which vehicles and drivers could be easily identified as having passed the inspection and/or training, respectively, guaranteeing that vendors would not change out the vehicles and drivers after passing the inspection.

Each district used at least four vehicles to transport spray teams between their operations site and spray sites. The total number of vehicles deployed per district was doubled this year due to the government's decision to reduce the carrying capacity of vehicles to reduce the risk of COVID-19. Upon return to the operations site, the SOPs turned in any unused insecticide and empty bottles to the SQLs, cleaned their sprayers using the progressive rinsing technique, and returned their personal protective equipment (PPE) and spray pumps to the storekeepers. SQLs also returned the insecticides to the storekeepers and handed over their data forms to the MFPs, who checked them for quality and submitted them to the DEC at the district level.

The logistics coordinator was in charge of managing stock at the central level and supervised the 88 storekeepers (two per permanent store: one government employee, and one assistant storekeeper directly hired by VectorLink Ethiopia). To ensure tracking of insecticide use, in 2020 the VectorLink Ethiopia team adopted and implemented the use of a standardized store ledger book to improve record keeping across all the districts, and the project supervisors conducted weekly physical inventory audits during IRS operations. Physical

inventory audits were conducted at district and sub-district stores to verify that the physical inventory matched the balance sheets as well as the numbers in the Performance Monitoring Tracker. All districts had storerooms where all of the commodities were stored according to the standard PMI Best Management Practices (BMPs), meaning the insecticide and insecticide-contaminated items were stored separately from the clean commodities. The project also provided IRS stock cards, bin cards and insecticide tracking forms to account for the quantity issued, quantity used, and quantity returned on a daily basis.

2.3.3 IRS SUPERVISION

Supervision of the 2020 IRS campaign was conducted in collaboration with the RHBs according to the 2020 supervision plan, which built on lessons learned in previous years to optimize spray and data quality. The schedule outlined the role of specific individuals, site(s) assigned, type of supervisory tools to be used, and the targeted frequency of use of each supervisory tool. The project deployed 14 full-time staff (nine zonal IRS coordinators and five senior staff) to the zones during IRS implementation to provide supportive supervision. Each VectorLink zonal IRS coordinator was in charge of 3–4 districts and worked closely with regional, zonal, and district MFPs. The project also recruited 28 seasonal district IRS supervisors for the 31 PMI targeted districts in the Benishangul-Gumuz and Gambela regions. Three of the seasonal district IRS supervisors who worked in Gambela were re-deployed to Benishangul-Gumuz after completing their duties in Gambela. Zonal IRS coordinators and seasonal district IRS supervisors provided support in districts during the IRS cascade training and IRS implementation. They also ensured that there was capacity building of the district staff and spray quality in the districts. At the national level, the chief of party (COP), the deputy COP, and the two operations managers provided continuous oversight in the three regions.

In addition to project senior management supervisors, FMOH and regional and zonal supervisors joined the district teams for supervision. All teams used standardized VectorLink supervision and monitoring tools, which were loaded on mobile phones, to assess spray quality, environmental compliance activities, and spray data collection. The project also printed the tools so that the supervisors could use paper copies in the absence of internet or mobile phones.

During the 2020 IRS campaign, supervision was conducted to the expected PMI VectorLink standard in all the 44 PMI targeted districts. The project ensured that there was compliance with PPE, homeowner preparation, wash area processes, and store management (Figure 2). During the 2020 IRS campaign, SOPs were well trained and maintained the appropriate distance, swath width, swath overlap, and speed in their application.

Figure 2: Signs of Good Household Preparation: Personal Items Stored Outdoors and Completely Empty Structures



2.4 INSECTICIDE

Ethiopia has an insecticide resistance management structure based on entomological studies. The Technical Advisory Committee, which meets twice per year, recommended the use of Actellic 300CS, an organophosphate, for the 2020 spray campaign in all 44 districts. The selection was based on data obtained from insecticide susceptibility tests conducted from 2014 to 2019, which showed that the main malaria vector, *An. gambiae* s.l., is susceptible to pirimiphos-methyl in all sites where the testing was done. Documented data on the residual life of Actellic 300CS in Ethiopia was also taken into consideration. Decay rate evaluation results from 2015 to 2019 indicated that the residual life of Actellic 300CS was 2–6 months depending on wall surface types. Additionally, Actellic 300CS is among the insecticides approved for public health use in Ethiopia by the Ministry of Agriculture. The committee also recommended to pilot the use of neonicotinoid (clothianidin)-based insecticides, SumiShield 50WG (clothianidin) and Fludora Fusion (clothianidin/deltamethrin) in one kebele (village) each in 2020 to determine residual efficacy in field settings in the hopes of expanding insecticide options to select from for future spray campaigns (see Section 3).

The project benefited from NGenIRS/UNITAID co-funding for the insecticide procured in 2020. Based on 2019 IRS insecticide consumption rates and the number of eligible structures, the team estimated that 134,291 units of insecticide were sufficient for the 2020 IRS campaign. Since the project had a balance of 25,720 bottles of Actellic 300CS from the 2019 spray campaign, VectorLink Ethiopia procured an additional 108,288 bottles of Actellic 300CS, 480 sachets of SumiShield 50WG, and 260 sachets of Fludora Fusion for the 2020 spray campaign. The two new chemicals (SumiShield 50WG and Fludora Fusion) were piloted in one kebele each in Menge District of Benishangul-Gumuz Region. Due to widespread supply chain disruption related to the COVID-19 pandemic, there was a delay in receiving the shipment of Actellic 300 CS, though it arrived in time for the second phase to start on June 23.

Because the Actellic 300CS left over from 2019 had an expiration date of December 2020, the project team developed a plan to use up this inventory in as few operations sites as possible. Storekeepers in selected sites (14 in Gambela and two in Oromia) were instructed to strictly follow the ‘first to expire first out’ (FEFO) principle to ensure the leftover supply would be exhausted. These storerooms were initially supplied with the first 85% of their estimated insecticide need to make sure that they would not end up with any excess insecticide that could not be used, and an adequate supply was available at the nearest regional warehouse for topping up as needed. The project allocated one vehicle per region specifically for transportation of insecticides within the districts. As part of supervision, the senior VectorLink team also conducted physical inventory control in all the storerooms to ensure that all the old stock was used before any new stock. In the store where the old and new stocks were mixed, the team ensured that the old stock of Actellic 300 CS was marked with highly visible paint so that it would be visually distinct from any new supply that was procured in 2020.

After the 2020 spray season, 1,814 bottles of Actellic 300CS, expiring in January 2022, remained. All leftover insecticide has been transported to the central warehouse in Addis Ababa for safekeeping, in compliance with the PMI BMP Manual, until the 2021 spray season.

2.5 IMPLEMENTING IRS DURING THE COVID-19 PANDEMIC

The first case of COVID-19 in Ethiopia was recorded in March 2020. As its prevalence increased, VectorLink Ethiopia adopted measures that complied with World Health Organization (WHO) and PMI guidelines to mitigate the transmission of the virus during the 2020 spray campaign. Before implementing the measures, the project revised its budget to include the activities; the budget was approved by PMI/USAID. The measures were as follows:

- The number of vehicles to transport IRS teams was doubled as per government requirements to ensure social distance during transportation.
- Most vehicles contracted to transport spray teams came from Addis Ababa. Since Addis Ababa was the epicenter of COVID-19 in Ethiopia, all the vehicles that came from there were thoroughly washed and sanitized to prevent transmission of the virus.

- Benishangul-Gumuz Region mandated that anyone entering the region had to first be tested for COVID-19. The project ensured that all drivers and workers coming from outside the region to support IRS implementation were tested for COVID-19 and quarantined for at least 72 hours before entering the region (Figure 3).
- The project ensured that IRS teams were reminded frequently to wash hands with soap and water, to stay home if they were feeling sick, and that there was no physical contact (handshakes) among the teams.
- The project ensured that all operational sites had hand-washing stations, and soap was always available.
- The project also reinforced morning health checks for all IRS team members and temperature checks were carried out daily at all operational sites using infrared thermometers, which were project procured.
- The project ensured that all IRS teams donned N-95 facemasks and PPE upon entering operations sites and all IRS actors were encouraged to continue wearing masks outside the operations sites.
- There was strict enforcement of social distancing: 2 m between people and segregation of teams.
- The project ensured that IRS teams were staggered during breakfast, morning mobilization, deployment of teams, and end-of-day clean-up in adherence with physical distancing rules.
- The project restricted access to operations sites to the schedule times and enforced the use of latex gloves by storekeeper and team leaders, per PMI's BMP, during record keeping (documenting of insecticide and commodities issue).

The Government of Ethiopia used legal recourse to strictly enforce the mitigation measures (social distance, sanitizing, mask wearing, and temperature checks) which encouraged people's compliance and made supervision easier. Throughout the period of IRS implementation, the project recorded no suspected or confirmed COVID-19 case in seasonal, government, or VectorLink Ethiopia staff.

Figure 3: VectorLink Staff Being Tested for COVID-19 before Entering Benishangul-Gumuz Region



2.6 SECURITY

While preparations for the 2020 IRS campaign were underway, Ethiopia experienced episodes of ethnic conflict. Although they were less severe than in 2018 and 2019 IRS, the project ensured that all VectorLink staff and seasonal workers received security awareness trainings. The team also created a WhatsApp group for all VectorLink staff to share real-time information on security.

The first phase of IRS operations (June 2-July 5, in the 14 districts of Gambela Region and three districts of West Guji Zone in Oromia) was completed without any security problems. As the team started the second phase (in 20 districts in Benishangul-Gumuz and seven districts in Oromia), a popular singer in Ethiopia was killed, resulting in violence and demonstrations across the country, and the government blocked the internet for the entire country for three weeks. As a result, the campaign was suspended for a week in the Oromia districts.

During the conflict, the VectorLink team developed a good relationship with local authorities including the local political leadership and security authorities. They provided the project information about the unrest on a daily basis, which enabled the team to make informed security decisions, in particular on where spray teams could and could not go.

Table 5 shows the number of kebeles that were partially or completely excluded from the IRS operations due to security issues.

Table 5: Kebeles that were Affected by Security Concerns

Region	Zone	District	# of Kebeles Partially Excluded from Spray	# of Kebeles Fully Excluded from Spray	Number of Structures Excluded
Benishangul-Gumuz	Metekel	Wombera	1	2	526
		Mandura *	9	0	1,912
	Kamash	Agelo Meti*	8	0	848
		Kamashi*	4	0	731
Oromia	Horo Guduru Wollega	Jardega Jarte	0	1	1,407
Total			22	3	5,424

*These districts experienced no active security issue this year, but some community members who moved out of the area because of the last year's conflict had not returned.

2.7 INFORMATION, EDUCATION, AND COMMUNICATION

Since IRS has been administered in Ethiopia for many years, community acceptance is generally high and the majority of the population is familiar with safety requirements and procedures to take before and after IRS. Nevertheless, it was still important to familiarize the communities with the requirements and procedures. In order to mitigate the risks of COVID-19 transmission, the project did not conduct training for mobilizers or pre-spray door-to-door mobilization and reduced the number of mobilizers from 1,656 in 2019 to 1,175 in 2020. Instead, the project worked with the district health teams to identify community leaders, who were oriented at kebele level by IEC officers on approaches of effective community mobilization using mass communication. VectorLink Ethiopia recruited two mobilizers per kebele (from among community leaders, kebele administrators, and other influential persons in the community) to ensure effectiveness of the sensitization. The project also ensured that messaging of all IRS materials was sensitive to local gender and social norms, and promoted the inclusion of women in the IRS workforce.

The main channels for communicating IRS information to the community and thus promoting IRS acceptance were radio and posters. The project used key IRS messages for radio spots, which started one week before spray operations and were aired three times daily throughout the spray period. The key messages included information on household preparation for IRS, avoidance of re-plastering of sprayed walls, and adherence to personal and environmental safety precautions. Radio discussions also focused on achieving high coverage and addressing other community concerns about spray activities. The project also communicated IRS messages through posters to promote acceptance. Ten posters per kebele were posted in selected public places like health centers and marketplaces. The IRS messages were prepared in four languages (Amharic, Afan Oromo, Berta, and Gumuz) for the 2020 spray campaign and emphasized key messages to inform the communities about common misinformation on IRS in Ethiopia. Figure 4 is a poster showing an SOP spraying a structure. Its text encourages residents to allow their houses to be sprayed and discourages re-plastering after spraying. In all regions, community-level communication activities began approximately two weeks prior to and continued throughout the campaign.

For the 2020 IRS campaign, the VectorLink Ethiopia project revised and used the IEC materials developed in 2019 in collaboration with the PMI-supported Johns Hopkins Center for Communication Programs' Communication for Health project.

To supplement the mass media communication, the project engaged mobilizers to accompany the spray teams. During this exercise, mobilizers announced the arrival of the spray teams using megaphones one day before spraying began. The mobilizers were given job aids, which enabled them to be focused and effective when delivering the IRS messages to the community, such as how to prepare their houses.

2.8 CAPACITY BUILDING

The PMI VectorLink Ethiopia project has continued to build the capacity of key governmental staff at the central, regional, zonal, and district levels; the ultimate goal is for the FMOH/National Malaria Control Program (NMCP) to implement government-funded IRS with improved quality and best management practices. Although some capacity building activities (like supportive supervision to non-PMI regions and training of clinicians) had to be cancelled to avoid risk of spreading COVID-19, the project continued to build the supervisory skills of national, regional, zonal, and district staff by including them in IRS training programs. In 2020, two staff from the NMCP, two staff each from the three PMI targeted regions, and three staff from each of the 44 targeted districts attended IRS training and supervision programs.

Figure 4: IEC Poster Used to Mobilize the Community for IRS



VectorLink Ethiopia procured both international and local commodities for the 44 PMI-supported IRS districts and 60 graduated districts (where PMI formerly supported IRS). (See Annex A for full list). To improve environmental compliance in Amhara, Tigray, and SNNP regions, the project renovated 15 soak pits in 15 selected districts. The TOTs will use renovated soak pits as models for safe disposal of effluent waste during the training.

The government delayed its IRS campaign in Amhara and SNNP regions due to COVID-19. In September, 2020, the project sent two VectorLink staff to monitor the spraying in those regions, to support the FMOH in implementing according to PMI standards. This will also allow the project to identify any challenges facing the FMOH-supported districts so that recommendations can be made for future IRS campaigns.

VectorLink Ethiopia has been working with nine universities (Addis Ababa, Jimma, Mekelle, Jigjiga, Arba Minch, Dire Dawa, Assosa, Debre Markos, and Gondar) to build their institutional capacity to conduct entomological monitoring and insecticide resistance monitoring so they can serve as training and resource centers in the future. Despite postponing entomological training for academic and technical staff from universities and research institutes, the project conducted a two-day on-the-job training on insectary management for two Debre Markos University staff members. The project procured insectary materials for the Amhara and Tigray public health institutes, Debre Markos University, and Gonder University. Molecular and ELISA reagents were procured for Arba Minch and Jimma universities. VectorLink Ethiopia also supplied the Ethiopian Public Health Institute, the Armauer Hansen Research Institute, and Arba Minch and Jimma universities with entomology equipment.

