



U.S. PRESIDENT'S MALARIA INITIATIVE



**THE PMI VECTORLINK PROJECT MALI**  
**2019 END OF SPRAY REPORT**  
**SPRAY CAMPAIGN**  
**JULY 1, 2019 – AUGUST 4, 2019**

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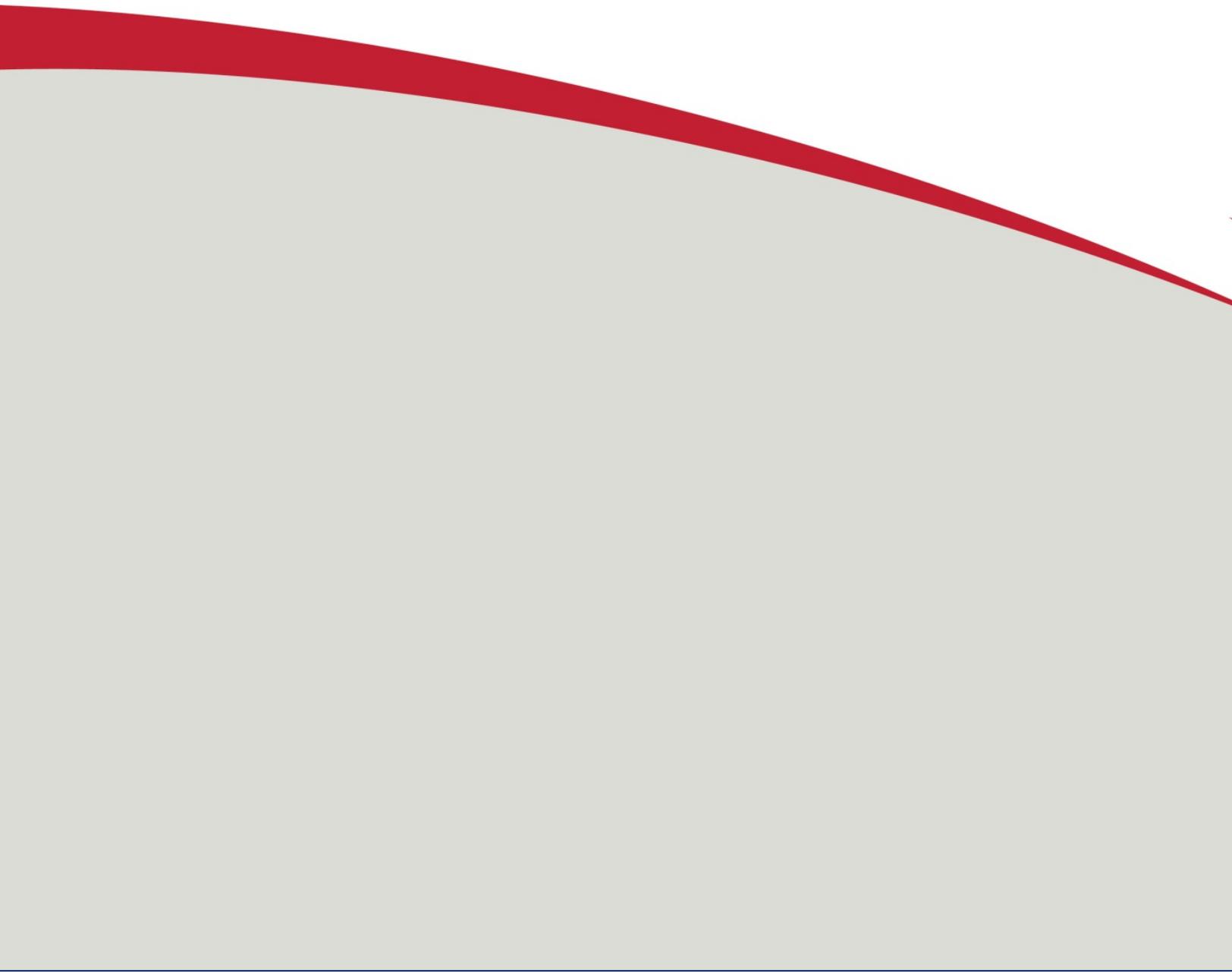


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# THE PMI VECTORLINK PROJECT MALI

## 2019 END OF SPRAY REPORT SPRAY CAMPAIGN

JULY 1, 2019 – AUGUST 4, 2019



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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>DCV</b>	Data Collection Verification
<b>DEC</b>	Data Entry Clerk
<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>DOS</b>	Directly Observed Spraying
<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 Tracking
<b>PPE</b>	Personal Protective Equipment
<b>PSECA</b>	Pre-Season Environmental Compliance Assessment
<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

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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 aims to provide technical, managerial, and operational support to Mali’s National Malaria Control Program (NMCP) through IRS.

VectorLink Mali conducted its 2019 IRS campaign from July 1 to August 4, 2019. The project aimed to spray 149,919 eligible structures in 35 geographically contiguous health areas (“Aires de Santé”) in three districts in Mopti Region: Bandiagara, Djenné, and Mopti. The project sprayed Actellic 300CS (the organophosphate, pirimiphos-methyl) in Bandiagara and Mopti, and SumiShield 50WG (the neonicotinoid, clothianidin) in Djenné.

Project achievements during the 2019 spray campaign included (see Table ES-1):

IRS results:

- Sprayed 148,198 structures out of 153,191 structures found by spray operators (SOPs), resulting in 96.7% spray coverage and 98.9% progress.
- Protected 690,793 people, including 98,217 children under 5 years and 35,484 pregnant women.
- Trained 616 individuals to deliver IRS<sup>1</sup> in three districts. Of these, 43 were supervisors, 107 were team leaders, and 466 were SOPs. Women accounted for 20.4% of all staff trained,<sup>2</sup> and 14% of supervisory positions.
- Sprayed 121,587 structures in Bandiagara and Mopti districts combined with 51,347 bottles of Actellic 300CS (2.4 structures per bottle) and sprayed 26,611 structures in Djenné District using 10,269 sachets of SumiShield 50WG (2.6 structures per sachet) at an average rate of 11 structures per day per SOP.

Spray planning and supervision:

- Prepared and stocked 35 operations sites and two central warehouses (one of which was relocated from Bankass to Bandiagara).
- Maintained strong and effective partnerships with government counterparts: the NMCP, the National Directorate for Sanitation and Pollution Control, the Mopti Regional Health Office, the district health offices in the three IRS-supported districts, local authorities, and community leaders. As a result, planning and supervision of all IRS activities were conducted in a joint manner, as were community awareness activities, trainings and meetings facilitation.

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1 Based on the definition of the indicator “Number of people trained with USG [U.S. Government] funds to deliver IRS,” spray personnel trained to deliver IRS only include spray personnel such as SOPs, team leaders, and supervisors. Clinicians, data clerks, information, education and communication (IEC) mobilizers, drivers, washers, porters, pump technicians and security guards were excluded.

2 This includes supervisors, mobilizers, SOPs, team leaders, data entry clerks, M&E assistants, district storekeepers, and clinicians.

Entomology:

Conducted wall bioassays 24 to 48 hours after spraying and recorded 100% mortality of susceptible *Anopheles gambiae* (Bandiagara, Djenné, and Mopti) on all wall surface types sprayed with both insecticides, indicating high spray quality.

Environmental compliance:

- Began safely disposing of all IRS insecticide contaminated wastes, including 51,347 empty Actellic bottles, 10,269 empty SumiShield sachets, and 22,560 used masks.

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

Number of districts covered by PMI-supported IRS in 2019	3 districts: Bandiagara, Djenné, and Mopti
Insecticide used in 2019 IRS	Organophosphate (Actellic 300CS) in Mopti and Bandiagara, and SumiShield 50WG in Djenné
Structures targeted for spray in 2019	149,919
Structures found by spray operators in 2019	153,191
Number of structures sprayed by PMI-supported IRS in 2019	148,198
2019 spray coverage*	96.7%
2019 spray progress **	98.9%
Population protected by PMI-supported IRS in 2019	690,793 total 35,484 pregnant women 98,217 children under 5
Dates of PMI-supported IRS campaign	July 1, 2019 – August 4, 2019
Length of 2019 campaign	30 operational days
Number of people trained with funds from the U.S. Government to deliver IRS in 2019***	616 people (541 men, 75 women)***

\*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. It includes only spray personnel such as SOPs, team leaders, and supervisors. It excludes clinicians, data clerks, IEC mobilizers, drivers, washers, porters, pump technicians, and security guards.

# RESUME

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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 sa campagne de PID 2019 du 1<sup>er</sup> juillet au 4 Août, 2019. Les objectifs étaient de contribuer à réduire les taux de morbidité et de mortalité liés au paludisme dans les districts sanitaires de Bandiagara, de Djenné et Mopti en aspergeant 149 919 structures éligibles (soit respectivement 58 694, 24 094 et 67 131) réparties dans 35 aires de santé géographiquement contiguës. Deux classes d'insecticides ont été utilisées : un organophosphoré (pirimiphos-méthyl -Actellic 300CS) à Bandiagara et Mopti et un néonicotinoïde (clothianidine- SumiShield 50WG) à Djenné.

Les réalisations du projet au cours de la campagne de 2019 sont comme suit résumées (voir le Tableau ES-2):

Principaux résultats:

- 148 198 structures aspergées sur les 153 191 structures trouvées par les opérateurs, soit un taux de couverture et de progrès respectivement de 96,7% et de 98,9%
- 690 793 personnes protégées, dont 98 217 enfants de moins de cinq ans et 35 484 femmes enceintes.
- 616 personnes formées pour mettre en œuvre des opérations de PID3 dans les trois districts cibles. 43 d'entre elles étaient des superviseurs, 107 des chefs d'équipes et 466 des opérateurs. Les femmes représentaient 20,4% du personnel formé, et 14% des postes de supervision.
- Aspergion de 121 587 structures des districts de Bandiagara et de Mopti avec 51 347 bouteilles d'Actellic 300CS (2.4 structures par bouteille) et de 26 611 structures traitées dans le district de Djenné avec 10 269 sachets de SumiShield 50WG (2.6 structures par sachet), soit globalement, un taux journalier de 11 structures en moyenne par opérateur.

Préparation et supervision de la campagne PID:

- Etablissement de 35 sites opérationnels et deux magasins centraux (l'un à Sévaré et l'autre, initialement à Bankass et relocalisé à Bandiagara, après l'exclusion de Bankass des cibles PID)
- Maintien de partenariats solides et efficaces avec les homologues gouvernementaux: PNLN, DNACPN (Direction Nationale de l'Assainissement et du Contrôle des Pollutions et des Nuisances), la direction régionale de la santé de Mopti, les 3 bureaux de santé des districts ciblés par la PID, les autorités locales. La planification et la supervision des activités de la campagne PID, de même que les activités de sensibilisation communautaire, la facilitation des formations et réunions avec les parties prenantes, ont été menées conjointement avec ces partenaires nationaux.

