



U.S. PRESIDENT'S MALARIA INITIATIVE



**THE PMI VECTORLINK PROJECT MALI**  
**2020 END OF SPRAY REPORT**  
**SPRAY CAMPAIGN**  
**JUNE 15, 2020 – AUGUST 12, 2020**

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



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# ACRONYMS

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<b>AIRS</b>	Africa Indoor Residual Spraying Project
<b>ASACO</b>	Community Health Association ( <i>Association de Santé Communautaire</i> )
<b>BMP</b>	Best Management Practices
<b>BNSS</b>	“Bi Niama Sini Sanou”
<b>COP</b>	Chief of Party
<b>DHIS2</b>	District Health Information System 2
<b>DNACPN</b>	National Directorate for Sanitation and Pollution Control ( <i>Direction Nationale de l’Assainissement et du Contrôle des Pollutions et des Nuisances</i> )
<b>DTC</b>	Health Center Technical Director ( <i>Directeur Technique de Centre de la Santé</i> )
<b>ECO</b>	Environmental Compliance Officer
<b>IEC</b>	Information, Education, and Communication
<b>IRS</b>	Indoor Residual Spraying
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MOE</b>	Ministry of Environment
<b>MOH</b>	Ministry of Health
<b>NMCP</b>	National Malaria Control Program
<b>PMI</b>	U.S. President’s Malaria Initiative
<b>PMT</b>	Performance Monitoring Tool
<b>PPE</b>	Personal Protective Equipment
<b>PSECA</b>	Pre-Season Environmental Compliance Assessment
<b>SDSES</b>	Service for Social Development and Economic Solidarity ( <i>Service de Développement Social et de l’Economie Solidaire</i> )
<b>SEA</b>	Supplemental Environmental Assessment
<b>SOP</b>	Spray Operator
<b>TOT</b>	Training of Trainers
<b>USAID</b>	United States Agency for International Development
<b>WHO</b>	World Health Organization

# EXECUTIVE SUMMARY

The U.S. President’s Malaria Initiative (PMI) VectorLink Project, funded by the U.S. Agency for International Development (USAID) and implemented by Abt Associates, supports the implementation of indoor residual spraying (IRS) in Mali. VectorLink Mali provides technical, managerial, and operational support to Mali’s National Malaria Control Program.

VectorLink Mali conducted the 2020 IRS campaign from June 15 to August 12, 2020. The project sprayed 129,302 structures out of 133,426 structures that spray operators (SOPs) found in 28 geographically contiguous health areas (*Aires de Santé*) in three districts in Mopti Region: Bandiagara, Djenné, and Mopti. This represents 96.9% spray coverage and 107.8% spray progress. The project sprayed Actellic® 300CS (the organophosphate, pirimiphos-methyl) in Djenné District, SumiShield® 50WG (the neonicotinoid, clothianidin) in Bandiagara District, and Fludora® Fusion WP-SB (clothianidin-deltamethrin) in Mopti District.

The project conducted wall bioassays within a week of spraying in all three districts. All three insecticides achieved 100% mortality of a susceptible insectary strain of *An. coluzzii* after the appropriate holding period.

Key project achievements during the 2020 spray campaign are summarized in Table ES-1.

**Table ES-1: VectorLink Mali at a Glance**

Number of districts covered by PMI-supported IRS in 2020	3 districts: Bandiagara, Djenné, and Mopti
Insecticide used in 2020 IRS (per district)	SumiShield® 50WG in Bandiagara, Actellic® 300CS in Djenné and Fludora® Fusion WP-SB in Mopti
Structures targeted for spray in 2020*	119,906
Structures found by SOPs in 2020	133,426
Number of structures sprayed by PMI-supported IRS in 2020	129,302
2020 spray coverage**	96.9%
2020 spray progress***	107.8%
Population protected by PMI-supported IRS in 2020	503,043 total 34,462 pregnant women 87,606 children under 5
Dates of PMI-supported IRS campaign	June 15, 2020 – July 24, 2020 (Bandiagara and Djenné) June 29, 2020 – August 12, 2020 (Mopti)
Length of 2020 campaign	28 operational days (Bandiagara and Djenné) 30 operational days (Mopti)
Number of people trained with funds from the U.S. Government to deliver IRS in 2020****	441 people (366 men, 75 women)

\* Final target was calculated using the revised structure definition and includes two extra villages sprayed in Djenné; it excludes 10 villages to which spray visits were cancelled due to security concerns.

\*\*Spray coverage is defined as the proportion of structures sprayed out of structures found during the campaign.

\*\*\* Spray progress is defined as the proportion of structures sprayed out of structures targeted.

\*\*\*\* Based on the PMI indicator definition, this indicator includes only spray personnel such as SOPs, team leaders, and community supervisors. It excludes clinicians, data clerks, information, education and communication mobilizers, drivers, washers, porters, pump technicians, and security guards.

# RESUME

Le projet VectorLink de l'Initiative du Président Américain contre le Paludisme (President's Malaria Initiative: PMI) financé par l'Agence Américaine pour le Développement International (USAID) et mis en œuvre par Abt Associates, soutient la stratégie de Pulvérisation Intra Domiciliaire (PID) au Mali. A travers la PID, le projet PMI VectorLink Mali apporte une assistance technique, managériale et opérationnelle au Programme National de Lutte contre le Paludisme (PNLP).

VectorLink Mali a conduit la campagne de PID 2020 du 15 juin au 12 août, 2020. Le projet a permis de traiter 129,302 sur 133,426 structures éligibles trouvées par les opérateurs dans 28 aires de santé géographiquement contiguës dans les districts sanitaires de Bandiagara, de Djenné et Mopti. Ce qui représente des taux de couverture et de progrès de la PID, respectivement de 96.9% et de 107.8% Trois types d'insecticides ont été utilisés : un organophosphoré (pirimiphos-méthyl-Actellic® 300CS) à Djenné, un néonicotinoïde (clothianidine- SumiShield® 50WG) à Bandiagara et Fludora® Fusion) WP-SB (clothianidine + deltaméthrin - à Mopti.

Le projet a réalisé des bioessai moins d'une semaine suivant la pulvérisation. Les trois insecticides ont atteint un taux de mortalité de 100% des sujets sensibles *Anopheles coluzzii* après la période de détention appropriée.

Les réalisations du projet au cours de la campagne de 2020 sont comme suit résumées (voir le Tableau ES-1):

**Table ES-1: Vectorlink Mali En Bref**

<b>Nombre des districts sanitaires couverts par PMI en 2020</b>	<b>3 districts sanitaires: Bandiagara, Djenné et Mopti</b>
Insecticide utilisé pour la campagne PID 2020	SumiShield® 50WG à Bandiagara, Actellic® 300CS à Djenné et Fludora® Fusion WP-SB à Mopti
Nombre de structures ciblées*	119 906
Nombre de structures trouvées par les opérateurs	133 426
Nombre de structures pulvérisées par les opérateurs en 2020	129 302
Taux de couverture de la PID 2020 **	96,9%
Taux de progrès de la PID 2020 ***	107,8%
Population protégée par PMI en 2020	503 043 au total 34 462 femmes enceintes 87 606 enfants de moins de 5 ans
Dates de la campagne financée par PMI	15 juin au 24 juillet 2020 (Bandiagara et Djenné) 29 juin au 12 août 2020 (Mopti)
Durée de la campagne	28 jours opérationnels (Bandiagara et Djenné) 0 jours opérationnels (Mopti)
Nombre de personnes formées avec les fonds du Gouvernement des Etats Unis d'Amérique pour faire la PID****	441 (366 hommes, 75 femmes)***

\* Cibles finales utilisant la définition révisée de structure (les cibles initialement quantifiés à l'aide de l'ancienne définition de structure étaient de 109 461) en plus de deux villages de Djenné pulvérisés, et excluant les 10 villages qui n'ont pu être accessibles pour raison d'insécurité.

\*\* Le taux de couverture correspond au pourcentage de structures pulvérisées hors des structures trouvées.

\*\*\* Le taux de progrès correspond au pourcentage de structures pulvérisées hors des structures ciblées.

\*\*\*\* En se basant sur la définition des indicateurs de PMI. Ce chiffre inclut seulement les acteurs comme les Opérateurs, les Chefs d'Equipe et les Superviseurs. Il exclut les DTC, les agents de saisie, les mobilisateurs, les Chauffeurs, les lingères, les maintenanciers, et les gardiens.

# I. COUNTRY BACKGROUND

The U.S. President’s Malaria Initiative (PMI) has funded indoor residual spraying (IRS) in Mali since 2008 with the aim of reducing the malaria burden, especially among children under 5 years old and pregnant women. In September 2017, the U.S. Agency for International Development (USAID) awarded Abt Associates a five-year contract, the PMI VectorLink Project, with the overall goal to reduce malaria transmission in Mali using IRS and thus contribute to the reduction of malaria-associated morbidity and mortality.

Malaria remains one of the leading public health problems in Mali. It is the cause of 36% of medical consultations, and annually there are 2,884,919 reported cases of malaria in health facilities and at the community level (2,013,645 simple cases, 871,274 severe cases, and 1,454 deaths)<sup>1</sup>. Children under 5 years of age and pregnant women are the most affected.

IRS is a proven malaria vector control intervention. In 2008, PMI started supporting IRS in Segou and Koulikoro regions. From 2011 to 2017, PMI continued supporting IRS through the PMI Africa Indoor Residual Spraying (AIRS) Project, which relocated operations to Mopti Region in 2017 due to 60% malaria prevalence compared with 30% nationally.<sup>2</sup> The PMI VectorLink project has continued implementing IRS in Mopti Region since 2018. Table 1 presents the history of PMI-supported IRS implementation in Mopti Region.

**Table 1: History of PMI-Supported IRS Implementation in Mopti Region, 2017-2020**

	Number of Target Health Areas / Total Number of Health Areas in District, Insecticide Used			
	2017	2018	2019	2020
<b>Bandiagara</b>	19/27 Pirimiphos-methyl	19/27 Pirimiphos-methyl	13/27 Pirimiphos-methyl	10/27 Clothianidin
<b>Bankass</b>	5/22 Pirimiphos-methyl	5/22 Pirimiphos-methyl	n/a	n/a
<b>Djenné</b>	9/22 Pirimiphos-methyl	7/22 Clothianidin	7/22 Clothianidin	7/22 Pirimiphos-methyl
<b>Mopti</b>	20/27 Pirimiphos-methyl	16/27 Clothianidin	15/27 Pirimiphos-methyl	11/27 Clothianidin-Deltamethrin

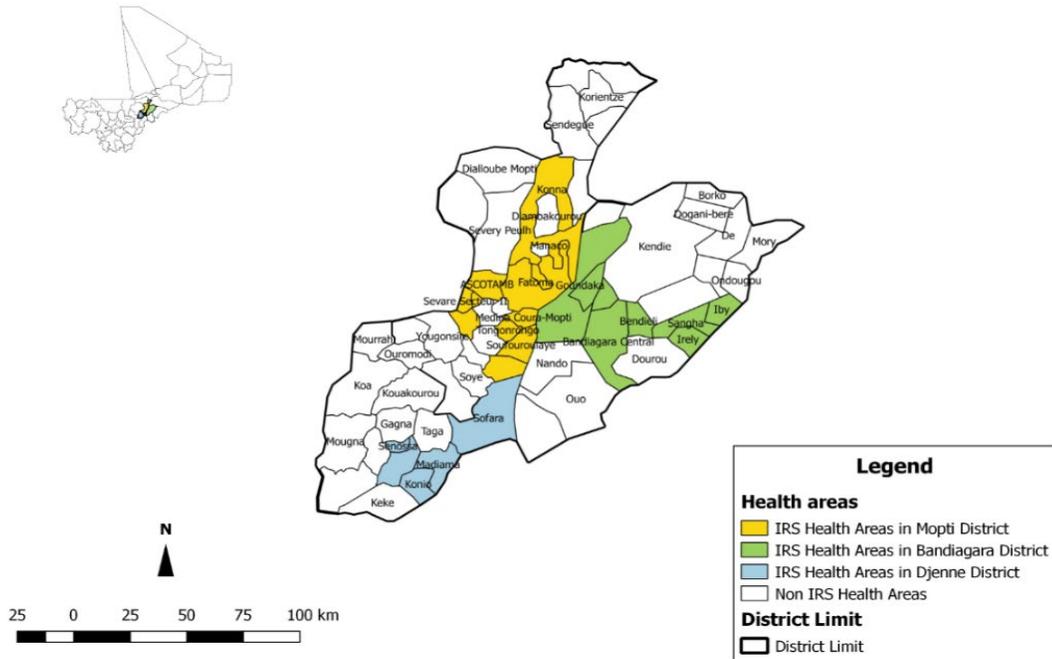
In 2020, PMI VectorLink’s third year, the project conducted IRS in 28 geographically contiguous health areas (*Aires de Santé*)<sup>3</sup> across three districts in Mopti Region: Bandiagara, Djenné, and Mopti (Figure 1), with SumiShield® 50WG, Actellic® 300CS, and Fludora® Fusion WP-SB, respectively.

1 Mali’s DHIS2 system, 2019.

2 Malaria Indicator Survey, 2015.

3 Three health areas in Bandiagara and four health areas in Mopti were excluded due to budget constraints.

**Figure I: Map of the 28 Health Areas in the Three PMI-Supported IRS Districts in 2020**



## 2. IMPLEMENTATION OF IRS ACTIVITIES

### 2.1 IRS PLANNING & PARTNER COLLABORATION

For the fourth consecutive year, IRS activities were implemented in Mopti Region, since their relocation under AIRS in 2017.

Due to reduced funding in the FY20 PMI Malaria Operational Plan for Mali and due to ongoing security concerns, the PMI VectorLink Mali project reduced the IRS target area from 35 health areas across three districts (Bandiagara, Djenné, and Mopti) in 2019 to 28 health areas across the same three districts in 2020. The 28 health areas represent 37% of all (76) health areas in these districts. Three of 13 health areas in Bandiagara, four of 15 health areas in Mopti, and certain urban neighborhoods in Djenné town were removed to prioritize geographic contiguity of the IRS target area and exclude areas with a heightened security risk.

The global Covid-19 pandemic significantly affected IRS operations especially training, supervision and spraying operations which were implemented between May and August. WHO declared the novel coronavirus outbreak a global pandemic on 11 March, 2020 and Mali confirmed its first two cases on 25 March, 2020.

In 2020, VectorLink Mali targeted 119,906 eligible structures<sup>4</sup> for IRS across the 28 health areas. Table 2 shows the number of health areas and corresponding structures targeted for IRS by district.

**Table 2: Number of Targeted Structures for IRS by VectorLink Mali in 2020 by District**

District	Total Number of Health Areas	Health Areas Targeted for IRS (% of total)	Population Targeted for IRS/Total Population (% of total)	Actual Number of Targeted Structures
Bandiagara	27	10 (37%)	158,329/429,721 (37%)	33,968
Djenné	22	7 (26%)	107,071/284,744 (38%)	23,486
Mopti	27	11 (46%)	243,394 /415,327 (59%)	62,452
Total	76	28 (37%)	508,794/1,129,792 (45%)	119,906

To develop district-level IRS operational plans, VectorLink Mali organized separate two-day microplanning meetings in March 2020 in each of the three districts with active participation of regional and district-level officials: sub-prefects, mayors, health office directors, technical directors of community health centers (*directeur technique de centre de la santé*, DTCs), community supervisors, community health associations (ASACOs), radio operators, and village chiefs.

During the microplanning meetings, the VectorLink Mali team emphasized key lessons learned from the 2019 campaign, such as the importance of monitoring insecticide consumption, accountability for district performance, and elimination of pre-campaign community mobilization, as well as innovations and updates for

<sup>4</sup> The definition of an eligible structure was revised between the 2019 and 2020 IRS campaigns. Formerly, a structure was defined as a standalone building. The revised definition accounts for multiple residential units within a single building, to better capture the true coverage rates and allow for more precise planning. The target of 119,906 structures in 2020 was calculated based on the revised definition, and also accounts for mid-campaign adjustments to the target areas (two additional villages sprayed in Djenné as well as 10 villages excluded for security reasons).

the 2020 campaign, such as the revised structure definition, mobile data collection, the revised work week (5 days on, 2 days off), and COVID-19 mitigation measures.

Prior to undertaking planning activities at regional, district, and community levels, VectorLink Mali facilitated a meeting with the IRS steering committee in February 2020. At this meeting, all key partners including government technical partners (National Malaria Control Program (NMCP)/Ministry of Health (MOH), National Directorate for Sanitation and Pollution Control (*Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances*, or DNACPN), Ministry of Environment (MOE), Ministry of Agriculture, and other government and non-government stakeholders) agreed on their roles as well as objectives, targets, planning, and needs for the 2020 spray campaign.