Finally, in May 2020, VectorLink Ethiopia held a virtual consultative meeting on *An. stephensi* in Ethiopia attended by all stakeholders including PMI Ethiopia. The meeting resulted in development of the National Policy Brief on *An. stephensi*. The NMCP will use the brief to inform control efforts, particularly larval source management in areas known to have *An. stephensi*, and to enhance surveillance and understanding of the extent of *An. stephensi*'s spread in Ethiopia. Finally, the NMCP plans to use the National Policy Brief to initiate operational research on alternative methods of vector control and use it to communicate key messages to the public and community health workers.

2.9 GENDER MAINSTREAMING

The PMI VectorLink Project views gender equality and female empowerment as development goals in their own right, and it measures progress toward these goals in terms of women's participation in its vector control activities. To achieve these goals, VectorLink Ethiopia worked closely with RHBs' gender advocates to implement policies that promote hiring female personnel. Due to low representation of female IRS actors in 2019, the VectorLink Ethiopia team created a multidisciplinary Gender Task Force, headed by the ECO, to ensure that all strategies for the 2020 campaign were implemented as planned. The task force worked with the COP and the project's global Gender Advisor to develop an operational plan for gender mainstreaming activities, building on the work done in Ethiopia thus far, and to ensure that policies are in line with USAID's Gender Equality and Female Empowerment strategy.

The project took the following actions:

Enhanced advocacy at the regional, zonal, district, and community levels to include more women at all levels in 2020 and ensured that all project recruitment advertisements explicitly stated that "women are strongly encouraged to apply."

Led and supervised the hiring process and ensured that all recruitment was conducted according to the hiring criteria and that all gender targets were met. In 2020, the project aimed to increase female seasonal workers to at least 35%, and have at least 15% in supervisory roles and 25% as SOPs/porters (Figure 5).

Constructed separate bathrooms for males and females, properly labeled them, and separated them for privacy.

Procured sanitary pads for all female seasonal workers and provided waste baskets at all operational sites. One female supervisor per site was designated to manage and distribute pads to the women as needed.

As a result of the above interventions, and despite the COVID-19 pandemic, which pushed the project to favor returning personnel in the recruitment process, the percentage of women recruited as SOPs/porters in the IRS campaign were more than doubled, from 13.2% in 2019 to 26.4% in 2020, and the percentage of women supervisors increased from 11.2% in 2019 to 13.5% in 2020. Overall women’s participation at the regional level increased from 27.9% in 2019 to 34.6% in 2020. The breakdown in women representation by region is shown in Table 6.

Figure 5: Female SOP Working in Assosa District



Table 6: Female Engagement in IRS Implementation by Region

Region	Female*	Male	Total	% Female
Benishangul-Gumuz	618	1,120	1,738	35.6%
Gambela	393	775	1,168	33.6%
Oromia	264	512	776	34.0%
Total	1,275	2,407	3,682	34.6%

* Female IRS personnel worked as: team leaders, SQLs, SOPs, porters, washers, water fetchers, storekeepers, and mobilizers.

The project also continued to emphasize the anti-sexual harassment policy during training and throughout implementation for all employees, and for spray personnel to promote a respectful working environment. In 2020, the project included sexual harassment awareness training for all spray teams at the district level, and posted an anti-sexual harassment policy poster in the local language at all operational sites.

In this reporting period, VectorLink Ethiopia project hired two women for full-time positions (Accountant, and Logistics and Warehouse Coordinator), increasing the proportion of women from 14.3% in 2019 to 17.1% in 2020 on the project team.

2.10 OVERVIEW OF PILOTS

The results of the SumiShield 50WG and Fludora Fusion pilot are described in Section 3.

In 2020, VectorLink Ethiopia used 344 Goizper sprayers for the first time in 35 PMI-supported IRS districts. The sprayers were distributed to 11 districts of Gambela Region, 17 districts of Benishangul-Gumuz Region,

and seven districts of Oromia Region. The remaining nine districts continued using Hudson sprayers from previous years. During the TOT, supervisors were oriented on the parts and use of the Goizper equipment. The supervisors in turn trained SOPs and SQLs. The SOPs reported that these pumps were lightweight and had a pressure gauge and backpack straps that made them much easier to use than the Hudson pumps. As a result, this will be recommended for countrywide use.

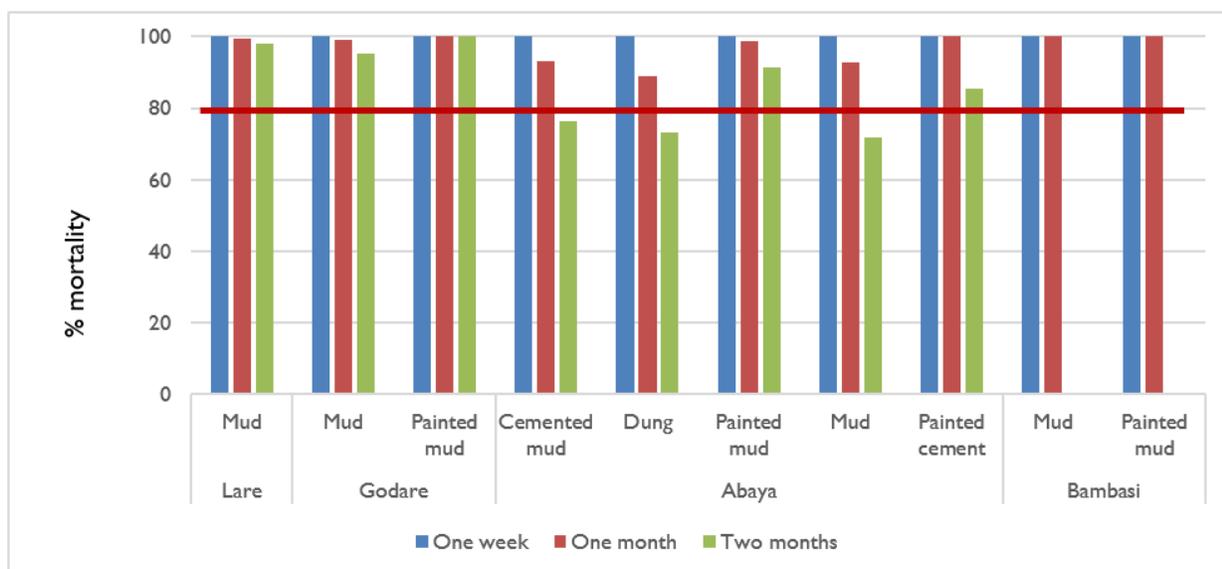
3. ENTOMOLOGICAL MONITORING

The PMI VectorLink Ethiopia project is conducting entomological monitoring to document essential information on entomological indices including vector density, sporozoite infection rates, level of insecticide resistance, and mechanisms of resistance. In addition, the project is carrying out surveys of *An. stephensi* in rural areas as part of an activity to map its distribution in the country. The findings of the entomological work will be reported in two standalone reports in this project year.

This section focuses on evaluation of the quality and decay rate of Actellic 300CS in Lare, Godare, Abaya, and Bambasi districts. It also contains data on bio-efficacy of the new insecticide formulations, SumiShield 50WG and Fludora Fusion, compared with Actellic 300CS sprayed in three kebeles (Bane Shegol, Belmunga, and Kuayu) of Menge district. WHO cone bioassays were conducted in 6 houses in each of the eight kebeles in Lare, Godare, Abaya, and Bambasi districts (two kebeles in each of the four districts) and 12 houses in each of the three kebeles in Menge district according to VectorLink SOP 009/01 found at [PMI VectorLink Standard Operating Procedures](#) (SOPs). All houses in Lare are mud walled while the houses in Godare have wall surfaces of mud and painted mud. In Abaya, the wall surfaces are cemented mud, dung, painted mud, mud, and painted cement. The houses in Bambasi, and most in the three kebeles in Menge District are mud and painted mud surfaces, although in Kuayu, a few houses with painted cement were also found.

Exposure to surfaces sprayed with Actellic 300CS in the first week in all four districts resulted in 100% *An. arabiensis* (insectary colony and susceptible to all insecticides) mortality. After one month, mortality in Lare, Godare, Abaya, and Bambasi was 99.4%, 99.2%–100%, 88.9–100%, and 100%, respectively. Mosquito mortality after two months in Lare and Godare was between 95.4 and 100%; however, the killing effect of exposure to cemented mud, dung, and mud houses in Abaya declined below 80%. In the same site, painted mud and painted cement houses killed 91.3% and 85.6% *An. arabiensis*, respectively (Figure 6).

Figure 6: Mortality of *An. arabiensis* Tested against Actellic 300 CS in Cone Bioassays



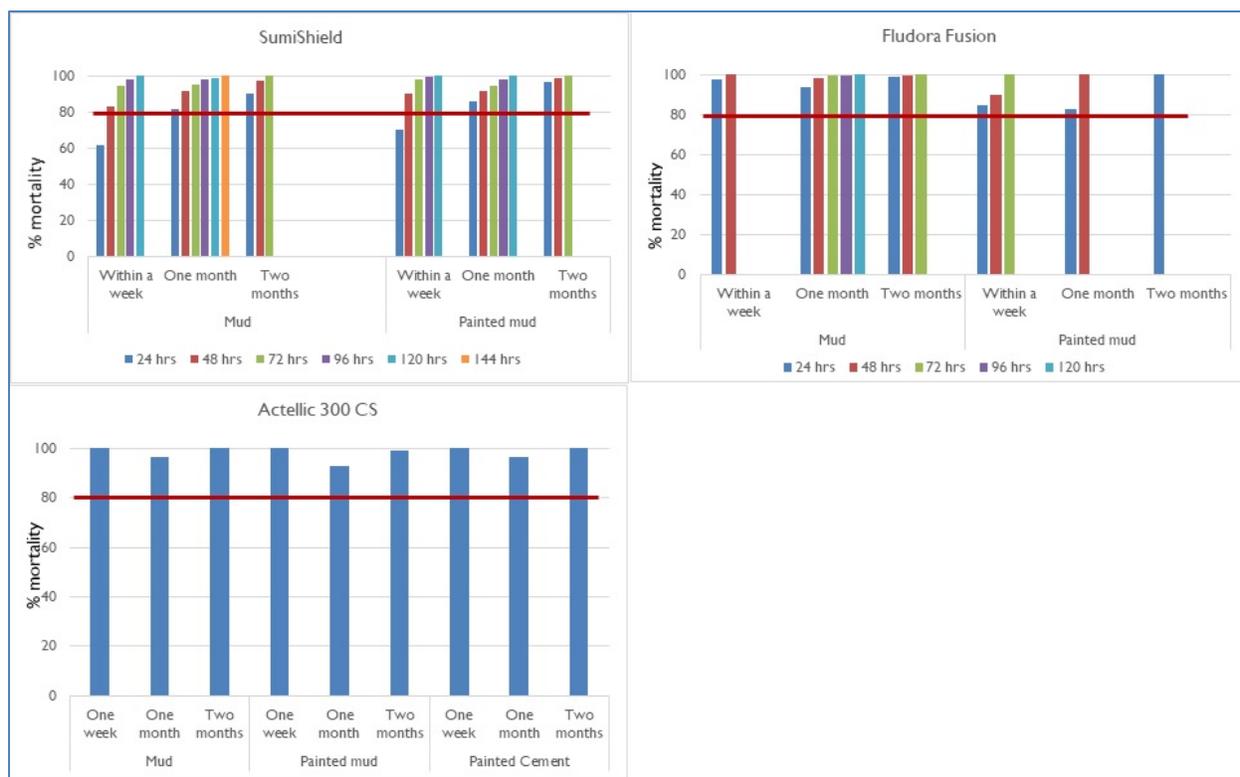
Exposure to mud and painted mud surfaces sprayed with SumiShield 50 WG induced 100% mortality of *An. arabiensis* within 120 hours after cone bioassay tests were conducted in the first week of spraying. After one month, the same mortality rate was observed after a 144-hour holding period when tested on mud surfaces and

120 hours on painted mud walls. After two months, mosquito mortality was 100% on both wall surfaces after a 72-hour holding period.

Exposure to Fludora Fusion-sprayed surfaces caused 100% mortality 48–72 hours after cone bioassay tests conducted in the first week of spraying, 48–120 hours after one month, and 24–72 hours after two months.

Exposure to surfaces sprayed with Actellic 300 CS in the first week of IRS killed 100% of insectary *An. arabiensis* within 24 hours. After a month the test was conducted on wild *An. gambiae* s.l. and mortality was 96.7%, 92.7%, and 96.7% on mud, painted mud, and painted cement surfaces, respectively. (Figure 7). The tests after two months of spraying were carried out on a colony strain of *An. arabiensis* and mortality was 100%, 99.3% and 100% in houses with wall surfaces of mud, painted mud and painted cement, respectively.

Figure 7: Mortality of Mosquitoes in Cone Bioassays Tested against SumiShield 50WG, Fludora Fusion, and Actellic 300 CS in Menge



There was little difference in the duration of the efficacy of SumiShield 50WG in mud and painted mud houses in all the three bioassay tests. In the first test within a week, 100% mortality of *An. arabiensis* was achieved 120 hours post-exposure on both types of surfaces. One month later, it took 144 hours on mud surfaces and 120 hours on painted surfaces to kill 100% of *An. arabiensis*. After the second month, 100% mortality occurred after 72 hours on both surfaces. On the other hand, Fludora Fusion caused 100 % mortality after 48 hours and 72 hours within a week on mud and painted mud surfaces, respectively. After a month and two months of bioassays on mud surfaces, Fludora Fusion killed 100% *An. arabiensis* after 120 hours and 72 hours, respectively. The killing time was much shorter on painted surfaces since Fludora Fusion took 72 hours within the first week, 48 hours after the first month, and 24 hours on the second month to cause 100% mortality of *An. arabiensis*. The difference in *An. arabiensis* 24-hour mortality due to Actellic 300 CS on different surface types was minimal and all timepoints were over the 80% mortality threshold.

Both SumiShield and Fludora Fusion were found effective in killing *An. arabiensis* in the time frame recommended by the manufacturing companies, seven days for the former and three days for the latter.

4. ENVIRONMENTAL COMPLIANCE

VectorLink Ethiopia operates under the Supplemental Environmental Assessment (SEA) that was approved in May 2020 and authorizes the nationwide use of approved IRS insecticides in the pyrethroid, carbamate, organophosphate, neonicotinoid classes and chlorfenapyr (pyrrole class) when recommended by World Health Organization Prequalification (WHO-PQ) team.

The status of the project’s environmental mitigation and monitoring measures are in Annex C the Environmental Mitigation and Monitoring Report.

4.1 IRS CAMPAIGN ASSESSMENTS

In 2020, the ECO, in collaboration with the VectorLink zonal IRS coordinators, conducted environmental compliance assessments and inspections before, during, and after IRS operations. These assessments helped to ensure all environmental safeguards for storage and waste disposal facilities were in place and that procedures mandated by the Environmental Mitigation and Monitoring Plan (EMMP) were adhered to at each IRS operations site, and during all operations.

Initial Pre-Season Environmental Compliance Assessments (PSECAs) were conducted in February 2020, at all 108 IRS operations sites in the 44 target districts using checklists embedded on smartphones. Data collected from the smartphone were uploaded to the Abt Associates environmental compliance database and generated a “Greenlight” if the site was ready or a worklist for remedial action to be taken if there was a deficiency.

