



U.S. PRESIDENT'S MALARIA INITIATIVE



THE PMI VECTORLINK MADAGASCAR 2020 END OF SPRAY REPORT (EOSR)

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Abt Associates Inc. | 6130 Executive Boulevard | Rockville, MD 20852
| T. 301.347.5000 | F. 301.913.9061 | www.abtassociates.com

**THE PMI VECTORLINK
MADAGASCAR
2020 END OF SPRAY REPORT (EOSR)**

Table of Contents

1. Acronyms	6
2. Executive Summary	7
3. Country Background & Activity Summary.....	9
4. Implementation of IRS Activities	11
4.1. IRS Planning and Partners' Collaboration.....	11
4.2. Training.....	13
4.3. Spray Operations & Supervision.....	15
4.3.1 Number of People Hired to Support Campaign by Cadre & Sex.....	16
4.3.2 Operations Sites	17
4.3.3 Key Operational Details.....	18
4.4. Insecticide	18
4.5. IEC/SBC Activities & Outcomes.....	19
4.6. National Capacity Building and Collaboration Efforts	21
4.7. Gender Mainstreaming.....	22
5. Entomology	23
5.1. IRS Susceptibility.....	23
5.2. Residual Efficacy	24
6. Environmental Compliance	27
6.1. IRS Campaign Assessments.....	27
6.2. Incident Reports	29
6.3. Demobilization & Waste Management.....	29
7. Monitoring and Evaluation	30
7.1. Data Collection/Entry/Quality Assurance	30
7.2. mHealth.....	31
8. Results.....	33
9. Challenges, Lessons Learned and Key Recommendations	35

List of Tables

Table 1: Summary of the 2020 IRS Campaign Summary Results	8
Table 2: PMI Supported IRS in Madagascar: 2011-2020	9
Table 3: Number of Spray Teams Recruited during the 2020 IRS Campaign.....	13
Table 4: Number of Training Sessions and People Trained, Disaggregated by Job Title, Spray Zone and Gender.....	14
Table 5: Distribution of Seasonal Workers Hired for Each Position by Gender and Spray Zone	16
Table 6: Operational Sites and Communes in Each District.....	17
Table 7: Average Number of Structures Sprayed by Bottle or Sachet of Insecticide, by District, Madagascar IRS campaign, 2020.....	18
Table 8: List of IEC Items Distributed during the 2020 Spray Campaign.....	21
Table 9: Incidents during the 2020 IRS Campaign.....	29
Table 10: List of Waste Generated from the 2019 Spray Campaign.....	29
Table 11: Summary of the 2020 Key IRS Results.....	33
Table 12: 2020 IRS Results by District.....	34
Table 13: Reasons for Non-Spray by District	34

List of Figures

Figure 1: IRS Districts and Entomological Monitoring Sentinel Sites of PMI VectorLink Madagascar	10
Figure 2: IRS Mini Launch Ceremony in Andranohinaly Tuléar II.....	11
Figure 3: Masters Training with Application of COVID-19 Prevention Measures.....	14
Figure 4: 2020 IRS Spray Coverage (Number of Structures Sprayed / Number of Structures Found).....	15
Figure 4A: IRS Coverage for Each District from 2018 to 2020.....	15
Figure 5: 2020 IRS Spray Progress (Number of Structures Sprayed / Number of Structures Targeted)	16
Figure 6: Mobilizer Using a Megaphone to Sensitize the Population of His Fokontany for IRS Acceptance..	20
Figure 7: Results of Insecticide Susceptibility Tests against <i>An. gambiae</i> s.l. using the WHO Tube Test.....	23
Figure 8: Residual Effectiveness Observed for Actellic® 300 CS with Wild Strain of <i>Anopheles gambiae</i> s.l in Bezaha.....	25
Figure 9: Residual Effectiveness Observed for Sumishield® 50 WG with Wild Strain of <i>Anopheles gambiae</i> s.l in Tsaragiso and Kiliarivo	25
Figure 10: Residual Effectiveness Observed for Fludora® Fusion with Wild Strain of <i>Anopheles gambiae</i> s.l in Irina and Ranotsara Nord.....	26
Figure 11: Collection of Larvae in Rice Fields	26
Figure 12: Biological Plantation of Tozzi Green Company.....	27
Figure 13: A Spray Operator Filling Out a Spray Form	30
Figure 14: Team Leader Supervises an SOP Fill out a Spray Form	31

I. ACRONYMS

CDC	Centers for Disease Control and Prevention
DCV	Data Collection Verification
DEC	Data Entry Clerk
ECO	Environmental Compliance Officer
HDPE	High Density PolyEthylene
IEC	Information, Education and Communication
IRS	Indoor Residual Spraying
M&E	Monitoring and Evaluation
MoE	Ministry of Environment
MEP	Monitoring and Evaluation Plan
MSP	Mobile Soak Pit
NMCP	National Malaria Control Program
PMI	U.S. President's Malaria Initiative
PPE	Personal Protective Equipment
SBC	Social Behavior Change
SEA	Supplemental Environmental Assessment
SOP	Spray Operator
TL	Team Leader
TO	Task Order
TOT	Training of Trainers
USAID	United States Agency for International Development
WHO	World Health Organization

2. EXECUTIVE SUMMARY

One key objective of the U.S. President's Malaria Initiative (PMI) VectorLink Project is to limit exposure to malaria vectors and reduce the incidence and prevalence of malaria through indoor residual spraying (IRS). To achieve this objective, PMI VectorLink Madagascar conducted IRS campaigns in the South West (Tulear II, Sakaraha and Betioky Sud) and in Ihorombe (Ihosal and Iakora) regions of Madagascar using three insecticides: organophosphates (Actellic® 300 CS), clothianidin (SumiShield® 50 WG) and clothianidin & deltamethrin combination (Fludora Fusion). The 2020 spray campaign was conducted from November 2 to December 3, 2020, during which 201,013 structures were targeted. This target was reduced from the original target of 203,513 structures, after a field assessment revealed that 2,500 structures were located in environmentally sensitive areas or were inaccessible in the newly added district of Iakora. In total, PMI VectorLink Madagascar found 203,028 eligible structures and sprayed 197,787 structures. This effort resulted in an overall coverage rate of 97.4 percent for all five districts while protecting 833,483 people from the burden of malaria in 2020.

The followings are key highlights of PMI VectorLink Madagascar's spray campaign in 2020:

- A total of 1,114 people were trained, of whom 259 (23.2 percent) were women. Out of the total number of people trained, there were 705 spray operators (SOPs), of whom 83 (11.8 percent) were women.
- A total of 12,096 bottles of Actellic® 300 CS, 14,081 sachets of SumiShield® 50WG, and 12,814 sachets of Fludora Fusion were used (Table 7) in Tulear II, Sakaraha, Betioky Sud, Ihosal and Iakora. The utilization ratios were: 5.6 structures per Actellic bottle in the district of Betioky, 5.2 structures per Sumishield sachet in Tulear II and Sakaraha districts, 4.2 structures per Fludora Fusion sachet in Ihosal, and 5.1 structures per Fludora Fusion sachet in Iakora district.
- During the first week of the campaign, cone bioassays were conducted to assess the quality of the spray. The results indicated 100 percent mortality for all insecticides sprayed (Actellic 300 CS, Sumishield and Fludora Fusion).
- PMI VectorLink Madagascar utilized mobile soak pits (MSPs) in remote areas to reduce the travel time of SOPs and safely dispose of IRS liquid waste from the field. Tyvek suits were used in remote areas as personal protective equipment (PPE).
- The PMI VectorLink Madagascar team implemented two mobile technologies including a mobile performance management tracking (PMT) tool to monitor daily operational results, and an e-Inventory system to monitor the stock of insecticide and spray equipment at all operational sites. PMI VectorLink Madagascar also used the Webex system as a communication tool for daily internal debriefing on IRS progress.
- The VectorLink Madagascar team used the VectorLink Collect database (DHIS2) to closely monitor the spray progress electronically on a daily basis.
- The PMI VectorLink Madagascar team strengthened Information, Education, Communication (IEC) messaging during the campaign in collaboration with the USAID-funded ACCESS project in Betioky, Tulear II and Sakaraha districts.
- The PMI VectorLink Madagascar team organized advocacy meetings in all five districts with traditional leaders and local authorities prior to the spray campaign to minimize refusal rates.
- The VectorLink project worked in very close collaboration with the NMCP/MoH during the planning and implementation of the spray campaign. The NMCP was involved in the training of

seasonal workers at all levels, as well as the supervision activities and debriefing meetings during the campaign.

The Table 1 below summarizes key results obtained during the IRS 2020 campaign.

Table 1: Summary of the 2020 IRS Campaign Summary Results

Insecticide class	Tulear II	Sakaraha	Betioky Sud	Iakora	Ihoso	Total
	Clothianidin (Sumishield 50WG)	Clothianidin (Sumishield 50WG)	Organophosphate (Actellic 300 CS)	Clothianidin & Deltamethrin (Fludora Fusion)	Clothianidin & Deltamethrin Combination (Fludora Fusion); and Clothianidin (Sumishield 50WG)**	
Number of structures targeted by IRS	50,471	25,461	68,231	11,543	45,307	201,013
Number of structures found by IRS teams	50,583	25,905	69,949	11,540	45,051	203,028*
Number of structures sprayed	49,062	25,206	68,155	11,335	44,029	197,787
Spray progress (sprayed/targeted)	97.2%	99.0%	99.9%	98.2%	97.2%	98.4%
Spray coverage (sprayed/found)	97.0%	97.3%	97.4%	98.2%	97.7%	97.4%
Population protected	198,221	101,752	279,157	52,505	201,848	833,483
Pregnant women protected	8,362	4,767	11,998	1,327	6,050	32,504
Children under five protected	33,172	16,248	47,842	8,850	31,919	138,031
Number of people receiving training funded by US Government (USG) to conduct IRS	275	145	365	84	245	1,114

*The spray teams found more structures during the spray campaign compared to the number of structures found during enumeration.

**Only four sachets of Sumishield insecticide were used in Ihoso to spray additional structures towards the end of the campaign due to the high demand of IRS from the population once the Fludora Fusion insecticide was fully used in the district.

3. COUNTRY BACKGROUND & ACTIVITY SUMMARY

PMI has been supporting IRS in Madagascar since 2008 in line with the National Malaria Control Program Strategic Plan. IRS was initially implemented in 55 districts within the Central Highlands (CHL). Table 2 below shows the list of all PMI supported IRS from 2011.

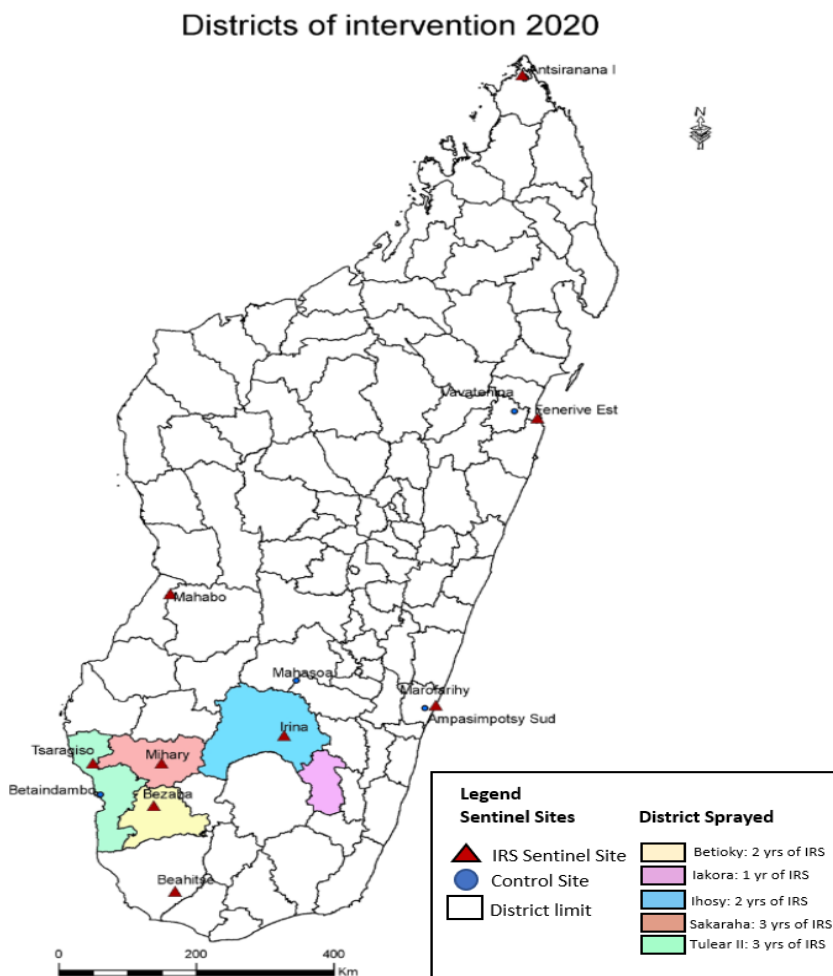
Table 2: PMI Supported IRS in Madagascar: 2011-2020

Year	Geographic Area	IRS Strategy	Insecticide	Number of Structures Sprayed	Population Protected
2011	CHL & Fringe (8 districts)	Blanket	Pyrethroid & Carbamate	222,026	1,324,525
	Southern Madagascar (8 districts)	Blanket	Carbamate	280,671	1,261,147
2012	CHL & Fringe (41 communes)	Focal	Pyrethroid & Carbamate	87,081	522,292
	Southern Madagascar (8 districts)	Blanket	Carbamate	284,310	1,259,698
2013	CHL & Fringe (40 communes in 7 districts)	Focal	Pyrethroid & Carbamate	82,091	481,301
	Southern Madagascar (7 districts)	Blanket	Carbamate	261,379	1,106,837
2014	CHL and Fringe (~40 communes)	Focal	Pyrethroid and Carbamate	125,125	749,965
	East Coast (3 districts)	Blanket	Organophosphate	149,408	557,419
2015	East coast (3 districts) and South East (1 district)	Blanket	Organophosphate	247,902	1,016,841
2016	East Coast (3 districts) and South East (2 districts)	Blanket	Organophosphate	310,426	1,257,036
2017	East Coast (3 districts) and South East (5 districts)	Blanket	Organophosphate	487,636	2,008,963
2018	East Coast (3 districts) and South East (4 districts)	Blanket	Organophosphate	548,775	2,232,097
	South West (2 districts)		Neonicotinoid (SumiShield)		

Year	Geographic Area	IRS Strategy	Insecticide	Number of Structures Sprayed	Population Protected
2019	Ihorombe (1 district)	Blanket	Organophosphate & Clothianidin & Deltametrin (Fludora Fusion)	267,874	1,150,922
	South West (4 districts)		Neonicotinoid (SumiShield) & Organophosphate		
2020	Ihorombe (2 districts)	Blanket	Clothianidin & Deltametrin (Fludora Fusion)	197,787	833,483
	South West (3 districts)		Neonicotinoid (SumiShield), Organophosphate & Clothianidin & Deltametrin combination (Fludora Fusion)		

In 2020, in accordance with the new 2018-2022 National Malaria Control Strategic Plan, PMI VectorLink Madagascar conducted spray operations in three districts (Tulear II, Sakaraha and Betioky) in the South West and in two districts (Ihosa and Iakora) in Ihorombe’s region from November 2, 2020 to December 3, 2020.