## 2.2 TRAINING

Before beginning the spray campaign, VectorLink Mali collaborated with government technical partners to train personnel involved in IRS. Eleven types of trainings were held between May 30 and June 13, 2020. The VectorLink Mali team maintained the changes introduced to training in 2019 for cost effectiveness reasons. For example, instead of holding formal trainings for washers, store guards, and community mobilizers, the project did task orientation for these groups on the first day of the campaign. Additionally, instead of a three-day training, clinicians received a refresher session on insecticide poisoning case management during the TOT. In total, 757 people were trained, 231 (23.1%) of whom were women.

This year (2020) was Mali's first campaign using smartphones to collect spray data. Thus, every SOP was trained on how to collect data via the smartphone.

As part of its COVID-19 pandemic mitigation plan, the team also developed a specific module on basic mitigation of disease transmission for inclusion in IRS training programs. An orientation for all participants on basic information about the coronavirus, its symptoms, how it is transmitted, and how it can be prevented was done during training sessions. To accommodate trainees in accordance with social distancing guidance, the project engaged five extra venues. Table 3 shows the number of people trained, disaggregated by gender.

**Table 3: Number and Type of Community Actors Trained, By Gender and Job Category**

Category of Persons Trained	Training of Trainers		Spraying Operations		Supervisors Training		M&E Assistants Training		Storekeepers Training		Washing Training		Transport Safety and Security		Store Security Training		Pump Repairs Training		IEC Training		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
DTCs	22	6																			28
*Spray operators			278	55																	333
*Team leaders			62	15																	77
*Community supervisors					26	5															31
District Supervisors					4	0															4
mHealth Coordinator							1	0													1
M&E assistants							1	7													8
Storekeepers									21	7											28
Washers											0	64									64
Drivers													69	0							69
Security guards															77	7					84
Pump technicians																	11	1			12
Mobilizers																			197	64	261
Subtotal M/F	22	6	340	70	30	5	2	7	21	7	0	64	69	0	77	7	11	1	197	64	1000
<b>Total</b>	<b>28</b>		<b>410</b>		<b>35</b>		<b>9</b>		<b>28</b>		<b>64</b>		<b>69</b>		<b>84</b>		<b>12</b>		<b>261</b>		<b>1000</b>

DTC= Health Center Technical Director (*Directeur Technique de Centre de la Santé*); IEC=information, education, and communication; M&E=monitoring and evaluation

\*Community actors who form the spray personnel.

## 2.3 SPRAY OPERATIONS & SUPERVISION

The 2020 IRS campaign was implemented in two phases, Phase 1 over 28 operational days in Bandiagara and Djenné districts (June 15–July 24), and Phase 2 over 30 operational days (June 29–August 12) in Mopti District.

### 2.3.1 HUMAN RESOURCES

VectorLink Mali worked with each district to recruit spray teams, which generally comprised one team leader who supervised five SOPs. Two team leaders and their teams were managed by one supervisor who reported to the DTC, who managed an IRS operations site. Four VectorLink Mali IRS coordinators supported the DTCs and liaised with project leadership.

For the selection and recruitment of seasonal workers, a selection committee – comprising the sub-prefect (who represented the prefect and presided over the committee), the mayor, the DTC, the president of the ASACO, and the village chief – was set up in each of the 28 targeted health areas. The committee in each area recruited SOPs, team leaders, community supervisors, pump mechanics, storekeepers, security guards, and washers based on criteria developed by VectorLink Mali’s technical team. Hiring criteria for SOPs included being at least 21 years old, speaking the appropriate language for the area, and, in particular, being able to read and write and being in good health and able to carry spray equipment for several hours per day.

VectorLink Mali hired a total of 915 seasonal staff including 4 district supervisors, 31 community supervisors, 77 team leaders, 333 SOPs, 28 storekeepers, 84 security guards, 64 washers, 1 mHealth coordinator, 8 M&E assistants, and 261 mobilizers. Of the 915 seasonal staff, 688 (75%) were men and 227 (25%) were women. Table 4 shows the breakdown of spray personnel hired for 2020 operations by gender and their roles.

**Table 4: Hiring By VectorLink Mali for 2020 IRS Campaign**

Category	Number of Staff Hired to Support IRS						Total (% Female)
	Spray Ops		Data Capture		Other		
	M	F	M	F	M	F	
District supervisors	–	–	–	–	4	–	4 (0%)
District logisticians	–	–	–	–	3	–	3 (0%)
M&E assistants	–	–	1	7	–	–	8 (88%)
Pump mechanics	–	–	–	–	11	1	12 (8%)
mHealth coordinator	–	–	1	–	–	–	1 (0%)
IRS data transporters	–	–	7	2	–	–	9 (22%)
Spray operators	278	55	–	–	–	–	333 (17%)
Community supervisors	26	5	–	–	–	–	31 (16%)
Team leaders	62	15	–	–	–	–	77 (19%)
Storekeepers	–	–	–	–	21	7	28 (25%)
Washers	–	–	–	–	–	64	64 (100%)
Mobilizers	–	–	–	–	197	64	261 (24%)
Security guards	–	–	–	–	77	7	84 (8%)
Total M/F	366	75	9	9	313	143	915 (25%)
<b>TOTAL</b>	<b>441</b>		<b>18</b>		<b>456</b>		

### 2.3.2 OPERATIONS SITES

In 2020, the IRS campaign operated out of 28 operations sites (one in each of 28 health areas). In 21 out of 28 health areas, the community health center served as the operations site with a store room and a wash area. In the other seven health areas, the warehouse is located within the community health center but the wash area is situated elsewhere (a maximum of 3km away) due to lack of adequate space within the health center compound. Among the IRS store rooms, 11 are temporary, serving only for the duration of the spray campaign, while the 17 others are reserved for IRS year-round. All IRS operations sites are donated by the Government of Mali.

Daily spray activities began at 6:00 am (after breakfast provided by the project), with the spray personnel meeting at their designated operations site to collect their personal protective equipment (PPE) and other equipment and supplies (sprayers, insecticide, data tools, etc.) and otherwise prepare for the day. Once all commodities were distributed, the supervisor met with the spray team leaders, and shared the day's spray schedule and the route to each community. Before departure, DTCs and community supervisors held morning assemblies to communicate important announcements, feedback from field supervision, information about performance tracking, and expectations for the day. Examples of technical guidance given during the assemblies are: the methods for numbering the structures (sprayed and non-sprayed) recommended by the M&E team and reminders for SOPs to not mix insecticide until they reached the structures whose owners had accepted spraying. Supervisors also conducted a daily health check to ensure that all team members were healthy enough to carry out the day's activities<sup>5</sup>. VectorLink Mali and government supervisors attended these morning assemblies whenever possible.

The spray teams left the site by 7:00 am for the communities and returned to the operations sites between noon and 1:00 pm. Upon returning to their operations sites, the SOPs carried out end-of-day clean-up in accordance with PMI's Best Management Practices (BMP) manual. Team leaders returned all insecticide bottles/sachets (both empty and unused) to the site storekeeper.

### 2.3.3 PROCUREMENT AND LOGISTICS

Based on the findings of the logistics needs assessment and the inventory remaining after the 2019 campaign, VectorLink Mali quantified the procurement needs for the 2020 campaign. Whenever possible, the project procured items locally to ensure cost effectiveness and timely delivery. Only certain PPE, spare parts for the Goizper sprayers, entomological equipment/reagents, and smartphones were procured internationally. The procurement of all commodities and services involved an open, competitive tendering process. (See Annex A for detailed lists of items procured locally and internationally and the post-campaign balance.)

During the district-level microplanning meetings held in March 2020, the VectorLink Mali team worked with public health officers, DTCs, and community supervisors to determine transportation (personnel and commodities) needs for the 2020 IRS campaign.

VectorLink Mali contracted 69 vehicles. They included 33 minibuses, 11 hard-top 4x4s, and 15 taxis to support IRS operations at the 28 operations sites, and as well as 10 vehicles to transport supervisors. The 69 vehicles included the 59 originally planned plus 10 that were rented to transport staff in compliance with the project's COVID-19 mitigation measures. To minimize the risk of insecticide exposure and spillage, all 4x4s that transported insecticide and minibuses that transported SOPs underwent a pre-contract vehicle inspection that certified them to operate according to BMP criteria.

In the weeks preceding the campaign, the Operations Manager, Logistics Coordinator, and Environmental Compliance Officer (ECO) deployed IRS commodities to all 28 operations sites. The distribution was done on time for Bandiagara and Djenné districts to start on June 15 as planned. Due to delays in the Fludora® Fusion WP-SB shipment caused by international supply chain disruptions related to the COVID-19 pandemic, the 11 operations sites in Mopti District started on June 29, two weeks later than scheduled.

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<sup>5</sup> The daily health check of spray teams included additional temperature check using contactless thermometers, as part of COVID-19 adaptations.

In all spray districts, the spray calendars were designed to start in the farthest locations from the operations sites and end in more central areas. The team worked in close collaboration with local authorities to assess safety and security conditions before traveling to certain districts, and occasionally deviated from the calendar to avoid suspicious activity (see Section 2.8).

During the campaign, storekeepers updated and maintained inventory records (stock cards, ledger books, and insecticide tracking forms) and managed the requests for and fulfillment of IRS supplies. Supervisors regularly checked stock records and conducted physical stock counts, with a focus on insecticides and other items with frequent movement, to ensure uniformity between delivery notes, stock cards, insecticide tracking forms, ledger books, and physical stock counts. Site supervisors and storekeepers liaised closely with the district coordinators and central warehouse managers to maintain adequate stock of all commodities, attaching copies of requests, goods issued, and goods delivery notes to diligently document the movement of materials throughout the region.

VectorLink Mali paid all IRS seasonal staff using Orange Mobile Money transfer. Electronic mobile payment provided a safe and secure way for the project to transmit over 94 million francs CFA (\$172,950.12) to seasonal workers. To use the mobile service, VectorLink Mali executed a contract with Orange Mali prior to the spray campaign. There were two payment cycles: the first payment was made 10 days after the start of the campaign, and the second at the end of the campaign. Orange transferred the money to the phone numbers the seasonal workers had provided. After each payment, Orange generated a system report as proof of payment; the report also showed unsuccessful transmissions that required a repayment to be sent.

### 2.3.4 IRS SUPERVISION

Staff from VectorLink Mali, and the NMCP/MOH, DNACPN, Regional Directorate for Sanitation and Pollution Control (*Direction Régionale de l'Assainissement et du Contrôle des Pollutions et des Nuisances*, or DRACPN), Service for Social Development and Economic Solidarity (*Service de Développement Social et de l'Economie Solidaire*, or SDES) and regional and district health offices collaborated to supervise IRS. Table 5 shows institutions/stakeholders that participated in IRS and level of supervision. Each category of supervisor was assigned targets and numbers of supervision forms to be submitted, by district.

**Table 5: Institutions/Stakeholders that Participated in IRS Supervision**

Level	Institution/Position	Responsibilities
National	NMCP/MOH, DNACPN	Overall supervision for IRS activities
Regional	Regional health officials, SDES regional officials, DRACPN officials,	Overall supervision at each operations sites
District	District Health officials, SLDES,* SACPN,** DTCs, district supervisors	Close supervision at each operations sites
VectorLink Mali staff	Abt Associates	Overall supervision of IRS activities

SLDES=Service Local de Développement Social et de l'Economie Solidaire, SACPN=Service d'Assainissement et du Contrôle des Pollutions et des Nuisances

Supervision of the IRS campaign had the following structure:

- SOPs were divided into teams of five, with one team leader supervising each team.
- Each community supervisor supervised two spray teams and reported directly to the DTC, who in turn reported to the VectorLink IRS district coordinator.
- VectorLink Mali implemented a supervision plan to ensure coordination of supervision and clear communication and follow-up so that corrective measures were implemented immediately.
- VectorLink Mali staff was informed daily of any red flags generated by CommCare during supervision and any alert the M&E team detected concerning the insecticide consumption of a given health area. This

helped the team prioritize which health areas to visit, and it served as a valuable mechanism for directing evidence-based deployment of the staff in areas where problems were identified.

- mHealth supervision checklists were used to assess the daily performance of SOPs and team leaders, as well as adherence to environmental compliance requirements and data collection protocols. This promoted real-time tracking and monitoring of issues observed by supervisors during spray operations.
- All operation sites used the Spray Performance Tracking Sheet on a daily basis. At the end of each day, community supervisors submitted summary data from this sheet to the IRS coordinator. The IRS coordinator compiled the data from the site sheets, updated the district Spray Performance Tracking Sheet, and submitted a daily report to the Operations Manager and VectorLink M&E staff.
- VectorLink Mali used operations site visitor books to record supervisory feedback. Every supervisor who visited the operations site noted their observations and recommendations in the book. The next supervisor would then follow up to make sure the recommended actions had been taken. In this way, issues were documented and those specific to each operations site had been properly addressed.
- The VectorLink Mali's staff and government supervisors, both at national and regional level, met remotely every Sunday to review campaign provisional results and progress, share observations from supervision, discuss challenges, and develop recommendations to be immediately implemented at all sites.
- During spray operations, VectorLink Mali used the Directly Observed Spraying checklist to ensure that all SOPs in the field were adhering to high-quality standards for spraying, and to standardize spray quality supervision by team leaders and other supervisors. Community supervisors entered houses to directly observe spray techniques, and correct and guide SOPs as necessary. Team leaders used the checklist to evaluate SOP performance, and community supervisors used it to monitor teams' and team leaders' adherence to this supervision protocol.

Supervisory system enhancements, which VectorLink Mali initiated during the 2019 IRS campaign, became routine practices for the 2020 campaign, carried out through the following steps:

- At the end of each day, community supervisors reviewed the data on the Spray Performance Tracking Sheet with the storekeepers and subsequently transmitted it to the CommCare server.
- Community supervisors held daily morning leadership meetings with team leaders and storekeepers, during which they discussed the Spray Performance Tracking Sheet data from the previous day. If the data showed any problems, the supervisors took remedial actions such as reminding the team leaders to communicate with SOPs to limit the team's production of wastewater and to avoid wasting insecticide. The community supervisor recorded the morning debriefing report in the visitor book and signed it and communicated the key messages to the teams during morning mobilization.
- Each site held a mandatory end-of-day meeting (in the evening, after work) every other day, attended by the DTC, the community supervisors, and the storekeepers. They reviewed spray performance rates, insecticide use, and difficulties encountered, and then proposed solutions. The meeting conclusions were reported on in the register used for the morning debriefing. The DTC signed the report of the evening meeting. When district coordinators visited a given site, they would review the register to ensure these meetings were being held and recorded, to reinforce the site-level team's accountability for monitoring performance and insecticide consumption.

## 2.4 INSECTICIDE

Based on 2019 monitoring, cone bioassay results suggested that both Actellic® 300CS and SumiShield® 50WG continued to provide adequate duration of effectiveness, with more than 80% mortality achieved (24 hours and 72 hours, respectively, after exposure) on the majority of wall substrates at least five months after spraying. This made both insecticides eligible for use in the 2020 campaign. Furthermore, World Health Organization (WHO) prequalification and country registration of Fludora® Fusion WP-SB (clothianidin+deltamethrin), a new IRS product that combines two insecticide classes (neonicotinoid and pyrethroid) for dual modes of action, enabled the project to use an additional IRS insecticide, in line with Mali's rotation strategy for insecticide resistance management.

In this context, the project worked with the NMCP to select Actellic® 300CS for spraying in Djenné (which had sprayed SumiShield® 50WG for two consecutive years), SumiShield® 50WG for spraying in Bandiagara (which had sprayed Actellic® 300CS for two consecutive years), and Fludora® Fusion WP-SB for spraying in Mopti (which had sprayed SumiShield® 50WG in 2018 and Actellic® 300CS in 2019).

PMI VectorLink Mali estimated that 47,528 units of insecticide would cover the 2020 targets. Budget constraints did not allow procurement of any buffer quantity of insecticide. Table 6 shows the insecticide quantification, by district.