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- 3 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
  - 4 Incluant les superviseurs, mobilisateurs, opérateurs, chefs d'équipes, agents de saisie, Coordinateur mHealth, magasiniers et cliniciens

## Entomologie

- Conduite de bio essai dans les 24 à 48 heures suivant l'aspersion. Les résultats faisaient état d'un taux de mortalité de 100% des sujets sensibles *Anopheles gambiae* (Bandiagara, Djenné et Mopti) sur tous les types de surfaces murales traitées avec les deux types insecticides, indiquant une qualité de pulvérisation élevée.

## Conformité environnementale:

- Démarrage du processus de destruction sécurisée des déchets contaminés par l'insecticide utilisé lors de la campagne de PID de 2019, comprenant 51 347 bouteilles vides d'Actellic 300CS, 10 269 sachets vides de SumiShield 50WG et de 22 560 masques usagés.

**Table ES-2: Vectorlink Mali En Bref**

Nombre des districts sanitaires couverts par PMI en 2019	3 districts sanitaires: Bandiagara, Djenné et Mopti
Insecticide utilisé pour la campagne PID 2019	Actellic 300CS à Bandiagara et Mopti SumiShield 50WG à Djenné
Nombre de structures ciblées	149 919
Nombre de structures trouvées par les opérateurs	153 191
Nombre de structures pulvérisées par les opérateurs en 2019	148 198
Taux de couverture de la PID 2019 *	96,7%
Taux de progrès de la PID 2019 **	98,9%
Population protégée par PMI en 2019	690 793 au total 35 484 femmes enceintes 98 217 enfants de moins de 5 ans
Dates de la campagne financée par PMI	1er juillet au 04 août 2019
Durée de la campagne	30 jours opérationnels
Nombre de personnes formées avec les fonds du Gouvernement des Etats Unis d'Amérique pour faire la PID***	616 (541 hommes, 75 femmes)***

\* 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.

# 1. 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 and pregnant women. In September 2017, 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 via 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 32% of medical consultations<sup>5</sup>, and there are 2,439,954 annual cases of malaria in health facilities and at the community level (1,646,837 simple cases, 793,117 severe cases, and 1,178 deaths, implying a 0.48 per thousand lethality rate). Among the population children under five years of age and pregnant women are the most the affected. .

IRS is a proven, effective vector control intervention used in Mali. In 2008, PMI started supporting IRS there, and it worked in two districts (Bla and Koulikoro). In 2011, through its Africa Indoor Residual Spraying Project (AIRS), PMI continued supporting IRS until the current VectorLink project. Table 3 presents an overview of the key phases of IRS implementation in Mali, prior to the PMI VectorLink project.

**Table 3: Key phases of PMI-Supported IRS implementation in Mali, 2008-2017**

Year	Region	Districts	Number of health areas	Type of insecticide used	Comments
2008	Ségou	Bla*	27	Lamda-cyhalothrinds	PMI –supported IRS started in two districts in the South of Mali
	Koulikoro	Koulikoro*	18	Lamda-cyhalothrinds	
2009	Ségou	Bla*	27	Lamda-cyhalothrinds	–
	Koulikoro	Koulikoro*	18	Lamda-cyhalothrinds	–
2010	Ségou	Bla*	27	Deltamethrine	–
	Koulikoro	Koulikoro*	18	Deltamethrine	–
2011	Ségou	Bla*	27	Bendiocarb	Extended to the district of Baroueli
		Baroueli*	23		
2012	Koulikoro	Koulikoro*	18	Bendiocarb	–
	Ségou	Bla*	27	Bendiocarb	–
	Baroueli*	23			
2013	Koulikoro	Koulikoro*	18	Bendiocarb	–
	Ségou	Bla*	27	Bendiocarb	–
	Baroueli*	23			
2014	Ségou	Bla*	27	Pirimiphos-methyl	–
	Koulikoro	Koulikoro*	18	Bendiocarb	–

5 Système Local d’Information Sanitaire (SLIS), 2018.

Year	Region	Districts	Number of health areas	Type of insecticide used	Comments
2015	Ségou	Baroueli*	23	Pirimiphos-methyl	Removal of IRS from the district of Bla
	Koulikoro	Koulikoro*	18	Pirimiphos-methyl	—
2016	Ségou	Baroueli*	23	Pirimiphos-methyl	—
	Koulikoro	Koulikoro* Fana*	19 21	Pirimiphos-methyl	Extended to the district of Fana
2017	Mopti	Bandiagara Bankass Djenné Mopti	19/27 5/22 9/22 20/27	Pirimiphos-methyl	PMI shifted IRS operations from the South to the Mopti Region in central Mali due to 60% prevalence compared with 30% nationally.

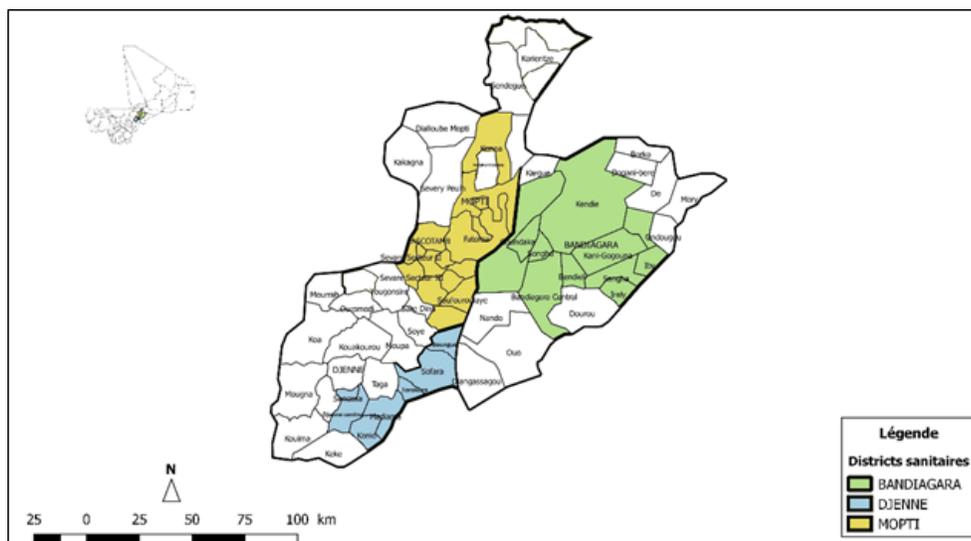
\*All health areas in the District received IRS (blanket spraying).

In 2018, during the first year of PMI VectorLink, IRS was conducted in 46 of the 98 (47%) health areas in the four aforementioned districts.<sup>6</sup> Both Actellic 300CS and SumiShield 50WG were used in the 2018 IRS campaign.

It is worth noting that according to the Mali Demographic and Health Survey 2018, the national prevalence of malaria has decreased from 35.7 in 2016 to 18.9% in 2018 (specifically from 59.8 to 24.9% in Mopti, from 41.6 to 29.7% in Sikasso, from 36.7 to 25.9% in Segou, and from 34.8 to 21.7% in Koulikoro). The significant reduction in prevalence of malaria, in particular in areas that have received IRS, suggests that it remains a key intervention in the malaria control in Mali.

In 2019, PMI VectorLink's second year, the project targeted for IRS 149,919 eligible structures in 35 geographically contiguous health areas<sup>7</sup> in three districts in Mopti Region: Bandiagara, Djenné, and Mopti (Figure 1).

**Figure 1: Map of the 35 Health Areas in the Three PMI-Supported Districts, 2019**



6 The target health areas were selected based primarily on security conditions in the region.

7 Five health areas in Bankass and six health areas in Bandiagara were excluded due to insecurity and budget constraints

## 2. PRE-SEASON ACTIVITIES

### 2.1 SELECTION OF IRS DISTRICTS AND HEALTH AREAS

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

Due to reduced funding in the FY19 PMI Malaria Operational Plan for Mali, the PMI VectorLink Mali project reduced the IRS target area from 46 health areas across four districts (Bandiagara, Bankass, Djenné, and Mopti) in 2018 to 35 health areas across three districts in 2019 (Bandiagara, Djenné, and Mopti). The five health areas that had previously been targeted in Bankass and six out of 19 health areas in Bandiagara were removed from the target to prioritize geographic contiguity of the IRS target area, and remove insecure areas.

Due to an insecticide shortage in 2018, the number of structures found in 2018 was not a reliable estimate for the 2019 target. The project determined the number of 2019 target structures in each of the 35 health areas by comparing the number of structures found in 2017 and 2018 and selecting the larger of the two as the 2019 target.

Ultimately, in 2019, VectorLink Mali targeted a total 149,919 eligible structures for IRS across the 35 health areas in three target districts in Mopti Region: Bandiagara, Djenné, and Mopti. The 35 represents 46% of all (76) health areas in these districts. Table 4 shows the number of health areas and corresponding structures targeted for IRS by district.

**Table 4: Number of Targeted Structures for IRS by Vectorlink Mali in 2019 by District**

District	Total Number of Health Areas	Health Areas Targeted for IRS (% of total)	Population protected for IRS/Total Population (% of total)	Number of Targeted Structures
Bandiagara	27	13 (48%)	252,862/429,721 (59%)	58,694
Djenné	22	7 (26%)	122,054/284,744 (43%)	24,094
Mopti	27	15 (68%)	315,877/415,327 (76%)	67,131
Total	76	35 (46%)	690,793/1,129,792 (61%)	149,919

### 2.2 DISTRICT PLANNING MEETINGS

To develop district-level IRS operational plans, PMI VectorLink Mali organized a two-day microplanning meeting in March 2019 in each of the three districts (Bandiagara, Djenné, and Mopti) 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.

Issues discussed during the microplanning meetings included:

- Timing and duration of spray operations

- Targeting requirements
- Selected insecticide in each district
- Procurement and logistics
- Spray performance targets
- Monitoring and supervision plan
- Recruitment of spray operators (SOPs)
- Selection of SOPs' breakfast providers
- Role and responsibilities of stakeholders before, during, and after spray campaign
- Key lessons learned from the 2018 campaign, such as monitoring insecticide consumption and zero-tolerance for double-spraying, accountability for district performance, and elimination of pre-campaign community mobilization

Prior to undertaking planning activities at regional, district, and community levels, the VectorLink Mali project facilitated a meeting with the IRS steering committee in March 2019. At this meeting, all key partners including government technical partners (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 2019 spray campaign.