VectorLink Ethiopia resolved all gaps identified during the initial PSECA and brought all facilities into compliance. This included converting 18 temporary wash areas into fixed concrete wash slabs to obviate the burden of rebuilding them each year, and construction of 19 temporary soak pits for the CB-IRS operations sites in Guba and Wombera in Benishangul-Gumuz Region. The final PSECA, completed two weeks before the scheduled start of the campaign, verified the completion of all rehabilitation activities and confirmed the readiness of each operations site. An authorization meeting was held with the Home Office Environmental Compliance Manager to authorize insecticide deployment to operations sites that have met all the requirements.

To reinforce compliance with environmental safety and ensure that adequate and effective supervision could be carried out without interruption throughout the campaign, the Home Office Environmental Compliance Manager and VectorLink Ethiopia ECO developed a contingency plan to use in case internet connectivity was lost. This plan was pivotal: During the nationwide internet outage, a combination of paper checklists and a call tree were used to communicate compliance issues and quickly initiate corrective actions. A total of 21,037 supervision checklists were completed during the 2020 IRS campaign with a total of 140 red flags reported. All non-compliance issues were resolved in collaboration with the Operations Manager and the coordinators in a timely manner.

4.2 INCIDENT REPORTS

The project reported three incidents to PMI during the 2020 spray campaign, in accordance with incident report requirements and summarized in Table 7.

Table 7: Environmental Incidents Reported During the IRS Campaign

Date	Type	Description
July 17, 2020	Vehicle accident	A driver of a motorcycle collided with the parked IRS vehicle resulting in motorcycle damage, and the driver sustaining severe injury to the head. The motorcycle driver was not wearing a helmet, and did not possess a driver's license or valid motorcycle registration at the time of the incident.
July 11, 2020	Vehicle accident	A duly authorized contracted driver of vehicle (owned and operated by vehicle supplier) travelled from the Dangur District during heavy rains and the vehicle slipped off the road, resulting in vehicular damage and the driver sustaining a shoulder injury. The driver was the sole occupant of the vehicle and there were no other vehicles involved in the incident.
June 30, 2020	Theft	Following the killing of popular singer, Haacaaluu Hundeessaa, protestors stole IT equipment, which included: 35 tablets, 4 laptops, 8 internet modems, 15 power banks, and 1 Wi-Fi router from the project vehicle as the equipment was being transported from Majeng Zone to Addis Ababa.

4.3 DEMOBILIZATION AND WASTE MANAGEMENT

VectorLink Ethiopia conducted the Post-Season Environmental Assessment in all 44 PMI target districts immediately after spraying. The assessment confirmed that all IRS items, including insecticides and IRS waste, were collected from the operations sites and returned to the central warehouse. All soak pits and their surrounding areas were cleaned, cleared of any waste, and secured with locks, and all wash areas were covered with plastic sheets to prevent vandalism as well as contamination by humans and animals.

The project is in the process of collecting contaminated waste from district stores for transport to the central warehouse in Addis Ababa. VectorLink Ethiopia signed a Memorandum of Understanding with Tewodros Fikru rubber and plastic production factory to recycle empty bottles into electrical conduit cables. Solid waste disposal methods are summarized in Table 8.

Table 8: Summary of Type, Quantity, and Disposal Stream of Solid Waste

Waste Category	Quantity	Disposal Method
Blurred faceshield	1,727 pcs	Will be incinerated in high-temperature incinerator in Addis Ababa.
Boots	445 pcs	Will be given to SOPs in need after the boots are washed with soap thoroughly.
PVC gloves	2,547 pcs	Will be given to deserving workers after the gloves are cleaned with soap and water. Gloves too torn to be accepted by SOPs will be buried in Addis Ababa at a solid waste dump site called "Koshe/Reppie."
Used nose masks	75,075 pcs	Will be incinerated at the central warehouse of Addis Ababa City Administration at a high-temperature incineration site called "Reppie."
Worn-out overalls and insecticide bags	2,024 pcs	Will be given to deserving SOPs after the items are thoroughly cleaned with soap and water.
Cardboard boxes	11,077 pcs	Will be recycled into insecticide packaging material in a government-owned pulp and paper production factory.
Empty Actellic 300 CS bottles	132,934 bottles	Will be recycled into electric cable transferring conduits.
Empty SumiShield 50WG sachets	480 pcs	Will be incinerated in a high-temperature incinerator in Addis Ababa.
Empty Fuldora Fusion sachets	260 pcs	Will be incinerated in a high-temperature incinerator in Addis Ababa.

During the campaign, liquid effluent from the rinsing of pumps was re-used for mixing insecticide the next day. Water that was used to wash the outside of the spray tank and rinse the strainer and nozzles was managed and disposed of at specially constructed soak pits at each operations site.

5. MONITORING AND EVALUATION

VectorLink Ethiopia designed and implemented the M&E system in accordance with the 2020 IRS Ethiopia work plan and IRS Performance Monitoring Plan. It successfully incorporated lessons learned from the previous IRS campaigns and best practices from other PMI VectorLink countries. Additionally, the project implemented the new VectorLink Collect database management system developed using District Health Information Software-2 (DHIS-2) platform.

5.1 DATA COLLECTION, ENTRY, AND QUALITY ASSURANCE

VectorLink Ethiopia together with the Home Office team designed standardized data collections forms to capture data on all core PMI indicators (Annex D shows all the performance indicators with annual targets and results). The Daily Spray Operator form is the primary data source for data entry, analysis, and reporting. In 2020, VectorLink Ethiopia transitioned from the Microsoft Access database to the new VectorLink Collect database. The project developed this database using the DHIS-2 system for spray data entry, cleaning, and reporting. The project granted access to the VectorLink Collect database to relevant parties in NMCP and PMI mission office.

The M&E team provided TOT to MFPs and supervisors where they demonstrated a good understanding of the forms and were able to explain the forms in detail during the cascade training for SOPs, porters, and SQLs.

In previous years, the SQL collected the IRS data instead of the SOPs. Based on successful pilots in Benishangul-Gumuz and Oromia regions in 2019, during the 2020 spray season, SOPs collected IRS data from households. This approach gave SQLs more time to focus on supervision. VectorLink Ethiopia provided a two-day M&E training to ensure all SOPs and SQLs understood the tools and were able to record the household IRS data.

VectorLink Ethiopia employed 65 DECAs for data entry and cleaning. Each DECA entered the data with a combination of web-based and offline data entry. The project entered data first by totals (i.e., total lines of each form) for quick reporting and feedback, then by details (i.e., detailed data for each structure). For quality control and timely generation of the weekly spray progress reports for PMI, all data were expected to be entered and synced within 48 hours of spraying. In some instances, this did not happen, due to intermittent or weak internet connectivity and because of the nationwide blockage of internet service.

During the extended internet shutdown, the back-up system was used to extract the data for operational use and for reporting purposes. The project proactively developed a tool that was able to capture data offline, which helped the M&E team to easily retrieve and store data from the system during the nationwide internet outage.

PMI VectorLink Ethiopia implemented data quality assurance activities for data collection and data entry. Data collection forms went through several checks before being entered into the database. Supervisors and team leaders verified the collected spray data. At the end of each day, the M&E assistants reviewed the data collected and addressed any data quality issues in consultation with district supervisors before transporting the data to data centers. DECAs performed final verification of spray form data and arithmetic checks before entering data to the database. Furthermore, the PMI VectorLink Ethiopia M&E Manager, Database Manager, and M&E Coordinator provided feedback regarding errors found on the data collection process and gave recommendations to the VectorLink Ethiopia operations team to minimize future errors on the SOP forms.

To ensure the secure storage of all data collected, the M&E team filed all submitted paper forms by geographical area and date in binders shelved at the district level. Electronic data were secured by DHIS-2 VectorLink cloud servers, hosted by the BAO Systems team.

The DECs cleaned spray data daily throughout the spray campaign, under the supervision of the M&E Manager, M&E Coordinator, and Database Manager.

5.1 MHEALTH

VectorLink Ethiopia collaborated with Dimagi to ensure quality reporting and supervision in all target districts.

The Dimagi platform included:

- **Mobile-based Performance Monitoring Tracker** – Daily SMS of four essential spray progress indicators sent by the MFPS.
- **Smartphone-based Spray Supervision System** – Five spray operations checklists are loaded onto a smartphone and completed in the field by supervisors.
- **Bulk SMS Job Aids** – The project used an automated SMS system to remind spray staff (e.g., team leaders, MFPS) of specific guidelines and/or to communicate problems or challenges noted during the spray campaign.

5.2 IRS CAMPAIGN RESULTS

VectorLink Ethiopia planned to target 540,588 structures, but the target was adjusted to 535,164 over the course of the 2020 campaign due to security issues prohibiting teams from reaching certain areas. The SOPs sprayed 527,375 structures out of 551,504 structures found, a spray coverage of 95.6%. The campaign protected 1,511,728 people, including 43,747 (2.9%) pregnant women and 226,996 (15%) children under the age of 5. Table 9 shows regional-level performance. Annex B specifies campaign start and end dates for each district; Annex E shows spray progress and coverage data by district and region.

Table 9: Regional Spray Progress and Coverage

Province	Original Targeted	Adjusted Targeted*	Found	Sprayed	Spray Progress**	Spray Coverage
Benishangul-Gumuz	282,980	278,963	290,109	276,403	99.1%	95.3%
Gambela	112,072	112,072	114,099	109,267	97.5%	95.7%
Oromia	145,536	144,129	147,296	141,705	98.3%	96.2%
Total	540,588	535,164	551,504	527,375	98.5%	95.6%

* The excluded kebeles are listed in Table 5.

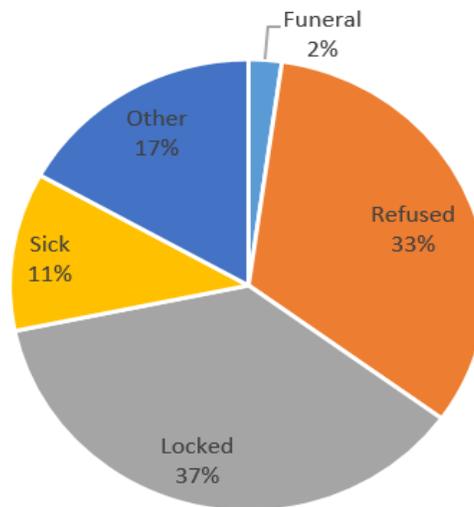
** Spray progress is calculated using the adjusted target.

The 2020 spray campaign did not spray 24,129 structures (4.4% of total structures found). As illustrated in Figure 8, the reasons for not spraying were: structures were locked (36.7%), refusals (32.9%), sick person in the structure (11.4%), funerals (2.2%), and other¹ (16.8%). Refusals and locked structures were the two major reasons for unsprayed among structures found across all three regions, accounting for 3.4% (1.8% locked, 1.6% refusals) in Benishangul-Gumuz, 2.9% (1.6% locked, 1.3% refusals) in Gambela, and 2.5% (1.2% locked, 1.3% refusal) in Oromia. The proportion of unsprayed structures due to refusals varied from district to district. In Benishangul-Gumuz Region, it ranged from 0.0% in Sedal District to 3.3% in Bambasi District. In Gambela, the lowest was 0.1% (Akobo District) and the highest was 3.4% (Jor District). In Oromia, the minimum was 0.1% (Malka Soda District) and the maximum was 2.7% (Ilu District). The reason for the refusals is not known but there seems to have a correlation between high rate of refusal and rain in Bambasi and Ilu Districts, where

¹ Other includes: No adult present at home, newborn baby, ceremony, unable to move out house equipment, and allergy to the smell of the insecticide.

the operation team reported rain was the main challenge to deliver IRS in these districts. There was no indication that refusal is related to COVID-19.

Figure 8: Reasons for Unsprayed Structures



6. CHALLENGES AND LESSONS LEARNED

6.1 CHALLENGES

The 2020 IRS campaign showed a marked reduction in the number and magnitude of technical challenges as compared with the 2019 campaign. Major challenges were the following:

COVID-19 Pandemic

- The national COVID-19 lockdown was by far the biggest challenge to the 2020 IRS campaign, forcing the day of the campaign start date from May 12 to June 2. Starting in June meant the team had to cope with the difficulties of spraying in the rainy season (see below).
- Federal government guidelines on COVID-19 that restricted domestic travel and prohibited meetings and gatherings meant the project had to delay pre-spray activities, and this put logistical pressure on the team. The project also had to ensure that trainings and meetings were held in smaller groups at the zonal, rather than regional, level and this increased the number of training days for the VectorLink staff, who are among the trainers. The reduced number of days for TOT put additional pressure on the team to prioritize and consolidate key information to ensure spray quality and safety were not compromised. One advantage of increasing the number of vehicles for appropriate social distancing was that the teams could move more freely and this positively affected daily output and consequently progress.
- During IRS implementation, the team had to supervise and ensure that the spray teams were following all the COVID-19 guidelines related to symptom checking, hygiene, social distancing, and masking. This increased the responsibilities of the IRS supervisors who were already overburdened.
- One of the COVID-19 measures that VectorLink Ethiopia implemented was reduction of the number of days for training of trainers. This meant that the project in collaboration with the district health teams relied on the old supervisors to be involved in the spray campaign. This reduced the chances to hire new supervisors and this impacted the ability to increase female supervisors.

Security Concerns

- Security concerns forced the project to suspend the campaign in seven districts in Oromia (four in Horo Guduru Zone and three South West Shoa Zone) and then extend spraying beyond the original end date, into the rainy season. This forced the spray team to work in unfavorable conditions.

Spraying in the Rainy Season

- Due to delayed start date of the 2020 IRS campaign, the VectorLink Ethiopia team had to cope with poor road conditions and other difficulties of spraying in the rainy season. This had the potential to reduce daily spray output thereby affecting spray progress. However, the spray teams were innovative and used animals, or sometimes walked long distances on muddy roads to reach the target communities (Figure 9).
- The rainy season also had the potential to jeopardize spray coverage, as most householders are reluctant to remove their belonging from their homes during the rainy season. However, the strong mobilization teams convinced most householders to adequately prepare their households.

Internet Outages

- Security concerns led the government to shut down the internet for three weeks, which prevented supervisors from synchronizing their tablets to the server on a daily basis and made it challenging for senior management to take corrective actions in real time.
- The internet outages also made it difficult for the M&E team to enter and clean data during the IRS campaign.

Figure 9: Coping with Problems Related to Rain during the Spray Campaign



6.2 LESSONS LEARNED AND RECOMMENDATIONS

Similar to 2019, VectorLink Ethiopia ensured that the RHBs were highly engaged in planning, mobilization, implementation, and supervision for the 2020 IRS season. This contributed to the successful 2020 campaign.

In the 2020 spray season, VectorLink Ethiopia introduced a new approach in Benishangul-Gumuz and Oromia regions, in which SOPs, all of whom had at least a 10th grade education, collected IRS data from homeowners in addition to carrying out their normal spray duties. This was very successful and so the project is proposing that SOPs in Gambela Region also should collect data in the future spray campaigns.

In 2020 IRS campaign, the project introduced process flow charts to ensure efficiency and safety during morning and evening activities. All TOT participants were oriented on these flow charts. This worked very well in all the sites and VectorLink Ethiopia recommends using such flow charts in countries that are not using them.