Figure 1: IRS Districts and Entomological Monitoring Sentinel Sites of PMI VectorLink Madagascar And Number of Years of IRS



4. IMPLEMENTATION OF IRS ACTIVITIES

The 2020 spray campaign took place in the context of the COVID-19 pandemic. Therefore, to safely implement the campaign, the project developed a COVID-19 mitigation plan, which included preventive measures at all levels of project implementation, control mechanism and management of possible suspected cases of COVID-19 at all the operational sites. Field supervisions enabled the project to ensure the compliance to the various safety and health measures put in place for safe implementation of IRS activities. Please see Annex D for the complete list of recommended measures.

4.1. IRS PLANNING AND PARTNERS' COLLABORATION

The IRS campaign was implemented from November 2 to December 3, 2020 in five districts (Tulear II, Sakaraha, Betioky, Iakora and Ihosy). The 2020 IRS mini-launch ceremony took place in the commune of Andranohinaly in the district of Tulear II on November 5, 2020. The local health and administrative authorities, mobilizers, partners (ACCESS, IMPACT and UNICEF), PMI VectorLink and PMI Madagascar teams also participated in the launch activities.

Figure 2: IRS Mini Launch Ceremony in Andranohinaly Tulear II



Temperature check before the launch ceremony



Authorities observing spraying during launch ceremony



USAID/PMI's speech during launch ceremony



NMCP Coordinator talking to the media during the launch ceremony



Authorities in PPE prior to field visit

The project managed spray operations in 15 operational sites (four in Betioky, four in Ihosy, two in Sakaraha, four in Tular II and one in Iakora). With the support of local authorities, seasonal workers were recruited from the communities benefiting from spraying. At the operational site and commune level, the operational site coordinator and local authorities jointly conducted seasonal staff recruitment under the supervision of the Health Zone Manager/District Coordinator. SOPs worked in all communes according to the spray plans developed before the campaign and adjusted based on the daily risk assessment of the security situation in some of the spray areas (Annex D).

Within each district, the project established operational sites, for a total of 15 operations sites during the 2020 IRS campaign. Each operational site had a warehouse (secondary warehouse) to store spray materials as well as a permanent soak pit to accommodate the spray teams during the end-of-day clean-up. The team set up a total of 81 mobile soak pits (MSPs) for use in remote areas and 33 permanent soak pits.

Each morning, breakfast was served to SOPs and Team Leaders (TLs) before they were deployed to the field to conduct spray operations. Right after the teams were served breakfast, a morning mobilization meeting took place, where the spray teams were brought together for important information-sharing (i.e., performance related aspects, recommendations, etc.).

Vehicles were rented by the project to transport the spray teams to and from the spray sites, operational sites and end-of-day clean-up sites. The team also used vehicles for supervision related purposes and to transport spray equipment and insecticide.

At the end of each day, SOPs handed their completed spray forms to their team leaders, who checked and compiled them before submitting them to their site supervisor. The site supervisor sent spray forms to data entry centers for immediate entry into PMI VectorLink Madagascar’s VectorLink Collect database. Table 3 below shows the number of spray teams recruited during the 2020 IRS campaign.

Table 3: Number of Spray Teams Recruited during the 2020 IRS Campaign

Region	Districts	Operation Sites	Number of Team Leaders	Number of SOPs	Total
South West	Betioky	Betioky	13	65	78
		Bezaha	15	75	90
		Soamanonga	10	50	60
		Tongobory	9	45	54
	Sakaraha	Sakaraha 1	11	55	66
		Sakaraha 2	7	33	40
	Tulear II	Andranohinaly	7	37	44
		Mitsinjo Betamimena	9	45	54
		Ankilimalinike	7	33	40
		Ankiloaka	12	60	72
Ihorombe	Ihosy	Ambatolahy	5	26	31
		Ambia	9	48	57
		Ranohira	7	35	42
		Ankily	9	48	57
	Iakora	Ranotsara Nord	10	50	60
Total			140	705	845

4.2. TRAINING

PMI VectorLink Madagascar organized and hosted training sessions for the seasonal staff. The project designed the training sessions to ensure that all seasonal workers were trained in their roles and had a solid understanding of how to implement all IRS activities. PMI VectorLink Madagascar staff conducted all training sessions in collaboration with the National Malaria Control Program (NMCP) and representatives from the Ministry of Health (MOH) at the national, regional and district levels. The training sessions took place from September 21, 2020 to November 1, 2020. A total of 1,114 people were trained. In addition, the project incorporated gender awareness and sexual harassment training in all the trainings conducted before the campaigns started. Participants learned about the importance of gender equity and equality for the success of the spray campaign, and for women’s empowerment in society. Table 4 below shows the number of training sessions and the number of people trained, disaggregated by spray zone and gender.

Table 4: Number of Training Sessions and People Trained, Disaggregated by Job Title, Spray Zone and Gender.

Training	Date	Iakora		Ihosy		Betioky		Sakaraha		Tulear		TOTAL		
		M	F	M	F	M	F	M	F	M	F	M	F	Total
Masters Training	September 21 to September 26	4	0	6	2	8	1	3	1	4	4	25	8	33
Training of Financial Assistants	September 28 to September 30	0	1	0	1	1	0	0	1	0	1	1	4	5
Training of DECs	October 19-October 21 & October 26-October 28	2	1	4	2	5	1	2	2	4	2	17	8	25
Training of Warehouse Keepers	October 14 to October 18	2	1	3	5	7	5	1	3	5	4	18	18	36
Training of Security Officers	October 31	2	0	2	0	2	0	6	0	2	0	14	0	14
Training of Trainers (TL)	October 19 to October 24	9	1	23	7	30	17	12	6	25	10	99	41	140
Training of SOPs	October 26 to October 31	49	1	154	3	193	42	69	19	152	23	617	88	705
Training of Spray Pump Technicians	October 30 and October 31	5	0	14	0	21	3	6	3	18	0	64	6	70
Training of Washers	October 31	0	6	0	19	0	29	0	11	0	21	0	86	86
Total		73	11	206	39	267	98	99	46	210	65	855	259	1,114
Percentage of Women		23.2%												

*Note that the enumeration activity and the related training took place in March 2020 in the district of Iakora.

Mobilizers received a one-day briefing session on messages and flyers to use with beneficiaries of IRS.

Government Health Workers (medical and paramedical officers) also received a one-day briefing session for insecticide poisoning case management. Additionally, all drivers received a one-day briefing on environmental compliance and safety aspects.

Figure 3: Masters Training with Application of COVID-19 Prevention Measures



Health and Safety of Seasonal Workers and Beneficiaries

Prior to the start of the spray campaign, seasonal workers and district health staff were trained by the VectorLink project on the management of potential health risks of using Fludora® Fusion, Sumishield and Actellic, detailed steps to take in the event of an incident, and proper household preparation. In addition, all seasonal workers went through the general pre-campaign medical checkup, including the female workers who took a pregnancy test (before and mid-campaign).

4.3. SPRAY OPERATIONS & SUPERVISION

Number of Eligible Structures Found and Spray Coverage

SOPs found a total of 203,028 structures (146,437 in the South West and 56,591 in Ihorombe’s Region) and sprayed 197,787 (142,423 in the South West and 55,364 in Ihorombe’s region). In the South West, SOPs sprayed 97.3 percent of all structures identified, and 97.8 percent of all structures in Ihorombe’s region. The overall coverage rate achieved for all five districts was 97.4 percent as indicated in Figure 4 below, as compared to previous years (Figure 4A). The total number of structures found by spray operators exceeded the targeted number of structures due to the fact that there appeared to be an increase in the number of structures found in Betioky, which according to the information the project gathered could be explained by an increase of the population that moved away from areas affected by food security issues. In addition, the IEC mobilization directly conducted by the village leaders led to a higher acceptance rate during this spray campaign. Furthermore, during the spray campaign, village leaders also helped the spray teams access some of the remote areas that were initially marked as inaccessible.

Figure 4: 2020 IRS Spray Coverage (Number of Structures Sprayed / Number of Structures Found)

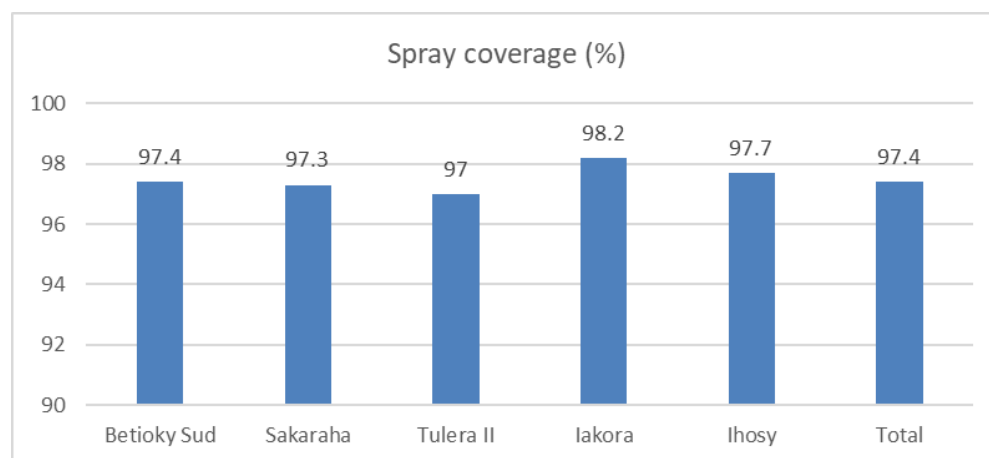


Figure 4A: IRS Coverage for Each District from 2018 to 2020

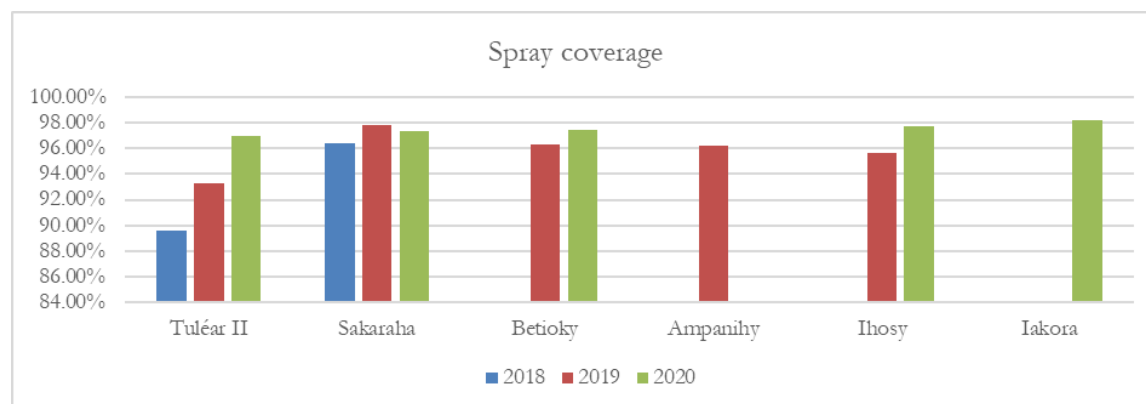
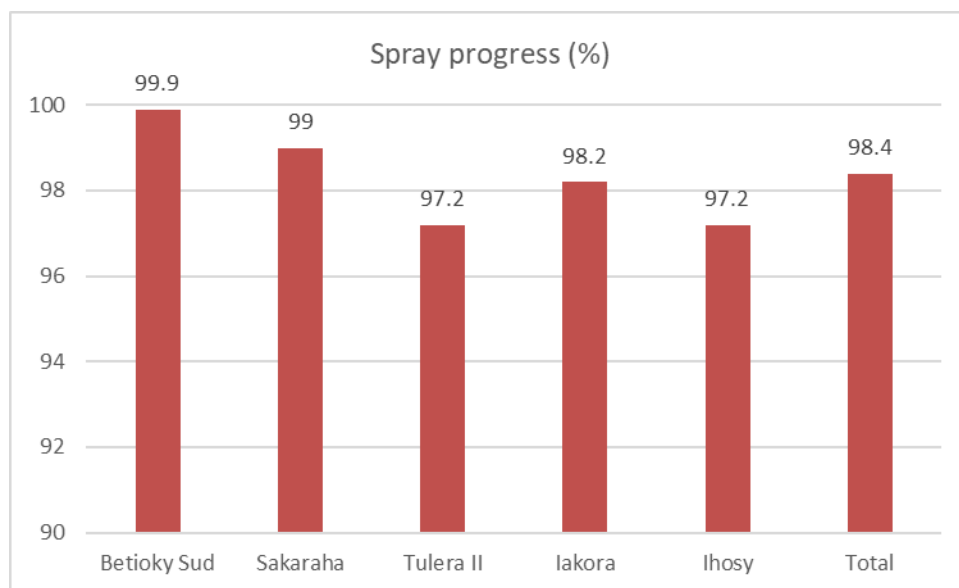


Figure 5: 2020 IRS Spray Progress (Number of Structures Sprayed / Number of Structures Targeted)



4.3.1 NUMBER OF PEOPLE HIRED TO SUPPORT CAMPAIGN BY CADRE & SEX

In collaboration with local government authorities (District Health Director, Mayor and Basic Health Center Chief), PMI VectorLink Madagascar hired 1,239 seasonal workers (859 seasonal workers in the South West, including 649 men and 210 women; 363 seasonal workers in the Ihorombe's region, including 315 men and 48 women, and 17 other seasonal workers at the central level including 12 men and five women) (Table 5).