**Table 6: Insecticide Quantification, by District**

	<b>Bandiagara</b>	<b>Djenné</b>	<b>Mopti</b>	<b>Total</b>
Number of targeted rooms	78,963	50,906	127,123	256,992
Estimated number of units needed for 2020	15,428	9,505	22,595	47,528
Proposed insecticide	SumiShield® 50WG	Actellic® 300CS	Fludora® Fusion WP-SB	--
Number of units left over from 2019	313	9,646	N/A	9,959
Number of units procured for 2020	15,120	0	22,620	37,740

To avoid waste, since 2017 the project has emphasized communication between team leaders and SOPs to discourage the mixing of insecticide late in the spray day; instead, team leaders direct SOPs in need of additional insecticide to obtain it from SOPs who have extra. This practice worked so well in 2020 that in some health areas, SOPs rarely had any insecticide leftover in their sprayers at the end of the day.

Throughout the 2020 spray campaign, the VectorLink Mali team tracked insecticide consumption daily. The team used of the MS Excel-based tool developed in 2019 to compute insecticide utilization rates in each of the 28 health areas based on the daily Performance Monitoring Tool reports, and compare them with the utilization rates expected, based on the insecticide quantification. The results allowed the VectorLink team to remain confident that there was sufficient supply to spray all targets in all three districts. Where spray teams made faster progress – and thus consumed more insecticide – early in the campaign, the project team closely monitored consumption rates to ensure the insecticide would last.

Table 7 shows insecticide availability and consumption in 2020. In total, 46,921 bottles/sachets of insecticide were used to spray 129,302 structures.

**Table 7: Insecticide Use during the 2020 Campaign**

	<b>SumiShield® 50WG</b>	<b>Actellic® 300CS</b>	<b>Fludora® Fusion WP- SB</b>	<b>Total</b>
Total insecticide bottles/sachets available for 2020 campaign (leftover from 2019 + procured in 2020)	15,433	9,646	22,619	47,698
Total insecticide bottles/sachets used during the 2020 IRS campaign	14,965	9,646	22,310	46,921
Balance after the campaign	468*	0**	309***	777--

\* SumiShield® 50WG sachets (Exp: December 2022)

\*\* To exhaust the expiring inventory of Actellic® 300CS, two extra villages in Djenné district were sprayed.

\*\*\*Fludora® Fusion WP-SB sachets (Exp: February 2022)

## 2.5 INFORMATION, EDUCATION, AND COMMUNICATION

To ensure high spray coverage rates, VectorLink Mali used various IEC strategies before and during the spray campaign to create awareness and encourage households and communities to accept IRS while minimizing person-to-person contact in observance of the COVID-19 restrictions. These strategies included embedding mobilizers within spray teams and using mass media communication.

VectorLink Mali worked with regional and district public health officials to contract 11 local radio stations in the three spray districts to complement IEC activities. The project collaborated with the NMCP/MOH and SDSES to train the radio operators and strengthen their capacity to raise awareness about IRS and malaria prevention. Since Fludora® Fusion WP-SB was used for the first time in Mali in 2020, the project developed specific IEC messages to dispel any concerns about the new insecticide's effectiveness, compared with the two that were used in previous years.

Starting one month before the spray campaign began, during the campaign, and for one week after the campaign, community radio stations continuously broadcasted announcements with spray information and schedules. In addition, during the campaign, VectorLink Mali staff hosted weekly radio programs in collaboration with the national, regional, and district-level authorities and community leaders to support mobilization. 8,415 radio spots and jingles in Bambara, Fulfulde, and Dogonon were broadcast to promote the IRS campaign and engage beneficiaries in IRS. The radio spots aired three times a day from May 23 to August 15, 2020.

The interactive radio talk shows were held every Saturday at 11:00 am on “Djamana” radio and transmitted simultaneously with the 10 radio partners across the target districts. Beneficiaries were invited to call in to ask questions and share their concerns. The weekly shows featured government partners such as the NMCP/MOH, the Mopti regional health officer, the SDSES officer, and community leaders, as well as VectorLink Mali. These talk shows and other live interviews allowed the VectorLink Mali team to explain to listeners how essential it was to deliver IRS, especially during the COVID-19 pandemic, and to ensure listeners that all necessary precautions would be taken to keep them safe during the 2020 campaign.

Once the campaign started, IEC mobilizers visited individual houses on the day before the SOPs were scheduled to arrive to remind beneficiaries of their preparations responsibilities. The mobilizers then returned with the spray teams and afterward to reiterate key messages and provide information about insecticide effectiveness. Due to high acceptance rates in previous years, the mobilizers limited their messages to the practical components of spraying rather than education about malaria or IRS.

The VectorLink Mali team held meetings with village chiefs and their assistants, who were key to the project's achieving effective and successful community awareness and mobilization for spraying in 2019. The VectorLink team, in collaboration with the district health officers, met with the chiefs of five urban health areas in Mopti (on June 9, 2020) and the coordinator of the chiefs of eight urban areas in Bandiagara (on June 12, 2020). As in 2019, all the chiefs expressed their appreciation at being treated as major stakeholders in the community mobilization. Again, in return, they committed to carrying out their sensitization tasks with the utmost dedication.

## 2.6 CAPACITY BUILDING

To promote sustained vector control in the future, VectorLink Mali implemented the 2020 IRS campaign in close collaboration with the NMCP and DNACPN on the national level, and, in Mopti, with health officers at the regional and district level. Since 2018, three focal persons from each of the two national agencies have been formally assigned to work with the VectorLink Project on IRS activities. The government partners participated in all stages of planning, implementation, and supervision of IRS activities.

During the planning phase, VectorLink Mali worked with these partners to conduct the many preparatory activities including microplanning workshops, community awareness meetings, and trainings. Each activity included a working session to develop and assign a list of tasks to partners.

- VectorLink Mali organized master trainer meetings with three representatives from the NMCP and three from the DNACPN to prepare IRS campaign trainings and equip the representatives with the knowledge and skills required to effectively prepare seasonal workers to implement all aspects of high-quality IRS.
- VectorLink Mali worked with its government partners to facilitate training of radio operators, and to update key awareness messages to communicate.
- The government partners helped facilitate training of trainers (TOT) for the DTCs, and trainings of supervisors, team leaders, and storekeepers. The NMCP representatives co-delivered the technical training sessions (spray technique, data collection, and entomological monitoring), and the DNACPN representatives co-facilitated the environmental compliance component of the TOT and helped conduct the Pre-Season Environmental Compliance Assessment (PSECA) inspections. All government partners also played an active role in supervising SOP training.

During the campaign, national government partners participated in producing radio programs for community mobilization, supervising IRS activities, environmental compliance inspections, and weekly virtual meetings to discuss campaign progress, highlight issues, and develop solutions. Local government counterparts supported VectorLink Mali in addressing all challenges, including regarding mobilization.

Through this practical experience, NMCP demonstrated capacity to independently assume responsibility for:

- IRS planning: leading strategic meetings, quantifying insecticide and commodities, coordinating micro-planning, recruiting, and facilitating technical sessions for TOT;
- Conducting IRS supervision (using ODK); to verify spray quality, data quality, household preparation, respect of safety measures, storekeeper performance, and end-of-day clean-up quality; and
- Planning and facilitating post-spray review meetings.

The DNACPN demonstrated capacity to conduct pre-, mid-, and post-IRS environmental inspections, training, supervision, and waste management with minimal support from the project.

In future years, the VectorLink project will emphasize M&E and entomological monitoring skills to further equip the NMCP and DNACPN to implement IRS activities after the PMI VectorLink project ends (see section 6.3).

## 2.7 GENDER MAINSTREAMING

Because the roles and power relations between men and women affect how an activity is implemented, gender mainstreaming is key for the PMI VectorLink project. Therefore, prioritizing gender mainstreaming in IRS activities aims to help advance gender equality and empower women and girls to participate fully in and benefit from the development of their societies, as outlined in USAID gender-related policy. VectorLink Mali implemented a number of activities to promote gender mainstreaming. They included:

- Training: VectorLink Mali included gender sessions in all IRS trainings conducted (TOT, supervisors, SOP trainings). DTCs and supervisors received an orientation on the importance of gender mainstreaming for a successful IRS campaign. As a result, participants understood the importance of integrating more women into the spray teams and working toward their equal participation in all aspects of vector control.
- Advocacy: The VectorLink Mali team continued to advocate for increased participation by women in all vector control activities. The district microplanning meetings discussed the importance of equal representation of men and women as seasonal workers in all IRS activities. The project encouraged the selection committees set up in each spray health area to increase the recruitment of women as seasonal workers. It also collaborated with each district's Coordination of the Women's Associations and NGOs (CAFO) for awareness during the IRS campaign.
- Printed materials: The VectorLink Mali team posted anti-sexual harassment posters in all operations sites, at the district warehouses, and at the data entry center in Sévaré to encourage seasonal workers to report any and all forms of harassment they observe. The posters were printed in French.

- Gender-friendly work environment: VectorLink Mali ensured the work environment was suitable for mixed-gender teams by constructing separate and clearly labeled bathrooms and toilets for men and women in each operations site.

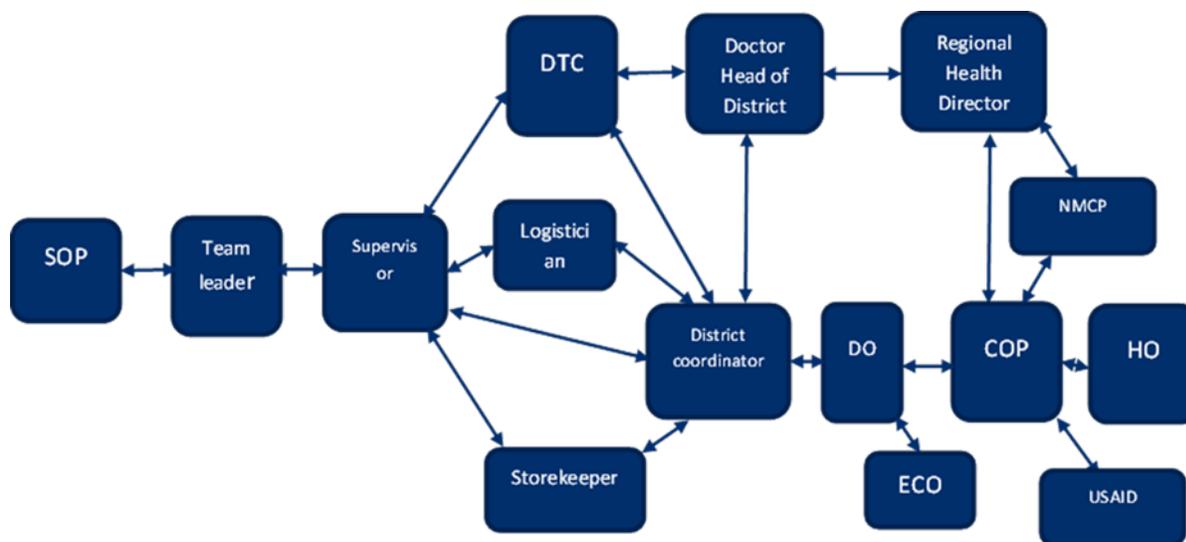
In the 2020 IRS season, women represented 25% (n=227) of the 915 people VectorLink Mali hired as seasonal staff, compared with 21% in 2019. Of the 441 people hired as SOPs, team leaders, and supervisors, 17%, 19%, and 16%, respectively, were women. Despite persisting resistance on the part of communities to women’s participation, the proportion of women SOPs increased slightly in 2020, by 13% from 2019.

## 2.8 SECURITY IN CENTRAL MALI

Given the unpredictable security situation in Mopti Region, VectorLink Mali developed security tools and procedures to mitigate risk to personnel during the 2020 IRS campaign. The measures included:

- Reactivation of Crisis Communication Mechanisms. The WhatsApp Group is an effective tool for communicating with and accounting for staff during an emergency and use of the communication chain developed in 2018 (Figure 2).
- Support and security guidance provided by Abt’s Director of Global Security, to enable the VectorLink Mali team to continually monitor the frequency and location of security incidents and mitigate the staff’s risk of harm before, during, and after spray activities.

**Figure 2: The VectorLink Mali Telephone Communication Chain**



As in past years, specific security management measures included:

- Every day at 7:00 pm, each VectorLink district coordinator updated the Operations Manager on the security situation in that district, based on information from DTCs. Any critical information was shared with the Chief of Party (COP) and discussed for the appropriate follow-up.
- The VectorLink Mali staff members used the telephone communication chain (see Figure 2) to share security information and verify security events of which they had been informed.
- DTCs confirmed that there was no known safety risk before authorizing spray teams to leave the operations site for the day’s targeted communities.
- Before supervisors visited an area, they consulted the DTC, so that they were well informed about the security status of the area.

- The VectorLink Mali team and Abt’s Global Security Office monitored the security situation through daily communication with local authorities and community leaders; they also monitored publicly available security data from sources such as the Armed Conflict Location and Event Data Project (ACLED).
- The project attached a summary of relevant events to the weekly spray progress report it submitted to PMI for their awareness.
- VectorLink Mali leadership systematically shared any security alert notice regularly received from the portal “International SOS” with the entire staff.
- The security situation also was updated during the weekly meeting held between VectorLink Mali staff and government supervisors.

During the campaign, security events directly affected two of the project’s targeted districts, Bandiagara and Djenné:

- On July 5, in week 3 of the campaign, vehicles travelling on National Road (NR) 15 near Goundaka (Bandiagara-Mopti) were attacked, and four people were killed. Two of them were off-duty seasonal staff. (See Incident report # MAL\_070520-001\_Health-Safety.) The spray team of the Goundaka health area took the day off to mourn the loss of their two colleagues and resumed IRS operations on the following day.
- Because the security situation remained tenuous in 10 targeted villages and hamlets in Djenné for the duration of the spray campaign, local authorities advised against the VectorLink team travelling there. Official written correspondence received from the local government and the regional and district health officers and shared with PMI is in Annex B. Table 8 lists the villages and hamlets.

**Table 8: Villages Not Sprayed Due To Security Concerns**

District	Health Area	Village	# Rooms Not Sprayed	Estimated # People
Bandiagara	Irely	Tendji-Irely	412	786
		Intemeni	461	891
	Goundaka	Makou	598	1122
	Songho	Denguembére	643	1294
		Goro	565	1359
		Songho (hamlet: OndonSahn)	105	246
	Iby	Neni-Damaguine (hamlet: Bronron)	78	135
	Sangha	Banani-Nah (hamlet: Tassogo)	112	254
Djenné	Bonguel	Kouffa-Dagadian (hamlet: Dagadian)	177	398
		Diongue Ouro	754	1376
<b>TOTAL</b>			<b>3,905</b>	<b>7,861</b>

## 2.9 COVID-19 RISK MITIGATION

During the planning and implementation of the 2020 IRS campaign, the VectorLink Mali team was committed not only to protecting the target population from malaria but also protecting the spray personnel, partners, and IRS beneficiaries from exposure to COVID-19. To do this, the project developed comprehensive risk mitigation measures, which were approved by PMI.

During training and pre-season activities:

- Training of all community actors on COVID-19 prevention.

- Shortening the length of certain training courses. For example the TOT was done in four days instead of the originally planned five days.
- Doing training in smaller groups (10–30) of participants, depending on size of the venue: This required five additional training sites. For example, the project rented one extra venue for the training of the 45 community supervisors and two extra for the training of the 77 team leaders.
- Installing handwashing stations at the entrance of each training venue. All participants were required to wash their hands prior to entering, and immediately upon leaving.
- Taking participants' temperatures using contactless thermometers before the participants entered the training room.
- Maintaining at least 2 meters physical distance from others at all times, even when wearing masks. Inside the training venues, chairs were spaced at least 2 meters apart.
- Requiring participants and trainers to wear face masks at all times, during and between training sessions, even when physically distant.

During the IRS campaign:

- Upon arrival of spray personnel at each operations site each day, the DTC or other designated person checked temperatures at the entrance to the site using an infrared thermometer.
- All personnel having to maintain a physical distance of at least 2 meters was maintained throughout the spray day, from breakfast and the morning briefing, to while travelling in vehicles to the spray sites and working in the community, and during end-of-day activities (Figure 3). Workers could not shake hands with anyone, either on the team or with homeowners.
- Team members washed their hands, using the handwashing station installed at the entrance to the site or hand sanitizer.
- In addition to the temperature check at entry to the site, the daily health check included a check for symptoms of COVID-19 such as cough, congestion, and loss of smell or taste.
- When it was time to depart the operations site for the spray area, SOPs stood in line to enter the vehicles. Ten persons traveled in a vehicle with an 18-passenger capacity, four persons in a six-seat "taxini." To accommodate this, the VectorLink team increased the number of vehicles, or when distances between the operations and spray sites were short, had vehicles make two trips. All passengers maintained maximum physical distance within the vehicle at all times and wore masks throughout the journey.
- Mobilizers, supervisors, and all spray personnel wore an issued N-95 mask at all times.
- At the end-of-day clean-up at operations sites, the SOPs were aligned in rows to access the rinsing area while respecting physical distancing.
- All IRS vehicles were sanitized twice daily with chlorinated disinfectant: before the morning trip to spray sites and at the end of the day.
- At end of the day, all smartphones and workstations (at the data entry center) were cleaned with alcohol-based solution. All mobile devices were assigned to the same person for the duration of the campaign.
- During supervision visits, the VectorLink and government supervisors, each wearing a face mask, reminded spray personnel to strictly adhere to COVID-19 prevention measures.
- The VectorLink Mali team made all weekly coordinating meetings virtual. These included the internal staff meeting on Saturday and the meetings to review campaign progress, attended by the VectorLink Mali team and government supervisors every Sunday.