As in 2019, the project implemented mobile payments during the 2020 spray campaign as a way to improve logistical and financial management. Despite some of the challenges that the team encountered in select remote sites of Gambela Region, which have no mobile payment infrastructures, the mobile payment system has generally proven to be very effective as it allowed the project to make payments remotely in a timely, cost efficient and secure manner.

ANNEX A: PROCUREMENT

Table A-1: International Procurements

Item	Quantity Required	Opening Balance	Quantity Procured	Total at Start of Campaign	Quantity Used	Quantity Damaged	Total at End of Campaign
White Hard Hat w/Standard 4 Pt Snap Lock Suspension, 16/cs	2,738	2,994	608	3,602	2,753		3,602
Venom 8" x 15.5" x .060" Clear Polycarbonate Faceshield, 10/bx	2,738	11,455	5,000	16,455		7,739	8,716
Universal Hard Hat Bracket For Faceshield Windows, 50/cs	2,738	5,637	500	6,137	3,000	500	5,637
Strainer for Spray Pump	1,739	2,387		2,387	1,839	548	1,839
26" Long Nitrile Glove, Rough Textured, Elastic & Grommeted End, Large	358	81	288	369	251	118	251
Goizper Pump	-	13	642	655	424		655
Sumishield		-	480	480	480		0
FludoraFusion		-	260	260	260		0
Actellic 300CS		25,720	108,288	134,008	132,194		1,814
Quarrow® 60 Lumen LED Head Lamp, One Size Fits Most, 3 AAA Batteries (Included), 12/cs			2,268	2,268	100		2,268
Helmet Clip for Head Lamp			3,700	3,700	100		3,700
Spray Pump Handson Expert	1,668	1,672	-	1,672	1,480	192	1,480
Nozzle Tip, Flat Fan, Ceramic C8002E, yellow	5,796	7,494	1,000	8,494	4,448		4,046
CFV	4,347	4,834		4,834	1,668		3,166
Seal, 16.5mm x 9mm x 2mm thick, viton	2,898	2,656	1,440	4,096	2,193		1,903
Spare Part Kit	98	228		228	49		179
Gloves	5,201	7,255		7,255		4,325	2,930
Black PVC Knee Boot, Plain Toe, 15", 6 pr/cs, US Men's Size 6	3,584	3,616	408	4,024		671	3,353
Rubber Boots / Female	458	275		275	75		200
N95 Disposable Respirator w/Exhalation Valve, Adjustable Nosepiece, 10/bx, 12 bx/cs	124,215	46,446	113,760	160,206	57,492		102,714

Table A-2: Local Procurements

Item	Quantity Required	Opening Balance	Quantity Procured	Total at Start of Campaign	Quantity Used	Quantity Damaged	Total at End of Campaign
Infrared Thermometer	46	0	46	46	46		46
Reflective Jacket	601	553	48	601	51		550
Big Washing Basin	409	333	76	409			409
Bucket 20 Lit	1,793	1,120	673	1,793	579		1,214
Shovel	75	38	37	75	10		65
Whistle for Security Guards	75	28	47	75	18		57
Funnel	1,647	1,054	593	1,647	827		820

Item	Quantity Required	Opening Balance	Quantity Procured	Total at Start of Campaign	Quantity Used	Quantity Damaged	Total at End of Campaign
210 Li. Barrel	833	738	95	833	192		641
Fire Extinguisher, big	50	48	2	50	2		48
Tent	644	316	328	644	90		554
Graduating Cylinder	455	337	118	455	261		194
Mattress	2,230	2,045	185	2,230	195		2,035
Plastic Sheet	128	83	45	128	20		108
Duffel Bag	715	513	202	715	244		471
Toilet Soap, small	30,237	2,783	27,454	30,237	28,168		2,069
Laundry Soap. Big	14,567	8,807	5,760	14,567	14,019		548
Thermometer	119		119	119			119
Towel	1,581	882	699	1,581	1,163		418
Spray Training Wall	134	107	27	134	9		125
Calculator	44	37	7	44	7		37
Neck Protection	3,784	2,766	1,018	3,784	995		2,789
Fabricated Bathroom Male	88	44	44	88	41		47
Fabricated Bathroom Female	88	41	47	88	43		45
Female Sanitary Napkins	999	170	829	999	838		161
Local Mask	12,000		12,000	12,000	12,000		0
Socks	5,276	839	4,437	5,276	4,461		815
Megaphone	88		88	88	88		0
Box-Files	316	213	103	316	90		226
Metalic Shelf with Accessories	660	378	282	660			660
Digital Thermometer	88		88	88			88
Bathroom Stall of 2 Room Female & 4 Room Male	176	85	91	176			176

ANNEX B: DATES AND DURATION OF SPRAY CAMPAIGN BY DISTRICT

Table B-I: Campaign Length by District

Region	Zone	District	Campaign Details		
			Spray Days	Spray Start Date	Spray End Date
Gambela	Agnuwa	Abobo	15	2-Jun	18-Jun
		Dimma	15	2-Jun	18-Jun
		Gambela Z	15	2-Jun	18-Jun
		Gog	15	2-Jun	18-Jun
		Jor	16	4-Jun	19-Jun
	Gambela Town	Gambela Town	16	2-Jun	20-Jun
	Itang Special	Itang Special	16	2-Jun	18-Jun
	Majang	Godare	15	2-Jun	18-Jun
		Mengeshi	16	2-Jun	18-Jun
	Nuer	Akobo	12	2-Jun	18-Jun
		Jikow	13	2-Jun	18-Jun
		Lare	14	2-Jun	18-Jun
		Makuey	14	2-Jun	18-Jun
		Wanthoa	15	2-Jun	18-Jun
	Benishangul-Gumuz	Assosa	Assosa	30	23-Jun
Bambasi			28	23-Jun	24-Jul
Homosha			28	23-Jun	25-Jul
Kumruk			29	23-Jun	26-Jul
Menge			29	23-Jun	26-Jul
Oda Buldigilu			30	23-Jun	27-Jul
Sherkole			28	24-Jun	25-Jul
Kamash		Agalo Meti	22	24-Jun	22-Jul
		Belo Jegenfoy	29	23-Jun	25-Jul
		Kamashi	25	24-Jun	23-Jul
		Sedal	26	23-Jun	23-Jul
		Yaso	27	24-Jun	24-Jul
Mao-Komo Special		Mao-Komo Special	30	23-Jun	27-Jul
Metekel		Bullen	28	23-Jun	26-Jul
		Dangur	30	23-Jun	27-Jul
		Dibate	30	23-Jun	27-Jul
		Guba	21	23-Jun	15-Jul
	Mandura	29	23-Jun	27-Jul	
	Pawi	30	23-Jun	27-Jul	

Region	Zone	District	Campaign Details			
			Spray Days	Spray Start Date	Spray End Date	
Oromia	Horo Gudro Wellega	Wombera	21	23-Jun	14-Jul	
		Abay Chomen	27	23-Jun	29-Jul	
		Abe Dongoro	30	23-Jun	30-Jul	
		Amuru	30	23-Jun	3-Aug	
		Jardega Jarte	30	23-Jun	2-Aug	
		South West Shoa	Goro	30	23-Jun	3-Aug
			Ilu	30	24-Jun	1-Aug
			Woliso	30	23-Jun	3-Aug
		West Guji	Abaya	30	2-Jun	5-Jul
			Gelana	29	3-Jun	5-Jul
			Malka Soda	30	2-Jun	5-Jul

ANNEX C: ENVIRONMENTAL MITIGATION AND MONITORING REPORT

Table C-1: Environmental Mitigation and Monitoring Report

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1a. Insecticide selection for any USAID-supported malaria program is subject to the criteria listed in the USAID Programmatic Environmental Assessment, country SEAs, and host country requirements.	The insecticides are approved for IRS use pursuant to the approved PEA and SEA, which is valid nationwide through 2024 and authorizes the use of the pyrethroid, carbamate, organophosphate, and neonicotinoid classes of insecticide.	No outstanding issues	The SEA was approved on 5/27/20. Actellic 300 CS®, SumiShield 50WG® 50 and Fludora® Fusion are registered in country.
1b. Procurement and inventory logs must be maintained.	All procurement and inventory logs of Actellic 300 CS®, SumiShield 50WG® 50 and Fludora® Fusion were maintained.	No outstanding issues	None
1c. Ensure storage facility and PPE are appropriate for the active ingredient used and in accordance with approved SOPs.	All storage facilities and PPE were selected based on the PMI BMP manual and conforming with requirements outlined in the Material Safety Data Sheets (MSDS).	No outstanding issues	None
1d. Distribute insecticides to facilities that can manage such commodities safely in storage, use, and disposal (i.e. in a manner generally equivalent to Implementing Partner’s own SOPs/WMP).	Insecticides were distributed to facilities that can safely store and dispose of such commodities and were chosen pre-season based on requirements outlined in the PMI BMP manual.	No outstanding issues	None
1e. Pre-contract inspection and certification of vehicles used for pesticide or spray team transport.	Pre-contract inspection and certification of vehicles was conducted between May 28-30 and June 17-23, 2020. In total, 211 vehicles were inspected and certified for use in the IRS campaign.	No outstanding issues	None

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1f. Driver training	All 211 hired drivers were trained before they were dispatched to districts.	No outstanding issues	VectorLink oriented all drivers who joined the IRS campaign on safety measures for transporting insecticides, accident and spills response procedures, and safe driving techniques.
1g. Cell phone, personal protective equipment (PPE), and spill kits onboard during pesticide transportation.	All 211 drivers had cell phones as a pre-requisite to their vehicles being rented. All were given a set of PPE to use when transporting insecticides and/ or spray team members. Transportation vendors provided each vehicle with a first aid kit and spill management kit.	No outstanding issues	Vendors stocked all vehicles with complete spill kits and first aid kits to last the whole spray campaign after VectorLink staff emphasized this requirement for all vehicles.
1h. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact.	All 718 females (SOPs, washers, squad leaders, supervisors and store assistants) were given pregnancy tests before they were hired. The tests were done a week before the start of the IRS in each region.	No outstanding issues	No positive pregnancy test was recorded.
1i. Health fitness testing for all operators	All 2879 spray actors received medical examinations (physical examinations, blood pressure) to determine their physical fitness for the program's demands.	No outstanding issues	All spray actors passed the medical examination and were declared medically fit for training as spray team members.
1j. Procurement of, distribution to, and training on the use of PPE for all workers with potential pesticide contact.	Both international and local procurements were completed before training began. The use of PPE was demonstrated during TOTs, cascade, and storekeeper training, before the spray campaign began.	No outstanding issues	All spray actors were fully trained on correct PPE use. This message was reinforced during morning mobilization.
1k. Training on mixing pesticides and the proper use and maintenance of spray pumps.	Training covered the correct mixing procedure for insecticides, including triple rinse of the Actellic 300 CS bottles. The trainings demonstrated the proper use and maintenance of sprayers. A total of 44 pump technicians were then trained on how to repair major defects.	No outstanding issues	Team leaders were available to assist pump technicians in the field to ensure that faulty pumps were immediately replaced or fixed. If the defect was major, the pump technician was called.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1l. Provision of adequate facilities and supplies for end-of-day clean-up	VectorLink Ethiopia upgraded 18 temporary soak pits to permanent soak pits. In addition, 19 temporary soak pits were constructed. A total of 102 fixed soak pits and 5 MSP II were used. Each IRS campsite had latrines and bathing facilities for both sexes. All facilities were compliant, and had the materials required for clean-up. A total of 2033 end-of-day inspections were conducted.	No outstanding issues	Adequate water, barrels, wash basins, soap, and detergents were available at all times at each operations site. Washing facilities for both female and male SOPs and supervisors were provided at all campsites for total compliance.
1m. Enforce spray and clean-up procedures.	End-of-day clean-up was done in designated wash areas and supervised by the ECO, VectorLink IRS coordinators, government district supervisors, and other VectorLink staff. PMI VectorLink staff and government supervisors inspected 107 sites and a total of 2033 inspections were submitted. There were 4 red flags regarding end-of-day clean-up and all were immediately resolved.	No outstanding issues	Observed cases of non-compliance were resolved immediately.
1n. IEC campaigns to inform homeowners of responsibilities and precautions.	The IRS IEC campaign was effectively carried through in-person community mobilization before and during the spray camping and through radio adverts, hosted radio discussions, printed materials, i.e., posters. The project used 1175 mobilizers to conduct community mobilization and sensitization on IRS to inform homeowners what to do before, during, and after spraying.	No outstanding issues	Due to the rainy season, most householders are reluctant to remove all their possessions from their homes. Most householders were convinced to adequately prepare their households due to strong mobilization teams.
1o. Prohibition of spraying houses that are not properly prepared.	SOPs were advised not to spray in structures that were not properly prepared.	No outstanding issues	None