Table 5: Distribution of Seasonal Workers Hired for Each Position by Gender and Spray Zone

	Central		Iakora		Ihosy		Betioky		Tulear II		Sakaraha		Total		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Total
Operational Site Coordinator (OSC)			2	0	3	1	4	0	3	1	2	0	14	2	16
Operational Site Coordinator Assistant			2	0	4	0	4	1	1	3	1	1	12	5	17
District Finance Assistant			0	1	0	1	1	0	0	1	0	1	1	4	5
Data Entry Clerk			2	1	4	2	5	1	4	2	2	2	17	8	25
Warehouse Keeper			2	1	5	3	7	5	4	5	1	3	19	17	36
Office Guardians			2	0	4	0	4	0	4	0	4	0	18	0	18
Janitors			0	1	0	1	0	1	0	1	0	1	0	5	5
Team Leaders			9	1	23	7	30	17	25	10	12	6	99	41	140
Spray Operators			49	1	155	2	198	37	151	24	69	19	622	83	705
Spray Pump Technician			5	0	14	0	21	3	18	0	6	3	64	6	70
Operational Site Guardians			8	0	16	0	20	0	29	0	12	0	85	0	85
Washers			0	6	0	19	0	29	0	21	0	11	0	86	86
Moto Courier			2	0	4	0	4	0	3	0	0	0	13	0	13

	Central		Iakora		Ihosy		Betioky		Tulear II		Sakaraha		Total		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Total
E-Inventory Data Entry Clerk			0	0	0	0	0	0	0	1	0	0	0	1	1
Health Zone Manager District Coordinator Assistant	5	1	0	0	0	0	0	0	0	0	0	0	5	1	6
M&E Assistant	2	1	0	0	0	0	0	0	0	0	0	0	2	1	3
Central Finance Assistant	1	2	0	0	0	0	0	0	0	0	0	0	1	2	3
Environmental Compliance Officer Assistant	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2
Logistics Assistant	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1
IT Assistant	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1
E-Inventory Developer	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	12	5	83	12	232	36	298	94	242	69	109	47	976	263	1,239

4.3.2 OPERATIONS SITES

Table 6: Operational Sites and Communes in Each District

Districts	Operations Sites (# Communes)	Commune Names	Excluded Environmentally Sensitive Communes*
Ihosy	Ambatolahy (5)	Ambatolahy, Satrokala, Andiolava, Soamatasy, Menamaty Iloto	Antsoha
	Ambia (5)	Ambia, Zazafotsy, Sahambano, Analavoka, Sakalalina	
	Ranohira (3)	Ranohira, Ilakaka, Andohan'Ilakaka	
	Ankily (6)	Ankily, Irina, Analaliry, Tolohomiady, Mahasoia, Ihosy	
Iakora	Ranotsara Nord (4)	Volambita, Ranotsara, Iakora, Andranombao	Begogo
Betioky	Betioky (7)	Betioky, Beantake, Ambatry, Maroarivo, Masiaboay, Ankazomanga Ouest, Antohabato	
	Bezaha (10)	Bezaha, Manalobe, Andranomangatsiaka, Ankilivalo, Fenoandala, Salobe, Belamoty, Tanambao Befamoty, Antsavao (Ambatofotsy), Montifeno	
	Soamanonga (6)	Soamanonga, Soaserana, Marosavao Bas, Lazarivo, Sakamasay, Beora	
	Tongobory (5)	Tongobory, Vatolatsaka, Tameantsoa, Besely, Beavoaha	
Sakaraha	Sakaraha I (5)	Sakaraha, Miary Taheza, Mihavatsy, Ambinany Besakoa, Amboronabo	Mikoboka; Mitsinjo
	Sakaraha II (4)	Miary Lamatihy, Bereketa, Mahaboboka, Andamasiny Vineta,	

Districts	Operations Sites (# Communes)	Commune Names	Excluded Environmentally Sensitive Communes*
Tuléar II	Andranohinaly (5)	Andranohinaly, Andranovory, Ambohimahavelona, Manorofify, Antanimena	Saint Augustin, Maromiandra, Belalanda, Tsifota
	Mitsinjo Betanimena (5)	Miary, Behompy, Mitsinjo Betanimena, Betsinjaka, Ambolofoty	
	Ankilimalinike (4)	Manombo, Marofoty, Tsianisiha, Ankilimalinike	
	Ankililoaka (4)	Ankililoaka, Milenaka, Soahazo, Analamisampy	

* Environmental sensitivity to insecticide

4.3.3 KEY OPERATIONAL DETAILS

This year, the team used a mobile payment system through three Mobile Money Operators (Telma, Orange and Airtel) for the payment of seasonal workers. The mobile payment system has proven to be very cost effective as it allowed the project to make payments remotely in a timely, cost efficient and secure manner. In terms of cost efficiency, the project paid a small transfer fee per transaction and did not have to incur the additional expenses (perdiems, fuel, car rental costs, security forces presence, etc.) associated with in-person payments by the project staff. In very remote areas with no mobile payment options, some of the seasonal workers were paid in cash; this specifically applied to some of the mobilizers.

4.4. INSECTICIDE

The Table 7 below shows insecticide usage by district. At the end of the campaign the project had no stock remaining. As seen in Table 7, one sachet of insecticide sprayed 5.2 structures in Tuléar II and Sakaraha, while spray operators in Betsioky Sud sprayed 5.6 structures per bottle. In Ihosy, one sachet or bottle sprayed 4.2 structures, and in Iakora, one sachet sprayed 5.1 structures. At the end of the spray campaign, the project had no stock of insecticide remaining.

Table 7: Average Number of Structures Sprayed by Bottle or Sachet of Insecticide, by District, Madagascar IRS campaign, 2020

Region	District	No. Structures Sprayed	Insecticide				Average Number of Structures Sprayed per Bottle or Sachet of Insecticide
			Actellic 300CS	SumiShield	Fludora Fusion	Total	
Ihorombe	Ihosy	44,029	0	4*	10,386	10,390	4.2
	Iakora	11,335	0	0	2,206	2,206	5.1
South West	Tuléar II	49,062	0	9,263	161	9,424	5.2
	Sakaraha	25,206	0	4,814	0	4,814	5.2
	Betsioky	68,155	12,096	0	61	12,157	5.6
Total		197,787	12,096	14,081	12,814	38,991	5.1

*The team used four sachets of SumiShield insecticide in Ihosy to spray additional structures due to the high demand of IRS from the population once the Fludora Fusion insecticide was fully used in the district, towards the end of the campaign.

4.5. IEC/SBC ACTIVITIES & OUTCOMES

Mobilization Methodology

PMI VectorLink Madagascar organized awareness raising events with chiefs of fokontany before, during and after the IRS campaign. During the 2020 IRS campaign, mobilizers (Chief of fokontany and one additional person) were recruited within their own fokontany, and were integrated within the spray teams. Each spray team had two mobilizers who accompanied them during the spray days.

The project team worked with media channels to radio broadcast spots and inform communities of the IRS campaign schedule and its benefits for malaria control. Post spray campaign activities included radio broadcasts to continue sensitizing communities on precautions (i.e. not painting walls for six months, not covering the wall with posters, etc.) to take after spraying.

PMI VectorLink Madagascar worked closely with the NMCP to conduct IEC during mobilization activities. IEC messaging, which was developed in close collaboration with NMCP, also included communication on COVID-19 mitigation measures to avoid transmission risks, and potential refusal rates. The project adopted the following working methodologies to conduct mobilization:

- Reviewed key policy documents (National Malaria Control Strategic Plan, PMI Strategy documents on IRS messages, etc.).
- Discussed and planned IEC/social behavior change (SBC) activities in collaboration with the NMCP's SBCC team.
- Conducted advocacy meetings in each district with local and traditional authorities in the region, districts, communes, and fokontany leaders.
- Worked with the ACCESS project in Betioky Sud, Tulear II and Sakaraha districts to hold advocacy meetings and sensitization campaigns in close coordination with community health workers.
- Trained seasonal staff involved in the implementation of SBCC activities (spray team and mobilizers).
- Disseminated IEC materials in the intervention communes and fokontany.
- Conducted mobilization through the chief of fokontany.
- Aired radio messages on all radio stations with a wide geographical coverage in all five targeted districts. Messages included COVID-19 mitigation measures that the spray teams would be implementing to avoid any transmission risks.
- Organized radio broadcasts with the participation of IEC officials from the public health system to strengthen advocacy at all levels.
- Provided supervisory training and ensured supervision of field mobilization teams.

Advocacy and Mobilization

To ensure the involvement of local leaders in the spray campaign and to help the project minimize refusals from beneficiaries, PMI VectorLink Madagascar launched a contest: "The Best District" for the 2020 IRS campaign. Activities included:

- Organizing an advocacy workshop in each district, with targeted and limited participants (a maximum of 15 people) in the project intervention regions and districts. The health, administrative and traditional authorities, and representatives of churches, education, and the Ministry of Population, mass media took part in the workshops. The PMI VectorLink project announced the contest at the district level. The "Best District" represented the one with a minimum coverage rate of 95 percent. Iakora's district won the contest with the highest coverage rate of 98.2 percent, and was provided with a certificate. Ithosy's district came in second position

with a 97.7 percent coverage rate. This contest created competition between the districts, which in turn increased SOP motivation and performance.

- Mobilizers (chief of fokontany and one additional person) who are recruited within their own fokontany informed communities of the arrival of the spray teams.

Figure 6: Mobilizer Using a Megaphone to Sensitize the Population of His Fokontany for IRS Acceptance



- Organized advocacy actions in the communes and fokontany before and during the IRS campaign. The PMI VectorLink project collaborated with a communal committee through courtesy visits, meetings with local authorities, and information sessions at different levels (communes and fokontany) with the involvement of all social actors, to strengthen advocacy and IRS messages and to share information about the spray program. As local leaders, chiefs of fokontany supported the project in setting up banners and posters and carrying out IEC mobilization in their villages and announcing the planning of IRS in close collaboration with the mobilizers. Their positions helped to ensure easy community mobilization and increased IRS acceptance.
- Mobilizers accompanied spray teams to inform communities a few days before the spray in each fokontany. They used megaphones and drums.
- Mobilizers and Chief of fokontany conducted mobilization activities before and during the spray campaign by accompanying SOPs in the villages on the spray day. The team used the following five categories of messages during mobilization activities:
 - Advocacy messages targeting local authorities and leaders to gain their support in advocating for IRS within their communities.
 - Messages to communities about the benefits of IRS.
 - Messages to families on household preparation.
 - Messages to SOPs on approaches they should adopt and precautions they should take during and after spraying.
 - Messages to beneficiaries to not post or wipe or paint treated walls for six months after spraying.

Other activities

The PMI VectorLink project used mass communication (radio, drums, community meetings while respecting safe distancing with small groups of up to 10 people, advocacy meetings, launching ceremony), and distributed 82 banners at district and commune levels, 5,000 informative posters at the fokontany level and 100,000 flyers at the household level during the 2020 spray campaign. The team reviewed all materials jointly

with the NMCP communication staff in order to comply with the Malagasy government’s requirements and strategy.

The project also aired radio messages in local dialects in collaboration with radio stations targeting broad geographic coverage in the project’s intervention regions and districts to strengthen IRS messages and disseminate the spray schedules. The team aired two types of radio spots: a radio spot announcing the arrival of IRS in the district and a radio spot to educate people to not paint or hang posters on the wall for six months after spraying. There were 702 broadcasts announcing the arrival dates of the spray teams, and 279 broadcasts about not painting or hanging posters after completion of the spray, totaling 981 radio broadcasts overall.

On November 5, 2020, PMI VectorLink Madagascar organized a mini-IRS launch ceremony in Tulear district to sensitize the population on IRS, and kick off IRS activities. This event benefited from the participation of the Regional Directorates of Health team, NMCP representatives, South West region’s governor representative, local authorities, mass media, PMI Madagascar team, and the PMI VectorLink team. The event was broadcasted on local and national TV and radios.

Table 8 below shows the list of IEC items distributed during the 2020 spray campaign.

Table 8: List of IEC Items Distributed during the 2020 Spray Campaign

Districts	T-Shirts	Caps	Banners	Posters		Flyers
				Localization	Sensitization	
Betioky	840	840	29	1650	200	20,000
Iakora	179	179	5	200	100	20,000
Ihosy	493	493	19	950	200	20,000
Tulear II	492	492	19	1000	200	20,000
Sakaraha	259	259	10	400	100	20,000
Total	2,263	2,263	82	4,200	800	100,000

4.6. NATIONAL CAPACITY BUILDING AND COLLABORATION EFFORTS

As in previous years, one reason for the success of the 2020 IRS campaign has been the effective collaboration between the NMCP, the Regional Directorates of Health, the District Public Health Services and the PMI VectorLink Madagascar project team.