**Figure 3: In the Time of COVID-19: Social Distancing Throughout the Spray Day**



# 3. ENTOMOLOGICAL MONITORING

Entomological surveillance is a key component of IRS programming, providing information on the quality of IRS operations, the residual efficacy of insecticide applied, and vector susceptibility to insecticides used for malaria vector control.

## 3.1 MOSQUITO SUSCEPTIBILITY

In 2019, the VectorLink Mali project collected larvae in the three IRS sites of Bandiagara, Djenné, and Mopti, and in 10 non-IRS sites. *An. gambiae* s.l. larvae were reared either in the field or at the VectorLink insectary in Bamako, and WHO susceptibility tests for pirimiphos-methyl (0.25%) and clothianidin (2%) were conducted on emergent adults aged 2–5 days. In 2019, full vector susceptibility to 0.25% pirimiphos-methyl was found in all 13 sentinel sites (24 hours after exposure). *An. gambiae* s.l. were susceptible to clothianidin in all the sites surveyed, including the IRS sites (100% mortality reached within 48 hours of exposure). As described earlier, the 2020 IRS campaign used SumiShield® 50WG (clothianidin) in Bandiagara, Actellic® 300CS (pirimiphos-methyl) in Djenné, and Fludora® Fusion WP-SB (deltamethrin and clothianidin) in Mopti as part of a rotation strategy for insecticide resistance management.

## 3.2 IRS QUALITY ASSESSMENT AND RESIDUAL EFFICACY

Quality assurance testing was performed in all three IRS districts (Table 9) 2–3 days after IRS using cone bioassays on sprayed walls. The bioassays were carried out with a laboratory-reared susceptible colony of *An. coluzzii* Ngousso strain according to VectorLink SOPs<sup>6</sup>. Cone bioassays were conducted in a total of 30 structures (10 in each district) per month. Four wall types (mud, painted mud, cement, and painted cement) were tested; Table 10 shows the number of each type of wall tested in each district. Negative controls were performed in parallel with mosquitoes exposed to untreated portable substrate blocks. The contribution of airborne effects to overall mortality in cone bioassays was also assessed using fumigant bioassays. Thus, 10–12 females of the *An. coluzzii* susceptible strain were introduced into a cage approximately 10 cm away from the sprayed wall and about 1.0 m above the floor. The mortality rates were recorded 24 hours after exposure for Actellic® 300CS and every 24 hours up to a maximum of seven days for SumiShield® 50WG and Fludora® Fusion WP-SB.

**Table 9: IRS Cone Bioassay Surveillance Sites for 2020**

District	Health Area	Site (village)	Spray Status	Insecticide Sprayed	Geographic Zone	IRS History
Mopti	Sokoura	Sarema	Sprayed	Fludora® Fusion WP-SB	Sahelian	2017 OP, 2018 NN, 2019 FF
Bandiagara	Bandiagara Central	Dandoli	Sprayed	SumiShield® 50WG		2017 OP, 2018 OP/NN, 2019 NN
Djenné	Madiama	Madiama	Sprayed	Actellic® 300CS	Sahelian Flooded	2017 OP, 2018 NN, 2019 OP

<sup>6</sup> <https://pmivectorlink.org/resources/tools-and-innovations/>

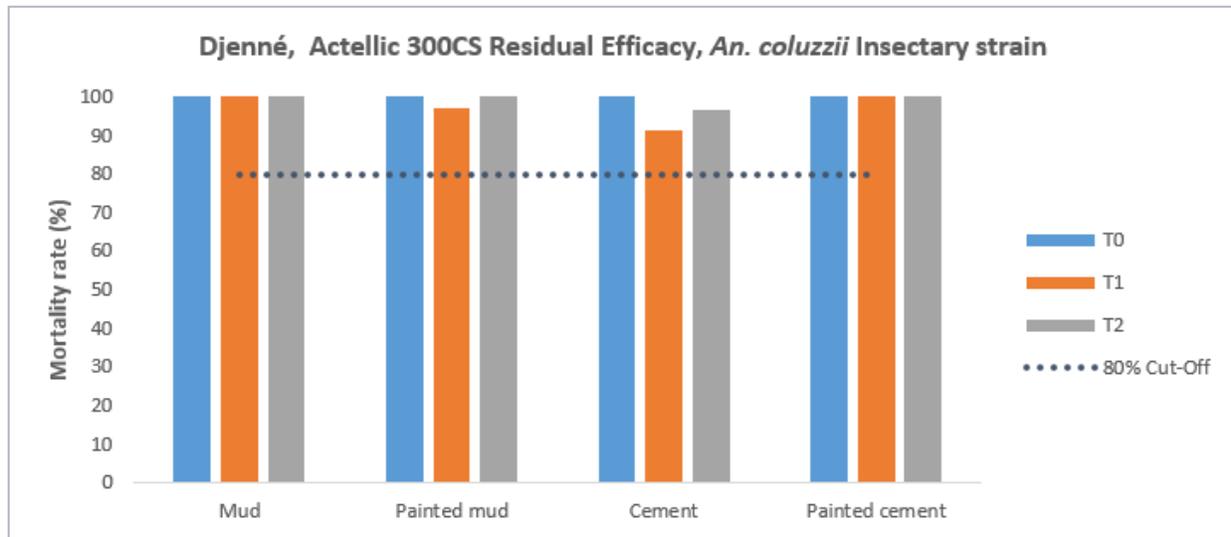
**Table 10: Number of Each Type of Wall Tested after the 2020 spray**

Districts	Site (village)	Mud (N)	Painted mud (N)	Cement (N)	Painted Cement (N)
Mopti	Sarema	6	3	1	0
Bandiagara	Dandoly	9	0	1	0
Djenné	Madiama	4	3	1	2
<b>Total</b>		<b>19</b>	<b>6</b>	<b>3</b>	<b>2</b>

### 3.2.1 CONE BIOASSAYS

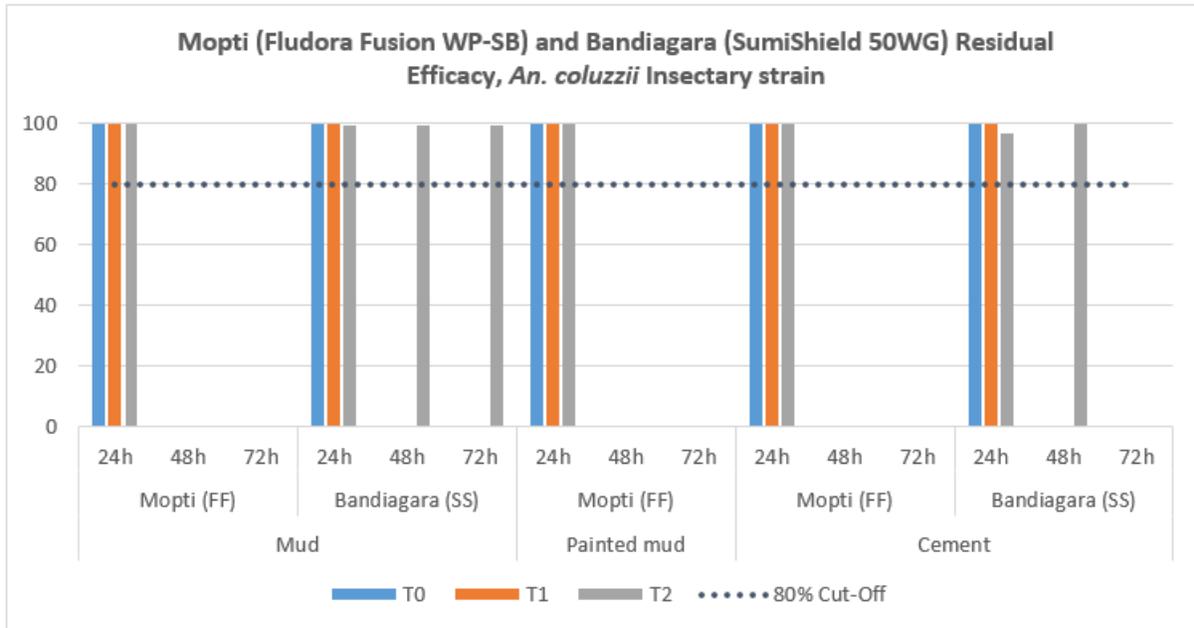
WHO cone wall bioassays at T0 (within five days after spraying) produced 100% mortality of susceptible *An. coluzzii* no matter the insecticide or the type of wall surface tested in all IRS districts (Figure 4 and 5). At T2 (two months after spraying), full mortality (100%) was recorded on all types of wall surface in all three sites, except on cement walls in Djenné, where mortality was 96.8% (Figure 4).

**Figure 4: Results of Cone Bioassay with Insectary-Reared Susceptible *An. coluzzii* Ngouso Strain in Djenné, June–August 2020**



Note: The dotted line at 80% mortality indicates the WHO threshold for residual efficacy.

**Figure 5: Results of Cone Bioassay with Insectary-Reared Susceptible *An. coluzzii* Ngouso Strain in Mopti and Bandiagara June–August 2020**

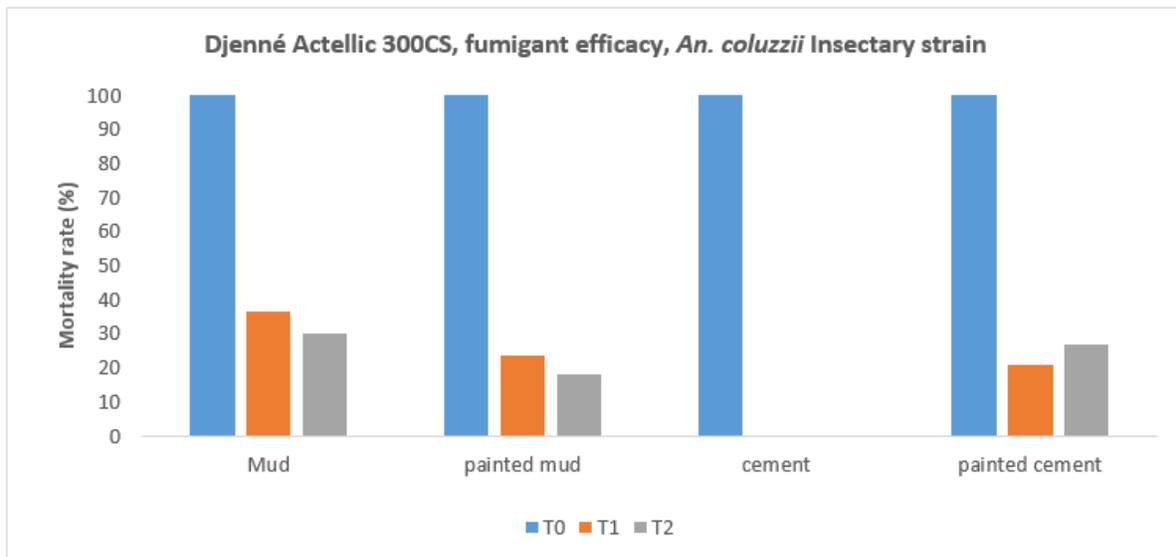


Note: The dotted line at 80% mortality indicates the WHO threshold for residual efficacy.

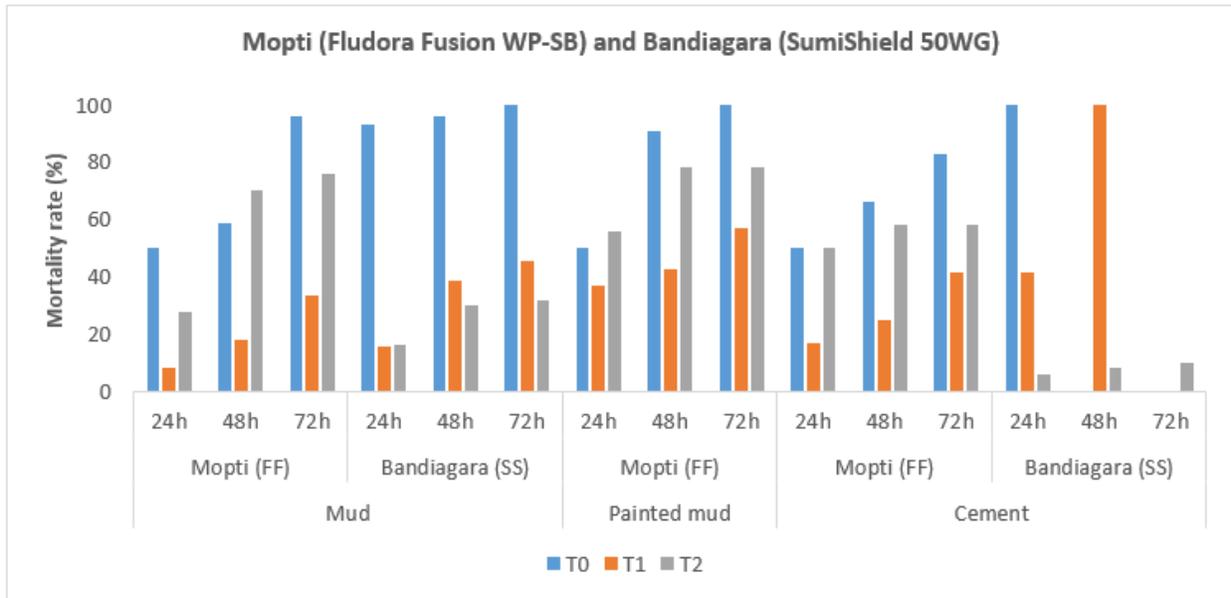
### 3.2.2 FUMIGANT EFFECT

The mortality rate was very high (83–100%) 2–3 days after IRS (T0) for all three insecticide formulations. At T1 (one month) after IRS, mortality decreased and varied from 0% on cement walls sprayed with Actellic 300 CS in Djenné (Figure 6) to 100% on SumiShield 50 WG sprayed cement walls in Bandiagara (Figure 7). At T2 (two months) after IRS, fumigant mortality was <30% in Djenné for houses sprayed with Actellic 300 CS and also <30% in Bandiagara for houses sprayed with SumiShield 50 WG. Fumigant mortality was 60–80% in Mopti in houses sprayed with Fludora Fusion WP-SB after 72h holding period (Figure 7).

**Figure 6: Results of Fumigant Bioassays Testing Following IRS in Djenné, June–August 2020**



**Figure 7: Results of Fumigant Bioassays Testing Following IRS in Mopti and Bandiagara June–August 2020**



# 4. ENVIRONMENTAL COMPLIANCE

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VectorLink Mali operates under the Supplemental Environmental Assessment (SEA) that was approved in June 2016 and amended in July 2018. The SEA and amendment authorize the nationwide use of approved insecticides for IRS in the pyrethroid, carbamate, organophosphate, and neonicotinoid classes and chlorfenapyr (pyrrole class) when recommended by the WHO Prequalification (WHO-PQ) team. For the 2020 spray campaign, VectorLink Mali prepared a Pre-Spray Letter Report in April 2020 that highlighted the environmental compliance plan and choice of insecticides for the campaign.

The status of the project's environmental mitigation and monitoring measures are documented in Annex C.

## 4.1 IRS CAMPAIGN ASSESSMENTS

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

Initial PSECA's were conducted on February 6–18, 2020, at all 28 operations sites using checklists embedded on smartphones. Data collected from the smartphone were uploaded to the Abt Associates environmental compliance database and generated a “Greenlight” if the site was ready or a worklist for remedial action to be taken if there was a deficiency. The worklists generated by the ODK application during the initial PSECA were complemented by the inspection team's trip report, which contained more detailed recommendations for addressing the deficiencies.

VectorLink Mali resolved all deficiencies identified during the initial PSECA and brought all operations sites (including 40 fixed soak pits and 13 mobile soak pits) into compliance. The final PSECA, completed two weeks before the scheduled start of the campaign, verified the completion of all rehabilitation activities and the readiness of each operations site. An authorization meeting was held with the Home Office Environmental Compliance Manager to authorize insecticide deployment to operations sites that have met all requirements.