## 2.3 INSECTICIDE SELECTION AND QUANTIFICATION

Based on entomological monitoring and insecticide resistance results after the 2017 IRS campaign, both Actellic 300CS (pirimiphos-methyl) and SumiShield 50WG (clothianidin) were used for IRS in Mali in 2018. In the FY18 PMI Malaria Operational Plan, Actellic 300CS was selected for spraying Bandiagara and Bankass and SumiShield 50WG was selected for Mopti and Djenné. However, uncertainties related to security conditions obliged the spray team to start spraying in urban health areas, and to consume as much Actellic left over from the 2017 campaign as early in the campaign as possible, so that all of the old stock (expiration March 2020) would be used up before any campaign interruption happened. This, paired with a shortage of insecticide, resulted in each district ultimately receiving both types of insecticide.

When it was time to order insecticide for the 2019 campaign, there was insufficient evidence to judge if the residual effect of SumiShield 50WG was comparable to Actellic 300CS in Mali. However, because Actellic 300CS had a short residual life (three months) in 2017, the project sought to continue spraying SumiShield 50WG in 2019 to continue gathering decay rate data. Furthermore, generating evidence that SumiShield 50WG is equally effective as Actellic 300CS would allow PMI and PMI VectorLink to implement an insecticide rotation strategy that would help mitigate the development of insecticide resistance in the malaria vector population.

As such, for the 2019 campaign, the VectorLink project conservatively planned to spray SumiShield 50WG in Djenné only (accounting for 17% of structures) and Actellic 300CS in Mopti (which had been sprayed primarily with SumiShield 50WG in 2018) and Bandiagara (which had been sprayed primarily with Actellic 300CS in 2018). Based on the lessons learned through the insecticide shortage in 2018, VectorLink Mali revised the insecticide quantification methods for 2019. The insecticide need was quantified by individual health area, rather than by district or region, based on a combination of historical consumption data (since 2017) and accounting for the overconsumption of insecticide observed in 2018. For example, for health areas that sprayed at the expected rate in 2018 or recorded more structures/rooms in 2018 than in 2017, the 2018 insecticide consumption rate was applied. For health areas that experienced excessive consumption in 2018, the average of the 2017 and 2018 consumption rates was applied to estimate the true insecticide need.

As a result of this quantification, PMI VectorLink Mali estimated that 68,165 units of insecticide would be sufficient to cover the 149,919 structures. An additional 5% buffer was applied for each type of insecticide to minimize operational challenges related to insecticide fulfillment,<sup>8</sup> and 71,573 units of insecticide were ultimately procured for 2019 IRS campaign.

## 2.4 PROCUREMENT AND LOGISTICS

In October 2018, prior to the spray campaign, VectorLink Mali’s logistics team conducted an inventory of all 2018 leftover IRS equipment and supplies.

At the district level, during the microplanning meetings held in March 2019, VectorLink Mali’s team worked with public health officers, DTCs, and community supervisors to determine transport logistics needs for the 2019 IRS campaign. The assessment report was an important benchmark for procurement of IRS commodities for the 2019 spray campaign. Based on assessment findings, the necessary arrangements were made to designate a new central warehouse in Bandiagara, following the closure of the central warehouse in Bankass, which no longer was an IRS target district. Doing this helped reduce the distances from the central warehouse to the operations sites for commodities, supplies, and insecticide that had to be transported to sites during the campaign.

In May 2019, the VectorLink Mali team finalized the logistics and commodities distribution for the 2019 IRS campaign, and the delivery schedules to all 35 operations sites. The operations manager, logistics coordinator, and environmental compliance officer (ECO) implemented the plans for moving IRS commodities to all 35 operations sites on June 28–30, 2019.

VectorLink Mali contracted 75 vehicles (35 minibuses and 11 hard-top 4x4s and 29 taxinis) to support IRS operations at the 35 operations sites. It also contracted 13 vehicles to transport supervisors.

Table 5 shows the quantities of key IRS commodities distributed to each district for the spray campaign, and Table 6 shows the vehicles planned to transport SOPs.

**Table 5: Distribution of Selected IR Commodities to Operational Sites**

Operation Sites	Number of Teams	Overalls	Boots (Pair)	Helmets	Spray Pumps	Gloves	Masks / Respirators
Bandiagara	39	763	385	294	325	428	6079
Djenné	18	240	120	85	95	200	3100
Mopti	50	788	394	300	272	450	11720
Total	107	1791	899	679	692	1078	20899

**Table 6: Distribution of Different Types of Vehicles per District**

District	Minibuses	Hard-top 4x4	Taxini	Pirogue	Horse Carts
Bandiagara	13	14	–	–	--
Djenné	08	03	–	5	6
Mopti	14	07	29	5	--
Total	35	24	29	10	6

<sup>8</sup> An additional 5% of each insecticide was procured to accommodate any potential underestimation of sprayable surface area within the eligible structures.

Based on the findings of the logistics needs assessment, including the projected quantity of insecticide and other specific requirements, VectorLink Mali initiated international and local procurements. (See Annex A for detailed lists of items procured locally and internationally and the post-campaign balance.) Whenever possible, the project procured items locally to ensure cost effectiveness and timely delivery.

For the 2019 campaign, the international procurement targeted exclusively commodities such as the personal protective equipment (PPE), spare parts for the Goizper model spray tanks, entomological equipment/reagents, and first aid kits. The local procurements of commodities and services involved an open, competitive tendering process. The VectorLink Mali procurement committee selected suppliers based on the lowest-cost technically acceptable bids that met the criteria given in the solicitation for the quotations.

## 2.5 HUMAN RESOURCES

VectorLink Mali worked with each district to recruit spray teams, which generally consisted of one team leader supervising five SOPs. Two team leaders and their teams were managed by one supervisor who reported to the DTC, who served as the manager of an IRS operations site. Four VectorLink IRS coordinators supported the DTC's managers and liaised with project leadership.

For the selection and recruitment of seasonal workers, a selection committee – comprising the sub-prefect (president of the committee and representative of the prefect), the mayor, the DTC, the president of the ASACO, and the village chief – was set up in each of the 35 targeted health areas. The committee in each area recruited that area's 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 a minimum age of 21 and speaking the appropriate language for the area, and in particular: (1) the ability to read and write and (2) of good health with the ability to carry spray pumps for several hours per day.

VectorLink Mali hired a total of 1,348 seasonal staff including 3 district supervisors, 43 community supervisors, 107 team leaders, 466 SOPs, 35 storekeepers, 70 security guards, 88 washers, 1 mHealth coordinator, 18 data entry clerks (DECs), and 390 mobilizers. Of the 1,348, 1,070 were men and 278 (21%) were women. Table 7 breaks down spray personnel hired for 2019 operations by gender and role.

**Table 7: Hiring By Vectorlink Mali for 2019 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	–	–	–	–	3	–	3 (0%)
District logisticians	–	–	–	–	3	–	3 (0%)
Data clerks	–	–	1	17			18 (94%)
Pump mechanics	–	–	–	–	10	2	12 (17%)
mHealth coordinator	–	–	1	–	–	–	1 (0%)
IRS data transporters	–	–	8	1	–	–	9 (11%)
Spray operators	412	54					466 (13%)
Community supervisors	37	6	–	–	–	–	43 (14%)
Team leaders	92	15	–	–	–	–	107 (14%)
Storekeepers	–	–	–	–	22	13	35 (37%)
Washers	–	–	–	–	–	88	88 (100%)
Mobilizers	–	–	–	–	316	74	390 (19%)
Entomological technicians	–	–	–	–	12	3	15 (20%)
Security guards	–	–	–	–	65	5	70 (7%)
Drivers	–	–	–	–	88	–	88 (0%)

Category	Number of Staff Hired to Support IRS						Total (% Female)
	Spray Ops		Data Capture		Other		
	M	F	M	F	M	F	
Total M/F	541	75	10	18	519	185	1,348 (21%)
TOTAL	616		28		704		

## 2.6 TRAINING

Before beginning the spray operation, Vectorlink Mali collaborated with government technical partners to train personnel involved in IRS. Eleven different types of trainings were held between May 12 and June 30, 2019. The VectorLink Mali’s team made a few changes to training this year. For example, instead of holding formal trainings for clinicians and community mobilizers, task orientation was completed on the first day of the campaign. In total, 985 people were trained, 209 (21.2%) of them women.

Also this year, to improve houses’ marking during the spraying campaign, VectorLink Mali updated the marking syntax used in past years. Specifically, in 2019, marking no longer included the year in the marked date and it added the operator’s code number as well as the use of “R” to indicate refusals. Below the illustration of the marking syntax:

- Syntax used until 2018: DD-MM-YY / Structure ID / Spray Status (P or NP)
- Updated syntax starting in 2019: DD-MM / Structure ID /SOP Code/Spray Status (P or NP or R)

Orientation to the participants on the new syntax marking was done during training sessions.

Table 8 lists each type of IRS training conducted, a description of topics it covered, and its duration. Table 9 shows the number of people trained, disaggregated by gender.

**Table 8: Type, Description, and Duration of Trainings**

Type	Date	Duration	Description of Training
Training of Trainers (TOT)	June 14–18, 2019	5 days	VectorLink Mali, jointly with government partners, organized and conducted a TOT designed for district and health area-level IRS coordinators who would go on to train seasonal workers. The main objective of the TOT was to enable participants to effectively explain and demonstrate current IRS best practices to SOPs, storekeepers, community mobilizers, and other seasonal workers. The TOT emphasized familiarizing participants with the sprayer and PPE, the steps of mixing insecticides (Actellic 300CS and SumiShield 50WG), the use of the control flow valves, spraying techniques, a field simulation for spraying, environmental compliance, community mobilization, gender inclusiveness, and supervision. Participants also were oriented on the “Take 5 Security” briefing. Representatives from the Goizper pump manufacturer and SumiShield producer participated in training facilitation.
Team Leaders	June 20–22, 2019	3 days	The training was designed to prepare team leaders to lead teams of five SOPs and ensure high-quality spraying. Team leaders were also trained in spray techniques. The training covered: spray team leader responsibilities, giving and receiving constructive feedback, using the Directly Observed Spraying (DOS) checklist to supervise spray quality, and team leader data collection and reporting. After this three-day training, team leaders participated in the five-day SOP training as well.