This collaboration took the form of mutual capacity building throughout the entire 2020 IRS campaign process. The success of the campaign also stems from the effective participation of the local community, represented by the local authorities, traditional leaders and fokontany chiefs.

As part of the capacity building component of the program, the VectorLink team included one national level and two regional level staff from the NMCP in the master training session in Tulear. The NMCP team also participated in the joint planning of the campaign, the various trainings, workshops, or advocacy sessions for a successful IRS campaign. Two entomology Laboratory Technicians were recruited to reinforce the capacity of the NMCP laboratory, especially for molecular analysis and ELISA tests. Furthermore, the project provided NMCP with entomology materials and supplies for capacity building.

During the campaign, a joint team comprised of members from both NMCP and VectorLink was established to monitor IRS activities on a daily basis. At the end of each day, the team organized a "daily debriefing" via WebEx with the supervision team to analyze the results of the day as well as strengths and areas for improvement.

The NMCP has managers working in tandem with PMI VectorLink Madagascar to cover areas ranging from environmental compliance, entomological monitoring, social mobilization, training, logistics management, supervision and coordination of field operations.

4.7. GENDER MAINSTREAMING

During the 2020 campaign, the VectorLink Madagascar project employed 21.2 percent women, with 28.9 percent in supervisory roles. This was slightly lower than in 2019 (35 percent) due to the security challenges and cultural aspects in Ihosy, as well as accessibility in Iakora.

To improve gender mainstreaming, the project sensitized all stakeholders on the importance of recruiting women for IRS campaigns. Recruiters gave priority to women who met all eligibility requirements. As part of the spray campaign requirements, all female workers took a pregnancy test before the start of the campaign. To make women comfortable in their work, the project:

- Ensured every woman received the appropriate size for coveralls and boots.
- Provided disposable and reusable sanitary pads for use while in the field.
- Constructed separate restrooms for male and female workers, properly labeled and well separated for privacy.
- Encouraged women to report any sexual harassment.
- Paid all seasonal workers via mobile money so women could have control of their own funds.

The project incorporated gender awareness and sexual harassment training in all the trainings conducted before the campaigns started. Participants learned about the importance of gender equity and equality for the success of the spray campaign, and for women's empowerment in society.

During the campaign, gender awareness and sexual harassment guidelines were posted at all operations sites. A one-page addendum code of ethics was added to the contracts and was signed by every seasonal worker. No complaints or incidents related to sexual harassment were reported to the project gender focal point person during the spray campaign.

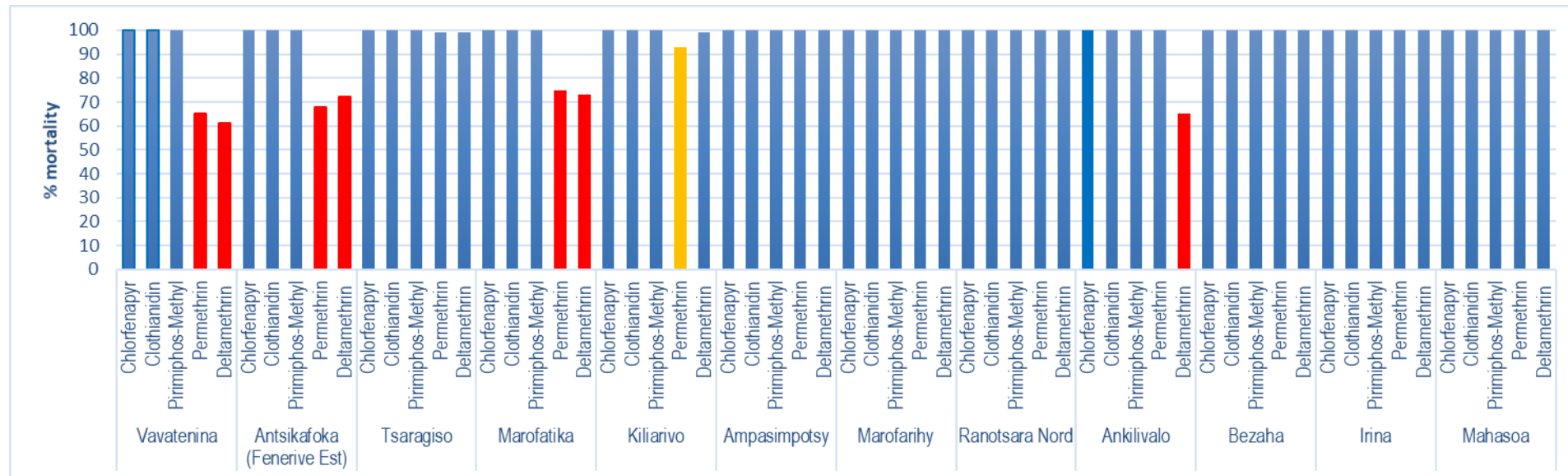
5. ENTOMOLOGY

5.1. IRS SUSCEPTIBILITY

The results of the vector susceptibility tests (Figure 7) indicated full susceptibility of *An. gambiae* s.l. to pirimiphos-methyl, clothianidin and bendiocarb in all areas where the tests were conducted.

Susceptibility to deltamethrin and permethrin was observed in Tsaragiso (Tulear II district), Ampasimpotsy (Manakara district), Marofarihy (Manakara district), Ranotsara Nord (Iakora district), Bezaha (Betioky district), Irina (Ihosy district) and Mahasoa (Ambalavao district). The test results also showed that *An. gambiae* s.l. is resistant to deltamethrin and/or permethrin in Vavatenina, Antsikafoka (Fenerive Est district), Marofatika (Tulear II district) and Ankilivalo (Mahabo district). Resistance was suspected for permethrin in Kiliarivo (Sakaraha district).

Figure 7: Results of Insecticide Susceptibility Tests against *An. gambiae* s.l. using the WHO Tube Test



5.2. RESIDUAL EFFICACY

IRS quality assurance and decay rate were monitored in selected sites in all five districts: Irina (Ihosy district), Kiliarivo (Sakaraha district), Tsaragiso (Tulear II district), Besakoa/Bezaha (Betioky district) and Ranotsara Nord (Iakora district). Fumigant bioassays were also carried out in each tested house at all the monitoring sites, to determine the airborne effects of all insecticides used for IRS as recommended by PMI.

Monthly cone bioassay tests were conducted, using the World Health Organization (WHO) procedure to assess the residual effectiveness of insecticides sprayed during the 2020 IRS campaign. Since the transport of larvae or adult insecticide susceptible mosquitoes (Kisumu strain) is challenging, all cone bioassay tests were performed with wild adult of *Anopheles gambiae* s.l susceptible to the insecticide (pirimiphos-methyl, clothianidin, deltamethrin), reared from local field-collected larvae and pupae. The mosquitoes were exposed to the sprayed surfaces with all three insecticides (Fludora Fusion, Actellic 300CS, SumiShield 50WG and Fludora Fusion) for 30 minutes and the "knock-down" rate was recorded at 30 minutes and 60 minutes post exposure. The vector mortality was observed after a 24-hour recovery period for pirimiphos-methyl; delayed mortality of SumiShield® 50 WG and Fludora Fusion was supposed to be recorded for five days. However, in most cases, 100 percent mortality was achieved within a 48-hour holding period, within one week and one month after spray. When control mortality was between five percent and 20 percent, test mortality was corrected using Abbott's formula. The residual life of pirimiphos-methyl (Actellic 300CS®) was tested in the sentinel sites of Bezaha. SumiShield® 50 WG® was tested in Tsaragiso and Kiliarivo, and Fludora® Fusion in Irina and Ranotsara Nord.

In the IRS districts where these sentinel sites are located (South West: Bezaha, Tsaragiso and Kiliarivo; and Ihorombe regions: Irina and Ranotsara Nord), most of the structures are made of mud or concrete brick; however, tests were also performed on the wooden doors of each house tested to assess the efficacy of the insecticide on wood. In each site, four houses with mud surfaces and four wood surfaces (doors) sprayed with insecticides were randomly sampled and used for the test. During the first week of IRS campaigns, PMI VectorLink Madagascar conducted cone bioassay tests to assess whether the quality of the spray was satisfactory. The results indicated that the spray quality was good with mortality being 100 percent for all the structures sampled. One month after spraying (T1- December 2020), pirimiphos-methyl (Actellic® 300 CS), clothianidin (SumiShield® 50 WG®) and Fludora Fusion showed 100 percent mortality on all wall types (mud and wood) (Figure 8). The residual efficacy of each insecticide will be monitored until the mortality drops below 80 percent for two consecutive months.

The results for fumigant effect of pirimiphos-methyl 300 CS showed 93 percent mortality of the mosquitoes tested in Bezaha at T0, and 50 percent one month after (T1). For Sumishield® 50 WG and Fludora Fusion, the results showed 0 percent mortality at day 2 in Tsaragiso, Kiliarivo, Irina and Ranotsara Nord at T0 and T1. Pirimiphos-methyl started losing its efficacy one month after spray, while it occurred within one week (T0) of spray for SumiShield and Fludora Fusion.

Figure 8: Residual Effectiveness Observed for Actellic® 300 CS with Wild Strain of *Anopheles gambiae* s.l in Bezaha

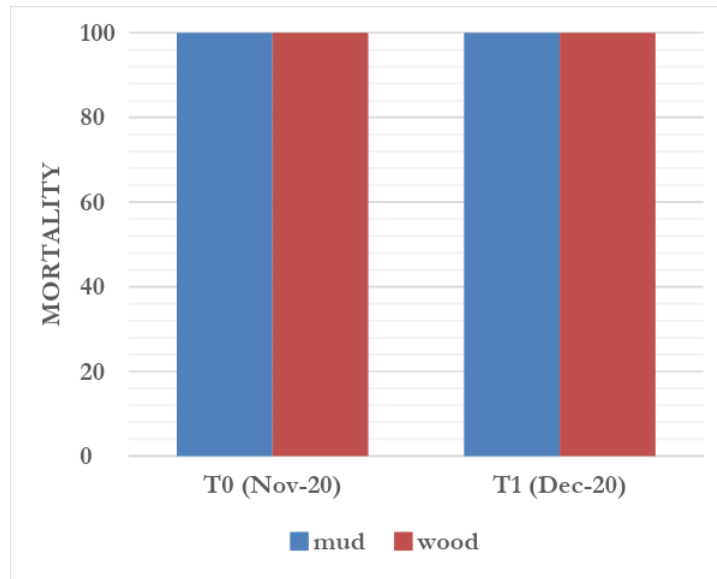


Figure 9: Residual Effectiveness Observed for Sumishield® 50 WG with Wild Strain of *Anopheles gambiae* s.l in Tsaragiso and Kiliarivo

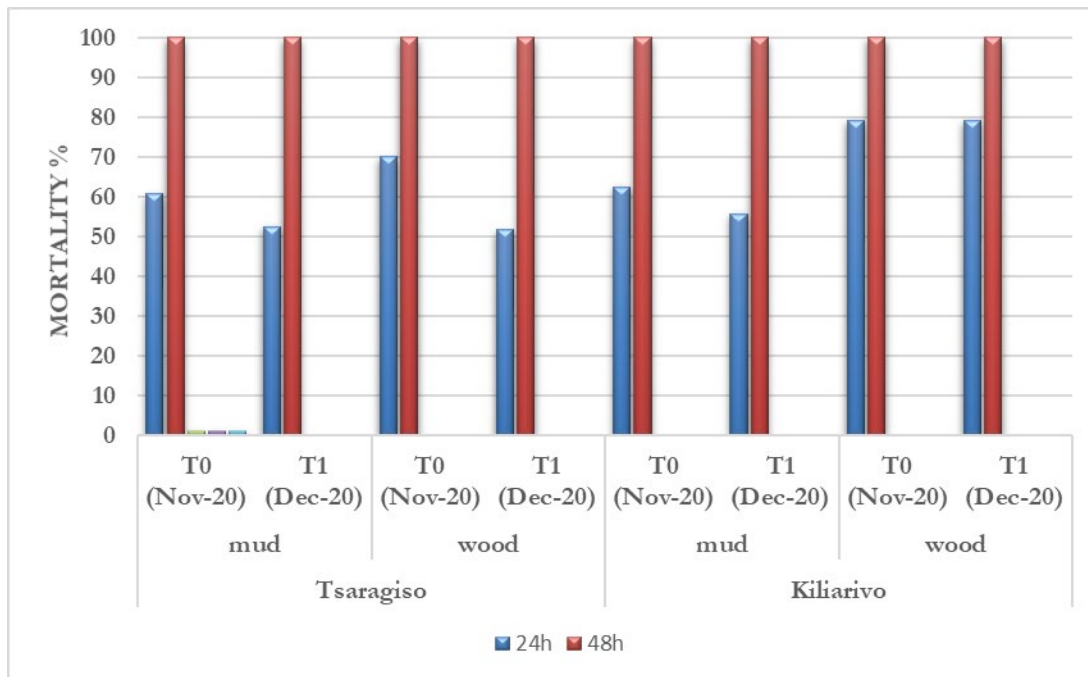


Figure 10: Residual Effectiveness Observed for Fludora® Fusion with Wild Strain of *Anopheles gambiae* s.l in Irina and Ranotsara Nord