To reinforce compliance with environmental guidelines, monitoring and supervision using five checklists embedded on smartphones. All non-compliance issues were resolved in collaboration with the Operations Manager and the coordinators in a timely manner. Challenges experienced and lessons learned are detailed in Section 6.

VectorLink Mali in collaboration with the MOH ensured that all SOPs and team leaders underwent medical examinations in June 2020 in order to assess their physical fitness for IRS operations. Pregnancy tests were administered to all female seasonal workers who would be working with the insecticides, namely SOPs, team leaders, spray supervisors, guards, storekeepers, and washers, to ensure that no expectant or nursing mothers were at risk of insecticide exposure. No positive pregnancy test was recorded.

In September 2020, VectorLink Mali will conduct the Post-Season Environmental Assessments in all 28 sites using the smartphone-embedded checklists. These assessments will confirm that all IRS items, including insecticides and IRS waste, are collected from the operations sites and returned to the central warehouse, all soak pits and their surroundings areas have been cleaned, cleared of any waste, and secured with locks, and all wash areas were covered with plastic sheets to prevent vandalism as well as contamination by humans and animals.

## 4.2 INCIDENT REPORTS

As described in Section 2.8, Security, VectorLink Mali reported one incident (MAL\_070520\_Health-Safety), an armed attack on vehicles that killed four persons, including two off-duty VectorLink staff (one SOP and one security guard) from the Goundaka health area in Bandiagara District.

## 4.3 DEMOBILIZATION & WASTE MANAGEMENT

Following completion of IRS operations, the site storekeepers updated their stock records and balanced inventory records before closing the storerooms. Subsequently, VectorLink Mali segregated, collected, and transported all commodities from the operations site stores to the two central warehouses in Bandiagara and Sévaré.

In 2016, the project signed a Memorandum of Understanding with Bi Niama Sini Sanou (BNSS) plastic recycling company, which transforms bottles into sheaths, trash cans, and PVC pipes. All empty Actellic® 300CS bottles will be rigorously washed with detergent, pierced, and transported to BNSS along with other plastic waste. All insecticide sachets and other contaminated waste such as nose masks, activated carbon, used wipes, and Tyvek suits will be incinerated by trained operators at VectorLink Mali's incinerator at the Noumoubougou landfill. Paper waste such as empty insecticide cartons will be disposed of at the health area level through local burners. Uncontaminated PPE will be offered to the spray staff for personal use after thorough washing with soap and water. Details on solid waste disposal plans are shown in Table 11.

**Table 11: Type, Quantity, and Disposal Method of 2020 IRS Solid Waste**

Waste Type	Quantity	Disposal Method	Date of Disposal
Empty SumiShield® sachets	14,965 Pcs	Incineration	October 2020
Empty Fludora® Fusion WP-SB sachets	22,310 Pcs	Incineration	October 2020
Contaminated cardboard	1,226 Pcs	Incineration	October 2020
Nose masks	17,465 Pcs	Incineration	October 2020
Activated carbon	78 kg	Incineration	October 2020
Tyvek suit	285 Pcs	Incineration	October 2020
Empty Actellic® 300CS bottles	9,646 bottles	Recycling	September 2020
Gloves	744 Pcs	Recycling	December 2020
Helmets	46 Pcs	Recycling	December 2020
Plastic sheets	77 Pcs	Recycling	December 2020
Face shields	400 Pcs	Recycling	December 2020

# 5. MONITORING AND EVALUATION

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All M&E activities and processes for the 2020 IRS campaign closely followed the processes outlined in the PMI VectorLink Mali 2020 Work Plan and the M&E Concept Paper developed by the PMI VectorLink core team. M&E activities, under the supervision of the COP, were led by the VectorLink Mali M&E Manager and the Database Manager. Two M&E Assistants per district worked across the operational sites, and two were based at the data center.

## 5.1 DATA COLLECTION, ENTRY, AND QUALITY ASSURANCE

Building on the success of the mobile phone data collection pilot projects in Burkina Faso and Kenya, the VectorLink Mali project implemented the VectorLink Collect DHIS2-based system for data management and reporting for 2020 IRS campaign. BAO Systems, the team from Abt's Data Science, Surveys, and Enabling Technology (DSET) division, and the VectorLink home office M&E team developed a special ETL process to link the Ona platform to the VectorLink DHIS2 instance to serve as the primary, centralized database across the VectorLink Mali project. The primary objective of mobile data collection is to facilitate reporting and operational decision making during the spraying campaign. This provides near real-time spray coverage results and can be used to assist with data-cleaning activities. All electronic data are securely stored and backed up on VectorLink servers, cloud-hosted by the BAO Systems team.

Data flow started with the SOPs who served as primary data collectors; data that they collected were verified by team leaders, who then completed summary forms. Data quality assurance was carried out daily during the IRS campaign by a variety of VectorLink staff (SOPs, team leaders, M&E assistants, supervisors, data transporters, IRS coordinators, M&E manager, and database manager). Specific activities conducted to ensure data quality included physical data verification at three levels:

- SOP level: Team leaders and the supervisors reviewed and verified data collected via ODK application on mobile phones, and then synchronized to VectorLink Collect Servers.
- District level: IRS coordinators, district officials, and DTCs received the paper forms (Team Leader Daily IRS Data Summary Form, Insecticide Distribution and Management Form, Operator Health Check Form, and Daily IRS Stakeholder Attendance Form) from the supervisors. IRS data transporters delivered the other data collection forms to the data center each evening for classification and archiving.
- Campaign level: The M&E team worked daily on the SOPs performance and constantly communicated with M&E Assistants, who in turn communicated with the field teams to improve the results. The daily insecticide monitoring tool was updated and shared with the entire VectorLink Mali team to guide supervision at operational sites that had unexpectedly high insecticide consumption rates. Finally, daily monitoring of spraying coverage and progress by health area was done on VectorLink Collect to guide the field teams.

## 5.2 MHEALTH

VectorLink Mali collaborated with Dimagi to ensure quality reporting and supervision in all target districts. The team implemented the best attributes of the IRS reporting system from 2019, including the content and format of inputs and outputs. The Dimagi platform included:

- Daily reminder messages: Daily SMS reminders (job aids) sent to SOPs, team leaders, supervisors, and IRS coordinators.

- Performance Monitoring Tool data: This system was used to update data and send daily reports. The Dimagi platform collected and sent out daily aggregated summary data on spray performance for target health areas and districts.
- Supervisory checklists: This system was used to update and send out daily supervisory checklist reports and included:
  - SOP morning mobilization inspection
  - SOP transportation vehicle inspection
  - Homeowner preparation and SOP performance
  - Storekeeper performance inspection
  - End-of-day clean-up inspection

Results from the Dimagi platform show that in 2020 there was generally a better use of the supervisory checklist application than in 2019. A total of 2,998 inspection forms were submitted (against 2,232 expected) by the community supervisors, including 1,000 Homeowner Preparation and Spray Operator Performance forms, 560 End-of-Day Clean-Up Inspection forms, 434 Storekeeper Performance Inspection forms, 564 SOP Morning Mobilization Inspection forms, and 440 SOP Transportation Vehicle Inspection forms. The expected numbers of the different types of forms were 558, 372, 372, 558, and 372, respectively.

## 5.3 RESULTS

The complete list of program indicators for the 2020 spray campaign is presented in the M&E Plan matrix in Annex D. The following sections provide summaries on the core PMI indicators and other spray indicators.

### 5.3.1 SPRAY COVERAGE AND PROGRESS

The 2020 VectorLink Mali campaign sprayed 129,302 of the 133,426 structures found by SOPs, for a spray coverage of 96.9% and a spray progress of 107.8%, as seen in Table 12. A total of 503,043 people were protected, including 34,462 pregnant women and 87,606 children under 5.

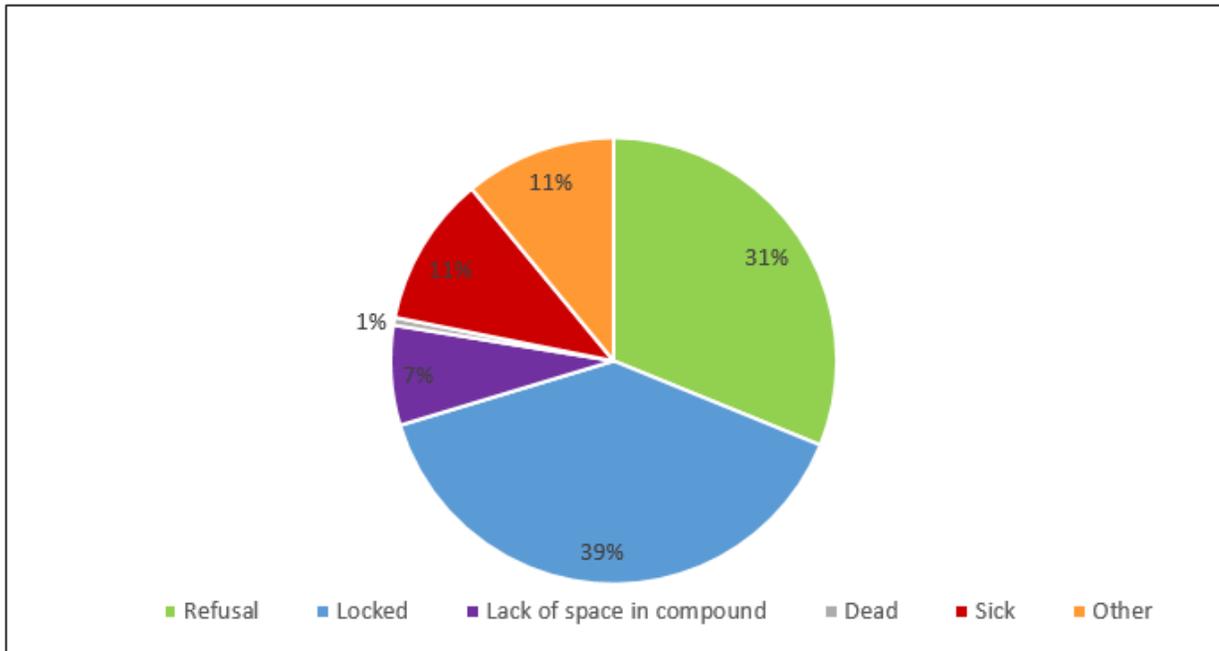
**Table 12: Spray Coverage and Population Protected**

District	Eligible Structures Found	Structures Sprayed	Spray Coverage	Population Protected				
				Males	Females	Total	Children <5	Pregnant Women
Bandiagara	38,500	36,945	96.0%	66,497	68,440	134,937	22,700	6,886
Djenné	27,822	27,450	98.7%	55,726	58,504	114,230	21,664	7,793
Mopti	67,104	64,907	96.7%	126,562	127,314	253,876	43,242	19,783
Total	133,426	129,302	96.9%	248,785	254,258	503,043	87,606	34,462

### 5.3.2 STRUCTURES NOT SPRAYED

In the 2020 IRS spray campaign, 4,214 structures (3.2% of total structures found) were recorded as unsprayed (as compared with 3.3% in 2019). The reasons for structures not being sprayed were: refusals (31.2%), locked structures (39.2%), sick person in the structure (10.9%), lack of space in compound (7.2%), “other” (11%), and dead (0.6%) (Figure 8). Refusals and locked structures were more common in the Bandiagara Central, Kamba, and Bendiely health areas (in Bandiagara District), and Sévaré 2 and Socoura health areas (in Mopti District). Only one health area (Bendiely) had spray coverage lower than 85% (82%) due to high numbers of structures being used for post-harvest onion storage.

**Figure 8: Reasons for Structures Not Sprayed (n=4,214 structures)**



In some cases, SOPs were prevented from entering multi-structure compounds (most often in Mopti town) and so they were unable to count or record the number of structures that were left unsprayed. These refusals were not captured in VectorLink Collect.

# 6. CHALLENGES AND LESSONS LEARNED

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Despite being implemented in the context of the COVID-19 pandemic and security risks across Mopti Region, the VectorLink Mali 2020 IRS campaign was successful overall. As with any IRS campaign, the VectorLink team encountered several challenges. These challenges, lessons learned and recommendations are listed for improving IRS implementation in 2021.

## 6.1 CHALLENGES

Security issues:

- Security risks continued in certain villages and hamlets of Mopti Region, and they prevented the senior supervisory team (from national and regional levels of government and VectorLink Mali) from conducting supervision there. In these cases, supervision was done at the district level and verified by the DTC. Upon receipt of any information transmitted by the DTC, the VectorLink operations and M&E teams reviewed them carefully. They then contacted the DTC to discuss the situation and ensure that problems identified were properly addressed.
- Security risks also prevented spray teams from travelling to (and spraying) some locations. District authorities provided official notification not to travel to or deliver IRS to these areas (see Annex B).
- Security issues sometimes prevented spray teams from adhering to the spray calendar. When these conditions existed, the spray teams either went on to another, safer village or returned to the operations site and sprayed one of locations nearby that had been scheduled for later in the campaign. For example, in week 2, the spray teams had to cancel their trips to Dagandjan, a hamlet in the health area of Bonguel (Djenné). In week 3, spray teams were not allowed to access certain villages located in the three health areas of Sangha, Irely, and Iby (Bandiagara). As a result, other locations were sprayed. The DTC and coordinator contacted the chiefs of the villages that could not be sprayed to reschedule the spray date, which would take place at the chief's invitation and based on the security situation. This had a negative impact on daily SOP output; even when spray teams could visit these villages, they found poor household preparation as a result of the schedule change.
- The most serious security incident that occurred during the campaign was the death of two off-duty community seasonal staff (a SOP and security guard) from the health area of Goundaka (Bandiagara), following an armed attack on July 5. The VectorLink team gave that day off to all personnel in the health area and hired two substitutes to ensure the campaign would continue normally and achieve the objectives set out in the microplanning.

COVID-19:

- The other serious challenge to the 2020 IRS campaign was the COVID-19 pandemic, which required adapting IRS activities to ensure staff and beneficiary safety. As of June 14, prior to the campaign, Mali reported a nationwide total of 1,809 confirmed COVID-19 cases, including 110 (in Mopti District), 7 (in Bandiagara), and 13 (in Djenné). By the time the campaign ended, the nationwide total had increased to 2,582 (cumulative since March 25, when counting began), with 156 cumulative cases reported in Mopti, 16 in Bandiagara, and 13 in Djenné. The pandemic meant introducing necessary and extensive COVID-19 mitigation measures to prevent spread of the disease and to ensure an uninterrupted IRS campaign. As a result, no positive cases were recorded among project staff, spray personnel, or beneficiaries during the campaign.

Mobile data collection:

- 2020 was VectorLink Mali's first campaign using smartphones to collect spray data. Every SOP was trained on how to collect data via the smartphone. Team leaders reviewed the phones daily, before syncing the data with the VectorLink Collect database. During the first week of the campaign, some SOPs in some operations sites had difficulties transitioning to the use of phones; they collected their data on paper, and the data then were manually entered into VectorLink Collect. Fortunately, as the campaign continued, these SOPs became able to use the digital tool, and henceforth all SOPs successfully collected data on mobile devices.
- For reasons of poor or non-existent internet coverage, the teams of four operational sites in Bandiagara and Djenné districts had to move to a centralized area to submit data to the server every two to three days, depending on the rest days of the relevant sites.

Other:

- Despite advocacy done in each targeted district and communities' promises to support the project efforts to increase the representation of women to 30% of IRS seasonal workers, the percentage of female SOPs remained well below the target (25%), even though it increased slightly (13%) from 2019.
- IRS progress was higher than expected in the first weeks. Using the robust supervision and tracking tools, the team determined that it was likely due to the transitions in the spray calendar to areas with increased density of rooms and smaller than average structure being sprayed earlier on. The team also reported new constructions in the Djenné and Mopti Districts. Additionally, high IRS acceptance rates from community leaders likely correspond to the high spray coverage rate reported. Ultimately the team successfully managed the insecticide supply, but these increases in progress year after year will be accounted for in quantifying insecticides for future campaigns.
- As in previous years, household preparation was challenging in some urban areas in Mopti town. Residents were reluctant to remove household items for spraying, either because they didn't have permission from the head of household, or because the items were too many.