Type	Date	Duration	Description of Training
Community Supervisors	June 20–23, 2019	4 days	The training was designed to prepare community-level supervisors to assist DTCs in the effective management of two team leaders. The supervisors were also trained on key IRS definitions (e.g., eligible structure), indicators, reporting (quality assurance) of collected data in a timely, consistent, and accurate manner. A session on mobile phone supervision highlighted mobile health (mHealth) functions, such as daily reporting via the Performance Management Tracking (PMT) system and mobile supervisory checklists.
Spray Operators	June 25–29, 2019	5 days	The main objective is to build upon SOPs' capacity to conduct IRS and effectively communicate with householders. In particular, the training emphasized the importance of finding all eligible structures and conducting high-quality IRS. Other topics covered: introduction to malaria control, spray techniques, handling insecticides and spray pumps, personal and environmental safety, field simulation (“live fire”) training, data collection, house marking, and the basics of information, education and communication (IEC) for IRS.
Data Entry Clerks (DECs) and mHealth Coordinator	June 28–30, 2019	3 days	DECs were trained on the use of data collection forms (Daily Spray Operator forms and Team Leader summary forms, and the VectorLink Mali supervisory toolkit), understanding key IRS definitions (e.g., eligible structure) and indicators, staff responsibilities, communication protocol, and review and reporting of collected data in a timely, consistent, and accurate manner. The training oriented DECs and mHealth coordinator to the District Health Information System 2 (DHIS2) database platform for data entry, and cleaning, and data quality assurance and control. Additionally, the mHealth coordinator was trained on field-level data flow, checking data quality, and using the Data Collection Verification (DCV) form.
Storekeepers	June 22–24, 2019	3 day	Storekeepers (one from each target health area) were trained on store and inventory management.
Washers	June 27, 2019	1 day	Washers were trained on best practices of washing and rinsing.
Store Security Guards	June 27, 2019	1 day	Guards were trained on their roles and responsibilities in monitoring stores.
Radio Operators	May 30–June 1, 2019	3 days	Hosts of community radio stations were trained on the IEC messages to disseminate and on how to fill out the monitoring cards of broadcast messages. Participants at the workshop updated awareness messages to communicate before, during, and after spray operations to help increase the community's acceptance for IRS and ensure householders can be properly prepared for spraying.
Drivers	June 26, 2019	1 day	Drivers received orientation on safety procedures while transporting insecticides, and on the use of first aid kits. They also were trained on what to do while transporting SOPs to and from the field, and in case an accident occurred leading to an insecticide spill. Emphasis was also placed on raising awareness of the use of safety belts by all passengers, strict compliance with other traffic rules, and, most importantly, “Take 5 Security” principles.
Entomology Technicians	May 12–13, 2019	2 days	Entomological technicians were trained in mosquito field collection practices, insectary maintenance, identification of mosquito breeding sites, larval and pupae collection, identification of <i>Anopheles</i> larvae from Culicene, and managing Human Landing Catches.

**Table 9: Number and Type of Seasonal Workers Trained, By Gender and Job Category**

Category of Persons Trained	Training of Trainers		Spraying Operations		Supervisors Training		Data clerks Training		Logistics Training		Washing Training		Transport safety and security		Store security Training		Logistics Training		Entomology Training		IEC Training		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
DTCs	29	6																					35	
IRS Coordinators	4	0																					4	
*Spray operators			412	54																			466	
*Team leaders			92	15																			107	
*Community supervisors					37	6																	43	
Data clerks							1	17															18	
Storekeepers									22	13													35	
Washers											0	88											88	
Drivers													88	0									88	
Security guards															65	5							70	
District logisticians																		3	0				3	
Warehouse keepers																		2	0				2	
Entomologist technicians																				12	3		15	
Radio hosts																						9	2	11
TOTAL M/F District	33	6	504	69	37	6	1	17	22	13	0	88	88	0	65	5	5	0	12	3	9	2	985	
Total Trained	39		573		43		18		35		88		88		70		5		15		11		985	

\*Based on the PMI indicator definition. It includes only spray personnel such as SOPs, team leaders, and supervisors. It excludes clinicians, DECs, IEC mobilizers, drivers, washers, porters, pump technicians, and security guard.

**Figure 2: TOT in Spray Technique**

The practical session, simulations of insecticide application in Sévaré (Mopti District), June 14–19 2019

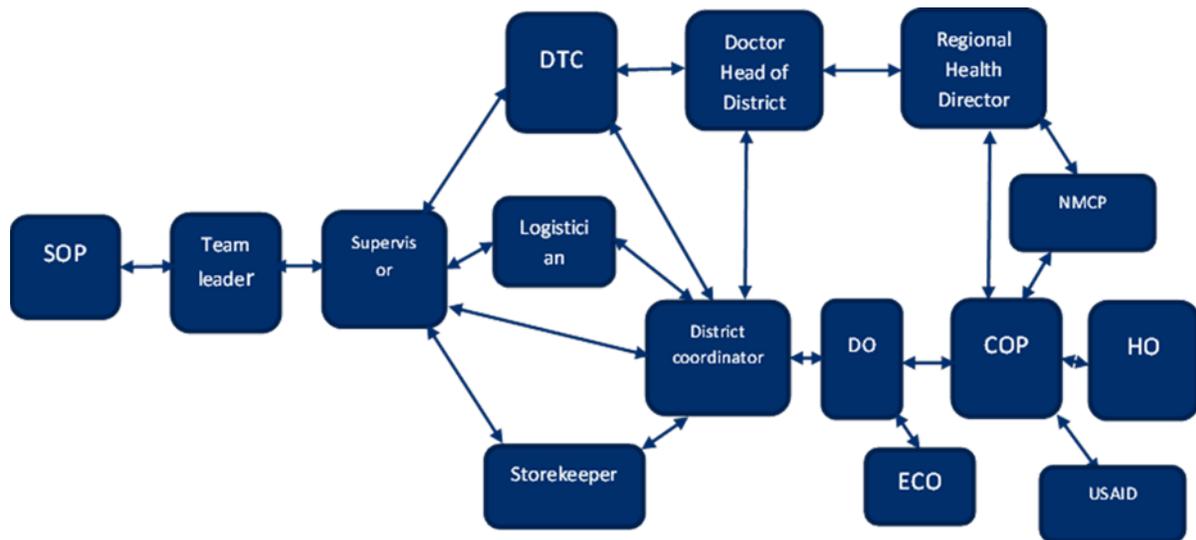


## 2.7 SECURITY

To ensure effective mitigation of personnel’s risk of exposure during the 2019 IRS campaign, given the unpredictable security situation in Mopti Region, VectorLink Mali developed basic security tools and procedures. These include:

- 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 3).
- Security guidance provided by the Abt’s director of Global Security, following his pre-IRS campaign visit to Mali on June 11–20, 2019. During the visit, he conducted a security assessment, developed tailored security protocols, and strengthened the security committee’s decision-making and crisis-response skills, and delivered safety materials and a refresher orientation to the VectorLink Mali’s team.

**Figure 3: The VectorLink Mali Telephone Communication Chain**



# 3. INFORMATION, EDUCATION, AND COMMUNICATION

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To ensure successful spray operations, VectorLink Mali used various IEC strategies before and during the spray campaign to create awareness and encourage households and communities to accept IRS. These strategies included door-to-door sensitization and mobilization, meeting with regional and district-level officials and local authorities, and mass media representatives.

## 3.1 MOBILIZATION CONCURRENT WITH SPRAY

During the microplanning meetings, participants in the three districts were informed about changes in the support VectorLink Mali would provide to community mobilization activities. Outreach through radio, with information about IRS and spray schedules for the 390 targeted villages, would continue. But because 2019 was the third consecutive year of IRS in the target areas, communities were expected to be well aware of the benefits of IRS. Therefore, door-to-door mobilization efforts would be streamlined to emphasize household preparation rather than education about malaria and/or IRS. IEC mobilizers would no longer be engaged for 20 days prior to the campaign. One mobilizer, identified by the DTC as one of the best who had been trained and worked in previous years, would be hired to work the day before and for the duration that the spray operation in each village. In addition, local authorities would complement the mobilizers, with community mobilization strategies and approaches before and during the campaign, with the aim of increasing people's acceptance of IRS.

One day before the arrival of the spray team, once the community supervisor or the DTC had confirmed the imminent arrival of spray team to the village chief, the IEC mobilizer would relay the news to the community residents, and sensitize them on preparing their houses for spraying.

As planned, IEC mobilizers visited individual houses on the day before the SOPs were scheduled to arrive and then accompanied spray teams as they sprayed. They told beneficiaries about their responsibilities before the spray team's arrival in the village, and during and after spraying. Mobilizers also provided information about insecticide effectiveness. Additionally, they collected data using the IEC Mobilizer form, filled and issued an IRS card to each sprayed household, and marked all consenting eligible structures. SOPs visited both marked and unmarked structures but the advanced door marking and sensitization shortened the time the SOPs needed to spend with each household while spraying.

At the same time, campaign supervisors circulated throughout the communities to supervise mobilization activities and IRS operations, identifying problems in the distribution and use of IRS cards or structure marking conventions and providing on-the-spot training to ensure the best possible community preparation for optimal spray operations.

Lastly, as a result of meetings held by the VectorLink team with village chiefs, their assistants, and religious leaders in certain urban areas (Mopti, Bandiagara) and rural areas where SOPs indicated refusals as the most common reason among structures not sprayed up to 60% in health areas like Soufouroulaye and Sofara), local authorities actively contributed to the campaign's success by going door-to-door and visiting resistant households in person to help get their buy-in and accept IRS.

VectorLink Mali complemented this with announcements on community radio stations. Starting one month before the spray visits began, through the spraying, and for one week after the campaign, community radio stations continuously broadcast announcements with spray information and schedules to the villages. 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. Based on the experience of the 2018 campaign, specific IEC messages were developed to dispel myths about the insecticide's effectiveness, related to the strength of its odor.

The VectorLink Mali team also held meetings with village chiefs and their assistants, who have been key in achieving effective and successful community awareness and mobilization for spraying. For example, the VectorLink team, in collaboration with the district health officers, met with the chiefs of 13 urban health areas in Mopti (on July 1, 2019, the first day of the campaign) and chiefs of eight urban areas in Bandiagara (on July 15, 2019). All the chiefs expressed their appreciation at being treated as major stakeholders in the community mobilization. In return, they carried out their sensitization tasks with the utmost dedication.

## 3.2 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 before, during, and after the IRS campaign.

From May 30 to June 1, 2019, Vector Link Mali, in collaboration with the NMCP/MOH, SDES (Service de Développement Social et de l'Economie Solidaire) representatives facilitated the training of radio operators, and strengthened their skills and capacity in raising awareness about IRS and malaria prevention information. As a result, IEC messages were updated, and specific messages were developed, explaining to the population that IRS insecticides may change from year to year but that they are equally effective even if they have different characteristics, including smell.

VectorLink Mali used a variety of media to ensure wide dissemination of IRS spray campaign information, and to explain and encourage acceptance of IRS. 6,930 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 June 1 to August 9, 2019. They emphasized key messages on the benefits of IRS and the role of the community before, during, and after spray, and highlighted that the intervention was funded by USAID/PMI.

Additionally, interactive radio talk shows were held every Saturday at 11:00 am at "Djamana" radio and were transmitted synchronously with the 10 other radio partners across the three target districts. Beneficiaries were invited to share their concerns and ask questions by calling in. The weekly talk shows featured rotating government partners such as the NMCP/MOH, the Mopti regional health officer, the SDES officer, and community leaders, in collaboration with VectorLink Mali. These talk shows and other live interviews allowed the VectorLink Mali team to explain to listeners why the 2018 IRS campaign had been ended prematurely and to ensure them that all necessary arrangements had been made for the 2019 campaign to be completed smoothly.