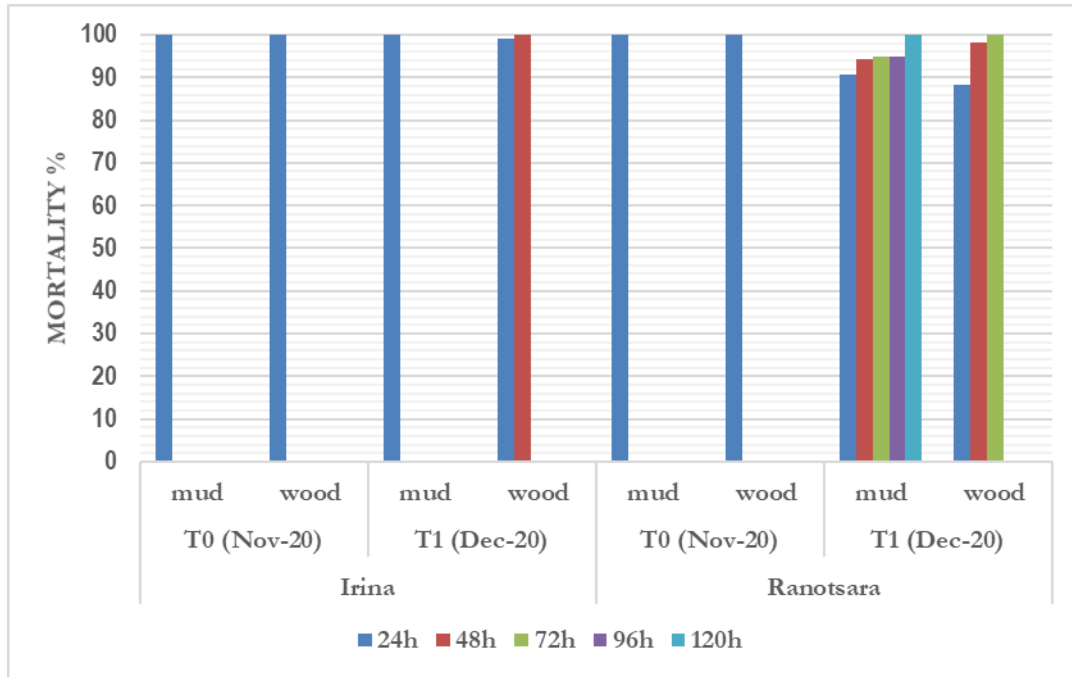


Figure 11: Collection of Larvae in Rice Fields



6. ENVIRONMENTAL COMPLIANCE

6.1. IRS CAMPAIGN ASSESSMENTS

Environmental Compliance

The PMI VectorLink Madagascar project operated under a supplemental environmental assessment (SEA) approved by USAID in 2019, and authorizes the use of pyrethroids, organophosphates, carbamates, neonicotinoids, pyrrole (chlorfenapyr) (when listed by WHO PQ) and clothianidin and deltamethrin combination.

Challenges and Considerations

In 2020, the project intervened in three districts in the South West Region (Betioky, Tulear II and Sakaraha) and in two districts in the Ihorombe Region (Ihosaloina and Iakora). As this was the first campaign in Iakora, PMI VectorLink Madagascar's Environmental Compliance Officer (ECO) conducted a geographical reconnaissance in Iakora to identify the proper sites of storerooms, the safest method of SOP transportation with insecticide, and environmental measures required to safeguard communities during the spray.

The geographical reconnaissance uncovered a protected area in the Begogo commune in the district of Iakora. In addition, the commune was only accessible through several river crossings. Therefore, the decision was made to exclude the Begogo commune from the spray areas.

In Ihosaloina district, the Tozzi Green Company continues to expand its plantation of organic farming (Eucalyptus and Geranium). The evolution of insecurity in the commune of Menamaty Iloto also stimulated the team to conduct a feasibility assessment there.

These environmental compliance activities required strict compliance with Best Management Practices (BMPs) for sensitive areas. The team took specific measures to avoid all contamination when spraying the following areas:

- Structures within 500 meters of protected areas were not sprayed.
- Minimum distance of 3 km observed between the structure and the organic farming.
- Close supervision in these areas was conducted during spraying.
- Information meetings were held with the district representative of the Ministry of Agriculture and Livestock to communicate the nature of the spray and the implications on their activities.
- In addition to the measures taken for sensitive areas, the team communicated information and guidelines on spraying methods regarding sensitive areas to the project and spray teams.

Figure 12: Biological Plantation of Tozzi Green Company



Pre-Season Environmental Compliance Assessments

The PMI VectorLink Madagascar team conducted a pre-season environmental assessment (PSECA) in all districts prior to the spray campaigns, using smartphones with PMI standard environmental compliance checklists. The checklist contained questions to ensure that operational sites, with special emphasis on soak pits and warehouses, were properly set up before spraying. They also guided PMI VectorLink Madagascar's staff to ensure that all PPE and insecticides were delivered and safely stored in warehouses and that seasonal staff working in the warehouses or with soak pits had received appropriate training. The team also used smartphones to collect data on the geographical information of each operational site visited in the geographic information system and to take photos of soak pits and warehouses to show what repairs were needed, or if the site was ready. All necessary repairs were made to soak pits prior to the launch of the spray campaign based on the outcome of the inspections.

PMI VectorLink Madagascar translated all documents (i.e. Material Safety Data Sheet, guide to first aid, recommendations in case of spillage, warning signs) into Malagasy. In addition, before the campaign, all seasonal staff underwent medical checkups, as well as pregnancy tests for women.

Environmental Compliance Activities during the Campaign

PMI VectorLink Madagascar's staff conducted inspections to ensure that spray operations met environmental compliance standards as specified in the BMPs. These inspections included monitoring the use of PPE, progressive rinsing of spray pumps, vehicles used to transport spray teams and insecticides, storage conditions of PPE and insecticides as well as warehouses displaying warning signs. The staff also closely monitored the proper management and storage of IRS waste, accuracy of the stock cards at the warehouses level and use of proper spray techniques by SOPs. In addition, the staff checked that beneficiaries had received clear information about the IRS campaign and knew how to prepare their structures for spraying. PMI VectorLink Madagascar monitored the condition of fixed and mobile soak pits on a regular basis to ensure proper flow and drainage.

PMI VectorLink Madagascar equipped the SOPs with wipes to clean their visors throughout the day as needed. SOPs were satisfied with the wipes as they improved their visibility. New visors were provided as replacement whenever necessary. Team leaders collected the contaminated wipes at the end of the day and classified them as waste to be treated.

Mobile Soak Pit (MSP)

In some of the operational sites, PMI VectorLink Madagascar used mobile soak pits to accommodate spray teams that could not rely on the existing permanent soak pits.

Post-Spray Environmental Compliance Activities

Post-spray environmental inspections took place from December 03 to December 16, 2020. The main objective of the inspections was to ensure that all soak pits and warehouses had been properly decontaminated and closed out. All the warehouses were emptied of materials and equipment used during the spray campaign. After these items and the insecticide had been removed, warehouses were decontaminated with water mixed with bleach and soap. The decontamination process was performed before handing the premises back to the owners. All soak pits were covered with a concrete lid to prevent people from accessing materials and from interfering with the insecticide-waste degradation process.

At the end of the campaign, the team returned all mobile soak pit materials to the warehouse. Undamaged containers, buckets, and sponges were decontaminated and stored for reuse. Damaged materials were classified as IRS waste (see below). The PMI VectorLink Madagascar Environmental Compliance Officer supervised decontamination activities.

6.2. INCIDENT REPORTS

Despite the fact that all the necessary trainings were given and precautions were taken, the project experienced some incidents, which were managed in a timely manner. The table below summarizes the incidents that were communicated to PMI within 48 hours of the incident:

Table 9: Incidents during the 2020 IRS Campaign

	Incidents	Location	Date
1.	Incident involving a team leader bitten by a dog in the field	Tular District	November 09, 2020
2.	Incident involving a spray technician who had experienced some blisters on his hands (unrelated to insecticide)	Ihosy District	November 18, 2020

6.3. DEMOBILIZATION & WASTE MANAGEMENT

Table 10 below shows the list of waste generated from the 2020 IRS campaign.

Table 10: List of Waste Generated from the 2020 Spray Campaign

Designation	Type	Disposal Method	Estimation date of transfer to disposal site
Empty bottles	HDPE	Recycle	March 2021
Plastic materials	Plastic	Recycle	March 2021
Sponges	Sponge	Recycle	March 2021
Empty boxes	Paper	Incineration	March 2021
Cotton materials	Cotton	Incineration	March 2021
Empty sachets	Paper	Incineration	March 2021
Others (garbage bag, absorbent paper)		Incineration	March 2021

Adonis, a local firm, will recycle the used empty bottles of Actellic® 300CS and incinerate empty sachets of SumiShield® 50 WG and Fludora Fusion®. Adonis has the capability and the Ministry of Environment and Sustainable Development's authorization to do so. Adonis will also incinerate or recycle other materials (plastics, metal, etc.) and relevant equipment out of use.

Gloves and boots used during the spray campaign contain greater than one percent chlorine. If incinerated, they can create dangerous persistent organic pollutants (POPs). After decontamination (washing them with soap and water), the project team will dispose of such materials, that are deemed no longer suitable for IRS campaigns, by donating them.

7. MONITORING AND EVALUATION

7.1. DATA COLLECTION/ENTRY/QUALITY ASSURANCE

Data collection

Data collection followed the protocols described in the 2020 work plan. The data collection forms were developed to ensure the collection of all PMI-requested indicators. Before the beginning of each spray campaign, the project trained those involved in data collection on the data collection process and in completing all appropriate forms. Spray data were collected by SOPs. Data collection forms went through several checks (i.e., by the team leader, operational site coordinators) before being entered into the database.

Figure 13: A Spray Operator Filling Out a Spray Form



VectorLink Collect database

PMI VectorLink Madagascar used the VectorLink Collect database for spray data entry, cleaning, and reporting. The database had multiple advantages, including the ability to have real time view of data entry progress, development of powerful dashboards, and pivot tables to track performance and remote interaction with the system from any location. The project granted access to the VectorLink Collect database to relevant parties within the NMCP and PMI Mission office.

Before the start of the campaign, the M&E and operations teams worked together to gather the needed metadata that would enable the roll out of the database (i.e., geographical information to fokontany level, personnel codes which uniquely identify the seasonal staff in the program, and spray targets to sub-location level). These were then set up into the system prior to the start of the campaign to enable entry and reporting.

The PMI VectorLink Madagascar project employed a total of 25 data entry clerks (DECs), including: three in Iakora, six in Ihosy, six in Betioky, six in Tuléar II and four in Sakaraha. Each district had its own data entry

center. Each DEC entered the data from the forms into the project's VectorLink Collect database. DECs entered spray data first by the summarized totals per SOP form, for quick insight into the spray campaign. Then, DECs entered the "details" line by line to ensure accuracy of the data entered. The DECs completed data cleaning within two weeks after the end of the campaign.

Data quality assurance and verification

Field monitoring/supervision was reinforced by the VectorLink Madagascar team during the 2020 spray campaign in the absence of field data collection verification (DCVs) due to COVID-19. Data quality assurance was carried out daily during the IRS campaign by a variety of VectorLink staff. All the IRS forms were verified by team leaders and operations site coordinator assistants.

Figure 14: Team Leader Supervises an SOP Fill out a Spray Form



7.2. MHEALTH

Commcare Applications

In 2020, the project continued to employ the use of m-Health applications to support quick decision making across different components of the program, and to complement the CommCare tools used across the project. The complementary m-Health tools were designed in Open Data Kit (ODK), which is open source.

Supervision Forms

Digitized checklists were designed and used for supervision across the program. These included (a) morning mobilization and transport vehicle inspections to assess compliance before teams depart for fieldwork in the morning; (b) homeowner preparation and SOP performance to assess the passing of key messages and observe spraying at the structure level; (c) storekeeper performance checks to ensure compliance with storage requirements and record keeping at the stores; and (d) the end of day clean-up inspections were to check compliance at the wash area.

All project supervisors at different levels were issued smartphones to support supervision. For any gaps noted during supervision, the digitalized checklists would generate daily alerts (red flags) to all supervisors and decision makers who would then take the necessary action. During the first few days of the campaign, it was noted that some supervisors were not carefully reading the questions in the checklists before responding. This resulted in a number of false red flags. On-the-job training and immediate feedback was provided to supervisors directly, via WhatsApp fora, morning mobilization meetings, and during the daily debrief meetings.

Performance Management Tracker (PMT)

Daily submission of key operations data via PMT SMS provided key indicators on campaign progress and performance through automated email reports. Each site supervisor received a mobile phone to submit the daily reports to CommCare HQ via Telerivet. After data verification with the SOPs and TLs, the site supervisor submitted the data as summarized on the TL forms to the CommCare HQ platform. The same data was updated on the performance tracking sheet posted at every site. The key indicators reported in this system included: the number of SOPs that worked for the day, number of structures found, number of structures sprayed, and the number of insecticide bottles/sachets used during the campaign.

Job aid messages

The M&E manager and the technical team designed messages sent as alerts to the different cadres of seasonal staff. These messages sent out via SMS (through the Dimagi platform) spanned different aspects of the project, including IEC/BCC, operations, M&E, environmental compliance, and gender. The main objective was to reinforce and enhance compliance during the campaign. Messages were sent out in Malagasy language.

Other complementary m-health applications

E-inventory tracker: Storekeepers submitted a daily SMS (through Viamo) with the required store indicators. The Logistic Coordinator aggregated these data in an e-inventory database and used that information to make prompt decisions on replenishment. For each store, storekeepers tracked insecticide distribution and usage by reporting on bottles issued to SOPs and bottles returned at the end of the day (returned and emptied).

8. RESULTS

Key Spray Results

The M&E plan tracks performance and progress across the different components of the project on the following key objectives: implementation of vector control interventions, entomological and epidemiological data to drive decision-making, support the delivery and storage of IRS and other vector control products, and innovation. The M&E plan (Annex A) indicator matrix shows how PMI VectorLink Madagascar has performed against these indicators.