## 6.2 LESSONS LEARNED

- Maintaining an effective, constant, and clear chain of communication among people involved in the IRS campaign and, importantly, complying scrupulously with government officials and local authorities, made it possible to reduce spray teams' exposure to risks and insecurity.
- During the 2020 IRS campaign, VectorLink Mali fully achieved its transition to mobile data collection. Compound-level data collection and quality were significantly improved. This made updated data available faster in the VectorLink Collect database and dashboard, resulting in greater transparency about the campaign performance indicators for PMI and government partners.
- Implementation continued of improvements to the supervisory system and insecticide management system developed in 2019. Making both elements part of routine practices was key to the success of the 2020 IRS campaign. The complementary systems helped ensure efficient monitoring of the campaign progress, including insecticide consumption. For example:
- With initial higher-than-expected progress in some areas, the team used these tools to ensure that insecticide quantities would last through the campaign.
- In week 5 of the campaign, the team projected approximately 500 hundred units of Actellic (expiring in December 2020) would be left over after reaching all targeted areas in Djenné. With support from the NMCP and PMI, the project was assigned two additional villages (Balessena and Sirimou) not originally in the target area. Their spraying used up the expiring inventory without adding operational days even as it protected additional population.
- When reduced funding forced VectorLink Mali to reduce the IRS target area in 2020, the project prioritized certain urban centers of Mopti and Djenné for exclusion because spray teams faced persistent challenges in previous years due to many compounds having insufficient space to prepare safely for IRS. Excluding

such areas helped spray teams save time, efficiently exceed their daily performance targets, and maintain timely campaign progress.

- Based on both PMI and government guidelines, developing and implementing an effective and realistic plan to mitigate the spread of COVID-19 was key to reducing spray teams', communities', partners', and staff's exposure to the disease. This required adapting IRS activities, sound preparedness, and continuous promotion of awareness for strict adherence to the prevention measures. As a result, no staff or IRS beneficiaries contracted COVID-19 during the project's activities, and beneficiaries are protected from malaria.

## 6.3 RECOMMENDATIONS

- Continue to advocate for increased participation by women in IRS activities. During district microplanning meetings, the VectorLink team will continue discussing with stakeholders how progress can be made toward the target of having women constitute 30% of seasonal workers in the 2021 IRS campaign.
- Based on past years' experience with effective communication between team leaders and SOPs before they mixed a unit of insecticide toward the end of the day, the VectorLink Mali team recommends that the 2021 IRS campaign extend such communication to community supervisors. This will minimize spray teams returning from the field with mixed insecticide and significantly rationalize the use of insecticide by SOPs.
- Continue to work hand in hand with the NMCP and DNACPN when implementing IRS activities in order to continue building their capacity to do it themselves, with a particular emphasis on building M&E and entomological monitoring skills in subsequent years<sup>7</sup>. The project will engage the designated national representatives in these activities, from the development through use and analysis.
- VectorLink Mali will initiate discussions with the NMCP and DNACPN to determine together if any targeted capacity building could complement the project's overall support and identify which responsibilities could be transferred to the government representatives in 2021.

## 6.4 CONCLUSION

The 2020 Mali IRS campaign was very successful despite the ongoing COVID-19 pandemic, security challenges, and the reduction in available funds. The numbers of pregnant women and children who benefited from IRS remained relatively high despite the decrease in number of health areas targeted from 53 in 2017, to 47 in 2018, 35 in 2019, and 28 in 2020. For example, 35,484 pregnant women were protected by PMI-supported IRS across 35 districts in 2019 while 34,462 pregnant women were protected across 28 health areas in 2020, representing a 3 percent decrease in pregnant women protected between 2019 and 2020. The number of children under five protected similarly only decreased by 11 percent (from 98,217 to 87,606) in the same time frame despite a 20 percent reduction in target health areas.

This success achieved despite such challenges has been possible because of the resilience demonstrated by the VectorLink Mali team and their counterparts in addition to the strong relationships with the government allowing the project to make difficult decisions with their support, to continue operating safely, and to protect Malians from malaria despite reductions in PMI funding.

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<sup>7</sup> Vectorlink project focuses exclusively on programmatic/technical support, though it should be noted that financial/administrative management skills are also essential in increasing national capacity.

# ANNEX A: 2020 Post-IRS INVENTORY

Item Description	Balance after 2019 IRS Campaign	Number of Items Procured 2020	Stock Before 2020 Campaign	Consumed/ Unusable Stock after 2020 IRS Campaign	Usable Stock Remaining for 2021
<b>International Procurement</b>					
Insecticide, Actellic 300CS / Exp Feb 2021	9,646	00	9,646	9,646	00
Insecticide, Fludora Fusion WP SB / Exp Feb 2022	00	22,619	22,619	22,310	309
Insecticide, SumShield 50WG / Exp Dec 2022	313	15,120	15,433	14,965	468
Spray Pump Goizper	978	00	978	67	911
Helmet	917	00	917	57	860
Bright Red Vest	119	00	119	13	106
Bright Green Vest	234	00	234	27	207
Gumboots	1,393	00	1,393	23	1,370
Coverall	2,483	00	2,483	24	2,459
Full Coverall	00	34	34	00	34
Tyvek Coverall /Mobile Soak Pit Teams	288	00	288	210	78
Tyvek Coverall /not suited for IRS	1,595	00	1,595	00	1,595
Wipes “lingette”	9,189	00	9,189	7653	1,536
Thermometer, Simple /or Electronic	72	00	72	01	71
Gloves	849	1,440	2,289	594	1,695
Respirator Mask	3,480	30,000	33,480	18,240	15,240
Face Shield	711	250	961	400	561
Support Face Shield	2,467	00	2,467	32	2,435
Complete Handle /Goizper	233	00	233	104	129
Complete Handle ( sans cylindre)	00	190	190	00	190
Handle	106	00	106	106	00
Hose /Goizper	137	20	157	18	139
Team Leader Survey Kit 7.5 /Goizper	241	150	391	187	204
Pressure Regulator /Goizper	227	00	227	119	108
Fan Even Nozzle /Goizper / Buse	595	00	595	00	595
Filter Simple /Goizper	291	00	291	35	256
Safety Valve 2.5 Bar /Goizper	607	00	607	37	570
Assembly (583,1175,19) /Goizper	208	00	208	123	85
Filter with Gaskets /Goizper / Round Gasket AN8	1,414	00	1,414	150	1,264

Item Description	Balance after 2019 IRS Campaign	Number of Items Procured 2020	Stock Before 2020 Campaign	Consumed/ Unusable Stock after 2020 IRS Campaign	Usable Stock Remaining for 2021
Lance Tube /Goizper	353	00	353	35	318
DISC HC 80 0.2 /3/Goizper /Ref1236	524	00	524	168	356
Valve /Goizper /Ref 165	346	00	346	123	223
Collar Seal /Goizper /Ref 613	524	00	524	305	219
Chamber Cover(158)	261	00	261	80	181
Cover Screw (180)	474	00	474	278	196
Key for Goizper Sprayer/ To Tighten Chamber	20	00	20	00	20
Activated Carbon /Kg	103	00	103	20	83

# ANNEX B: CORRESPONDENCE FOR NON-SPRAYED AREAS

REGION DE MOPTI  
CERCLE DE BANDIAGARA  
Commune Rurale de Sangha

REPUBLIQUE DU MALI  
UN PEUPLE – UN BUT – UNE FOI

**Monsieur le Maire de la commune de Sangha**

**A**

**Le coordinateur de PMIVECTOR LINK**

**Objet** : information sur la situation  
Sécuritaire dans la Commune

Dans le cadre de la mise en œuvre des activités de la campagne de Pulvérisation Intra-domiciliaire, j'ai l'honneur de vous informer de la situation d'insécurité prévaut dans certaines parties de la commune.

Suite à l'insécurité résiduelle dans les hameaux de Soban-Da, Soban – Dou, Bronron, Sabel, Gorogondou, Kara, Mana, Boudiguén, l'accès de ces différents Hameaux constitue une menace pour la vie des agents chargés de la pulvérisation Intra domiciliaire.

Veillez, croire Monsieur le coordinateur, l'expression de ma franche collaboration.

Sangha, 23 Juillet 2020

*P/ Le Maire*  
*Le secrétaire général*  
  
*Koussa Tame*

REGION DE MOPTI  
CERCLE DE BANDIAGARA  
N°2020-013/P-CB

REPUBLIQUE DU MALI  
Un Peuple -Un But -Une Foi

Le Préfet du cercle de Bandiagara

**A**

Monsieur le Coordinateur de PMI Vector Link

**Objet** : information sur la situation  
Sécuritaire dans le cercle

Dans le cadre de la mise en œuvre des activités de la campagne de pulvérisation intra domiciliaire, j'ai l'honneur de vous informer de la situation d'insécurité qui prévaut dans certaines parties du cercle.

Suite à l'insécurité résiduelle dans les villages de Goro et Deguemberé, l'accès à ces différents villages constitue une menace pour la vie des agents chargés de la pulvérisation intra domiciliaire.

Veillez croire Monsieur le coordinateur, l'expression de ma franche collaboration

Bandiagara le 13 juillet 2020  
P/Le Préfet P.O  
2ème Adjoint

**Ampliations :**  
Original.....1  
GRM.....1.P/CR  
Archives & Chrono.. 2/2

  
*Abdoulaye TRAORE*  
Membre du Corps Préfectoral

Région de Mopti  
District sanitaire de Bandiagara  
Centre de Santé Communautaire de Ireli

République du Mali  
Un Peuple-Un But-Une Foi

A Monsieur le coordinateur du Projet PID

Monsieur,

Nous sommes maintenant au terme de la pulvérisation intra-domiciliaire de la quatrième édition, mais je vous fais part de ma très grande tristesse pour la non-pulvérisation des villages de : Tendji-Ireli et Intemenou, à cause de la situation sécuritaire régnante dans ces zones, la route reliant à ces villages n'est pas accessible.

Monsieur le coordinateur, veuillez croire à ma version comme en témoigne l'attaque du 14/07/2020 à Intemenou et hameau à causé des pertes en vies humaines, les routes ne sont pas fréquentables les groupes armés font la navette.

**Ampliation**

Préfecture 1  
Sous-préfecture 1  
Mairie 1  
Archives 1

Ireli, le 21 Juillet 2020

Le Président ASACO  
Amadingué Lazare Douyon



La mairie P/O



AMAIGUERE A DOLO

Le sous Préfet P/O



Région de Mopti  
Cercle de Bandiagara  
Commune rurale de Doucombo  
Lettre N°010/CRDBO-CB-2020

République du mali  
Un Peuple-Un But- Une Foi

Doucombo, le 22 Juillet 2020

Le Maire de la Commune Rurale de Doucombo

A

Monsieur le Directeur du Programme PID

OBJET : Liste des villages n'ayant pas bénéficié des activités de Pulvérisation Intra-domiciliaire

Monsieur,

Les hameaux dont les noms suivent n'ont pas bénéficié des activités de pulvérisation intra- domiciliars suite à l'insécurité résiduelle :

Hameaux de Songho : Songhogare , Omoulouombo, Pogowal, Ondonsanh.

Hameau de Tillé : Tillékanda

Hameau de Sibo : Daga-Sibo

Monsieur, Veuillez croire à ma gratitude et mes considérations pour votre collaboration fructueuse.

Le Maire



BODOUN KASSOGUE

REGION DE MOPTI

REPUBLIQUE DU MALI

CERCLE DE BANDIAGARA

UN PEUPLE-UN BUT-UNE FOI

*Arrondissement de Goundaka*

*Le sous-préfet de l'Arrondissement de Goundaka*

A

*N° 04/SP-G*

Monsieur le Directeur du Projet PMI Vectorlink Mali

Objet :

Information sur la situation sécuritaire dans le cercle de Bandiagara.

Dans le cadre de la mise en œuvre des activités de la campagne de Pulvérisation Intra Domiciliaire, j'ai l'honneur de vous informer de la situation d'insécurité qui prévaut dans certaines parties de la commune de Pignari-Bana.

Suite à l'insécurité résiduelle dans les villages d'Ouro-fero, Toumpou, Piron, et Makou, l'accès à ces différents villages constitue une menace pour la vie des agents chargés de la pulvérisation intra domiciliaire.

Veillez croire Monsieur le Directeur, l'expression de ma franche collaboration.



*Goundaka, le 17 juillet 2020*

*Le sous - Préfet*  
*Maiga*

**Oumar Almansour MAIGA**  
Attaché d'Administration

REGION DE MOPTI

REPUBLIQUE DU MALI

CERCLE DE BANDIAGARA

UN PEUPLE-UN BUT-UNE FOI

COMMUNE RURALE DE SANGHA

**OBJET :** Notification des villages non pulvérisés

A

Monsieur le Directeurs du Projet de Vector Link PMI

Monsieur,

Je voudrais vous notifier que certains de mes villages et hameaux de l'aire de santé de Sangha ne pourront pas être pulvérisés pour des raisons sécuritaires durant la campagne de pulvérisation intra domiciliaire (Edition 2020).

Il s'agit :

- **Des Hameaux de Tereli :** Tereli-Guempto 1 et 2, Tereli-Kerekamana, Tereli-Bangala 1 et 2, Tereli-Binsoi 1,2,3,4 ; Tereli-Seguèrémassai, Tereli-Madina, Tereli-Mondial, Tereli-Anapiri, Tereli-Sono, Tereli-Baperin, Tereli-Danyangam, Tereli-Binesoi, Tereli-Ivénouwere, Tereli-Badeima, Tereli-amatoïn, Tereli-Yaloi, Tereli-Batrou, Tereli-Ponosèlè, Tereli-Douroubara.
- **Du Hameau de Banani-Nah :** Tassogo.

Nous apprécions la tenue de la campagne dans notre commune depuis 2017 et témoignons de l'efficacité de cette pulvérisation intra-domiciliaire comme stratégie efficace dans la lutte contre le paludisme. Cette réussite est visible durant ces dernières années car le nombre de cas du paludisme a drastiquement chuté.

En comptant sur votre bonne compréhension, Veuillez recevoir, Monsieur le Directeur l'expression de notre profonde gratitude.

Sangha, le 11 juillet 2020

Le 1<sup>er</sup> adjoint au Maire



**AMAIGUERE A DOLO**

CSREF = DJENNE  
CSCOM = Bonguel

Republique du Mali  
Un Peuple - un but une foi

Monsieur le DTC du CSCom de Bonguel

A

Monsieur le coordinateur P2D du District  
Sanitaire de Djienne

En la situation de l'insécurité dans  
l'aire saute de Bonguel, le chef du  
hameau de Sakadian déclare qu'il ne  
pulvériser son hameau pour la campagne  
2020. Je compte sur votre bonne compren-  
sion.

Bonguel le 23/06/2020



DRS = MOPTI  
CSRef = Djienne  
CSCom = Bonguel

Republique du Mali  
Un Peuple un But une foi

Monsieur le DTC du CSCom de Bonguel

A

Monsieur le coordinateur P2D Djienne

Pour raison de l'insécurité dans l'aire de  
saute de Bonguel, le chef du village  
de Djienne-Saka annonce que son village  
ne peut pas être pulvérisé pour la campa-  
gne 2020.