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1p. Two-hour exclusion from house after spraying	SOPs were trained to inform homeowners that they must leave their homes closed for two hours and then open the doors and windows and wait another 30 minutes before entering and sweeping the structure and disposing of the swept-up material into the pit latrines or burying it. All 15983 inspections revealed SOPs had informed household owners about post-spray procedures.	No outstanding issues	The ECO, zonal IRS coordinators, and district supervisors played a pivotal role in enforcing this requirement. No non-compliance issues observed.
1q. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.	Homeowners were instructed to wash their skin with plenty of water and soap if they experienced itching and to visit the nearest clinic if the itching persisted. Out of 15983 submissions, 6 red flags are observed.	No outstanding issues	Most SOPs provided the required information to homeowners, but some homeowners forgot the instructions. However, these instructions were repeated by PMI VectorLink staff and RHB staff doing monitoring and supervision
1r. Indoor spraying only	The ECO, zonal IRS coordinators, team leaders, and supervisors worked hard to ensure all sprayable surfaces were sprayed, including the walls, ceiling, and eaves of all sleeping spaces. Of the 15983 supervisory inspections conducted during the campaign observed no cases of SOPs spraying outdoor surfaces or open spaces.	No outstanding issues	None
1s. Training on proper spray technique	SOPs were trained on proper spray techniques during cascade training. The 15,983 inspections by the supervisors found only 7 instances of SOP non-compliance.	No outstanding issues	Observed cases of non-compliance were resolved immediately on the spot.
1t. Maintenance of pumps	Before the deployment of SOPs each morning, team leaders and supervisors serviced all spray pumps. Out of 15983 inspections done by supervisors, 18 leaking pumps were found. However, the pump technician, team leaders, and supervisors were always in the field to repair the defective pumps so that SOPs could quickly resume work.	No outstanding issues	Leaking pumps were replaced or fixed immediately.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1u. No application of insecticides within 30 yards of beekeeping sites	Spraying was done indoors only and at least 30 meters away from sensitive areas including beehives.	No outstanding issues	None
2a. Choose sites for disposal of liquid wastes according to PMI BMPs.	Selecting the soak pit sites for liquid waste disposal was jointly done by the ECO, VectorLink supervisors, and district supervisors and was supervised by the project COP in accordance with the PMI BMP. All operations sites were inspected to ensure that they met BMP standards before they were certified for use	No outstanding issues	All sites selected for both fixed and MSP were suitable for the disposal of liquid waste.
2b. Construct soak pits with charcoal to adsorb pesticide from rinse water.	Soak pits were constructed in accordance with recommendations outlined in the PMI BMP manual. VectorLink Ethiopia upgraded 18 temporary soak pits to permanent soak pits. Additionally, 19 temporary soak pits were constructed. A total of 102 soak pits and 5 MSP II were used.	No outstanding issues	None
2c. Maintain soak pits as necessary during season.	All 102 fixed soak pits and 5 MSP II were well maintained. All soak pits lasted throughout the spray campaign without any problems. Contaminated water drained properly into the soak pits.	No outstanding issues	None
2d. Inspection and certification of solid waste disposal sites before spray campaign.	VectorLink Ethiopia, with support from Ethiopia's Environmental Protection Authority, ensured that the sites for waste disposal were inspected to meet the standards. VectorLink Ethiopia will use the authority-approved incinerator to incinerate nose masks and contaminated cardboard boxes. Uncontaminated cardboard boxes will be recycled at the Ethiopian Pulp and Paper Production Company. Empty Actellic 300 CS bottles and plastic sheets will be recycled in Addis Ababa at Tewodros Fikru Plastic and Plastic Products Manufacturing Company.	Collection of all contaminated and non-contaminated cardboards, empty bottles, and nose masks is in progress from the PMI target districts to Addis Ababa.	A Waste management plan was developed prior to the commencement of the spray campaign.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
2e. Monitoring waste storage and management during campaign.	All waste materials were stored and managed according to PMI BMPs during the spray campaign. IRS solid waste was separated into categories (paper, plastic, rubber, and cloth), and stored in labeled bags. Out of the 717 storekeeper performance inspections that were conducted, 47 red flags were observed.	No outstanding issues	The entire VectorLink Ethiopia senior management team was in the field supervising IRS operations throughout the campaign and was able to immediately identify and correct any non-compliance issues.
2f. Monitoring disposal procedures post-campaign.	The ECO will monitor the post-spray campaign solid waste disposal. All IRS waste has already been sorted, labelled, collected and transported to Addis Ababa and will be incinerated or recycled as per PMI BMP guidelines.	No outstanding issues	None
3a. Maintain records of all pesticide receipts, issuance, and return of empty sachets/bottles.	Stock cards tracked insecticide going to and from the central store, with back-up ledger books at central, district, and sub-district stores. Out of the 717 storekeeper performance inspections that were conducted, 3 stock cards where the end-of-day balance of empty bottles did not equal the opening balance in the ledger.	No outstanding issues	Issues identified were rectified immediately.
3b. Reconciliation of number of houses sprayed vs. number of sachets/bottles used.	The average number of structures sprayed per bottle of insecticide was 4.02; similar to last year's average which was 4 structures per bottle.	No outstanding issues	None
3c. Visual examination of houses sprayed to confirm pesticide application.	Visual examination of houses sprayed was conducted by Squad leaders, field supervisors, operations manager, ECO and the COP observing the traces of the sprayed chemical of the walls, ceilings, and eaves during the visit. A total of 15,983 inspections were carried out.	No outstanding issues	Inspections were mainly done through a checklist, which included visual examination of sprayed walls, eaves, and ceilings.
3d. Perform physical inventory counts during the spray season.	The ECO, zonal IRS coordinators, and logistics coordinator conducted physical inventory counts during and after the spray season using the storekeeper performance inspection checklist. Out of the 717	No outstanding issues	Issues identified were rectified immediately.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
	inspections, 4 did not have a balance between the stock cards and the physical stock.		
4a. Insecticide shipments over water	The VectorLink Ethiopia team, in close collaboration with the Director of Environmental Compliance and Safety, implemented environmental compliance guidelines stipulated in the PMI BMP. The water crossing was successful and without incident.	No outstanding issues	A proposal to transport the insecticide via the Akobo River was prepared and approved prior to the commencement of the activity. The team evaluated all possible crossing points in terms of the distance, time required, type and capacity of boat, speed of transport, turbulence of the water, insecticide packaging, road transport before and after water crossing. Insecticide bottles were packed in 220-liter open-top barrels with a water-tight top and a locking ring. Waterproof labeling was affixed to the barrel, with the identity of the insecticide, number of bottles inside, the weight, the type of hazard posed by the contents, and appropriate PPE worn when handling the barrel.

ANNEX D: M&E PLAN MATRIX – 2020 CAMPAIGN RESULTS

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
Objective 1: Implementation of Malaria Vector Control (VC) Interventions														
1.1	Successfully Execute IRS and Other Integrated Malaria VC Activities													
1.1.1	Number and percentage of completed annual country work plans developed and submitted on-time	X	Project records Annually	Country										
1.1.2	Number of eligible structures targeted for spraying		Project records Annually	Country	595,618 ²	574,042 ³	545,496 ⁴	509,594 ⁵	540,588 ⁶	535,164 ⁷				
1.1.3	Number of eligible structures sprayed with IRS ⁸		Project records Annually	Country	506,275	472,569 ⁹	463,672	487,746	459,500	527,375				

² Number of eligible structures targeted was based on the number of structures found in 2017 and microplanning data from RHBS.

³ Number of targeted structures is lower than the Y1 target because the IRS team couldn't visit/access conflict areas. In addition, roadblocks and high river levels prevented access in some districts and an overestimation of structures in new PMI-supported districts inflated the campaign target.

⁴ Number of eligible structures targeted was based on the number of structures found in 2018, structures that were not covered in 2018 spray campaign due to security reasons, and an enumeration that was done in Gambela Region. Moreover, additional kebeles that were not previously targeted in the Oromia region are included.

⁵ Number of eligible structures targeted for spraying is lower than the target because the IRS team couldn't visit kebeles that had security problems. Moreover, a significant number of structures are only occupied on a seasonal basis and were therefore excluded from the target.

⁶ Number of eligible structures targeted is based on the number of structures found in 2019; it includes areas that could not be accessed in Y2 due to security issues and newly added administrative kebeles in PMI supported districts but does not include structures that are seasonally abandoned.

⁷ Number of eligible structures targeted for spraying is lower than the original Year 3 target because structures were excluded from few districts due to internal conflicts and IRS team couldn't visit these kebeles.

⁸ Target based on 85% of estimated eligible structures in indicator 1.1.2.

⁹ Number of eligible structures sprayed is low because IRS teams couldn't access conflicts areas and there was an overestimation of structures in some new PMI-supported districts.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.1.4	Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)		Project records Annually	Country	85%	97%	85%	96%	85%	95.6%				
1.1.5	Number of people protected by IRS		Project records Annually	Country Sex Pregnant women Children <5	1,622,386	1,264,189 ¹⁰ Male: 633,359 Female: 630,830 Pregnant women: 28,944 Children <5: 213,459	1,496,124	1,334,868 ¹⁰ Male: 668,769 Female: 666,099 Pregnant women: 33,245 Children <5: 228,262	1,411,268 ¹⁰ Male: 707,045 Female: 704,223 Pregnant women: 35,282 Children <5: 239,916	1,511,728 Male: 795,414 Female: 716,314 Pregnant Women: 43,747 Children <5: 226,996				
1.1.6	Number and percentage of vector control project country programs submitting an EOSR within 45 days after the end of spray (including completing MEP and EMMR)	X	Project Annually	Country										
1.1.7	Number and percentage of IRS country programs that conduct a Post-Spray Data Quality Audit within 90 days of spray completion	X	Data Collection Forms Annually	Country										
1.1.8	Number of Insecticide Treated Nets (ITNs) distributed, by channel		Project Records Annually	Country Channel	N/A	N/A	N/A	N/A	N/A	N/A				
1.1.9	Number and percentage of countries completing ITN durability monitoring data collection as planned in a given project year	X	Project Records Annually	Country										

¹⁰ Sex segregation was done based on the 2017 projection in the document “Federal Democratic Republic of Ethiopia Central Statistical Agency Population Projection of Ethiopia for All Regions at Woreda Level from 2014 – 2017,” where males comprise 50.1% of the population and females 49.9%.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.1.1.0	Number and percentage of PMI-funded durability monitoring surveys with reports submitted within 90 days of the end of data collection	X	Project Records Annually	Country										
1.2	Strengthen Capacity of NMCPs, VC Personnel, and Other Institutions to Implement and Manage IRS and Other VC Activities													
1.2.1	Total number of people trained to support VC in target areas		Project Training Records Annually	Country VC Intervention Sex Job Function	4,539	4,371 ¹¹ Male: 2,953(68%) Female: 1,418 (32%)	5,159	4,887 ¹² Male: 3,572(73%) Female: 1,315 (27%)	4,802 ¹³ Male: 3,121 (65%)	3,013 ¹⁴ Male: 2,303(76.4%) Female: 710 (23.6%)				
1.2.2	Total number of people trained to support VC in target areas with USG funds ¹⁵		Project Training Records Annually	Country VC Intervention Sex Job Function	TBD	2,413 ¹⁶ Male: 2,187 (91%) Female: 226 (9%)	TBD	2,297 ¹⁷ Male: 2,150 (94%) Female: 147 (6%)	2,436 ¹⁸ Male: 1,827 (75%)	2350 ¹⁹ Male: 1,782 (75.8%) Female:568 (24.2%)				

¹¹ TOT (276), DECs (49), Pesticide poison management (103), HEW (1,468), SQLs (393), SOPs (1,378), Porter (324), Washers (82), Drivers (129), Guards (81), Storekeepers (44) and Temporary Storekeepers (44).

¹² TOT (292), DECs (54), M&E Assistants (44), Pesticide poison management (79), Mobilizers (1,656), SQLs (644), SOPs (1,361), Porter (334), Washers (108), Drivers (145), Guards (87), Storekeepers (39) and Storekeeper assistants/pump technicians (44).

¹³ Supervisors (202), TL (92), DECs (63), M&E assistants (57), Pesticide poison management (88), Mobilizer (1,704), SQL (447), SOP (1,345), Porter (350), Washers (107), Drivers (146), Guards (113) Store keepers (44) , Store assistants/Pump Technicians (44). Porters are also back-up SOPs and trained with SOPs and thus they are included in this target.

¹⁴ TOT (200), SQL (444), SOP/Porters (1706), DECs (62), Store keepers (43), Assistant Store Keepers/Pump Technicians (44), Pesticide poison management (88), Drivers (211), Washers (115), Security Guards (100). The result reflects an effort to reduce number of trainees due to the COVID-19 pandemic.

¹⁵ As of 2018, this only includes spray operators, team leaders, and supervisors.

¹⁶ This includes 393 Squad Leaders, 1,378 Spray Operators, 81 Team Leaders, 151 Supervisors, 324 Porters, 42 Pump Technicians and 44 District MFPs. This indicator definition was later standardized by PMI and moving forward porters and pump technicians were excluded from this indicator calculation.

¹⁷ This includes 199 Supervisors, 93 Team Leaders, 644 Squad Leaders, and 1,361 SOPs.

¹⁸ SOP (1,345), Porter (350), SQL (447), TL (92), Supervisor (202).

¹⁹ This includes 104 supervisors, 96 Team Leaders, 444 squad Leaders, and 1706 SOP/Porters.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.2.3	Number of people trained during the Master (National) Training and/or IRS Training of Trainers.		Project Training Records Annually	Country Sex Type of Training	257	276 Male: 268 (97%) Female: 8 (3%)	320	292 Male: 281 (96%) Female: 11 (4%)	370 ²⁰ Male: 298 (85%) Female: 72 (15%)	228 ²¹ Male: 220 (96.5%) Female: 8 (3.5%)				
1.2.4	Total number of people hired to support VC in target areas.		Project Records Annually	Country VC Intervention Sex Job Function	4,528	4,366 ²² Male: 2,948 (68%) Female: 1,418 (32%)	5,997	4,755 ²³ Male: 3,419 (72%) Female: 1,336 (28%)	4,215 ²⁴ Male: 2,740 (65%) Female: 1,475 (35%)	4147 ²⁵ Male: 2,852 (68.8%) Female: 1,295 (31.2%)				
1.2.5	Number of VC project training workshops targeting NMCP and other host country staff		Project Training Records Annually	Country Technical Area Job Function	0	0	1	1	1 ²⁶	Not yet completed				
1.2.6	Number of NMCP and other vector control host country staff who have logged into VectorLink Collect		DHIS2 Logs Annually	Country Job Function	N/A	N/A	N/A	N/A	6 ²⁷	6				

²⁰ Master Training (19), TOT (351).

²¹ Master Training (28), TOT (200).

²² Supervisors (276), DEC's (44), Pesticide poison management (103), HEW (1,468), SQL (393), SOP (1,378), Porter (324), Washers (82), Drivers (129), Guards (81), Storekeepers (44) and Temporary Storekeepers (44).

²³ Supervisors (292), DEC's (45), M&E Assistants (44), Mobilizers (1,656), SQL (644), SOP (1,361), Porter (334), Washers (108), Water Fetchers (96), Guards (87), Storekeepers (44) and Storekeepers assistants/pump technicians (44).

²⁴ DEC's (48), M&E assistants (57), Mobilizer (1,704), SQL (447), SOP (1,345), Porter (350), Washers (107), Guards (113), Store assistants/Pump Technicians (44).

²⁵ Supervisors (267), Seasonal Supervisors (28), SQL (442), SOP/Porter (1,728), DEC's(65), M&E Assistants (57), Storekeepers(44), Storekeepers assistants/pump technicians (44), Washers (115), Water Fetchers (82), Security Guards (100), Mobilizers (1,175).

²⁶ Boot Camp for NMCP staff in non-PMI regions.

²⁷ 3 Regional Health Officers and 3 NMCP Staff.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.2.7	Number and percentage of technical assistance requests to support ITN distribution planning and/or implementation completed on time as planned in a given project year	X	Project Records Annually	Country Technical Area Channel										
1.2.8	Number and percentage of technical assistance requests to support operational routine monitoring systems for continuous ITN distribution completed on time as planned in a given project year	X	Project Records Annually	Country Channel										
1.3	Environmental Compliance and Safety													
1.3.1	Number of seasonal vector control personnel trained in environmental compliance and personal safety standards in vector control implementation		Project Training Records Annually	Country Sex (# and %) Job Function	2,628	2,751 ²⁸ Male: 2,445 (89%) Female: 306 (11%)	3,241	3,054 ²⁹ Male: 2,624 (86%) Female: 430 (14%)	2,890 ³⁰ Male: 1,879 (65%) Female: 1,011 (35%)	2,863 ³¹ Male: 2,182 (76.2%) Female: 681 (23.8 %)				
1.3.2	Number of health workers receiving insecticide poisoning case management training		Project Training Records Annually	Country Sex (# and %)	132	103 Male: 90 (87%) Female: 13 (13%)	132	79 Male: 60 (76%) Female: 19 (24%)	88 Male: 57 (65%) Female: 31 (35%)	88 ³² Male: 67 (76.1%) Female: 21 (23.9%)				

²⁸ TOT participants (276), SQLs (393), SOPs (1,378), Porter (324), Washers (82), Drivers (129), Guards (81), Storekeepers (44) and Storekeeper assistants (44).

²⁹ TOT participants (292), SQLs (644), SOPs (1,361), Porter (334), Washers (108), Drivers (145), Guards (87), Storekeepers (39) and Storekeeper assistants/pump technicians (44).