To monitor performance during the campaign, the key indicators tracked throughout the campaign included structures targeted, structures found, and the proportion of structures sprayed out of those targeted (spray progress) and those found (spray coverage). During spraying, the project collected population details to establish the populations protected. This included the total population disaggregated by gender and special groups, such as pregnant women and children under five. Table 11 provides a summary of key results.

Table 11: Summary of the 2020 Key IRS Results

Region	District	# Structures targeted	Spray- Structures found	Spray- Structures sprayed	Spray progression	Spray coverage	Population Protected	Spray- Pregnant women protected	Spray- Children <5 years old protected	Population not protected	Pregnant women not protected	Children under 5 years old not protected
SOUTH WEST	Betioky Sud	68,231	69,949	68,155	99.9%	97.4%	279,157	11,998	47,842	6,597	299	1,054
	Sakaraha	25,461	25,905	25,206	99.0%	97.3%	101,752	4,767	16,248	2,648	89	388
	Tulear II	50,471	50,583	49,062	97.2%	97.0%	198,221	8,362	33,172	5,603	225	823
SOUTH WEST TOTAL		144,163	146,437	142,423	98.8%	97.3%	579,130	25,127	97,262	14,848	613	2,265
IHOROMBE	Iakora	11,543	11,540	11,335	98.2%	98.2%	52,505	1,327	8,850	945	25	166
	Ihosy	45,307	45,051	44,029	97.2%	97.7%	201,848	6,050	31,919	4,138	103	659
IHOROMBE TOTAL		56,850	56,591	55,364	97.4%	97.8%	254,353	7,377	40,769	5,083	128	825
TOTAL IRS 2020		201,013	203,028	197,787	98.4%	97.4%	833,483	32,504	138,031	19,931	741	3,090

Insecticide Usage and SOP Performance

SOPs were given a daily target of 12 structures per day at the start of the campaign. Spray operations started in remote areas, progressively moving inwards towards the more centrally located operations sites in the field. The project used a total of 38,991 insecticide bottles/sachets to spray 197,787 structures (Table 12).

Table 12: 2020 IRS Results by District

District	Structures Sprayed	Spray Coverage	Number of Insecticide Bottles/Sachets Used	Average Number of Structures per Bottle	Average Number of Structures Sprayed per SOP per day
Betioky Sud	68,155	97.4%	12,157	5.6	12.9
Sakaraha	25,206	97.3%	4,814	5.2	13.2
Tulear II	49,062	97.0%	9,424	5.2	12.7
Iakora	11,335	98.2%	2,206	5.1	11.0
Ihosy	44,029	97.7%	10,390	4.2	12.5
Total	197,787	97.4%	38,991	5.1	12.3

At the end of the spray campaign, the project had zero sachet/bottle of insecticide left.

Reasons for non-spray

During the 2020 IRS campaign, VectorLink Madagascar did not spray 5,241 found structures (2.6 percent of all targeted and found structures, compared to 4.2 percent in 2019). The key reasons for non-sprayed structures was locked structures (no occupants home at the time of spray: 0.9 percent, 1,873 structures) followed closely by refusal (0.7 percent, 1,438 structures).

Table 13 below gives the breakdown for the reasons for non-sprayed structures by district.

Table 13: Reasons for Non-Spray by District

Reasons for Non-Spray	Betioky Sud	Sakaraha	Toliara II	Iakora	Ihosy	Total
Locked structures	536 (30%)	282 (40.4%)	549 (36.1%)	56 (27.4%)	450 (44.2%)	1,873 (35.8%)
Refusal	430 (24.1%)	214 (30.7%)	483 (31.8%)	46 (22.5%)	265 (26.0%)	1,438 (27.5%)
Sick	304 (17.1%)	142 (20.4%)	273 (18.0%)	38 (18.6%)	113 (11.1%)	870 (16.7%)
Family/local event	39 (2.2%)	8 (1.2%)	38 (2.5%)	9 (4.4%)	33 (3.3%)	127 (2.5%)
Insecticide smell	365 (20.5%)	22 (3.2%)	59 (3.9%)	7 (3.5%)	87 (8.6%)	540 (10.4%)
Others	113 (6.4%)	31 (4.5%)	128 (7.9%)	49 (24.0%)	72 (7.1%)	393 (7.4%)
Total	1,787	699	1,530	205	1,020	5,241

9. CHALLENGES, LESSONS LEARNED AND KEY RECOMMENDATIONS

While the spray campaign was successfully implemented, the team faced some challenges in the field, including:

- Fuel shortage: difficulty in getting fuel at the district level in Betioky and Iakora was a major challenge for the team to conduct IRS activities. The team had to either travel long distances to other districts for fuel or purchase fuel in bulk in Ihosy to avoid stock out during spray operations.
- Lack and quality of water: the project experienced a major lack of water at the district level, mainly in Sakaraha, Iakora, Ihosy and Tulear. Therefore, the spray teams had to carry water with them in the spray vehicles as water was not always available for insecticide mixing at the household level. In addition, the quality of the water was not good, which caused the pumps to be clogged often with debris found in the water.
- The operations sites selections this year was relatively easy considering the fact the team kept the same operations sites as in 2019. Only one new operations site in Iakora, along with two secondary warehouses were added due to difficult geographical access.

Recommendations

- During this year's spray campaign, the team used the approach of recruiting mobilizers (the Chief fokontany and one additional person) within their own fokontany, and embedding them into the spray teams, which contributed to a reduction in refusal rates. The project will continue with this approach for future campaigns.
- In addition, the diversification of multiple mobile payment providers allowed the project to continue to efficiently pay all seasonal workers no matter where they were based; thus, this approach will be adopted again for future campaigns. The payment of seasonal workers via mobile payment at the community level was generally successful. Having a SIM card was a recruitment pre-requisite for seasonal workers.
- Continue to reinforce the use of DHIS2 for the data entry clerks since this was highly efficient and effective in monitoring spray progress and coverage in near real-time.
- Continue to assess the availability of fuel and water shortages at the district level to ensure proper planning (bulk purchase of fuel, storage of clean water, etc.) prior to the start of the spray campaign.

ANNEX A: MONITORING & EVALUATION (M&E) PLAN

#	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	578,563	586,768	275,470	265,033	203,513	201,013				
1.1.3	Number of eligible structures sprayed with IRS ¹		Project records Annually	Country	491,778	548,789	234,150	267,874	172,986	197,787				
1.1.4	Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)		Project records Annually	Country	85%	93.5%	85%	95.8%	85%	97.4%				
1.1.5	Number of people protected by IRS		Project records Annually	Country Sex Pregnant women Children <5	2,213,003	2,232,097 M: 1,113,088 F: 1,119,009 Pregnant Women: 85,821 Children <5: 328,092	1,343,431	1,150,926 M: 587,766 F: 563,160 Pregnant Women: 53,287 Children<5: 204,833	833,390	833,483 M:424,741 F:408,742 Pregnant Women: 32,504 Children<5:13 8,031				
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	X	Data Collection Forms	Country										

¹ Target based on 85% of estimated eligible structures in indicator 1.1.2

#	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						
	Post-Spray Data Quality Audit within 90 days of spray completion		Annually																	
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																
1.1.10	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	3,360	2,511 M: 1,953 (77.8%) F: 558 (22.2%) VC Intervention: IRS	1,295	1,663 M: 1,232 (74.1%) F: 431 (25.9%) VC Intervention: IRS	1,827 M: 1,188 (65%) F: 639 (35%) VC Intervention: IRS	1,114 M:855 (76.8) F:259 (23.2 %) VC Intervention: IRS										
1.2.2	Total number of people trained to support VC in target areas with USG funds ²		Project Training Records Annually	Country VC Intervention Sex Job Function	3,360	2,511 M: 1,953 (77.8%) F: 558 (22.2%) VC Intervention: IRS		1,063 M: 916 (86.2%) F: 147 (13.8%) VC Intervention: IRS	1,827 M:811 (85.5%) F:137 (14.5%) VC Intervention: IRS	948 M:811 (85.5%) F:137 (14.5%) Operational Site Coordinator and Operational Site Coordinator Assistant (33),										

² For IRS programs, this includes spray operators, team leaders, and supervisors.

#	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
										Team Leaders (140), Spray Operators (705), Pump Technician (70),				
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	260	187 M: 121 (64.7%) F: 66 (35.3%) TOT	40	233 M: 170 (73.0%) F: 63 (27.0%) Masters Training, Training of Trainers	27	173 M:125 (72.3%) F:48 (27.7%) Masters Training, Training of Trainers				
1.2.4	Total number of people hired to support VC in target areas.		Project Records Annually	Country VC Intervention Sex Job Function	3,360	7,642 M: 5,267 (68.9%) F: 2,375 (31.1%) Enumerators/ Supervisors (718) Central Operations Assistant (4) Central Logistics Assistant (2) Central ITC Assistant (1) Central Financial Assistants (3) District Financial Assistants (10) E-Inventory Developer Assistant (1) Environmental Compliance Assistant (3) Central M&E Assistant (1)	2,468	2,818 M: 1,831 (65.0%) 987 (35.0%)	1,976	1,239 M: 976 (78.8%) F:263 (21.2%) Operational Site Coordinator and Operational Site Coordinator Assistant (33), District Finance and Administrative Assistant (5), Data Entry clerk (25), Warehouse keeper (36), Office Guardians (18),				

#	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
					M&E Assistant (9) District Coordinator Assistant (10) District IEC Assistant (9) Data Entry Clerks (DECs) (67) Sector Manager (187) District Warehouse Keeper (10) Commune Warehouse Keeper (187) Guardians (362) Team Leaders (390) Spray Operators (1934) e-Inventory data entry clerks (3) Moto courier (66) Washers (236) Mobilizers (3116) Porters (313) VC Intervention Type: IRS			VC Intervention IRS	Janitors (5), Team Leaders (140), Spray Operators (705), Pump Technician (70), Operational Site Guardians (85), Washers (86), Moto Courier (13), E-Inventory Data Entry Clerk (1), Health Zone Manager Assistant / District Coordinator Assistant (6), M&E Assistant (3), Central Finance and Administrative Assistant (3), Environmental Compliance Officer Assistant (2), Logistic Assistant (1), IT Assistant (1), E-Inventory Developer (1) VC Intervention: IRS					
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	N/A	N/A	N/A	N/A	2	1				

#	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
1.2.6	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	1	1	1	1				
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	3,372	3,342 M: 2,425 (72.6%) F: 917 (27.4%) Central Operations Assistant (4) Central Logistics Assistant (2) Environmental Compliance Assistant (3) District Coordinator Assistant (10) Sector Manager (187) District Warehouse Keeper (10) Commune Warehouse Keeper (187) Team Leaders (390) Spray Operators (1934) Moto courier (66) Washers (236) Porters (313)	1,942	1,630 M: 1,213 (74.4%) F: 417 (25.6%)	492	1,195 M:953 (79.7%) F:242 (20.3%) Operational Site Coordinator and Operational Site Coordinator Assistant (33), Warehouse keepers (36), Office Guardians (18), Team Leaders (140), Spray Operators (705), Pump Technician (70),				

#	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
										Operational Site Guardians (85), Washers (86), Moto Courier (13), Health Zone Manager Assistant / District Coordinator Assistant (6), Environmental Compliance Officer Assistant (2), Logistic Assistant (1)				
1.3.2	Number of health workers receiving insecticide poisoning case management training		Project Training Records Annually	Country Sex (# and %)	289	280 M: 133 (47.5%) F: 147 (52.5%)	108	130 M: 54 (41.5%) F: 76 (58.5%)	115	100 M: 52 (52%) F: 48 (48%)				
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 - PSECAs Annually	Country	495; 100%	471; 100% Fixed Soak pits: 97 Mobile Soak Pits: 374	120; 100%	135; 100% Fixed Soak pit: 40 Mobile soak pit: 95	216	114 Fixed Soak pit: 33 Mobile Soak pit: 81				
1.3.6	Number and percentage of storehouses inspected and approved prior to IRS campaigns		Project Records - PSECAs Annually	Country Storehouse Type	103; 100%	102; 100% Central Warehouses: 3 District warehouses: 9 Operational Sites Warehouses: 90	25; 100%	17; 100% Operation Site Warehouses: 17	16; 100%	15; 100% Operation Site Warehouses: 15				

#	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	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			987 (35%)	697	137 14.5%					
									Operational Site Coordinator and Operational Site Coordinator Assistant (7), Team Leaders (41), Spray Operators (83), Pump Technician (6)					
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	307; 50%	246; 40.6%	150; 50%	73; 30%	64; 35%	55; 28.9%				
									VC Intervention Type: IRS District M&E Assistant (8/9) District Coordinator Assistant (1/10) Finance Assistant (10/10) Sector Manager (66/187) Team Leader (132/390)					
									VC Intervention Type: IRS					
									VC Intervention Type: IRS Operational Site Coordinator and Operational Site Coordinator Assistant (7), District Finance and Administrative Assistant (4), Team Leaders (41), Health Zone Manager Assistant / District Coordinator Assistant (1), M&E Assistant (1),					