Je compte sur votre bonne compréhension  
Monsieur le coordinateur P2D Djienne

Bonguel, le 12/07/2020



Jumar Igoula DTC

# ANNEX C: ENVIRONMENTAL MITIGATION AND MONITORING REPORT

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PMI VectorLink Project (AID-OAA-TO-17-00027)

Implementing Organization: VectorLink Mali

Geographic location of USAID-funded activities: Bandiagara, Djenné, and Mopti districts

Period covered by this Reporting Form and Certification: August 2020

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1a. Insecticide selection for any USAID-supported malaria program is subject to the criteria listed in the USAID Programmatic Environmental Assessment, country SEAs, and host Mali requirements.	The insecticides are approved for IRS use pursuant to the approved Programmatic Environmental Assessment and SEA, which is valid nationwide through 2021 and authorizes the use of the pyrethroid, carbamate, organophosphate, and neonicotinoid classes of insecticide.	No outstanding issues	The SEA was approved on May 2016 and amended in July 2018 to include SumiShield® 50WG (neonicotinoid).  Actellic®, SumiShield® 50WG, and Fludora® Fusion WP-SB are registered in Mali.
1b. Procurement and inventory logs must be maintained.	All procurement and inventory logs of Actellic®, SumiShield® 50WG, and Fludora® Fusion WP-SB were maintained.	No outstanding issues	None
1c. Ensure storage facility and PPE are appropriate for the active ingredient	All storage facilities and PPE were selected based on the PMI BMP manual and	No outstanding issues	None

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
used and in accordance with approved Standard Operating Procedures.	conforming to requirements outlined in the Material Safety Data Sheets (MSDS).		
1d. Distribute insecticides to facilities that can manage such commodities safely in storage, use, and disposal (i.e. in a manner generally equivalent to Implementing Partner's own Standard Operating Procedures /Waste Management Plan).	Insecticides were distributed to facilities that can safely store and dispose of such commodities and were chosen pre-season based on requirements outlined in the PMI BMP manual.	No outstanding issues	None
1e. Pre-contract inspection and certification of vehicles used for pesticide or spray team transport.	Pre-contract inspection and certification of vehicles was conducted in two sessions, on June 10 and 25, 2020. In total, 69 vehicles were inspected and certified for use in the IRS campaign.	No outstanding issues	The ECO inspected and approved all vehicles and taxinis before their use in the 2020 IRS campaign.
1f. Driver training	The hired 69 drivers received training on June 12 and 26, 2020, on safety measures for transporting insecticides, accident and spill response procedures, and safe driving techniques.	No outstanding issues	All drivers signed the Abt policy on motor vehicles and received their certificate from the ECO.
1g. Cell phone, personal protective equipment (PPE), and spill kits onboard during pesticide transportation.	All hired drivers had cell phones. All vehicles used to transport insecticides and/ or spray team members were provided with PPE, a spill kit, and a first aid kit.	No outstanding issues	None
1h. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact.	DTCs administered a pregnancy test to every female candidate for SOP, team leader, local supervisor, storekeeper, and washer positions. No positive pregnancy test was recorded for female recruited for the spray operations.	No outstanding issues	The tests were completed one day before the SOP training started, to ensure pregnant women were not recruited for positions with potential insecticide contact.
1i. Health fitness testing for all spray operators	333 SOPs, 61 washers, 28 storekeepers, 77 team leaders, and 31 supervisors received health fitness testing to determine their physical fitness for the program's demands. The tests were conducted in June 2020 prior to their involvement in the 2020 IRS campaign.	No outstanding issues	All test results were sent to the ECO before the campaign started. All spray actors passed the medical examination and were declared medically fit for training as spray team members.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
1j. Procurement of, distribution of, and training on the use of PPE for all workers with potential pesticide contact.	Both international and local procurements were completed before training began. The use of PPE was demonstrated during TOTs, cascade, and storekeeper training, before the spray campaign began.	No outstanding issues	Field supervision done by VectorLink team, NMCP, DNACPN, community supervisors, team leaders, and others supervisors confirmed the appropriate use of PPE to ensure the safety of project personnel.
1k. Training on mixing pesticides and the proper use and maintenance of spray pumps.	333 SOPs and 12 sprayer technicians were trained on topics including pesticide mixing, sprayer maintenance, and proper use of sprayers took place on June 9–13, 2020, for SOPs and June 13-14, 2020, for sprayer technicians	No outstanding issues	None
1l. Provision of adequate facilities and supplies for end-of-day clean-up.	Prior to the campaign, the ECO inspected all wash areas and soak pits (40 fixed, 13 mobile) needed for end-of-day clean-up. Each IRS campsite had latrines and bathing facilities for each sex. All facilities were compliant, and had the materials required for clean-up.	No outstanding issues	Adequate water, barrels, wash basins, soap, and detergents were available at all times at each operations site.
1m. Enforce spray and clean-up procedures.	End-of-day clean-up was done in designated wash areas and supervised by the team leaders and supervisors. 559 end-of-day inspections were conducted. Observed cases of non-compliance were resolved immediately.	No outstanding issues	Storekeepers had an additional responsibilities overseeing SOPs' end-of-day activities.
1n. IEC campaigns to inform homeowners of responsibilities and precautions.	The IRS IEC campaign was effectively carried out by embedding mobilizers with spray teams, as well as meeting with regional and district-level officials and local authorities, and mass media representatives.	No outstanding issues	The roles of local IRS mobilizers and village local mobilizers are important. Traditional authorities participated actively in the mobilization and their efforts helped reduce spray refusals.
1o. Prohibition of spraying houses that are not properly prepared.	SOPs are instructed during training to not spray unprepared homes.	No outstanding issues	Team leaders oversaw structure preparation before spraying. The role of local mobilizers is important for assisting homeowners with preparation before the sprayers arrive.
1p. Two-hour exclusion from house after spraying	SOPs were trained to inform homeowners that they must leave their homes closed for two hours and then open the doors and windows and wait another 30 minutes before entering and sweeping the structure and	No outstanding issues	None

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
	disposing of the swept-up material in the pit latrines or burying it. A total of 1,000 homeowner preparation inspections were carried out to ensure compliance.		
1q. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.	SOPs and team leaders remind homeowners to wash itchy skin and go to a health clinic if symptoms do not subside. A total of 1,000 homeowner preparation inspections were carried out.	No outstanding issues	None
1r. Indoor spraying only	SOPs are trained to spray inside walls of homes only. This training was reinforced by the project teams and on-site supervision. A total of 1,000 homeowner preparation inspections were carried out to ensure compliance.	No outstanding issues	None
1s. Training on proper spray technique	A total of 333 SOPs were trained on proper spray technique and methods to overcome challenging spray areas. Training was carried out by the project teams, the COP, and the Operations Manager. A total of 1,000 homeowner preparation and SOP performance inspections were conducted by supervisors and the ECO to ensure proper technique were used.	No outstanding issues	Observed cases of non-compliance were resolved immediately.
1t. Maintenance of pumps	Before the deployment of SOPs each morning, team leaders and supervisors checked all sprayers to ensure they functioned properly. 12 sprayer mechanics were recruited in each district for sprayer maintenance during the spray campaign.	No outstanding issues	VectorLink Mali increased the number of sprayer mechanics during the campaign to assist SOPs with pump maintenance.
1u. No application of insecticides within 30 yards of beekeeping sites	Spraying was done indoors only and at least 30 m from sensitive areas including beehives.	No outstanding issues	None
2a. Choose sites for disposal of liquid wastes according to PMI BMPs.	The ECO selected the soak pit sites for liquid waste disposal according to PMI BMPs. A total of 40 fixed soak pits and 13 mobile soak pits were used for effluent waste disposal.	No outstanding issues	None

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
2b. Construct soak pits with charcoal to adsorb pesticide from rinse water.	Soak pits were constructed in accordance with recommendations outlined in the PMI BMP manual. A total of 40 fixed soak pits and 13 mobile soak pits were constructed and repaired with charcoal to absorb insecticide from rinse water.	No outstanding issues	None
2c. Maintain soak pits as necessary during season.	Team leaders and supervisors completed daily inspections to ensure the proper drainage and good condition of soak pits.	No outstanding issues	Supervisors and team leaders used the End-of-Day Supervisory Form to document 559 soak pit inspections. All soak pits lasted throughout the spray campaign without any problems.
2d. Inspection and certification of solid waste disposal sites before spray campaign.	The ECO in collaboration with the MOE inspected and certified solid waste disposal sites prior to the start of the campaign. As per the Memorandum of Understanding with BNSS plastic recycling company, all empty Actellic 300CS bottles and other plastic waste will be transported to BNSS. All insecticide sachets and other contaminated waste such as nose masks, activated carbon, used wipes, and Tyvec suits will be incinerated by trained operators at VectorLink Mali's incinerator at the Noumoubougou landfill.	No outstanding issues	A Waste Management Plan was developed prior to spray campaign.
2e. Monitoring waste storage and management during campaign.	All waste materials were stored and managed according to PMI BMPs during the spray campaign. IRS solid waste was segregated and stored in labeled bags. A total of 434 storekeeper performance inspections were conducted to ensure compliance.	No outstanding issues	Monitoring waste storage and management was carried out by storekeepers, the ECO, and a representative from the MOE.
2f. Monitoring disposal procedures post-campaign.	The ECO will monitor the post-spray campaign solid waste disposal. All IRS waste has been sorted, labelled, collected, and transported to central warehouses in Bandiagara and Sévaré.	Awaiting incineration of contaminated waste scheduled for October 2020, and plastic recycling scheduled for September–December 2020	Monitoring waste disposal will be carried out by ECO and a representative from the MOE.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
3a. Maintain records of all pesticide receipts, issuance, and return of empty sachets/bottles.	Stock cards tracked insecticide going to and from the central store, with back-up ledger books at central, district, and sub-district stores. A total of 434 storekeeper performance inspections were conducted to ensure compliance with BMPs.	No outstanding issues	Issues identified were rectified immediately.
3b. Reconciliation of number of houses sprayed vs. number of sachets/bottles used.	Records of all insecticide receipts, issuance, and return of empty bottles/sachets are recorded in the project stock card and dispatch record for insecticides and empty bottles/sachets.	No outstanding issues	The ECO and logistic supervisors inspected the insecticide stores to ensure stock card and dispatch records are maintained
3c. Visual examination of houses sprayed to confirm pesticide application.	Visual examinations of the houses sprayed were done by the team leader, COP, Operations Manager, entomological coordinator, and ECO.	No outstanding issues	None
3d. Perform physical inventory counts during the spray season.	Physical inventory counts were completed by the COP, Operations Manager, warehouse managers and ECO during the spray campaign. A total of 434 storekeeper performance inspections were conducted to ensure compliance with BMPs.	No outstanding issues	None
4a. Insecticide shipments over water	<p>The VectorLink Mali team implemented environmental compliance guidelines stipulated in the PMI BMP manual.</p> <p>The water crossing over the Bani River, Djenne was successful and without incident.</p>	No outstanding issues	The team assessed distance, time required, type and capacity of boat, speed of transport, and road transport before and after water crossing. Insecticide bottles were packed in labelled waterproof containers, and appropriate PPE worn during handling.

# ANNEX D: M&E PLAN MATRIX

#	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						
<b>Objective 1: Implementation of Malaria Vector Control (VC) Interventions</b>																				
<b>1.1</b>	<b>Successfully Execute IRS and Other Integrated Malaria VC Activities</b>																			
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	205,612 <sup>8</sup>	167,598	146,694	149,919	109,461 <sup>9</sup>	119,906 <sup>10</sup>										
1.1.3	Number of eligible structures sprayed with IRS <sup>11</sup>		Project records Annually	Country	183,225	160,723	124,690	148,198	93,042	129,302										
1.1.4	Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)		Project records Annually	Country	85.0%	95.9%	85.0%	96.7%	85.0%	96.9%										
1.1.5	Number of people protected by IRS		Project records Annually	Country Sex: Male Sex: Female Pregnant women Children <5	772,376	665,581 338,291 327,290 20,992 93,968	587,426	690,793 347,905 342,888 35,484 98,217	508,794	503,043 248,785 254,258 34,462 87,606										

- 8 The original target in the workplan was 215,558 structures. After one health area, twelve villages and one hamlet in Mopti, two villages and thirteen hamlets in Bankass, two hamlets in Bandiagara and free villages in Djenne, were excluded due to security concerns.
- 9 In 2020, PMI VectorLink will use a revised structure definition, which defines individual residential units within multi-unit buildings as individual structures. This definition is more consistent with the way structures are counted across all VectorLink programs and will facilitate performance monitoring including insecticide utilization tracking. The conversion of the target the former definition, which defined standalone structures as one single structure regardless of the number of residential units within them, to that using the revised definition will result in an increased target number of structures (greater than 109,461) IN THE 2020 END OF SPRAY REPORT AND CORRESPONDING MEP. All contractual deliverables, including the 2020 End of Spray Report and MEP, will report on PMI indicators in terms of structures using the revised definition. The target number of rooms for 2020 is 256,992 and will remain constant between the MEP in this work plan and the MEP in the End of Spray Report.
- 10 Final targets ARE ESTIMATED using the revised structure definition. The final target includes two villages in Djenné, which were added in the last week of the campaign to consume all of Actellic and excludes 8 villages in Bandiagara that could not be reached for security reasons.
- 11 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
1.1.6	Number and percentage of vector control project country programs submitting an EOSR within 45 days after the end of spray (including completing MEP and EMMR)	X	Project Annually	Country										
1.1.7	Number and percentage of IRS country programs that conduct a Post-Spray Data Quality Audit within 90 days of spray completion	X	Data Collection Forms Annually	Country										
1.1.8	Number of Insecticide Treated Nets (ITNs) distributed, by channel		Project Records Annually	Country Channel	N/A	N/A	N/A	N/A	N/A	N/A				
1.1.9	Number and percentage of countries completing ITN durability monitoring data collection as planned in a given project year	X	Project Records Annually	Country										
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										

#	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
<b>1.2</b>	<b>Strengthen Capacity of NMCPs, VC Personnel, and Other Institutions to Implement and Manage IRS and Other VC Activities</b>													
1.2.1	Total number of people trained to support VC in target areas		Project Training Records Annually	Country VC Intervention: IRS Sex: Male (#) Sex: Male (%) Sex: Female (#) Sex: Female (%) Job Function	2,711 <sup>12</sup>	824 <sup>13</sup>	824 <sup>14</sup>	616 <sup>15</sup>	972 <sup>16</sup>	1000 <sup>17</sup>				
1.2.2	Total number of people trained to support VC in target areas with USG funds <sup>18</sup>		Project Training Records Annually	Country VC Intervention Sex: Male (#) Sex: Male (%) Sex: Female (#) Sex: Female (%) Job Function	2,711 <sup>19</sup>	824 <sup>20</sup>	824 <sup>21</sup>	616 <sup>22</sup>	442	441 <sup>23</sup>				

12 DTC (47), Coordinators (4), SOPs (641), Data clerks (29), Supervisors (56), Team leaders (146), Logisticians (4), Storekeepers (47), guards (92), Washers (117), Monitors (12), Pump Technicians (14), Drivers (134), Mobilizers (1,366) and Warehouse Managers (2).

13 SOPs (626), Supervisors (55), Team leaders (143); none were previously affiliated with government posts.

14 SOPs (626), Supervisors (55), Team leaders (143).

15 SOPs (466), Supervisors (43), Team leaders (107). The number of health areas was reduced from 46 in 2018 to 35 in 2019, resulting in a decrease in seasonal workers.

16 SOPs (333), Supervisors (31), Team leaders (78), Storekeepers (28), Washers (64), Drivers (59), Guards (56), Mobilizers (274), Pump Technicians (12), M&E Assistants (8), mHealth Coordinator (1), and Clinicians (28).

17 SOPs (333), Supervisors (31), Team leaders (77), Storekeepers (28), Washers (64), Drivers (69), Guards (84), Mobilizers (261), Pump Technicians (12), M&E Assistants (8), District supervisors (4), mHealth Coordinator (1), and Clinicians (28).

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

19 DTC (47), Coordinators (4), SOPs (641), Data clerks (29), Supervisors (56), Team leaders (146), Logisticians (4), Storekeepers (47), guards (92), Washers (117), Monitors (12), Pump Technicians (14), Drivers (134), Mobilizers (1,366) and Warehouse Managers (2).

20 SOPs (626), Supervisors (55), Team leaders (143); none were previously affiliated with government posts.

21 SOPs (626), Supervisors (55), Team leaders (143).

22 SOPs (466), Supervisors (43), Team leaders (107). The number of health areas was reduced from 46 in 2018 to 35 in 2019, resulting in a decrease in seasonal workers.

23 SOPs (333), Supervisors (31), Team leaders (77). The number of health areas was reduced from 35 in 2019 to 28 in 2020, resulting in a decrease in seasonal workers.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.2.3	Number of people trained during the Master (National) Training and/or IRS Training of Trainers.		Project Training Records Annually	Country Sex: Males Sex: Females Type of Training	66	66 <sup>24</sup> 55 11	50	50 <sup>25</sup> 42 8	38	30 <sup>26</sup> 24 6				
1.2.4	Total number of people hired to support VC in target areas.		Project Records Annually	Country VC Intervention Sex Job Function	2,368 <sup>27</sup>	2,622 <sup>28</sup> 2,049; 78.1% 573; 21.9%	2,622 <sup>29</sup>	1,102 <sup>30</sup> 1,009 91.6% 93 8.4%	901 <sup>31</sup>	915 <sup>32</sup> 690 75.4% 225 24.6%				
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	1	1 <sup>33</sup>	1	1 <sup>34</sup>	1	1 <sup>35</sup>				

24 DTCs (46), CSREF (12), SLDSSES (4), SACPN (4).

25 DTCs (35), CSREF (9), SLDSSES (3), SACPN (3).

26 DTCs (28), DRACPN (2).

27 This number excludes washers (117), drivers (134) and security guards (92).

28 This number excludes washers (115), drivers (110) and security guards (90). None of these actors were previously affiliated with government posts.