Besides the 11 local radio stations, which continuously broadcast announcements and other radio programs, the VectorLink team collaborated with the national radio and television station (ORTM), for a televised talk show on IRS information that was broadcast three times during the campaign.

# 4. IMPLEMENTATION OF IRS ACTIVITIES

## 4.1 OVERVIEW

The 2019 IRS campaign was implemented for 30 operational days between July 1 and August 4. VectorLink Mali deployed a total of 107 spray teams from 35 sites. In all spray districts, spraying started in the farthest locations from the operation site and ended in more central areas.

The allocation of spray teams was determined by the number of eligible structures per district and the geography/terrain that the spray teams would cover (Table 10). Each SOP was expected to spray 12 structures per day except in the urban parts of Djenné and Mopti towns, where the daily performance target was nine structures.

**Table 10: Distribution of Spray Teams by District**

District	No. of Spray Teams	No. of Eligible Targeted Structures
Bandiagara	39	58,694
Djenné	18	24,094
Mopti	50	67,131
<b>Total</b>	<b>107</b>	<b>149,919</b>

Spray operations ran six days per week, with a day of rest coinciding with the local market day.

Daily spray activities began at 6:00 am, when the spray personnel met at their designated operations site (after eating breakfast) to collect their equipment (PPE, tanks, and insecticide) and get ready for the day. Once all commodities were distributed, the supervisor met with the spray team leaders, shared the spray schedule for that day, and the route to reach each community. Before departure, DTCs and community supervisors held morning assemblies to communicate important announcements, feedback from field supervision, performance tracking, and expectations for the day. Examples of technical guidance given during the morning assemblies were: the methods for numbering the structures recommended by the monitoring and evaluation (M&E) team and for SOPs to not mix insecticide until they reached structures whose owners had accepted spraying. Additionally, supervisors conducted a daily health check to ensure that all team members were healthy enough to carry out the day's activities. VectorLink and government supervisors attended these morning assemblies whenever possible.

After the SOPs retrieved the previous day's rinsate (i.e. insecticide-contaminated water) from barrels 1, 3, and 5, the spray teams left the site by 7:00 am for the communities to be sprayed that day. They returned to the operations sites between noon and 1:00 pm.

In the field, spray supervisors oversaw team leaders who assigned SOPs to the structures designated for spraying that day. Team leaders completed the DOS checklist, while supervisors used the Homeowner Preparation and SOP Performance forms for supervision. SOPs recorded data using the Daily Spray Operator data collection form.

Upon returning to their operations sites, the SOPs carried out end-of-day clean-up in accordance with PMI's Best Practices Manual (BMP). Team leaders returned all insecticide bottles/sachets (both empty and unused bottles/sachets) to the site storekeeper.

At the end of the day, team leaders verified the data on forms submitted in the Daily Spray Operator form: they checked the forms for completeness and accuracy, and corrected any errors found. They summarized all SOP data and submitted them to spray supervisors. The supervisors further verified the data and submitted them to the DTCs. The DTCs used the summarized data to complete the Performance Tracking Sheet that was posted on a wall at each operations site.

Lastly, the project collected all spray data forms and delivered them to the data center for entry into the VectorLink Collect database.

## 4.2 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), SDES and regional and district health offices collaborated to supervise IRS. Table 11 shows the institutions/stakeholders that participated in IRS supervision. Each category of supervisor was assigned targets and numbers of supervision forms to be submitted, by district; Annex B shows the results.

**Table 11: 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 teams and reported directly to the DTC, who in turn reported to the VectorLink IRS 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 by the M&E team of any red flags or operational decisions to be made regarding the insecticide consumption of a given health area. This helped the team to prioritize which health areas to visit and served as a valuable tool 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 operations sites used the Performance Tracking Sheet on a daily basis. At the end of each day, community supervisors submitted summary data from the Performance Tracking Sheet to the IRS coordinator. The IRS coordinator compiled the data from the site sheets, updated the district Performance Tracking Sheet, and submitted a daily report to the operations manager and VectorLink M&E staff.
- VectorLink Mali used 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 on those observations and recommendations. As a result, issues were identified and those that were specific to the operations sites were properly addressed.

- The VectorLink Mali's staff and government supervisors, both at national and regional level, met 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 DOS 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 DOS tool to evaluate SOP performance, and community supervisors used it to monitor teams' and team leaders' adherence to this supervision protocol.

In addition to the routine practices mentioned above, the VectorLink Mali's team successfully implemented important new elements intended to reinforce the supervisory system. The elements were described in the PMI VectorLink Mali 2019 Work Plan, based on lessons learned from the 2018 campaign:

- At the end of each day, community supervisors reviewed the data transmitted the data of the Team Performance Monitoring form with the warehouse managers and subsequently transmitted it to the VectorLink district coordinator by SMS or phone. The district coordinator compiled the information from all districts in their purview and sent it to the operations, M&E, and database managers on the same day.
- Community supervisors held daily morning leadership meetings with team leaders and storekeepers, during which they discussed the Team Performance Monitoring form data from the previous day and took appropriate measure such as maintaining effective communication between SOPs and team leaders to limit the team's production of wastewater and to avoid wasting insecticide. The morning debriefing report was recorded in the visitor book and signed by the community supervisor. The key messages were communicated to the teams through 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 performance, insecticide use, difficulties encountered, and proposed solutions. The meeting conclusions were reported on in the same 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.

Furthermore, on July 16 and 17, Jules Mihigo and Aliou Diallo from PMI Mali came to supervise spray operations.

### 4.3 LOGISTICS AND STOCK MANAGEMENT

VectorLink Mali trained 35 storekeepers, 3 district logisticians, and 12 pump technicians to manage the operations site stores and assist the two VectorLink full-time warehouse managers. The 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, to ensure uniformity between delivery notes, stock cards, insecticide tracking forms, ledger books, and physical stock counts.

During the campaign, the logistics and procurement manager provided regular updates for the two central warehouses. In turn, the warehouse managers provided regular inventory updates for each operations site store (the Sévaré warehouse manager was in charge of site stores in the health areas in Mopti and Djenné, and the Bandiagara warehouse manager was responsible for site stores in the health areas in Bandiagara). Site storekeepers were responsible for requesting needed supplies from the warehouse manager who was responsible for filling their orders. To properly track the movement of materials, delivered goods were accompanied with signed copies of request and delivery notes.

### 4.3.1 IRS VEHICLES AND TRANSPORTATION SAFETY

To minimize the risk of insecticide exposure and spillage, all trucks that transported insecticide and minibuses that transported SOPs underwent pre-contract vehicle inspections that certified them for operations according to BMP criteria for transport vehicles.

To ensure maximum compliance with safety issues, the ECO organized on June 26, 2019, a one-day training for the 88 drivers. Each vehicle was provided with a first aid kit, material safety data sheets, accident/emergency procedure sheets, a vehicle inspection certificate, and a spill kit for spill management.

### 4.3.2 IRS STORAGE AND INSECTICIDE STOCK MANAGEMENT

Every morning, at each operations site, storekeepers issued Actellic 300CS bottles or SumiShield 50WG sachets to team leaders, who signed an insecticide tracking card to acknowledge receipt of the exact quantity of bottles or sachets on behalf of their team. Each bottle/sachet of insecticide was serialized for tracking purposes. The team leader also noted on a separate card the quantity and serial numbers of each bottle/sachet issued to each SOP.

Storekeepers used IRS Daily Insecticide Usage Registers, Insecticide Trackers, and stock control cards to account for the quantities of insecticide issued, used, and returned. They also used the registers to account for the empty bottles/sachets and identify any discrepancy between quantities of insecticide issued and returned. When a discrepancy was noted, the VectorLink team conducted a supervision visit to the operations site store to perform a physical inventory.

The warehouse managers worked closely with the M&E team to ensure that records of used insecticides on stock cards corresponded to insecticide data reported in the project database.

### 4.3.3 IMPROVED INSECTICIDE USAGE TRACKING SYSTEM

VectorLink Mali used three databases to monitor spraying and triangulate insecticide consumption data:

- The electronic inventory tracking database,<sup>9</sup> a Monopost software programmed in MS Access and primarily used by warehouse managers
- The DHIS2-based PMI VectorLink database (VectorLink Collect) used primarily by the M&E team
- The SMS-based PMT, used primarily by the operations team to monitor progress on a daily basis

In 2019, the VectorLink Mali team strengthened the insecticide tracking system through the use of an Excel-based tool to compute insecticide utilization rates in each of the 35 health areas based on the daily PMT reports, and compare them with the expected utilization rates on which the insecticide quantification was based. The tool was designed to visually alert the team if a health area was consuming more insecticide per structure than expected; different colors indicate different levels of consumption. For example, green indicates normal use of insecticide; yellow and red show consumption that exceeds the pre-estimated rate, by less than 20% and more than 20%, respectively.

The M&E and operations teams worked together to develop a protocol to ensure all members of the team were appropriately informed of any red flags or operational decisions made based on the consumption data.

The storekeeper verified the number of empty and full bottles/sachets against the number of bottles/sachets recorded as having been issued. They then placed the empty bottles/sachets in their original boxes and stored them in a designated area of the storeroom to await their transfer to a central warehouse and then to a recycling facility after the IRS campaign. The unused bottles/sachets were returned to the available stock-on-hand, recorded on the stock cards, and were distributed the following day.

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<sup>9</sup> The system was developed by the VectorLink Mali procurement and logistics manager in 2013 and has since been disseminated to other VectorLink countries.

The insecticide usage results are shown in Section 6.7.3 of this report.