#	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
										Environmental Compliance Officer Assistant (1),				
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	248; 100%	27; 100% M: 18 F: 9	30; 100%	319; 100% M:221; 69.3% F:98; 30.7%	310; 100%	249;100% M:177 (71.1%) F:72 (28.9%)				
1.4.4	Number and percentage of women in senior leadership roles in VectorLink country offices	X	Project Records Annually	Country Sex (# and %)										
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	1,944	1,689	1080	900 VC Intervention: IRS Radio Spots	900	981 VC Intervention: IRS Radio Spots				
1.5.2	Number of print materials distributed to or targeted at beneficiaries		Project Records Annually	Country VC Intervention	551,168	403,684 Fliers: 385,482; Posters: 18,000; Banners:202	7,906	8,243 VC Intervention: IRS Posters: 8,127 Banners: 116	8,000	5,082 VC Intervention: IRS Posters: 5000 Banners: 82				
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	885,200	1,197,346 VC Intervention: IRS M: 548,641 W: 648,705	671,716	N/A N/A N/A	N/A	N/A				
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:	11; 100%	11; 100%	12; 100%	12; 100% IRS	12; 100%	10 (83.3%)				
2.1.2	Number and percentage of vector bionomics monitoring sites measuring all basic entomological		Entomological Reports Annually	Country VC Intervention:	11; 100%	11; 100%	12; 100%	12; 100%	12; 100%	10 (83.3%)				

#	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							
	indicators (species composition, indoor and outdoor human biting rates, hourly human biting rates, indoor resting densities)																				
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	11; 100%	11; 100%	12; 100%	12; 100%	12; 100%	10 (83.3%)											
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:	13 ; 100%	13; 100%	13; 100%	13; 100%	13; 100%	13; 100%											
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	72; 100%	72; 100%	40; 100%	40; 100%	40; 100%	40;100%											
					40, 100%	Actellic 300CS: 40, 100%	16,100%	Actellic 300 CS: 16,100%	8, 100%	Sumishield 50 WG: 16,100%	Fludora Fusion: 16, 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:	9; 100%	9; 100%	5; 100%	5; 100%	5; 100%	5; 100%											
					6, 100%	Actellic 300CS: 6, 100%	2, 100%	Actellic 300 CS: 2, 100%	3, 100%	Sumishield 50 WG: 3, 100%	1, 100%	Sumishield WG50: 2, 100%	Fludora Fusion: 1, 100%	1, 100%	Sumishield WG50: 2, 100%	Fludora Fusion: 2, 100%					
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																	
2.1.8	Number of people trained (VectorLink and non VectorLink staff) in entomological monitoring		Project Records Annually	Country Sex (# and %)	N/A	N/A	N/A	12	2	N/A											
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											

#	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
2.1.10	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										
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	N/A	N/A	N/A	N/A	N/A	N/A				
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	N/A	N/A	N/A	N/A	N/A	N/A				
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	1; 100%	1; 100% Organophosphate:100% Clothianidin:100%	1; 100%	1; 100% Organophosphate:100% Clothianidin:100% Fludora fusion:100%	1; 100%	1;100% Organophosphate:100% Clothianidin:100% Fludora Fusion: 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		
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	196; 100%	197; 100% IRS M: 75 F: 1	47; 100%	45; 100% IRS M: 27; 60% F: 18, 40%	38; 100%	39;100% IRS M: 21; 53.8% F:18; 46.2%						
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	99; 100%	90; 100%	20; 100%	17	17; 100%	16;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												
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	N/A	N/A	N/A	N/A	N/A	N/A						
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												

#	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
4.2.2	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	N/A	1 M&E: 1	N/A	N/A	N/A	N/A				
4.2.4	Number of success stories written or videos produced and shared on the VectorLink project website		Project Records Annually	Country	1	0	1	1	1	1				
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	2 1 Malaria elimination plan, 1 malaria communications plan	N/A	1 National Monitoring and Evaluation Plan				
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	1	0	1	1 IRS	1	1				
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	1	0	1	1 IRS	1	1				
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	N/A	N/A	N/A	N/A	N/A	N/A				

ANNEX B: ENVIRONMENTAL MITIGATION AND MONITORING REPORT

List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
1. Education, Technical Assistance, Training	N/A	N/A	N/A
2. Research and Development <ul style="list-style-type: none"> • Implement laboratory environmental, health, and safety (EHS) manuals with standard operating procedures (SOPs), or use existing SOPs, for laboratory operations in accordance with country-specific compliance mechanisms. • Implement SOPs for the safe storage, transport, and use of equipment, chemical reagents, insecticides, and supplies in conformance with international best practices (e.g., WHO, FAO) and host country requirements. Provide training to workers on the approved SOPs or Waste Management Plan (WMP) developed for properly handling and disposing of wastes. 	Periodic monthly supervision was carried out by the Technical Director in the various entomological sites. Trainings were given to entomology teams on the management of their laboratory and the waste management it produces.	N/A	N/A
3. Public Health Commodities	N/A	N/A	N/A
4. Small-Scale Construction <ul style="list-style-type: none"> • Obtain all needed authorizations prior to construction: permits, environmental and social impact assessments, etc. • Retain competent, licensed professionals to design and supervise construction 	N/A	N/A	N/A

List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
<ul style="list-style-type: none"> • Establish health, safety and environmental obligations in all contracts. • Complete a site emergency action plan • Provide safety training to all workers using construction equipment • Identify closest health care facility to handle injuries • Asbestos, lead based paints and other toxic materials will not be used under any circumstances. If the presence of asbestos is suspected in a facility to be renovated, the facility must be tested before rehabilitation works begins. Should asbestos be present, then the work must be carried out in conformity with host country requirements and with guidance to be provided by the Implementing Partner. All results of the testing for asbestos shall be communicated to the COR • Develop and follow a waste management plan (WMP). Identify authorized recycling or disposal facilities prior to generation of waste. • Minimize the generation of waste by: <ul style="list-style-type: none"> - Correctly assessing material needs (not over-buying) - Reducing amount of packaging used by suppliers - Reusing material on site, such as use of discarded materials for leveling ground and filling trenches, etc. 			

List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
<ul style="list-style-type: none"> • Designate secure on-site waste storage facilities • Ensure all workers are trained and dispose of wastes properly. • Complete and track hazardous waste manifests for all shipments • Source all construction material from an ecologically safe provider. • Contractor must provide and all workers must use personal protective equipment (PPE) such as hardhats, footwear, dust mask, safety glasses and reflective vests, as needed. • Ensure first aid and spill clean-up kits are easily available • Contractors must comply with the “Small-Scale Construction” chapter of the USAID Sector Environmental Guidelines (www.usaidgems.org/sectorGuidelines.htm). • Contractor will provide drinking water, latrine and a handwashing station to workers. • Contractors will arrange working hours to minimize disruption to the community. • If needed, construct drainage canals and infiltration pits for management of storm water and prevention of soil erosion. • Post-construction: ensure leftover materials have been properly disposed of. 			
5. Small-Scale Water and Sanitation	N/A	N/A	N/A

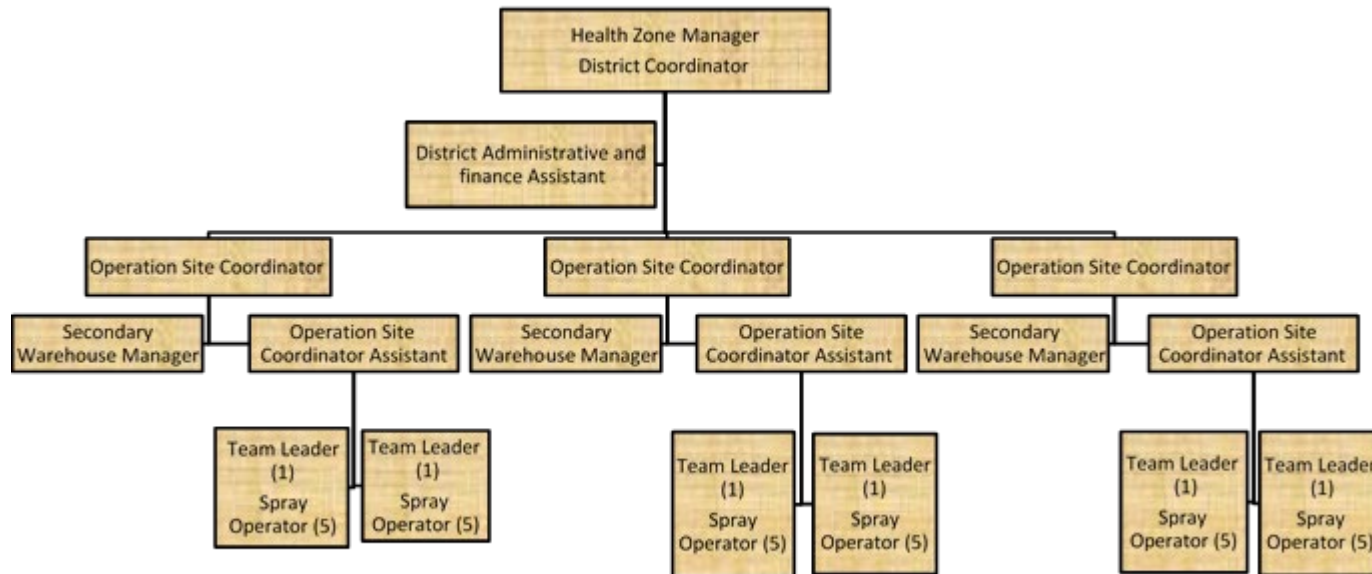
List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
6. Nutrition	N/A	N/A	N/A
<p>7. Vector Control</p> <ul style="list-style-type: none"> • Insecticide selection for any USAID-supported malaria program is subject to the criteria listed in the USAID Programmatic Environmental Assessment, country SEAs, and host country requirements. • Procurement and inventory logs must be maintained. • Ensure storage facility and personal protective equipment (PPE) are appropriate for the active ingredient used and in accordance with approved SOPs. • 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) • Inspect and certify vehicles used for insecticide or team transport prior to contract. • Train drivers • Ensure availability of cell phone, personal protective equipment (PPE) and spill kits during insecticide transportation. • Initial and 30-day pregnancy testing for female candidates for jobs with potential insecticide contact. • Health test all spray team members for duty fitness. 	<ul style="list-style-type: none"> • PMI VectorLink Madagascar during the year 2020 used two classes of insecticide: organophosphate and neonicotinoid. A letter report was submitted before the start of the IRS campaign • Pre-contract inspection and certification of vehicles was conducted October 31, 2020. 97 vehicles were selected to be used. • Driver training was conducted on October 31. About 99 drivers were trained for the 2020 spray campaign in five districts. • All drivers had cell phones as a pre-requisite for hiring and were provided with PPE and spill kits after being trained. PMI VectorLink Madagascar conducted 77 supervisions for the morning mobilization vehicle inspection. • Initial pregnancy tests were conducted before hiring Spray Operators, Washers and Store Assistants from October 15 to October 30, 2020. • Medical examinations were conducted for potential candidates as one of the benchmarks for selection of Spray Operators from October 26 to 30, 2020. • Both International and local procurement were carried out successfully prior to all trainings • The correct mixing procedure for pesticides, including triple rinse of the bottles, was included in all trainings. The 		<ul style="list-style-type: none"> • Actellic 300 CS was used in Betioky district. SumiShield 50 WG was used in Tulear II and Sakaraha districts, and Fludora Fusion in Iakora and Ihozy districts. • PMI VectorLink Madagascar contracted 70 vehicles for the South West region and 27 vehicles for Ihorombe region. • 140 Team Leaders (100 in South West and 40 in Ihorombe) were trained. Team leaders were also trained in the maintenance of spray pumps. 70 spray technicians (51 in South West and 19 in Ihorombe) received training on cleaning and maintaining the pumps. • At the end of the campaign, each storeroom was decontaminated by washing with water and soap mixed with bleach. • 100,000 flyers, 5,000 posters, 2,263 T-shirts, 2,263 caps, and 82 banners

List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
<ul style="list-style-type: none"> ● Procure, distribute, and train all workers with potential insecticide contact on the use of PPE. ● Train operators on mixing insecticides and the proper use and maintenance of application equipment. ● Provide adequate facilities and supplies for end-of-day cleanup. ● Enforce application and clean-up procedures. ● Implement Information, Education and Communication (IEC) campaigns to inform homeowners of responsibilities and precautions, including washing itchy skin and going to health clinic if symptoms develop and do not subside ● Ensure health facility staff are aware of insecticide poisoning management ● Storage facilities and transportation vehicles must be physically secured to prevent theft. ● Maintain records of all insecticide receipts, issuance, and return of empty containers. ● Conduct analysis comparing number of houses treated vs. number of containers used. ● Examine houses treated to confirm application ● Perform physical inventory counts during the application season. 	<p>supervisors were trained together with the Team Leader and the Spray Technicians on the maintenance of the pumps.</p> <ul style="list-style-type: none"> ● Most of the storage facilities were rented by the project. However, the end-of-day cleanup was solely the responsibility of the site coordinator, and supported by the field supervisors at each operations site. AIRS Madagascar conducted 623 supervisions for the end of day cleanup. ● The clean-up procedure for the pumps was done in the designated wash areas and supervised by the site coordinator. ● PMI VectorLink Madagascar conducted sensitization campaigns and information before spraying. IEC materials were distributed among households. ● 4,206 supervisions were made and found 28 cases where the resident was not informed of exposure protocol (instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside). <ul style="list-style-type: none"> ● Insecticide poisoning management was done for the health facility staff: from October 19 to 23, 2020. ● 149 inspections regarding storage facility were conducted. ● 77 supervisions on the transport of insecticides were conducted. ● Records of all pesticide receipts from central stores, issuances and returns of empties were kept on the stock cards with backups in ledger books at regional and 		<p>were distributed for mobilization purposes.</p> <ul style="list-style-type: none"> ● Recommendations and instructions were shared with the resident. The resident was immediately informed of the measures to be taken and helped to prepare their houses properly before spraying. The information was given immediately to the beneficiaries so that they could be aware of the steps to follow in the event of an accident. ● 100 health facility staff were trained (70 in South West, 30 in Ihorombe) ● In the South West: 5.4 structures were sprayed per bottle / sachet, and in Ihorombe 4.4 structures per sachet ● 33 Site Coordinators and their assistants and 36 Storekeepers were trained. ● Among the trainings, there is BMP, the use of the PPE, the maintenance of the equipment and the distances to respect in