29 This number excludes washers (115), drivers (110) and security guards (90).

30 This number excludes washers (88), drivers (88) and security guards (70). The proportion among these actors who are affiliated with government posts is currently unknown. The number of health areas was reduced from 46 in 2018 to 35 in 2019, resulting in a decrease in seasonal workers.

31 This number excludes drivers (59) and clinicians (28), and includes logisticians (3) and IRS data transporters (9). The proportion among these actors who are affiliated with government posts is currently unknown.

32 This number excludes drivers (69) and clinicians (28), and includes logisticians (3) and IRS data transporters (9). The proportion among these actors who are affiliated with government posts is currently unknown.

33 NgenIRS Insecticide 2019 Forecasting and Validation Workshop, August 16th & 17th 2018 to be held in Cotonou, Benin. NMCP Entomologist and Sentinel site Officer.

34 NgenIRS Insecticide 2020 Forecasting and Validation Workshop, August 13th & 14th 2019 held in Cotonou, Benin. Two NMCP Entomologists and Communication Officer.

35 Insecticide 2021 Forecasting and Validation Workshop, in September 2020 WITH NMCP PARTICIPATION.

#	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	2 <sup>36</sup>	4 <sup>37</sup>	16 <sup>38</sup>	12 <sup>39</sup>				
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										
<b>1.3</b>	<b>Environmental Compliance and Safety</b>													
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: Male (#) Sex: Male (%) Sex: Female (#) Sex: Female (%) Job Function	1,020 <sup>40</sup>	1,020 <sup>41</sup> 792; 77.6% 228; 22.4%	711 <sup>42</sup>	766 <sup>43</sup> 591; 77.2% 175; 22.8%	559 <sup>44</sup>	586 <sup>45</sup> 438; 74.7% 148; 25.3%				

36 NMCP M&E Manager and Epi Surveillance Officer.

37 NMCP Director, Deputy Director, M&E Manager and Epi Surveillance Officer.

38 DRS (2), DRDSES (2), CSREF (9) and SLDSES (3).

39 DRS (2), DRDSES (2), CSREF (6) and DRACPN (2).

40 This indicator includes the following vector control personnel: spray operators (626), team leaders (143), washers (115), storekeepers (46), and guards (90). Reported planned result was corrected from 1043 to 1020.

41 This indicator includes the following vector control personnel: spray operators (626), team leaders (143), washers (115), storekeepers (46), and guards (90).

42 This indicator includes the following vector control personnel: spray operators (442), team leaders (101), washers (63), storekeepers (35), and guards (70).

43 This indicator includes the following vector control personnel: spray operators (466), team leaders (107), washers (88), storekeepers (35), and guards (70).

44 This indicator includes the following vector control personnel: spray operators (333), team leaders (78), washers (64), storekeepers (28), and guards (56).

45 This indicator includes the following vector control personnel: spray operators (333), team leaders (77), washers (64), storekeepers (28), and guards (84).

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.3.2	Number of health workers receiving insecticide poisoning case management training		Project Training Records Annually	Country Sex: Male (#) Sex: Male (%) Sex: Female (#) Sex: Female (%)	47	46 39; 84.7%	35 <sup>46</sup>	35 28 80%	28	28 22; 78.6%				
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	63; 100%	62; 100%	47; 100%	45; 100%	43; 100%	43; 100%				
					Mobile Soak pits: 20	Mobile Soak pits: 12	Mobile Soak pits: 9	Mobile Soak pits: 13	Mobile Soak pits: 13	Mobile Soak pits: 13				
						10 <sup>47</sup>		9 <sup>48</sup>		8 <sup>49</sup>				
1.3.6	Number and percentage of storehouses inspected and approved prior to IRS campaigns		Project Records - PSECAs Annually	Country Storehouse Type	Storehouse: 49; 100%	49 <sup>50</sup> ; 100%	37; 100%	37 <sup>51</sup> ; 100%	30 <sup>52</sup> ; 100%	30 <sup>53</sup> ; 100%				

46 This formal training was eliminated in 2019; all 35 DTCs were re-oriented to insecticide poisoning case management on the first day of the IRS campaign.

47 ECO (1), DNACPN (3), DRACPN (2), SACPN (4)

48 ECO (1), DNACPN (3), DRACPN (2), SACPN (3)

49 ECO (1), DNACPN (2), DRACPN (2), SACPN (3)

50 47 storehouses and 2 warehouses

51 35 storehouses and 2 warehouses

52 28 Secondary storehouses and 2 Central warehouses

53 28 Secondary storehouses and 2 Central warehouses

#	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
<b>1.4</b>	<b>Promote Gender Equality in all Facets of Planning and Implementation</b>													
1.4.1	Number and percentage of women hired to support VC campaigns		Project Records Annually	Country Sex (# and %) Job Function	TBD; 35%	573 <sup>54</sup> , 22%	25%	289 <sup>55</sup> , 22%	30%	225 <sup>56</sup> , 27%				
1.4.2	Number and percentage of women hired in supervisory roles in target areas for VC activities		Project Records Annually	Country VC Intervention Job Function	TBD; 50%	8 <sup>57</sup>	26; 13%	13 <sup>58</sup> , 17%	18%	11 <sup>59</sup> , 19%				
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	2,727; 100%	2,671	1269; 100%	1,001 <sup>60</sup> ; 100%	770 <sup>61</sup>	811 <sup>62</sup>				
						2,091; 78.3% 580; 21.7%		781; 78% 220; 22%		636; 77.4% 175; 21.6%				
1.4.4	Number and percentage of women in senior leadership roles in VectorLink country offices	X	Project Records Annually	Country Sex (# and %)										

54 DTC (7), SOP (79), DEC (14), Community Supervisor (8), TL (18), Washers (115), Storekeepers (11), Mobilizers (318) and Ento Technicians (3).

55 DTC (7), SOP (54), DEC (17), Community Supervisor (6), TL (15), Washers (88), Storekeepers (13), Mobilizers (86) and Ento Technicians (3).

56 DTC (6), SOP (55), M&E ASSISTANTS (7), Community Supervisor (5), TL (15), Washers (64), Storekeepers (7), Mobilizers (64) and Ento Technicians (2).

57 Community Supervisors (8); none were previously affiliated with government posts.

58 Community Supervisors (6) and DTC (7); none were previously affiliated with government posts.

59 Community Supervisors (5) and DTC (6); none were previously affiliated with government posts.

60 DTC (35), SOP (466), DEC (18), Community Supervisor (43), TL (107), Washers (88), Storekeepers (35), Ento Technicians (15), Guards (70), Drivers (88), Radios Host (11), Logisticians (3) and VL Mali staff (22).

61 DTC (28), SOP (333), M&E Assistants (8), Community Supervisor (31), TL (78), Washers (64), Storekeepers (28), Ento Technicians (13), Guards (56), Drivers (59), Radios Host (22), Logisticians (3), District Supervisors (3), Pump technicians (12), Data Transporters (9), mHealth Coordinator (1) and VL Mali staff (22).

62 DTC (28), SOP (333), M&E Assistants (8), Community Supervisor (31), TL (77), Washers (64), Storekeepers (28), Ento Technicians (15), Guards (84), Drivers (69), Radios Host (22), Logisticians (3), District Supervisors (4), Pump technicians (12), Data Transporters (9), mHealth Coordinator (1) and VL Mali staff (23).

#	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
<b>1.5</b>	<b>Implement and Support SBCC and Mobilization Activities</b>													
1.5.1	Number of radio spots and talk shows aired		Project Records Annually	Country VC Intervention Talk Show or Radio Spot	7,560 <sup>63</sup>	7,560	6,930 <sup>64</sup>	6,930	6,930	6,930 <sup>65</sup>				
1.5.2	Number of print materials distributed to or targeted at beneficiaries		Project Records Annually	Country VC Intervention	83,000	83,000	0	0	0					
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	772,376	N/A <sup>66</sup>	N/A <sup>67</sup>	N/A	N/A	N/A				
<b>2. Entomological and Epidemiological Data to Drive Decision-Making</b>														
<b>2.1</b>	<b>Vector Control Activities Monitored via Entomological and Epidemiological Data</b>													
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	Number; Percentage VC Intervention	14	7	6	4 <sup>68</sup>	6	6, 100%				

63 In Mopti the broadcasts were done in 3 languages, 3 broadcast per day, 70 days, 12 radios, (7,560 = 3 X 3 X 70 X 12)

64 In Mopti the broadcasts were done in 3 languages, 3 broadcast per day, 70 days, 11 radios, (6,930 = 3 X 3 X 70 X 11)

65 In Mopti the broadcasts were done in 3 languages, 3 broadcast per day, 70 days, 11 radios, (6,930 = 3 X 3 X 70 X 11)

66 Door to door during community mobilization was completed. However, mobilizers were selected on the basis of their influence in the community, and literacy was not required. Therefore VL Mali is unable to accurately quantify the number of people reached through mobilization.

67 Mobilizers were selected on the basis of their influence in the community, and literacy is not required. Therefore VL Mali is unable to accurately quantify the number of people reached through mobilization.

68 Two control sites were excluded for insecurity situation: Diambacourou in Mopti and Tabitongo in Bandiagara.

#	Performance Indicator	Global Project Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
					Year 1		Year 2		Year 3		Year 4		Year 5	
					Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.1.2	Number and percentage of vector bionomics monitoring sites measuring all basic entomological indicators (species composition, indoor and outdoor human biting rates, hourly human biting rates, indoor resting densities)		Entomological Reports Annually	Number; Percentage  VC Intervention	14;100%	7; 100%	14;100%	4 <sup>69</sup> ; 100%	6; 100%	6, 100%				
2.1.3	Number and percentage of vector bionomics monitoring sites measuring the following all advanced entomological indicators: sporozoite rates and entomological inoculation rates		Entomological Reports Annually	Number; Percentage  IRS or Entomology Only Program		6;100%		6; 4, 100%	6; 100%	6, 100%				
2.1.4	Number and percentage of insecticide resistance monitoring sites that tested all priority insecticides for the relevant local vector control intervention		Entomological Reports Annually	Number; Percentage  VC Intervention	14;100%	14;100%	14;100%	14 Pyrethroid 14 Organophosphate 13 Carbamate 7 Clothianidin 4	11 In progress <sup>70</sup>					
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	Number; Percentage  Insecticide Type	20;100%	24;100%	19 walls; 100%	20 walls; 100% Actellic 300CS, Sumishield 50WG	30 Actellic 300CS, Sumishield 50WG	30 walls, 100% Actellic 300CS, Sumishield 50WG Fludora Fusion WP-S				

69 Two control sites were excluded for insecurity situation: Diambacourou in Mopti and Tabitongo in Bandiagara.

70 As of MID-SEPTEMBER 2020, 5 OUT OF 11 SITES HAVE BEEN COMPLETED.

#	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
2.1.6	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	Number; Percentage  Insecticide Type	4	4,100%	3	3,100%	3	3,100%				
						Actellic 300CS, Sumishield 50WG		Actellic 300CS, Sumishield 50WG		Actellic 300CS, Sumishield 50WG, Fludora Fusion WP-S				
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	Number  Sex: Male (#) Sex: Male (%) Sex: Female (#) Sex: Female (%)	18	18 <sup>71</sup>	18 <sup>72</sup>	18 <sup>73</sup>	16 <sup>74</sup>	15				
						4; 22,2%		4; 22,2%		13; 87%				
						14; 77.8%		14; 77.8%		2; 13%				
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	Number; Percentage	N/A	N/A	2	2,100%	2	In progress <sup>75</sup>				
2.1.10	Number of nets in which WHO cone bioassays were conducted to evaluate bio-efficacy of bed nets		Entomological Records Annually	Number; Percentage	N/A	N/A	60	60,100%	60	In progress <sup>76</sup>				

71 VL Entomologist (2), NMCP (1) Technicians Entomologist (15).

72 VL Entomologist (2), NMCP (1) Technicians Entomologist (15).

73 VL Entomologist (2), NMCP (1) Technicians Entomologist (15).

74 VL Entomologist (2), NMCP (1) Technicians Entomologist (13).

75 Expected completion in NOVEMBER 2020.

76 Expected completion in NOVEMBER 2020.

#	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
<b>2.2</b>	<b>NMCPs Develop Country-Level IRS and Other Malaria VC Strategies</b>													
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										
<b>2.3</b>	<b>Build capacity of NMCPs and local institutions to collect, analyze, and use data for strategic malaria control decision-making</b>													
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	Number Job Function Organization	N/A <sup>77</sup>	N/A	3 <sup>78</sup>	3 <sup>79</sup>	3 <sup>80</sup>	3				
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	Number; Percentage Job Function (see relevant footnote) Organization	N/A	N/A	2; 50%	2; 50%	2 <sup>82</sup> ;	2 <sup>83</sup> ; 100%				

77 This indicator is in the global PMP but pertains only to country programs integrating new data systems in a given year. The indicator is not applicable to Mali in Year 1 but may be relevant in future years.

78 NMCP (3).

79 NMCP Director, Planning, M&E Manager and Epi Surveillance Officer.

80 NMCP (3).

81 NMCP Entomologist and Sentinel Site Officer

82 NMCP (2)

83 NMCP Entomologist and Media - TIC Officer

#	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
<b>3. Procurement and Logistics</b>														
<b>3.1 Cost-Effective Procurement Mechanism Established</b>														
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	Number; Percentage Insecticide Type	2; 100% 1; 100%	2; 100% SumiShield	2; 100% SumiShield and Actellic	2; 100% SumiShield and Fludora Fusion	2; 100%					
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										
<b>3.2 Robust Inventory Management and Logistics Systems Established</b>														
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	Number; Percentage VC Intervention Sex Male (#) Sex: Male (%) Sex: Female (#) Sex: Female (%) Job Function (see relevant footnote)	49; 48 100%; 100%	37; 37 100%; 100%	33; 33 100%; 100%	33 <sup>84</sup> ; 33 100%; 100%						
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	Number; Percentage	49; 48 100%; 100%	37; 37 100%; 100%	30; 30 100%; 100%	30; 30 100%; 100%						

84 Storekeepers(28), warehouse keepers (2), and district logisticians (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						
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																
<b>4. Innovation</b>																				
<b>4.1 Conduct operational research or monitoring to scale up new tools, methods, and approaches</b>																				
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										
<b>4.2 Create and share knowledge through dissemination of best practices and lessons learned</b>																				
4.2.1	Number of innovations, best practices, and other data or lessons learned shared with other partners or international institutions for global reporting on the Vector Learning Exchange	X	Project Records Annually	Country  Technical Area																
4.2.2	Number of individual members who use the Vector Learning Exchange	X	Project Records Annually	N/A																
4.2.3	Number of symposia and/or presentations submitted to and accepted at global conferences		Project Records Annually	Country Technical Area	TBD	1 <sup>85</sup>	1	2 <sup>86</sup>	1	Pending										
4.2.4	Number of success stories written or videos produced and shared on the VectorLink project website		Project Records Annually	Country	TBD	0	1	1	1	1										
4.2.5	Number of peer-reviewed journal articles submitted and accepted	X	Project Records Annually	Technical Area																

85 VL Mali Entomologist participated in ASTMH.

86 NMCP Coordinator participated in ASTMH, LBMA entomologist conducted poster presentation at ASTMH.

#	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
4.2.6	Number of contributions to vector control global or country policy and/or guidance documents		Project Records Annually	Country Technical Area	1 <sup>87</sup>	1 <sup>88</sup>	1	0	1	1 <sup>89</sup>				
<b>4.3</b>	<b>Develop and deploy cost-savings approaches</b>													
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	N/A	N/A	3	3 <sup>90</sup>	1	4 <sup>91</sup>				
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	N/A	N/A	1	0	N/A	N/A				
<b>4.4</b>	<b>Cultivate public-private partnerships</b>													
4.4.1	Number of private sector entities engaged with to establish public private partnerships to increase the quality and coverage of malaria vector control activities globally		Project Records Annually	Country	1	1 <sup>92</sup>	1	1 <sup>93</sup>	1 <sup>94</sup>	1				

87 Submit one entomological article.

88 Entomology

89 INSECTICIDE RESISTANCE MANAGEMENT PLAN

90 Eliminate 20 days of pre-campaign mobilization, reduced number of supervision days at all levels, and modified training for washers, mobilizers, and poison management to orientation sessions on the first day of the campaign

91 1) Reduced number of training days for TOT, supervisors' training, and storekeeper's training; 2) reduced number of TOT participants; 3) reduced number of transportation vehicles, from 84 to 69; and 4) changed post spray review meetings approach.

92 UMAPLAST (Unite Malienne des Plastiques)

93 BNSS (Bi Niama Sini Sanou)

94 BNSS (Bi Niama Sini Sanou)