³⁰ Supervisors (202), TL (92), SQL (447), SOP (1,345), Porter (350), Washers (107), Drivers (146), Guards (113), Storekeepers (44), Store assistants/Pump Technicians (44)

³¹ Supervisors (104), TL (96), SQL(444), SOP/Porters (1,706), Washers (115), Drivers (211), Guards (100) Store keepers (43), Store assistants/Pump Technicians (44)

³² Not conducted centrally due to Covid-19 Pandemic, but video is recorded and distributed to all project site health workers.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.3.3	Number of adverse reactions to pesticide exposure documented that resulted in a referral for medical care		Incident Report Forms Annually	Country Type of Exposure	0	0	0	0	0	0				
1.3.4	Number of SEAs and Letter Reports submitted at least 60 days prior to the commencement of VC campaigns	X	Project Records Annually	Country										
1.3.5	Number and percentage of permanent and mobile soak pits inspected and approved prior to IRS campaigns or before first use		Project Records - PSECA's Annually	Country	115	110; (96%)	110	133; (100%)	168 ³³ ; (100%)	113 ³⁴				
1.3.6	Number and percentage of storehouses inspected and approved prior to IRS campaigns		Project Records - PSECA's Annually	Country Storehouse Type	46	46; (100%) 2 Central Warehouse s 44 Store rooms	46	46; (100%) 2 Central Warehouses 44 Store rooms	46 2 Central Warehouses 44 Store rooms	46 2 Central Warehouses 44 Store rooms				
1.4	Promote Gender Equality in all Facets of Planning and Implementation													
1.4.1	Number and percentage of women hired to support VC campaigns		Project Records Annually	Country Sex (# and %) Job Function	1,358 (30.0%)	1,418 ³⁵ (32.5%)	2,099 (35.0%)	1,336 ³⁶ (28.0%)	1,476 ³⁷ (35%)	1,295 ³⁸ (31.22%)				

³³ Due to a new CB-IRS approach in three districts (i.e. Akobo, Guba and Wombera) additional 25 new soak pits will be constructed in the 3 districts. Out of the 168 soak pits, 108 will be permanent soak pits and 60 will be mobile soak pits.

³⁴ 108 permanent and 5 mobile soak pits were inspected and used. The reasons for using fewer mobile soak pits than planned are a) change in IRS approach from district based to community based in Akobo, Guba and Wombera, and b) improved access to permanent soak pits in some areas.

³⁵ Supervisors (8); DECs (4); Pesticide poison management (13); HEWs (1,095); SQLs (24); SOPs (82); Porter (112); Washers (78); Storekeepers (1) and Temporary Storekeepers (1).

³⁶ Supervisors (11); DECs (3); M&E Assistants (1); HEWs (859); SQLs (87); SOPs (49); Porters (175); Washers (108); Storekeepers (3); and Water Fetchers (40).

³⁷ DECs (17), M&E assistants (20), Mobilizer (596), SQL (156), SOP (472), Porter (123), Washers (37), Guards (40), Store assistants/Pump Technicians (15).

³⁸ DECs (8), M&E assistants (3), Mobilizer (568), SQL (90), SOP/Porter (457), Washers (106), Guards (3), Supervisors (11), Seasonal Supervisors (1), Store keepers (4), Water fetchers (44).

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.4.2	Number and percentage of women hired in supervisory roles in target areas for VC activities		Project Records Annually	Country Sex (# and %) VC Intervention Job Function	63;	34 ³⁹ (5%)	99	98 (11%)	127 ⁴⁰ (15%)	108 ⁴¹ (13.34%)				
1.4.3	Number and percentage of trainees (permanent and seasonal) who have completed gender awareness training		Project Records Annually	Country Sex (# and %) Job Function	4,570 ⁴²	4,401 ⁴³ ; (96%) Male: 2,979 Female: 1,422	5,190 ⁴⁴	4,922 ⁴⁵ (95 %) Male: 3,602 Female: 1,320	4,843 ⁴⁶ Male: 3,148 (65%) Female: 1,695 (35%)	2,966 ⁴⁷ Male: 2,270 (76.5%) Female: 696 (23.5%)				
1.4.4	Number and percentage of women in senior leadership roles in VectorLink country offices	X	Project Records Annually	Country Sex (# and %)										

³⁹ In 2017, the community-based IRS approach was used in 5 districts and by design it involves women as SQLs since most SQLs are female HEWs. In 2018 district-based IRS was implemented which meant that SQLs were recruited from the general public and due to tough competition women accounted less from previous year.

⁴⁰ Storekeepers (7), Supervisors (30), TLs (14), SQL (67), and M&E Assistants (9).

⁴¹ Store keepers (4), Supervisors (11), SQL (90) and M&E Assistants (3).

⁴² 31 VectorLink staff, 257 supervisors, 60 DECAs, 132 Pesticide poison management, 1,615 HEW, 393 SQLs, 1,378 SOPs, 324 Porter, 82 Washers, 129 Drivers, 81 Guards, 44 Storekeepers and 44 Temporary Storekeepers.

⁴³ VectorLink staff (30), Supervisors (276), DECAs (49), Pesticide poison management (103), HEW (1,468), SQLs (393), SOPs (1,378), Porter (324), Washers (82), Drivers (129), Guards (81), Storekeepers (44) and Temporary Storekeepers (44).

⁴⁴ 31 VectorLink staff, 353 Supervisors, 692 SQLs, 1,413 SOP, 346 Porter, 100 Washers, 161 Drivers, 88 Guards, 88 Store, 60 DEC, 132 Pesticide poison Management, 1,726 HEWS.

⁴⁵ VectorLink staff (35), Supervisors (292), DECAs (54), M&E Assistants (44), Pesticide poison management (79), Mobilizers (1,656), SQLs (644), SOPs (1,361), Porter (334), Washers (108), Drivers (145), Guards (87), Storekeepers (39) and Storekeeper assistants/pump technicians (44).

⁴⁶ VectorLink staff (41), supervisors (202), TL (92), DECAs (63), M&E Assistants (57), Pesticide poison management (88), Mobilizers (1704), SQL (447), SOP (1,345), Porters(350), Washers (107), Drivers (146), Guards (113), Storekeepers (44) and Storekeeper assistants/pump technicians (44).

⁴⁷ VectorLink staff (41), supervisors (104), TL (96), SQL (444), SOP/Porters (1706), DECAs (62), Store keepers (43), Storekeeper assistants/pump technicians (44), Drivers (211). Washers (115) and security guards (100)

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.5 Implement and Support SBCC and Mobilization Activities														
1.5.1	Number of radio spots and talk shows aired		Project Records Annually	Country VC Intervention Talk Show or Radio Spot	N/A	N/A	N/A	2 Radio Spots	2 Radio Spots	2 ⁴⁸				
1.5.2	Number of print materials distributed to or targeted at beneficiaries		Project Records Annually	Country VC Intervention	5,817	6,561	8,630	7,550	8,300	9,387 ⁴⁹				
1.5.3	Number of people reached with vector control and/or SBCC messages via door-to-door messaging		Project Records Annually	Country VC Intervention Sex	N/A	N/A	1,496,124 ⁵⁰	844,917 ⁵¹ Male: 414,726 Female: 430,191	1,411,268 ⁵² Male: 707,045 Female: 704,223	N/A ⁵³				
2. Entomological and Epidemiological Data to Drive Decision-Making														
2.1 Vector Control Activities Monitored via Entomological and Epidemiological Data														
2.1.1	Number of project-supported entomological sentinel sites established to monitor vector bionomics (vector species, distribution, seasonality, feeding time, and location)		Entomological Reports Annually	Country VC Intervention	3 ⁵⁴	3; (100%)	10 ⁵⁵	9; (90%)	11 ⁵⁶	11 (100%)				

⁴⁸ Radio spots were aired two times (1 before IRS and 1 during IRS).

⁴⁹ A total of 7890 posters and 1697 job aids were printed and distributed to target audience.

⁵⁰ Total target population.

⁵¹ Door to door mobilization in five Kamashi zone districts and Oda district wasn't conducted due to security reasons.

⁵² Total target population. Sex segregation was done based on the 2017 projection in the document "Federal Democratic Republic of Ethiopia Central Statistical Agency Population Projection of Ethiopia for All Regions at Woreda Level from 2014 – 2017," where males comprise 50.1% of the population and females 49.9%.

⁵³ Door to door messaging was not carried out due to Covid-19 pandemic. Megaphones were used in public spaces to deliver key messages instead, and thus the number of people reached could not be recorded.

⁵⁴ The selected sites are: Abaya, Bambasi, and Lare.

⁵⁵ The selected sites are: Abaya, Bambasi, Lare, Diredawa, Kebridehar, Metema, Benatsemay Harbu, Jabitehnan, Metehara and Awash.

⁵⁶ Lare, Bambasi, Abaya, Harbu, Jabitehnan, Metema, Fentale, Awash, Diredawa, Kebridehar and Benatsemay.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.1.2	Number and percentage of vector bionomics monitoring sites measuring all basic entomological indicators (species composition, indoor and outdoor human biting rates, hourly human biting rates, indoor resting densities)		Entomological Reports Annually	Country VC Intervention	13	13; (100%)	6 ⁵⁷	6; (100%)	11 ⁵⁸ ; (100%)	11 (100%)				
2.1.3	Number and percentage of vector bionomics monitoring sites measuring the following all advanced entomological indicators: sporozoite rates and entomological inoculation rates		Entomological Reports Annually	Country IRS or Entomology Only Program	3 ⁵⁹	3; (100%)	6 ⁶⁰	9 ⁶¹ ; (150%)	11 ⁶²	11 (100%)				
2.1.4	Number and percentage of insecticide resistance monitoring sites that tested all priority insecticides for the relevant local vector control intervention		Entomological Reports Annually	Country VC Intervention	4 ⁶³	4; (100%)	6 ⁶⁴	6; (100%)	15 ⁶⁵	15 (100%)				

⁵⁷ The number of IR monitoring sites increased from 13 to 30 based on the guidance from PMI, including sites with *An. stephensi*.

⁵⁸ Lare, Bambasi, Abaya, Harbu, Jabitehnan, Metema, Fentale, Awash, Diredawa, Kebridehar and Benatsemay.

⁵⁹ The sites are: Abaya, Bambasi, and Lare.

⁶⁰ The selected sites are: Abaya, Bambasi, Lare, Diredawa, Kebrideher, and Benatsemay.

⁶¹ Additional three sites were added: Abaya, Bambasi, Lare, Diredawa, Kebrideher, Benatsemay, Habru, Jabitehnan and Metema. With the new PMP revision, this indicator definition has been refined. Thus the results from Y1 and Y2 may look different than the target and results for the remainder of the project.

⁶² Lare, Bambasi, Abaya, Harbu, Jabitehnan, Metema, Fentale, Awash, Diredawa, Kebridehar and Benatsemay

⁶³ The sites are: Abaya, Amibara, Halaba, and Ziway.

⁶⁴ The sites are: Abaya, Bambasi, Halaba, Abobo, Omonada, and Ziway.

⁶⁵ Awash, Amibara, Jabitehnan, Metema, Bambasi, Abobo, Abaya, Fentale, Dugdga, Omonada, Benatsemay, Misrakbadawacho, Godey, Erer, Humera

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.1.5	Number and percentage of houses in which WHO cone bioassays were conducted within two weeks of spraying with greater than 98% test mortality recorded for IRS countries		Entomological Reports Annually	Country Insecticide Type	48 ⁶⁶	48; (100%)	36 ⁶⁷	36 ⁶⁸ ; (100%)	84 ⁶⁹	84 (100%)				
2.1.6	Number and percentage of sites that conducted WHO cone bioassays after the completion of spraying at monthly intervals until test mortality drops below 80% for two consecutive months for IRS countries		Entomological Reports Annually	Country Insecticide Type	252 ⁷⁰	216	252 ⁷¹	144 ⁷² Ongoing	7 ⁷³	In progress				
2.1.7	Number of countries with an integrated vector control analytics dashboard created by PATH, available for decision-making	X	Project Reports Annually	Country										

⁶⁶ 12 houses from 4 kebeles were planned for cone bioassays to be conducted within 2 weeks of spraying to evaluate the quality of IRS.

⁶⁷ 12 houses from 3 kebeles will be used for cone bioassays within 2 weeks of spraying to evaluate the quality of IRS.

⁶⁸ 12 houses from 3 kebeles were used for cone bioassays within 2 weeks of spraying to evaluate the quality of IRS. With the new PMP revision, this indicator definition has been refined. Thus the results from Y1 and Y2 may look different than the target and results for the remainder of the project.

⁶⁹ 12 houses from 7 kebeles will be used for cone bioassays within 2 weeks of spraying to evaluate the quality of IRS. 60 houses will be sampled from areas where Actellic 300CS was sprayed. 12 houses will be sampled from each of the Sumishield 50 WG and FludoraFusion pilot sites.

⁷⁰ 36 bioassays per month for 7 months were planned to be conducted in 3 kebeles.

⁷¹ 36 bioassays per month for 7 months will be conducted in 3 kebeles.

⁷² Will continue up to two consecutive months below 80% mosquito mortality. With the new PMP revision, this indicator definition has been refined. Thus the results from Y1 and Y2 may look different than the target and results for the remainder of the project.

⁷³ 7 districts will be used for cone bioassays within 2 weeks of spraying to evaluate the quality of IRS. Five sites will be sampled from Actellic 300CS spray areas and one site will be sampled from each Sumishield 50 WG and FludoraFusion pilot sites.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.1.8	Number of people trained (VectorLink and non VectorLink staff) in entomological monitoring		Project Records Annually	Country Sex (# and %)	8	474 Male: 3 (75%) Female: 1 (25%)	20	2375 Male: 20 (87%) Female: 3 (13%)	3076	Postponed to 2021 due to COVID-19				
2.1.9	Number and percentage of sites in which WHO cone bioassays were conducted to evaluate bio-efficacy of bed nets		Entomological Records Annually	Country	N/A	N/A	N/A	N/A	N/A	N/A				
2.1.10	Number of nets in which WHO cone bioassays were conducted to evaluate bio-efficacy of bed nets		Entomological Records Annually	Country	N/A	N/A	N/A	N/A	N/A	N/A				
2.2 NMCPs Develop Country-Level IRS and Other Malaria VC Strategies														
2.2.1	Number and percentage of countries with an integrated malaria vector control strategy, including a plan for monitoring and managing insecticide resistance supported by the project	X	Project Records Annually	Country										
2.2.2	Number and percentage of countries with a data and visualization dashboard complete for IRS and/or entomology data in VectorLink Collect for vector control decision making	X	Project Records Annually	Country										

⁷⁴ Training was provided to two universities (Jigjiga, and Diredawa) and the Oromia Public Health Research Capacity Building and Quality Assurance Laboratory (Adama)- 2 Entomologists and 2 Ento Technicians.

⁷⁵ The training was provided to nine universities (Gondar-2, Jigjiga-1, Mekelle-1, Addis Ababa-3, Arba Minch-1, Debre-Markos-1, Diredawa-1, Assosa-1 and Jimma-2), EPHI-3, AHRI-4, NMCP-1 and OPHRCBQAL-2).