## 4.4 SECURITY

During the 2019 IRS campaign, the VectorLink Mali leadership team sought to minimize the risks to staff safety due to insecurity. Specific security management measures included:

- Every day at 7:00 pm, each VectorLink district coordinator presented to the operations manager an update of the security situation in that district, based on information gathered from DTCs. Any critical information was shared with the Chief of Party (COP) and discussed for the appropriate follow-on.
- The VectorLink Mali staff members used the telephone communication chain (see Figure 3 in Chapter 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 a site, they consulted the DTC, so that they were well informed on the security status of the areas they planned to supervise.
- On a daily basis, the VectorLink Mali team and Abt's Global Security Office monitored the security situation through communication with local authorities and community leaders; they also monitored publicly available security data from sources such as the Armed Conflict Location & Event Data Project (ACLED).
- VectorLink Mali, the PMI VectorLink home office, and Abt's Global Security Team held a weekly meeting to share information on security events in Mali in general, and with a focus on the Mopti Region, including the three target districts. If needed, mitigation measures were recommended.
- A summary of relevant events was attached to the weekly spray progress report 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, relevant security events that directly affected the three districts (Bandiagara, Djenné, and Mopti) included the following:

- In the second week of the campaign, there was an air raid in one IRS target area (Kani-Gogouna).
- The VectorLink team was advised by local authorities not to travel to the following areas in Bandiagara district:
  - Five villages in the health area of Kendié (Biri, Somme-Sissongo, Banguel-Toupe, Diamangolo and Amba). The presence of armed persons in these villages resulted in a massive displacement of the population, and the mayor advised against spray teams going to these villages. The villages account for approximately 1,765 structures and 6,155 people combined.
  - Two hamlets Koundou-Ando village in the health area of Iby (Soban-Dan and Soban-Dou). The DTC recommended removing these hamlets from the IRS area to be sprayed, since they had been abandoned. These hamlets contain approximately 86 structures and 307 people.
- During the third week of the campaign, a peaceful protest took place on July 22, 2019 in Sévaré town, in Mopti District.

Following inter-ethnic attacks and violence that had occurred a few months earlier, a village Nianangali and two hamlets (Oure Sa and Dendily) in the Soufroulaye health area were abandoned, accounting for a total of 56 structures.

Official written correspondence was received from the regional and district health officers and shared with PMI (Annex C). Table 12 lists the villages and hamlets that were recommended not be sprayed due to security concerns.

**Table 12: Villages Not Sprayed Due To Security Concerns**

Health District	Health Area	Village	# Structures not sprayed	Estimated # People
Mopti	Soufroulaye	Nianangali (hamlet: Oure Sa and Dendiby)	56	73
Bandiagara	Kendié	Biri	246	593
		Somme-Sissongo	275	962
		Banguel-Toupe	547	2,063
		Diamangolo	278	961
		Amba	419	1,577
	Iby	Koundou-Ando (hamlet: Soban-Dan and Soban-Dou)	86	307
<b>TOTAL</b>			<b>1,907</b>	<b>6,535</b>

## 4.5 VECTORLINK PAYMENT OF SEASONAL WORKERS

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 100 million francs CFA (\$ 178,571.43) to these 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. The first payment enabled Orange to identify and address most of the causes of unsuccessful transmissions.

# 5. ENTOMOLOGICAL MONITORING

## 5.1 INTRODUCTION

The 2019 IRS campaign used SumiShield 50WG in Djenné and Actellic 300CS in Bandiagara and Mopti. Quality assurance testing was performed in all targeted districts (Table 13) 1–2 days after IRS using cone bioassays on sprayed walls. The bioassays were carried out with a laboratory-reared susceptible colony of *An. coluzzii* following World Health Organization (WHO) protocols.

Cone bioassays were conducted in a total of 20 structures (10 in Djenné, 5 in Mopti, and 5 in Bandiagara). Four wall types (mud, painted mud, cement, and painted cement) were tested and the number of each type of wall tested in each district is shown in Table 14. In each sprayed house, laboratory reared, susceptible *An. coluzzii* mosquitoes were exposed on a wall at varying heights: 0.5 m, 1.0 m, and 1.5 m from the floor. In each cone, 10–12 females of the *An. coluzzii* susceptible strain were introduced for 30 minutes. In total at least 30 females of the *An. Coluzzii* used by room. Negative controls were performed in parallel with mosquitoes exposed to untreated blocks in an unsprayed area. 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 set on a chair, approximately 10 cm away from the sprayed wall and about 1.0 m above the floor. A control test was conducted with the same number of mosquitoes in a wire cage in a neighboring unsprayed house.

The mortality rates were recorded 24 hours later for Actellic 300CS and followed for seven days for SumiShield 50WG.

**Table 13: IRS Cone Bioassay Surveillance Sites For 2019**

District	Health Area	Site (village)	Spray Status	Insecticide Sprayed	Geographic Zone	IRS History
Mopti	Sokoura	Sarema	Sprayed	Actellic 300CS	Sahelian	2017 OP, 2018 NN
Bandiagara	Bandiagara Central	Bendjeli	Sprayed	Actellic 300CS		2017 OP, 2018 OP/NN
Djenné	Madiama	Madiama	Sprayed	SumiShield 50WG	Sahelian Flooded	2017 OP, 2018 NN

**Table 14: Number of Each Type of Wall Tested In Each Site**

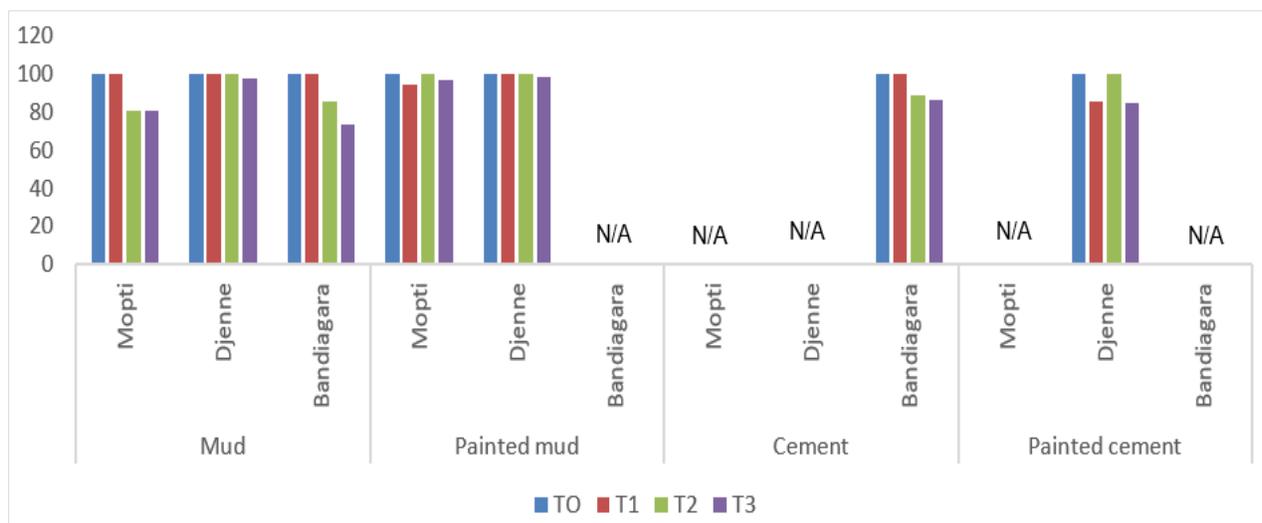
Districts	Site (village)	Mud (N)	Painted mud (N)	Cement (N)	Painted Cement (N)
Mopti	Sarema	3	2	0	0
Bandiagara	Dandoly	4	0	1	0
Djenné	Madiama	5	3	0	2
<b>Total</b>		<b>12</b>	<b>5</b>	<b>1</b>	<b>2</b>

## RESULTS

### 5.1.1 QUALITY ASSESSMENT AND IRS DECAY RATE MONITORING

- WHO cone wall bioassays at T0 (within five days after spraying) produced 100% mortality in susceptible *An. coluzzii* whatever the insecticide (Actellic 300CS or Sumishield 50WG) on all the type of wall surfaces tested (mud, painted mud, cement and painted cement) in the IRS districts (Figure 4)
- At T1 (one month after spraying), mortality on mud and cement surfaces treated with Actellic and Sumishield was 100%. The mortality varying from 94.3% to 100% on painted mud surfaces and from 85.7% to 100% on painted cement surfaces.
- At T2, the mortality rate of *An. coluzzii* on mud surfaces sprayed with Sumishield was 100%. On the same wall sprayed with Actellic, the mortality drop to 80.7%. Whatever the insecticide the mortality was 100% on the painted mud and the painted cement surfaces. The mortality rate was 90% on cement surface two months after IRS.
- At T3 (three months after spraying), the mortality rate of *An. coluzzii* susceptible strain was very variable depending on the type of walls and the insecticide used. There is the first time that we found a mortality rate under the 80% on mud surface treated with Actellic in Bandiagara. In the two other areas, the mortality on mud surface varied between 81% in Mopti to 98% in Djenné. On the painted mud surfaces, the mortality varied from 94% with Actellic to 100% with Sumishield. The mortality was 100% on painted cement and 89% on cement.

**Figure 4: Results of Quality Assurance Cone Bioassay Testing Following IRS (July - September 2019)**

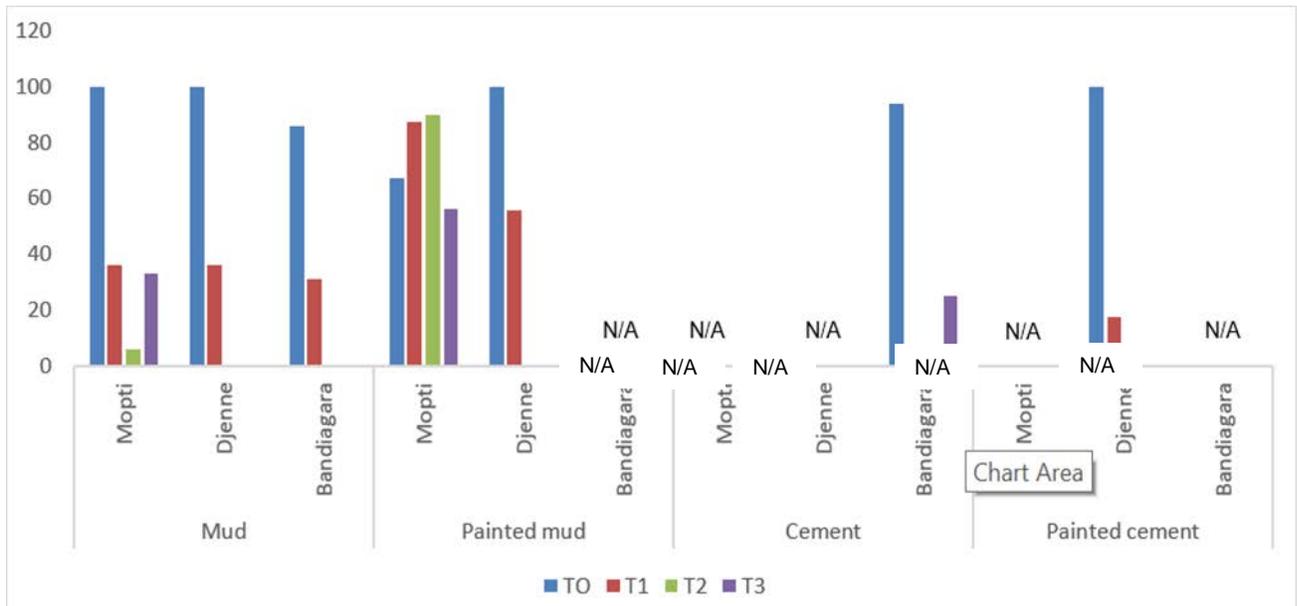


Note: N/A indicates that this wall type was not found in this district.