List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
<ul style="list-style-type: none"> • For shipments of insecticide over water, sachets/ bottles will be packed in 220 liter open top barrels with a water-tight top and a locking ring, or in a similar durable container. Waterproof labeling must be affixed to the barrel, with the identity of the pesticide, number of bottles inside, the weight, the type of hazard posed by the contents, and the personal protective equipment to be worn when handling the barrel. • Train applicators on the SEA operational requirements, SOPs, PMI BMPs, and approved WMP, developed for the safe and effective storage, distribution, application, and disposal of insecticides • Ensure application equipment and PPE are appropriate for the active ingredient used and in accordance with approved SOPs, and maintain equipment to avoid leaks. • Maintain application equipment • No application of insecticides within 30 yards of beekeeping sites • Handling, treatment, and disposal of nonhazardous (general waste) and hazardous wastes must be in accordance with the approved WMP/SOPs and the PMI BMPs. The WMP, which outlines SOPs for managing waste processes, must be in accordance with PMI best practices and host country requirements 	<p>district level, as well as the sub-districts warehouses. 149 controls were made regarding the documents of stock.</p> <ul style="list-style-type: none"> • On average, one bottle / sachet is needed to spray 5.1 structures • Visual examination of houses sprayed was conducted by observing the traces of the sprayed chemical of the walls, ceilings, and eaves. IRS technical staff and government supervisors conducted at least 4,206 examinations. • The Logistics and ECO ensured physical inventory monitoring during and after the spray season. 149 Inspections were made. • Site Coordinator, Assistant Site Coordinator and Storekeeper training was conducted from September 21 to September 26, 2020. • Team Leader and Spray Operator training was conducted (Team Leader in October 19 to 24, 2020 and Spray Operator in October 26 to 30, 2020). <ul style="list-style-type: none"> • PMI VectorLink Madagascar had submitted the Waste Management Plan in April 2020 in accordance with the Best Management Practice. • The selection of sites was done by the ECO and supervised by the COP according to the PMI BMPs. Several rounds of Pre-Season Environmental Compliance Assessments were conducted. For the South West, 25 PSECAs were conducted (from August 27 to October 29, 2020). In Ihorombe, 13 		<p>regards to the sensitive areas.</p> <ul style="list-style-type: none"> • PMI VectorLink Madagascar used 33 soak pits (24 in the South West, 9 in Ihorombe). 81 mobile soak pits were built. • The new soak pit with concrete was functional during the year and did not require any repairs. • PMI VectorLink Madagascar finalized the negotiation with Adonis for the start of waste treatment in March.

List each Mitigation Measure from Column 3 in the EMMP	Status of Mitigation Measures	List Any Outstanding Issues Relating to Required Conditions	Remarks
<ul style="list-style-type: none"> • Choose sites for disposal of liquid wastes, including fixed and mobile soak pit sites according to PMI BMPs • Construct fixed and mobile soak pits with charcoal according to the BMPs to adsorb insecticide from rinse water • Maintain soak pits as necessary during season • Monitor waste storage and management during campaign • Monitor disposal procedures post-campaign • Wastes will only be disposed in incinerators that comply with PMI BMPs • Collect and maintain treatment and disposal documents and records on file • Country-level USAID EC documentation must contain guidance on proper disposal of wastes 	<p>PSECA's were conducted during the same period.</p> <ul style="list-style-type: none"> • All the soak pits were constructed as per guidelines in the BMP. During the PSECA, the ECO supervised the construction of all new soak pits. • All soak pits were cleared of vegetation and served as a filter during the spray campaigns. • 149 inspections regarding storekeeper performance were conducted. • The ECO will monitor the post-spray campaign solid waste procedure and disposal from the district level to the central warehouse and to the final designation for proper disposal at Adonis, a waste management and recycling company in Madagascar. • Many trainings were conducted for IRS stakeholders in the five districts: Staff of basic health center, Operational Site Coordinator (OSC), Drivers, Team Leaders, Spray Operators, and Warehouse Keeper. • The rehabilitation of the storeroom was conducted according to the guidelines in BMP manual and using local materials if possible. The rehabilitation work was done under the supervision of the ECO. 		
8. Emergency Response	N/A	N/A	N/A

ANNEX C: SPRAY TEAM ORGANIGRAM



ANNEX D: COVID-19 MITIGATION MEASURES DURING THE 2020 IRS CAMPAIGN IN MADAGASCAR

During the 2020 IRS campaign implementation, the following measures were put in place to secure the intervention from COVID-19.

Activities	Security Measures Taken	Responsible Parties
Trainings	<ul style="list-style-type: none"> ● Adopt a work system in shifts. Form small groups and develop the schedule accordingly. ● Masks must be worn during the entire period of presence at the operational site. ● Mandatory hand washing with soap before entering the site. ● Maximum number of participants per session: between 15 and 30 depending on the size of the training room. A distance of two meters must be maintained between participants in the training to avoid contact. ● Restrict access to training sites according to the schedule. ● Include in the training program a session on information regarding COVID-19: Infectious agent, means of transmission, symptoms, prevention measures and case management. ● Avoid crowds outside training locations. ● Training materials / tools and furniture should be wiped or washed thoroughly at the end of each day. 	Trainers, supervisors, team leaders
Morning mobilization	<ul style="list-style-type: none"> ● Staggered arrival: Avoid having groups of more than 10 people. <ul style="list-style-type: none"> - For sites with sufficient space, design a schedule that ensures adequate separation between groups of 10. - Install handwashing devices at the entrance of operational sites. ● Masks to be worn during the entire period of presence on the site. ● Repeat messages on the transmission of COVID-19 daily ● Avoid gatherings inside and outside of the operational site. ● Keep spray teams physically separated. ● Add COVID-19 symptoms to the team leader's checklist. ● Restrict access to operational sites in accordance with the schedule. ● Have storekeepers and team leaders wear gloves to facilitate record keeping. ● Avoid crowds around the storekeeper. 	Site coordinators, supervisors, team leaders

Activities	Security Measures Taken	Responsible Parties
	<ul style="list-style-type: none"> ● Lead morning gatherings by spray team (8-10 people). ● Everyone uses their own pen to sign documents / tools. ● Respect the distance of two meters between individuals. 	
Moving from the operational site to the field (and back)	<ul style="list-style-type: none"> ● All vehicle drivers must follow the same rules as other seasonal workers. ● Masks to be worn at all times by all vehicle occupants. ● Specify the maximum number of occupants for each type of vehicle. ● Vehicles to transport small groups and make several trips as much as possible to avoid crowding. ● Wash vehicles and wipe seats with chlorine disinfectants at the end of each day. 	Supervisors, team leaders
Behavior in community and households	<ul style="list-style-type: none"> ● Keep a distance of two meters between people. Avoid physical contact. ● Wear mask at all times. ● Clean gloves with wet wipes before and after helping with home preparation. ● Keep gloves when handling household personal belongings. ● Spray operators and team leaders should carry wet wipes in backpacks. ● Operators and team leaders must keep a distance of two meters from household occupants when filling out spray data forms and when giving post-spray messages. 	Supervisors, team leaders
End of day clean up	<ul style="list-style-type: none"> ● Defer Arrivals. Avoid having groups of more than two teams (\pm 10 people). ● For sites with sufficient space, design a schedule that ensures adequate separation between groups of 10. ● Mask to be worn during the entire period of presence on the site. ● Avoid gatherings / gatherings outside the operation site. ● Keep spray teams physically separated. Respect the guideline of two-meter distance. ● Restrict access to operating sites according to schedules. ● Hand washing compulsory with soap after leaving the rinsing area. ● Avoid congestion around the storekeeper. 	Site coordinators, supervisors, team leaders
M&E	<ul style="list-style-type: none"> ● Install handwashing devices in data entry centers; masks to be worn during the entire period of presence at the data entry center. ● Maintain a separation of two meters between data entry clerks. ● Data entry centers should be limited to a maximum of 10 people working at the same time. ● Disinfection of laptops and workstations between work sessions. ● Supervisors must wear gloves and masks when transporting data from sites 	Site supervisor
Community mobilization	<ul style="list-style-type: none"> ● Avoid direct physical contact between people. No handshake or other greeting involving physical contact ● Avoid groups of more than 10. ● Masks to be worn when interacting with community members and spray teams. ● When possible, use mass media and other channels that do not require close contact with people. 	Mobilizers, proximity supervisors, etc.

Each morning, seasonal workers were reminded of the following guidelines/information:

COVID-19 (Corona virus disease) is a respiratory disease.

Symptoms may include:	What has to be done:	What you should not do:
➤ Cold (runny nose)	➤ Wash your hands often and correctly or use a hydro alcoholic gel	➤ Go to work when you are sick
➤ Headache	➤ Cough in your elbow and sneeze into a tissue - Throw the tissue immediately in the trash	➤ Touch the eyes, nose and mouth
➤ Cough	➤ Take daily precautions to stop the spread of germs; wash surfaces with soap and disinfectant	➤ Traveling if you feel unwell
➤ Irritated throat	➤ Be aware of the latest recommendations from the Government, CDC and WHO	➤ Close contact with people who are already sick
➤ Fever		➤ Panicking. Get the facts and follow the advice of government sources and health care professionals
➤ General malaise		➤ Go to work when you are sick

ANNEX E: CLIMATE RISK MANAGEMENT REPORT

Project Elements	Potential Climate Risk	Mitigation Measure	Status of Mitigation Measure	Outstanding Actions Relating to Required Conditions
Indoor residual spraying activities to reduce the morbidity and mortality of malaria	Long-term weather pattern changes can affect vector distribution and affected populations, thus requiring careful analysis and potential shifts in where IRS operations are targeted.	Monitor vector distribution and malaria outbreaks. Refocus activities based on ento/epi data to ensure appropriate targeting of IRS.	Monthly follow-ups are done by entomologists to monitor evolution of vector behavior, vector distribution and malaria incidence. This is used to guide discussions with the NMCP for appropriate coordination of IRS and entomological activities	Explore the collection of context indicators to include climate related data to better connect changes in vector populations with climate variability where feasible.
	Lack of water for mixing insecticide and end of day clean up, due to shifting precipitation patterns.	Ensure alternative water supplies are available (i.e. budget for water storage tanks, transportation, etc.).	Alternative water supply is arranged in some districts with water shortages. Project vehicles transport water in cans to provide suitable water for mixing insecticide, and in drums to supply the water for washing areas	None
	Inaccessibility of sites (i.e. roads/bridges wash away) and unavailability of households (i.e., farming fields), due to unpredictable, earlier start of the rainy season start	Monitor weather patterns. Ensure adaptability of spray calendar (i.e. half day sprays, budget for mop-up days, etc.). Consider alternative transportation (i.e. horse carts, boats).	The project utilizes climate services (climate data and weather patterns) for general strategic planning and management. Weather patterns are monitored particularly in the district of Iakora where the arrival of the rains risks poses severe challenges in conducting IRS	None
	Severe weather (i.e. drought, floods) impact electricity, cell networks and internet in offices and field sites.	Ensure alternative energy sources (i.e. generators and solar panels) and maintain an alternate communication plan in case of emergency.	Back-up generators are available in offices and in some storerooms. The VL Madagascar Project has diversified the service providers for communication (telephone and internet connection).	Explore utilization of solar panels as an energy source which would help to reduce emissions.
	Increased temperatures can impact spray teams' ability to deliver IRS (i.e., heat exhaustion)	Ensure daily health monitoring checklists are implemented and seasonal workers are aware of signs and risks of heat exhaustion. Further update BMPs to allow for intake of nourishment.	Workdays are started early in the morning with one hydration break given to SOPs during the day. In some operations sites, shading is set up before entering the washing area to allow SOPs to shelter from the sun	None

Project Elements	Potential Climate Risk	Mitigation Measure	Status of Mitigation Measure	Outstanding Actions Relating to Required Conditions
		Ensure IRS operations occur in the morning through mid-day to avoid increased temperatures to the greatest extent possible.	while waiting for their turn for end of day cleanup.	
Entomological monitoring to monitor malaria activities	Inaccessibility to access ento sentinel sites (i.e. roads/ bridges wash away), due to unpredictable weather patterns	Monitor weather patterns. Consider alternative transportation (i.e. horse carts, boats).	The project utilizes climate services (climate data and weather patterns) for general strategic planning and management. Sentinel sites have been set up in places that can be accessed by different means of transportation	None
	Unavailability of wild caught mosquitoes/larvae due to unpredictable rains (i.e. drought, or flooding of breeding sites) inhibiting the ability to collect necessary quantities of field mosquitoes for entomological testing	Consider feasibility of using Kisumu strain, laboratory reared mosquitoes.	The different work sites of entomologists are already equipped with laboratories	None
	Severe weather (i.e. drought, floods) impact electricity, cell networks and internet in offices and field sites.	Ensure alternative energy sources (i.e., generators and solar panels) and maintain an alternate communication plan in case of emergency.	Back-up generators are available in offices and in some storerooms. The VL Madagascar Project has diversified the service providers for communication (telephone and internet connection).	Explore utilization of solar panels as an energy source which would help to reduce emissions.
Long lasting insecticide treated bed net distribution and monitoring to reduce the malaria burden	Long-term weather pattern changes can affect vector distribution and affected populations.	Monitor vector distribution and malaria outbreaks. Refocus activities based on ento/epi data to ensure appropriate targeting of bed nets.	N/A	None
	Increased temperatures can decrease bed net usage	Monitor bed net usage and reinforce social behavioral change communication messages.	N/A	None
	Inaccessibility of distribution sites (i.e., roads/bridges wash away) due to unpredictable or severe weather	Monitor weather patterns. Consider alternative transportation and distribution plans.	N/A	None