⁷⁶ Participants will be from 10 universities and two research institutes.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.2.3	Number of countries that implement sub-national insecticide rotation	X	Project Records Annually	Country										
2.3	Build capacity of NMCPs and local institutions to collect, analyze, and use data for strategic malaria control decision-making													
2.3.1	Number of individuals trained from NMCPs and national institutions to review and interpret data for integrated vector control decision making		Project Training Records Annually	Country Job Function Organization	0 ⁷⁷	0	0 ⁷⁸	0	15 ⁷⁹	12 ⁸⁰				
2.3.2	Number and percent of targeted individuals that report using new analytical tools and/or skills in their planning, resourcing, implementation, or measurement activities		Capacity Assessments Thrice Over Project Life	Country Job Function Organization	0	0	0	0	15; 100%	12				
3. Procurement and Logistics														
3.1	Cost-Effective Procurement Mechanism Established													
3.1.1	Number and percentage of insecticide procurements that had a pre-shipment QA/QC test, done by a third party, at least 60 days prior to spray campaign	X	Procurement Records Annually	Country Insecticide Type										
3.1.2	Number and percentage of insecticide procurements received on-time to allow for the initiation of spray operations as scheduled		Procurement Records Annually	Country Insecticide Type	2 ⁸¹	2; (100%)	1 ⁸²	1; (100%)	3 ⁸³	3 (100%)				

⁷⁷ This activity was not planned for 2018 since Ethiopia was not using DHIS2.

⁷⁸ This activity was not planned for 2019 since Ethiopia was not using DHIS2.

⁷⁹ Will train people from the NMCP (3), Benishangul-Gumuz Regional Health Bureau (4), Gambela Regional Health Bureau (4) and Oromia Regional Health Bureau (4).

⁸⁰ NMCP (2), Gambela Regional Health Bureau (2), Benishangul-Gumuz Regional Health Bureau (5) and Oromia Regional Health Bureau (3).

⁸¹ Actellic 300CS (organophosphate).

⁸² Actellic 300CS (organophosphate).

⁸³ Actellic 300CS (organophosphate), SumiShield 50WG and Fludora Fusion.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
3.1.3	Number and percentage of targeted countries with international equipment procurements, including PPE, received on-time to allow for the initiation of vector control campaigns as scheduled	X	Procurement Records Annually	Country VC Intervention										
3.1.4	Number of VectorLink staff trained on procurement	X	Project Records Annually	Country										
3.2	Robust Inventory Management and Logistics Systems Established													
3.2.1	Number and percentage of logistics and warehouse personnel (seasonal and full-time) trained in VC supply chain management		Project Training Records Annually	Country VC Intervention Sex Job Function	88 ⁸⁴	88; (100%) Male: 86 (98%) Female: 2 (2%)	88 ⁸⁵	83, (94%) Male: 83 (100%) Female: 0(0%)	88 ⁸⁶	87 ⁸⁷ (100%) Male: 85% Female: 5.5%				
3.2.2	Number and percentage of operations site warehouses where physical inventories can be verified by daily stock records		Inventory and Stock Records Annually	Country	46	46; (100%)	46	46; (100%)	46; (100%)	46 (100%)				
3.2.3	Number and percentage of IRS countries that successfully completed spray operations without an insecticide stock-out	X	Inventory and Stock Records Annually	Country Insecticide Type										

⁸⁴ A total of 44 storekeepers and 44 temporary storekeepers.

⁸⁵ A total of 44 storekeepers and 44 temporary storekeepers.

⁸⁶ A total of 44 storekeepers and 44 temporary storekeepers/Spray pump technicians.

⁸⁷ A total of 43 storekeepers and 44 temporary storekeepers/Spray pump technicians.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
4. Innovation														
4.1 Conduct operational research or monitoring to scale up new tools, methods, and approaches														
4.1.1	Number of operational research studies on promising new tools or new methods/approaches to existing tools that are implemented		Project Records Annually	Country Type of Innovation	0	1 ⁸⁸	0	1 ⁸⁹	2 ⁹⁰	In progress				
4.2 Create and share knowledge through dissemination of best practices and lessons learned														
4.2.1	Number of innovations, best practices, and other data or lessons learned shared with other partners or international institutions for global reporting on the Vector Learning Exchange	X	Project Records Annually	Country Technical Area										
4.2.2	Number of individual members who use the Vector Learning Exchange	X	Project Records Annually	N/A										
4.2.3	Number of symposia and/or presentations submitted to and accepted at global conferences		Project Records Annually	Country Technical Area	0	0	1 ⁹¹	6 ⁹²	2 ⁹³	In progress				
4.2.4	Number of success stories written or videos produced and shared on the VectorLink project website		Project Records Annually	Country	0	0	2	1	2	1 ⁹⁴				

⁸⁸ Evaluation of community perception and attitude towards plastering in sprayed houses.

⁸⁹ Evaluation of community perception and attitude towards plastering in sprayed houses.

⁹⁰ VectorLink Ethiopia is piloting the use of Sumishield 50WG and Fludora Fusion. These insecticides have never been used in Ethiopia and will help determine future IRS approaches for campaigns. Additionally the project will conduct hut trial to investigate the impact of PBO nets and standard nets with and without Actellic 300 CS spraying.

⁹¹ Geographical distribution of *An. stephensi* in eastern Ethiopia.

⁹² Malaria Vectorial System and Insecticide Resistance in Ethiopia; The Distribution and Insecticide Resistance Status of *Anopheles stephensi* in Eastern Ethiopia, Blood meal analysis of wild-caught *Anopheles stephensi* in Ethiopia, Molecular approaches to species and biological form identification of *Anopheles stephensi*, Genetic diversity of *Anopheles stephensi* in eastern Ethiopia, Validating Use of Satellite Data for Household Enumeration in Rural Ethiopia.

⁹³ Technical area is TBD.

⁹⁴ One manuscript is shared by entomology team. One success story is in progress.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
4.2.5	Number of peer-reviewed journal articles submitted and accepted	X	Project Records Annually	Technical Area										
4.2.6	Number of contributions to vector control global or country policy and/or guidance documents		Project Records Annually	Country Technical Area	1	1	1	1	1 ⁹⁵	1 ⁹⁶				
4.3	Develop and deploy cost-savings approaches													
4.3.1	Number of innovative or novel approaches implemented to achieve cost savings in IRS and integrated malaria vector control programs		Project Records Annually	Country VC Intervention	0	0	1	0	1 ⁹⁷	1 ⁹⁸				
4.3.2	Number of cost effectiveness assessments of existing approaches in the implementation of IRS and integrated malaria vector control programs		Project Records Annually	Country VC Intervention	0	0	0	0	0	0				
4.4	Cultivate public-private partnerships													
4.4.1	Number of private sector entities engaged with to establish public private partnerships to increase the quality and coverage of malaria vector control activities globally		Project Records Annually	Country	1	1 ⁹⁹	1	1 ¹⁰⁰	0 ¹⁰¹	0				

⁹⁵ Malaria Operational Plans (MOPs) were previously included in the results. With the new PMP revision, these are no longer counted for this indicator. In 2020, the project will support NMCP Ethiopia to develop the IRM strategic plan.

⁹⁶ The project supported NMCEP in three major areas: Policy briefing, Preparation of National Strategic plan, and 2020-2025 Malaria Program Review.

⁹⁷ For the first year, Ethiopia will be moving from having spray operators do primary data collection on the Daily Spray Operator Forms in Benishangul-Gumuz and Oromia. This was piloted on a small scale in 2019 but is moving towards a large-scale rollout in 2020. This reduces cost by decreasing the number of Squad Leaders needed for the campaign.

⁹⁸ In Benishangul-Gumuz and Oromia regions spray operators have successfully performed recording of data on Spray Operator forms. In addition to this, in selected districts, site based management of spray operation has enabled to do planned activity within planned date.

⁹⁹ “Tewodros Fikru Rubber and Plastic Products Manufacturing Factory” is a privately owned company that recycles the empty insecticide bottles into electric conduits.

¹⁰⁰ “Tewodros Fikru Rubber and Plastic Products Manufacturing Factory” is a privately owned company that recycles the empty insecticide bottles into electric conduits.

¹⁰¹ Per recent revisions to the PMP, the partnership with “Tewodros Fikru Rubber and Plastic Products Manufacturing Factory” will not count.

ANNEX E: SPRAY PROGRESS AND COVERAGE BY DISTRICT AND BY REGION

Table E-I: Spray Progress and Coverage by District

Zone	District	Progress	Original Target	Adjusted Target	Found	Sprayed	Coverage	Total Population protected	Pregnant women	Children <5 years old
Agnuwa	Abobo	94.7%	5,942	5,942	5,763	5,629	97.7%	14,047	201	1,509
	Dimma	98.5%	8,291	8,291	8,246	8,170	99.1%	14,870	190	1,241
	Gambela Zuria	96.8%	3,897	3,897	4,049	3,771	93.1%	11,498	145	1,279
	Gog	92.2%	6,362	6,362	6,270	5,864	93.5%	19,404	287	3,162
	Jor*	100.2%	2,486	2,486	2,826	2,492	88.2%	7,056	100	1,065
	Agnuwa total		96.1%	26,978	26,978	27,154	25,926	95.5%	66,875	923
Gambela Town	Gambela Town	98.7%	10,822	10,822	11,576	10,686	92.3%	42,251	3,178	6,242
	Gambela Town Total	98.7%	10,822	10,822	11,576	10,686	92.3%	42,251	3,178	6,242
Itang Special	Itang Special District**	119.0%	8,235	8,235	10,359	9,798	94.6%	40,578	3,754	8,690
	Itang Special Total	119.0%	8,235	8,235	10,359	9,798	94.6%	40,578	3,754	8,690
Majang	Godare	89.4%	9,038	9,038	8,381	8,083	96.4%	20,661	118	1,172
	Mengeshi*	89.2%	9,371	9,371	9,566	8,355	87.3%	19,912	141	2,235
	Majang Total	89.3%	18,409	18,409	17,947	16,438	91.6%	40,573	259	3,407
Nuer	Akobo	96.3%	9,086	9,086	8,761	8,751	99.9%	20,833	2,549	6,387
	Jikawo***	110.5%	7,300	7,300	8,375	8,069	96.3%	40,284	2,244	5,803
	Lare	99.1%	11,535	11,535	11,492	11,435	99.5%	45,359	3,485	11,200
	Makuey	88.6%	10,505	10,505	9,521	9,305	97.7%	34,264	3,796	7,776
	Wanthoa	96.3%	9,202	9,202	8,914	8,859	99.4%	29,945	1,888	6,892
	Nuer Total	97.5%	47,628	47,628	47,063	46,419	98.6%	170,685	13,962	38,058

Zone	District	Progress	Original Target	Adjusted Target	Found	Sprayed	Coverage	Total Population protected	Pregnant women	Children <5 years old
Gambela Region Total		97.5%	112,072	112,072	114,099	109,267	95.8%	360,962	22,076	64,653
Assosa	Assosa	103.8%	34,787	34,787	38,515	36,121	93.8%	65,802	1,090	7,866
	Bambasi	92.9%	18,859	18,859	19,110	17,526	91.7%	35,901	466	4,332
	Homosha	100.5%	11,608	11,608	13,000	11,662	89.7%	19,817	339	3,014
	Kurmuk	102.3%	9,328	9,328	10,040	9,547	95.1%	18,624	483	2,722
	Menge	89.7%	32,023	32,023	29,951	28,721	95.9%	53,552	1295	9,171
	Oda Buldigilu	99.4%	23,822	23,822	24,614	23,674	96.2%	47,190	870	5,238
	Sherkole	92.4%	16,126	16,126	15,457	14,897	96.4%	37,601	740	6,904
	Assosa Total	97.0%	146,553	146,553	150,687	142,148	94.3%	278,487	5,283	39,247
Kamash	Agalo Meti	98.9%	7,436	6,588	6,895	6,513	94.5%	21,118	385	3,376
	Belo Jegenfoy	110.1%	7,376	7,376	8,894	8,118	91.3%	20,253	371	2,930
	Kamashi	103.1%	5,838	5,107	5,375	5,263	97.9%	11,017	175	1,514
	Sedal	106.7%	7,141	7,141	7,686	7,622	99.2%	22,758	408	3,287
	Yaso	105.9%	7,947	7,947	8,566	8,413	98.2%	20,536	382	3,811
		Kamash Total	105.2%	35,738	34,159	37,416	35,929	96.0%	95,682	1,721
Mao komo	Mao-Komo	97.8%	24,975	24,975	25,907	24,415	94.2%	45,283	806	5,551
		Mao-Komo Total	97.8%	24,975	24,975	25,907	24,415	94.2%	45,283	806
Metekel	Bullen	102.0%	11,324	11,324	11,759	11,547	98.2%	36,388	591	4,859
	Dangur	104.1%	9,368	9,368	9,825	9,753	99.3%	24,447	562	3,970
	Dibate	103.2%	15,172	15,172	16,231	15,665	96.5%	53,388	753	7,057
	Guba****	120.9%	5,579	5,579	6,937	6,744	97.2%	18,567	276	2,153
	Mandura	94.3%	14,699	12,787	12,675	12,057	95.1%	46,940	1089	7,590
	Pawi	94.2%	14,069	14,069	13,533	13,247	97.9%	29,650	284	3,185
	Wombera	98.4%	5,503	4,977	5,139	4,898	95.3%	16,967	372	2,560
		Metekel Total	100.9%	75,714	73,276	76,099	73,911	97.1%	226,347	3,927

Zone	District	Progress	Original Target	Adjusted Target	Found	Sprayed	Coverage	Total Population protected	Pregnant women	Children <5 years old
Benishangul-Gumuz Region Total		99.1%	282,980	278,963	290,109	276,403	95.3%	645,799	11,737	91,090
Horo Guduru	Abay Chomen	104.2%	12,178	12,178	13,047	12,695	97.3%	37,567	455	3,196
	Abe Dongoro	99.7%	25,390	25,390	25,711	25,303	98.4%	50,564	903	5,821
	Amuru	91.7%	9,127	9,127	8,637	8,372	96.9%	30,548	491	4,003
	Jardega Jarte	96.1%	9,348	7,941	7,732	7,631	98.7%	19,050	351	2,748
	Horo Guduru Total	98.8%	56,043	54,636	55,127	54,001	98.0%	137,729	2,200	15,768
South West Shoa	Goro	91.8%	14,955	14,955	14,951	13,735	91.9%	47,808	561	6,559
	Ilu	95.9%	17,564	17,564	17,800	16,840	94.6%	40,710	361	4,041
	Woliso	96.5%	16,219	16,219	16,420	15,658	95.4%	55,257	807	5,750
	South West Shoa Total	94.9%	48,738	48,738	49,171	46,233	94.0%	143,775	1729	16,350
West Guji	Abaya	104.0%	16,248	16,248	17,283	16,901	97.8%	67,884	1,294	10,363
	Gelana	100.9%	14,983	14,983	16,229	15,114	93.1%	97,934	3,266	18,445
	Malka Soda	99.3%	9,524	9,524	9,486	9,456	99.7%	57,645	1,445	10,327
	West Guji Total	101.8%	40,755	40,755	42,998	41,471	96.4%	223,463	6,005	39,135
Oromia Region Total		98.3%	145,536	144,129	147,296	141,705	96.2%	504,967	9,934	71,253
Total		98.5%	540,588	535,164	551,504	527,375	95.6%	1,511,728	43,747	226,996

* Lower coverage in Jor and Mengeshi districts due to a large number of refusals.

** Spray progress in Itang Special district is high because about 6,000 structures were excluded in 2019 due to population migration caused by flooding. In 2020, those communities returned and wanted to receive IRS, which the project delivered at the RHB's request.