### 5.1.2 FUMIGANT EFFECT

The mortality very high one week after IRS decreased one month after and varied between 0% on cement wall in Bandiagara to 87.5% on painted mud in Mopti one month after IRS. At T2 and T3, the mortality rate was respectively 90% and 56.5% on painted mud surface in Mopti. In all the others sites, the fumigant mortality rate was less than 50% (Figure 5).

**Figure 5: Results of Fumigant Bioassays Testing Following IRS (July – September 2019)**



Note: N/A indicates that this wall type was not found in this district.

# 6. MONITORING AND EVALUATION

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All M&E activities and processes for the 2019 IRS campaign closely followed the processes outlined in the PMI VectorLink Mali 2019 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. Eighteen DECAs worked in the data center, which received data from Bandiagara, Djenné, and Mopti districts.

## 6.1 KEY OBJECTIVES

The key objectives of VectorLink Mali M&E activities are to:

- Verify the accuracy of both the data collection and data entry processes through comprehensive training and supervision at all levels;
- Streamline and standardize data flow, minimize errors, and facilitate timely reporting;
- Ensure IRS data security and storage for future reference through the establishment and enforcement of proper protocols; and
- Document lessons learned and good practices observed in the implementation of project activities and apply these to future project years.

## 6.2 DATA MANAGEMENT

During the 2019 IRS campaign, data were collected and verified using standardized forms designed to capture all core PMI indicators.

The VectorLink Mali M&E team adhered to the former PMI VectorLink M&E protocols and introduced modifications in the data collection tools based on the Malian context with support from project peers and the home office M&E specialist. These improvements ensured collection, management, and reporting of high-quality data. The VectorLink Mali team was in its first year of rolling out the newly designed and configured VectorLink Collect DHIS2 database. The new database, with its dynamic dashboards and regular quality checks helped the M&E and operations teams to produce real-time reports for rapid feedback, provided data for supervision teams to follow up on spray quality, facilitated reconciliation of data collection errors, and helped to prevent additional errors in data collection and entry.

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. All forms were verified to ensure appropriate sections were filled out correctly, and the corresponding supervisor signed the form to indicate that it was reviewed appropriately. Together with the community supervisor, the DTC and data transporters worked to ensure that all the forms reached the data center at the end of each day or the following morning.

VectorLink Mali used a daily data tracking chart to alert IRS coordinators if the data were expected to arrive late. Use of the chart was very effective in reducing the delivery time of the forms.

Once the data were entered, paper forms were filed and temporarily archived at the data center. Eventually, all the forms were transferred to the VectorLink Mali office in Bamako for long-term storage.

## 6.3 VECTORLINK COLLECT - DHIS2

The VectorLink team in Mali implemented the VectorLink Collect DHIS2 system for data management and reporting for 2019 IRS campaign. BAO Systems and the team from Abt's Data Science, Surveys, and

Enabling Technology (DSET) division developed a customized VectorLink DHIS2 instance to serve as the primary, centralized database across the VectorLink Mali project. In Mali, DEC's used the offline-enabled desktop to enter the data and web-based applications to clean the data. The desktop application provided a platform to work offline, which was important given the interruptions in connectivity experienced at the data center. Both applications channeled data to the central Vectorlink Collect DHIS2 database for final storage and reporting. All electronic data are securely stored and backed up on DHIS2 VectorLink servers, cloud-hosted by the BAO Systems team.

## 6.4 DATA QUALITY ASSURANCE AND QUALITY CONTROL

Data quality assurance was carried out daily during the IRS campaign by a variety of VectorLink staff (SOPs, team leaders, 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, arithmetically verified, and signed off on all Daily Spray Operator forms.
- District level: IRS coordinators, District officials, and DTCs received the paper forms from the supervisors and checked the accuracy of the spray data with the Error Eliminator form. The Error Eliminator form allows one to check the quality of the data and the overall completeness of the form itself. Afterward, the monitors delivered the Daily Spray Operator forms to the data center each evening.
- Data entry level: DEC's reviewed each form for typos and transcription errors and verified the arithmetic calculations on the Daily Spray Operator forms were correct before entering them into the database. Also, the project uses the Data Entry Verification form to verify the accuracy of the data at the point of data entry. This process is done six times for each DEC.

## 6.5 M&E DATA QUALITY ASSURANCE TOOLS AND RESULTS

VectorLink Mali used three data quality assurance tools, which focus specifically on data quality assurance methods. After some initial struggles due to the conversion of the DCV form from paper to a mobile application, the users learned how to navigate the form on a smartphone. Table 15 shows the percentage of records verified by VectorLink Mali in 2019 using each data quality assurance tool.

**Table 15: Type of M&E Supervisory Tools Used and Data Clerk Results**

M&E Supervisory Tools	Structure Records Verified	Structure Records Corrected	Percent of Records Correct
Error Eliminator	12,830	1,283	90%
Data Collection Verification	3,076	338	89%
Data Entry Verification	1,880	244	87%

## 6.6 DIMAGI PLATFORM

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 2018, 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.
- DCV forms: This form was used and uploaded DCV forms weekly to the database.
- Performance Tracking Sheet 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 2019 there was generally a better use of the supervisory checklist application than in 2018. Annex B shows the number entries captured on the Dimagi platform for each supervision checklist.

## 6.7 RESULTS

The complete list of program indicators for the 2019 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.

### 6.7.1 SPRAY COVERAGE AND PROGRESS

The 2019 VectorLink Mali campaign sprayed 148,198 of the 153,191 structures found by SOPs, for a spray coverage of 96.7% and a spray progress of 98.9%, as seen in Table 16. A total of 690,793 people were protected, including 35,484 pregnant women and 98,217 children under 5. Annex E gives detailed results by health area.

**Table 16: Spray Coverage and Population Protected**

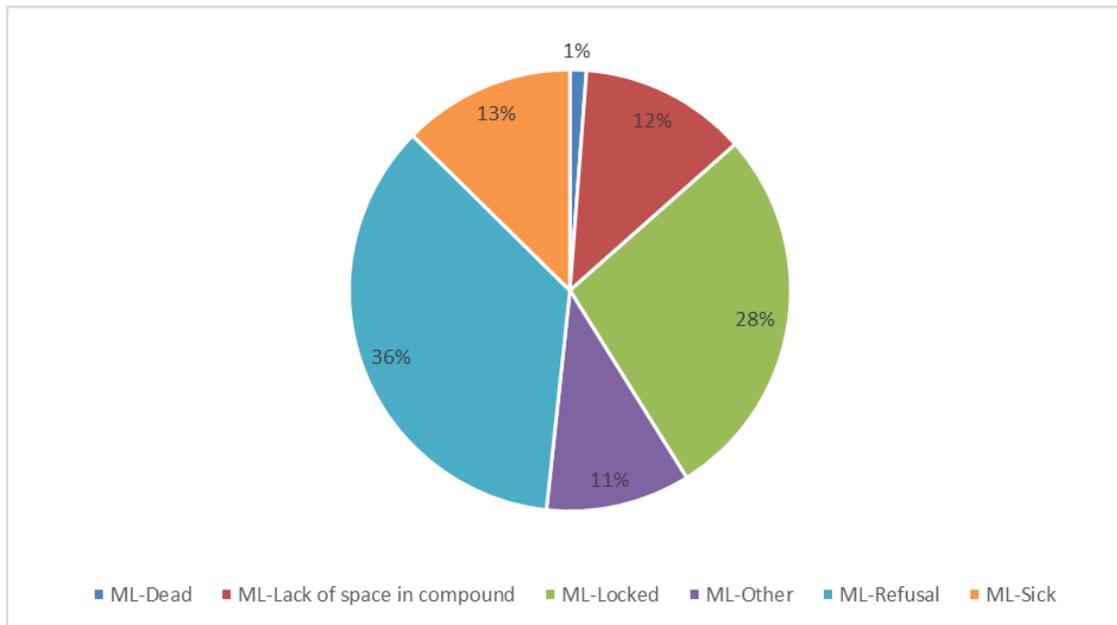
District	Eligible Structures Found	Structures Sprayed	Spray Coverage	Population Protected				
				Males	Females	Total	Children <5	Pregnant Women
Bandiagara	61,112	60,474	99%	127,291	125,571	252,862	35,494	9,950
Djenné	27,679	26,611	96.1%	63,204	58,850	122,054	21,569	8,256
Mopti	64,400	61,113	94.9%	157,410	158,467	315,877	41,154	17,278
<b>Total</b>	<b>153,191</b>	<b>148,198</b>	<b>96.7%</b>	<b>347,905</b>	<b>342,888</b>	<b>690,793</b>	<b>98,217</b>	<b>35,484</b>

### 6.7.2 REFUSALS AND STRUCTURES NOT SPRAYED

In the 2019 IRS spray campaign, 4,993 structures (3.3% of total structures found) were recorded as unsprayed (as compared to 2018 when 4.1% of structures found were recorded as unsprayed). The reasons for structures not being sprayed were: refusals (35.7%), locked structures (27.6%), sick person in the structure (12.6%), and lack of space in compound (12.3%), “other” (10.6%), and dead (1.2%). Figure 6 illustrates this.

In a few cases, refusals occurred on a larger scale, preventing SOPs from entering multi-structure compounds or buildings. In these cases, SOPs were unable to count or record the number of structures that were left unsprayed and therefore these refusals were not captured in VectorLink Collect. This occurred disproportionately in urban areas of high population density, where there are many multi-unit buildings, suggesting that the proportion of structures unsprayed due to lack of space in the compound is underestimated. According to the results of a rapid survey conducted in May 2019 by the VectorLink Mali team, the number of structures in compounds with lack of courtyard space could be as many as 7,892 out of 9,434 structures surveyed in the towns of Mopti and Djenné, further supporting the hypothesis that this reason for a structure being unsprayed is underestimated.

**Figure 6: Refusals and Structures Not Sprayed**



### 6.7.3 INSECTICIDE USAGE

Table 17 shows insecticide availability and use in 2019. In total, 61,617 bottles/sachets of insecticide were used to spray 148,198 structures. Table 18 shows the insecticide used by district. For details by health area see Annex F.