*** Jikow District showed greater progress because two villages that had to be sprayed under Makuey District last year were now sprayed under Jikow District.

**** Greater spray progress in Guba District was due to the establishment of additional settlements after the microplanning.

Note: Total campaign targets were adjusted/changed because some structures were not sprayed or visited for the following reasons:

i. Mandura 1,912 structures (7,086 estimated population), Agalo Meti 848 structures (2,754 estimated population), and Kamashi 731 structures (1,532 estimated population) vacant structures were excluded because the occupants were displaced due to internal conflict.

ii. Wombera: 526 structures (1,822 estimated population) were not sprayed due to security risks for the spray teams.

iii. Jardega Jarte: 1,407 structures (3,507 estimated population) were excluded due to ongoing conflict.

Figure E-1: Spray Progress, Gambela Region

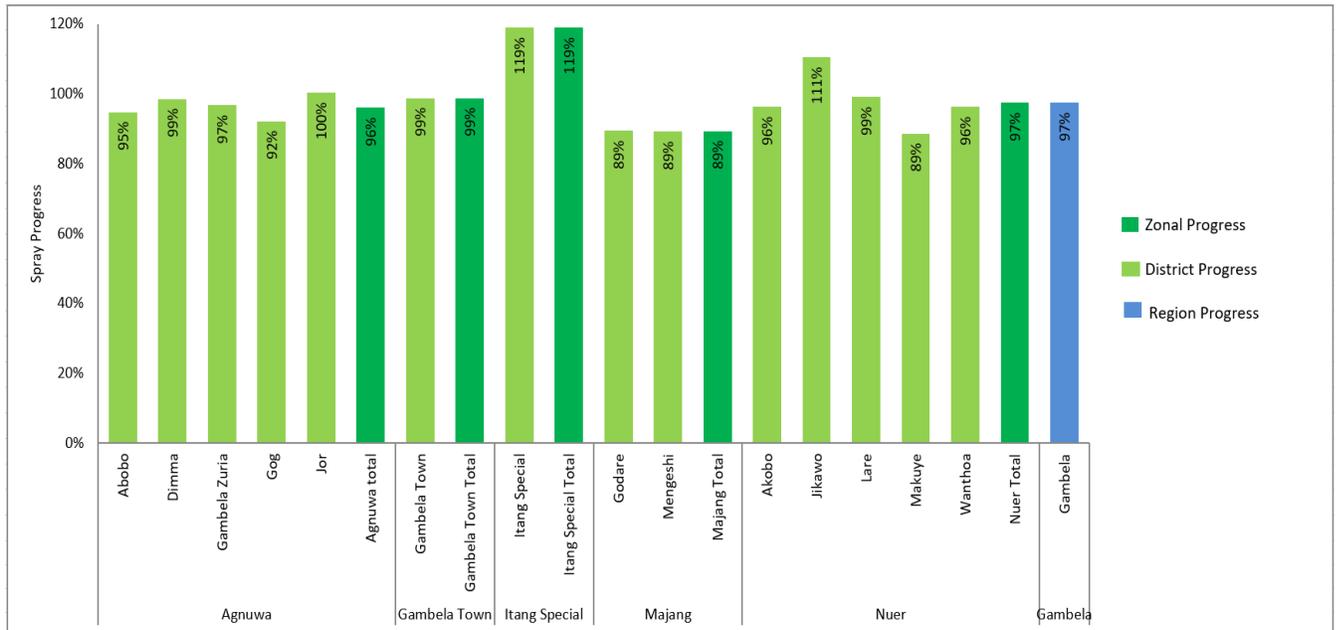


Figure E-2: Spray Coverage, Gambela Region

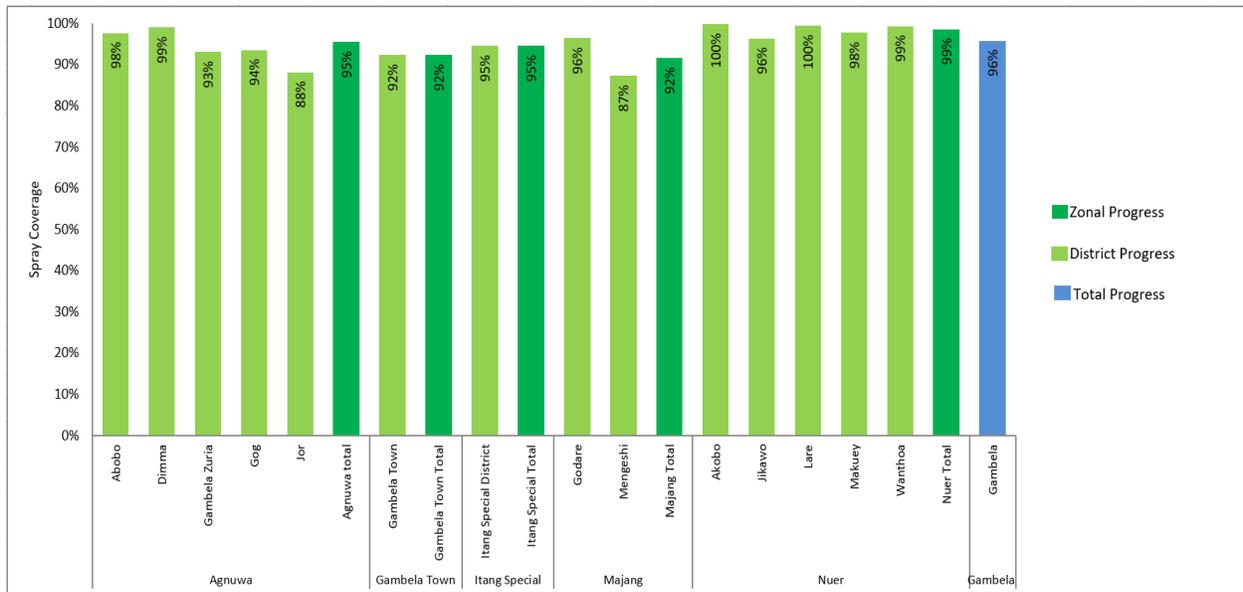


Figure E-3: Spray Progress, Benishangul-Gumuz Region

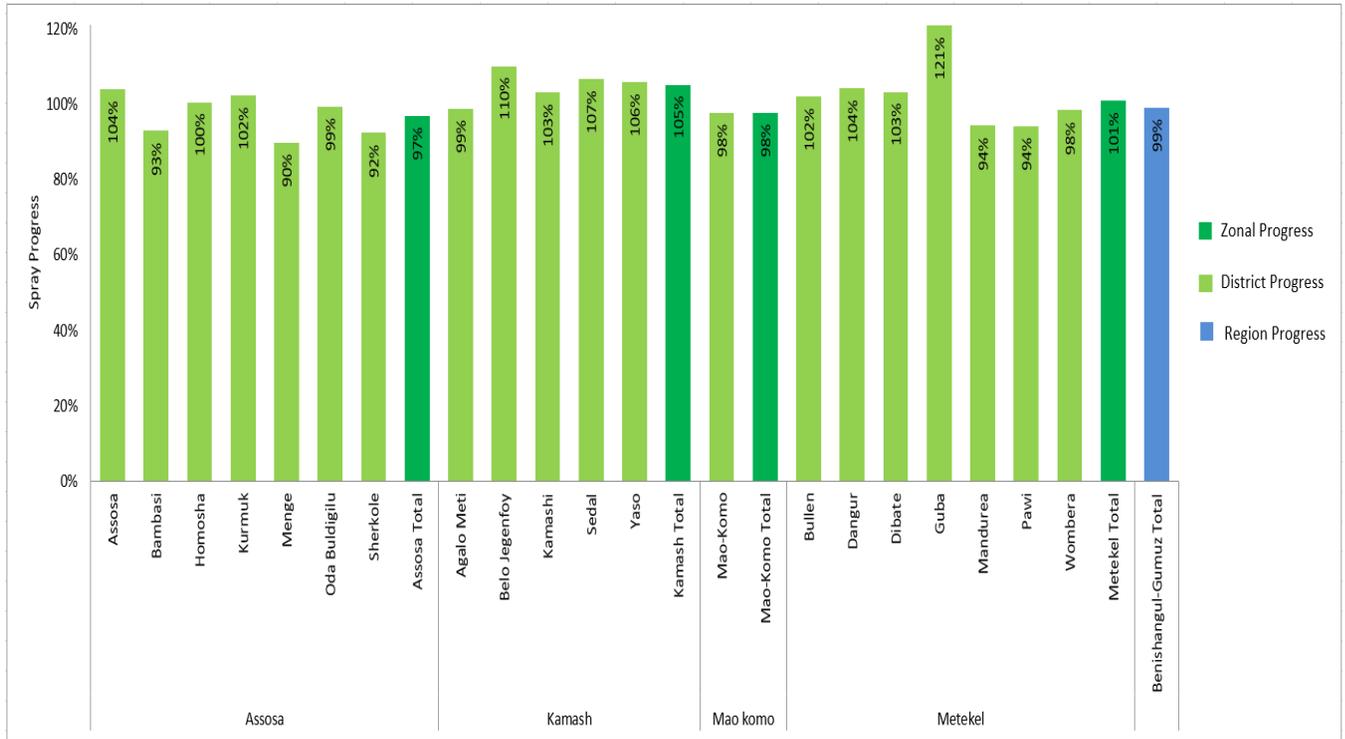


Figure E-4: Spray Coverage, Benishangul-Gumuz Region

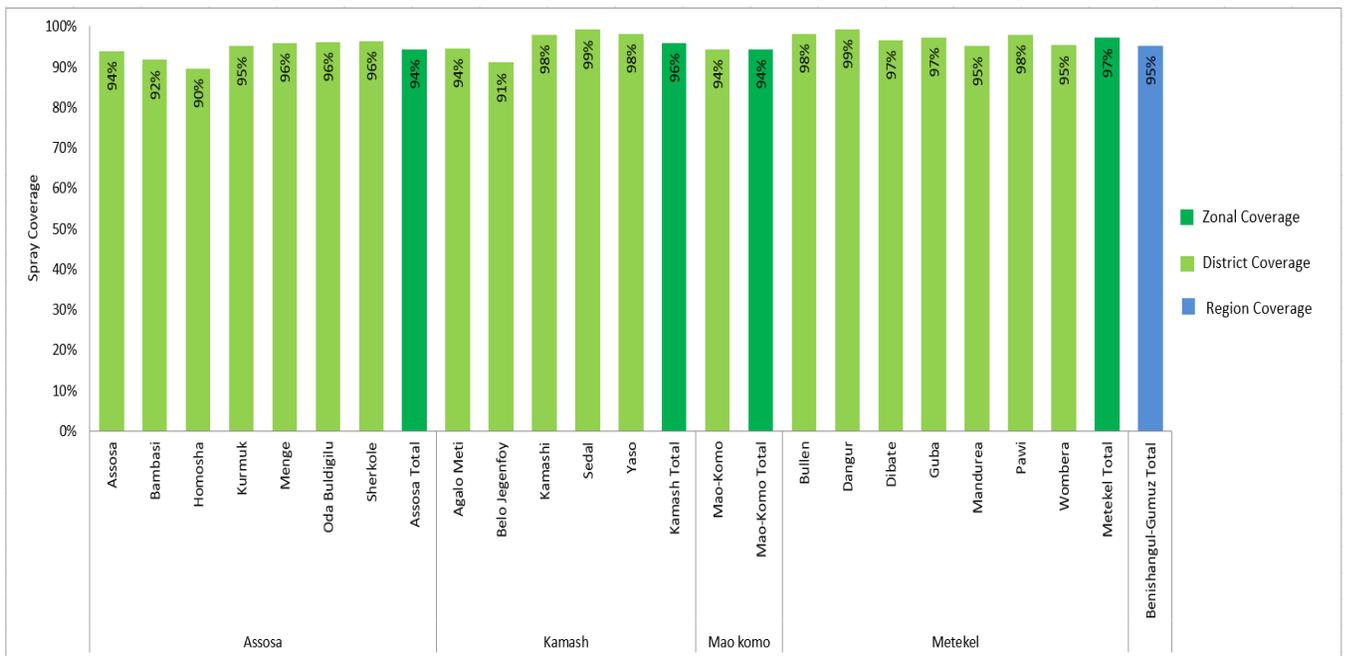


Figure E-5: Spray Progress, Oromia Region

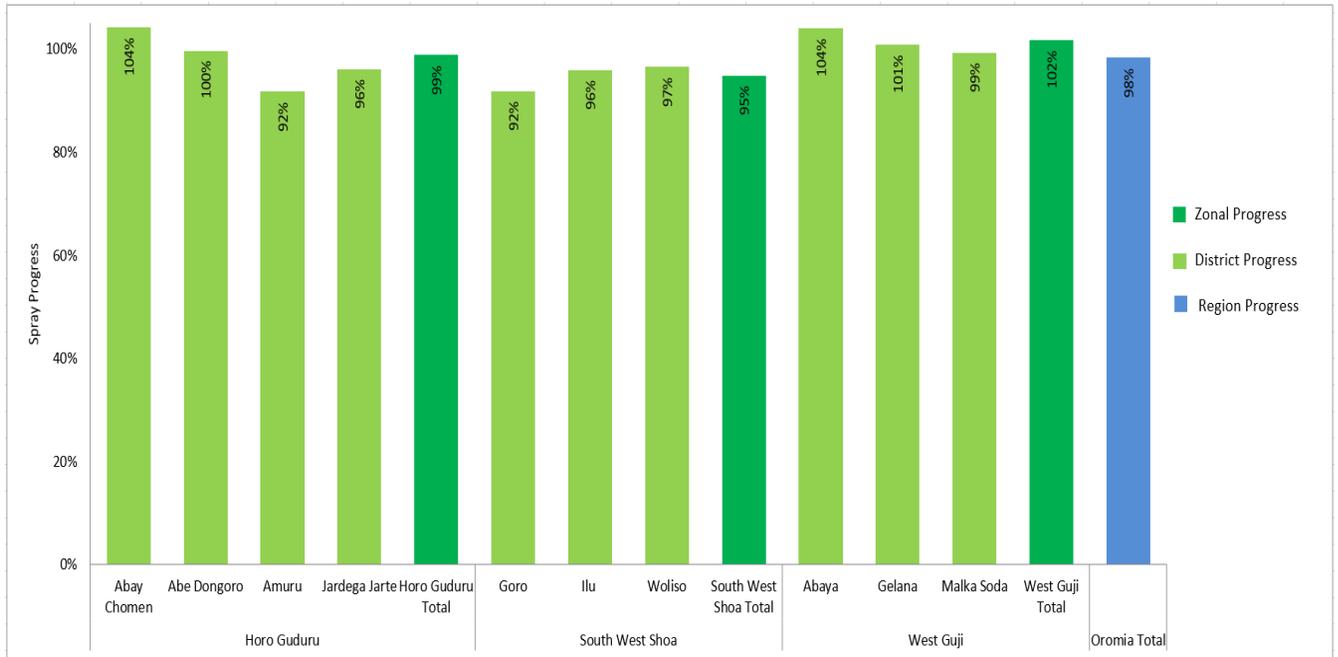


Figure E-6: Spray Coverage, Oromia Region