**Table 17: Insecticide Procurement and Usage during the 2019 Campaign**

Insecticide	Quantity (Units)
Actellic 300CS procured for the 2019 campaign	60,993
SumiShield 50WG procured for the 2019 campaign	10,583
Total number of insecticide bottles/sachets available for 2019 campaign	71,576
Actellic 300CS bottles and SumiShield 50WG sachets used during the 2019 IRS campaign	61,617
Balance after the completion of the campaign	9,959
Actellic 300CS bottles (Exp 02/21)	9,646
SumiShield 50WG sachets (Exp 01/22)	313

**Table 18: Number of structures sprayed by Insecticide and by District**

District	Structures sprayed	Rooms sprayed	Insecticide units used	Average Insecticide usage rate (structures per unit)	Average Insecticide usage rate (rooms per unit)
Bandiagara	60,474	134,664	25,514	2.4	5.28
Djenné	26,611	54,641	10,270	2.6	5.32
Mopti	61,113	143,686	25,833	2.4	5.56
<b>Total</b>	<b>148,198</b>	<b>332,991</b>	<b>61,617</b>	<b>2.4</b>	<b>5.4</b>

The Monitoring and Evaluation Plan Matrix in Annex D captures details on all programmatic indicators.

# 7. ENVIRONMENTAL COMPLIANCE

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## 7.1 ENVIRONMENTAL DOCUMENTATION

VectorLink Mali operates under a Supplemental Environmental Assessment (SEA) that was approved in 2016, and covers the use of all WHO-recommended insecticides for IRS, including pyrethroids, carbamates, organophosphates, and chlorfenapyr, a pyrrole, for the period of 2016–2021. The SEA is valid for IRS activities nationwide, so it includes the districts of Bandiagara, Djenné, and Mopti.

This SEA was amended and approved on July 2, 2018, with the introduction of clothianidin, a neonicotinoid.

The status of implementation of the project's Environmental Mitigation and Monitoring Plan (EMMP) is recorded in a report called the Mitigation and Environmental Monitoring Report EMMR (Annex G).

## 7.2 INTRODUCTION OF INSECTICIDE ROTATION

The 2019 campaign was the second year of SumiShield 50WG use in the Mopti Region (specifically, Djenné District only was sprayed with Sumishield 50WG for two consecutive years); Mopti and Bandiagara districts were sprayed with pirimiphos-methyl. Previously (in 2017), these districts had been sprayed with pirimiphos-methyl only. It is of note that from 2011 to 2014, Koulikoro, Barouéli, and Bla districts were sprayed with bendiocarb.

## 7.3 SOAK PITS

Because it is difficult or impossible to install a fixed soak pit in hard and rocky soil, a total of 13 mobile soak pits and 40 fixed pits were used for the IRS 2019 IRS campaign.

While mobile soak pits were generally used in combination with fixed soak pits (to accommodate larger teams), there are three health areas in the Bandiagara health district where only mobile soak pits were used: Kamba, Djiguibombo, and Kori-Maoundé.

In Socoura (Mopti District) and Kendie (Bandiagara District) health areas, fixed soak pits did not have the capacity to contain all wastewater produced by a large number of SOPs, and for cost saving causes, mobile soak pits were used to supplement the fixed ones.

Two other health areas in the Bandiagara District, namely Sangha and Goundaka, used both fixed and mobile soak pits, to allow spray teams to conduct multi-day missions and avoid excessive transportation.

. Using them helped VectorLink Mali to continue improving its environmental and safety compliance, time management, cost efficiency, and SOP convenience during the campaign.

## 7.4 PRE-SEASON ENVIRONMENTAL COMPLIANCE ASSESSMENT

In accordance with the 2019 action plan, the Pre-Season Environmental Compliance Assessment (PSECA) took place on April 11–24, 2019, at the 35 operations sites in the three target districts. The PSECA was carried out by an inspection team led by the VectorLink Mali ECO with representatives of the MOE at national, regional, and district levels.

The Open Data Kit (ODK) application through a smartphone was used to complete the both the initial and final PSECAs. 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 gaps identified during the initial PSECA and brought all facilities into compliance. The final PSECA, completed several days before the scheduled start of the campaign, verified the completion of all rehabilitation activities and confirmed the readiness of each operations site. A summary of repairs is listed in Annex F.

## 7.5 MEDICAL EXAMINATION

VectorLink Mali and the MOH had all SOPs and team leaders undergo a medical examination in June 2019 prior to their involvement in the 2019 campaign, in order to assess their level of fitness for the 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. No female seasonal workers tested positive.

## 7.6 MANAGEMENT OF INSECTICIDE ADVERSE EFFECTS

In general, all 35 DTCs, in addition to the IRS operations managers, served primarily as clinicians at the community health centers. VectorLink Mali had already trained them in 2017 and 2018 on poison management and on recognizing and treating the possible toxic effects of the insecticides. In Mopti and Bandiagara districts, where Actellic 300CS was sprayed, the MOH provided atropine, the antidote for pirimiphos-methyl (Actellic) insecticide poisoning, to all community health centers. No antidote is required at the community health centers of the Djenné district IRS areas using SumiShield.

## 7.7 MID-SPRAY ENVIRONMENTAL COMPLIANCE INSPECTION

To be more vigilant about safety and environmental compliance issues, a team of seven inspectors composed of the VectorLink ECO and six representatives from the MOE performed inspections throughout smartphones in the 2019 campaign.

Additionally, on behalf of PMI Mali, the appointed-consultant to the ECOS project conducted the IRS Environmental Compliance Field Evaluation on July 7 to 16. The primary recommendation given to the team was to improve information/sensitization on preparing their houses for spraying, but the formal report has not been shared with the team.

All compliance issues found were essentially resolved in collaboration with the operations manager and the coordinators. Some outstanding concerns are listed in the section 11 (Challenges and lessons learned)

## 7.8 POST-SEASON ENVIRONMENTAL ASSESSMENT

VectorLink Mali conducted the Post-Season Environmental Assessment in all 35 sites using the smartphone-installed checklist phones for making sure that all requirements are done for leaving safely operation sites.

## 7.9 WASTE MANAGEMENT PLAN

At the end of campaign, all waste was collected and transported to the central warehouses in Bandiagara and Sévaré. All empty Actellic 300CS bottles will be rigorously washed with detergent and pierced at the bottom before they are given to BNSS. From the warehouse, bottles and others plastic waste will be transported to the BNSS site in Bamako. Incineration is scheduled to start at the end of September 2019. Other wastes, such as empty sachets of SumiShield, contaminated masks, and cardboard, will be incinerated by trained operators at VectorLink Mali's incinerator at the Noumoubougou landfill. Details on disposal plans are shown in Table 19.

**Table 19: Type, Quantity, and Disposal Method of 2019 IRS Solid Waste**

Waste Type	Amount of Waste	Disposal Method	Disposal Site	Date of Disposal	Status
Empty sachets SumiShield	10,269	Incineration	Noumoubougou/Koulikoro	October 2019	Completed
Non-defective contaminated cardboard	4,451	Incineration	Mopti Regional Discharge	October 2019	Completed
Dust mask	22,560	Incineration	Noumoubougou/Koulikoro	October 2019	Completed
Activated Carbon	13	Incineration	Noumoubougou/Koulikoro	October 2019	Completed
Empty bottles Actellic300CS	51,347	Recycling	BNSS	December 2019	
Glove	1,064	Recycling	BNSS	December 2019	
Helmet	57	Recycling	BNSS	December 2019	
First aid kit container	113	Recycling	BNSS	December 2019	
Plastic sheet	77	Recycling	BNSS	December 2019	
Plastic bag	440	Recycling	BNSS	December 2019	
Face shield	700	Recycling	BNSS	December 2019	
Powdered soap sachet	56400	Recycling	BNSS	December 2019	
Flashlight	391	Recycling	BNSS	December 2019	

## 7.10 INCREASING EFFICIENCY IN INSECTICIDE USE

As mentioned above, SOPs are to mix insecticide only after arriving at their assigned compounds and verifying that the structures are ready to be sprayed. This avoids their return to the operations site with pumps full of mixed insecticide in case they find unprepared or locked structures, or in case it starts to rain.

Also to avoid waste, since 2017, the project has emphasized communication between team leaders and SOPs on the mixing of insecticide late in the spray day. Before mixing a final unit of insecticide to finish assigned spraying, an SOP checks with the team leader, who asks the team's other SOPs if any has finished spraying their assigned structures and has pesticide remaining in the pump. The SOP who needs additional pesticide uses what remained in the colleague's pump. This has enabled VectorLink Mali to decrease its production of wastewater, and avoid wasting insecticide.

This practice worked so well in 2019 that in some health areas, SOPs rarely need to use the barrel reserved for leftover insecticide from their pumps, which must be emptied and triple rinsed during end-of-day clean-up—the SOPs return from the field with empty pumps.

## 7.11 INCIDENTS

VectorLink Mali did not report any incident during the 2019 IRS campaign.

## 8. GENDER MAINSTREAMING

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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 increasing equal participation in all aspects of IRS.
- **Advocacy:** The VectorLink Mali team continued to advocate for increased participation by women in all IRS activities. The district microplanning meetings were used to discuss the importance of equal representation of men and women as seasonal workers in all IRS activities. Selection committees set up in each of the 35 spray health areas were encouraged to increase the recruitment of women as seasonal workers. The project worked also with the Coordination of the Women's Associations and NGOs (CAFO) of all districts for awareness during the IRS campaign. As a result, in the 2019 IRS season, women represented 21% (n=288) of 1,348 people VectorLink Mali hired as seasonal staff, compared with 21.7% in 2018. Of the 616 people hired as SOPs, team leaders, and supervisors, 14%; 14%, and 13%, respectively, were women. Despite difficulties encountered to increase the number of women SOPs, the 2018 levels (13%) have been maintained.
- **Printed materials:** Sexual harassment posters were posted in all operations sites, at the district warehouses, and the data entry center in Sévaré to encourage seasonal workers to report 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 labeling bathrooms and toilets for men and women in each operations site.

## 9. CAPACITY BUILDING

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To promote sustainability of IRS in the future, VectorLink Mali conducted 2019 IRS implementation in close collaboration with the NMCP and DNACPN on the national level, and, in Mopti, with health officers at the regional and district level. The government partners participated in all stages of planning, implementation, and supervision of 2019 IRS activities.

During the planning phase, VectorLink Mali worked with these partners in the many activities that prepare the IRS campaign, including microplanning workshops, community awareness meetings, and trainings. For each activity, a working session was organized to develop and assign a list of tasks among 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 these government partners to facilitate and conduct training of radio operators, and to update key awareness messages to communicate.
- These government partners helped facilitate and conduct 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 PSECA inspections. All these government partners also played an active role in supervising SOP training.

During the campaign, VectorLink Mali, in collaboration with its government partners, implemented the following activities:

- Hosting radio programs for community mobilization on IRS.
- Supervising IRS activities.
- Doing inspections for the environmental compliance assessments (with DNACPN).
- Holding weekly team meetings to share key campaign progress and experiences, highlight issues, and develop recommendations. Local government counterparts supported VectorLink Mali in addressing all challenges, including regarding mobilization.

Additionally, with the support of VectorLink Mali, four Malian representatives attended the NgenIRS Project sponsored insecticide quantification workshop held in Benin in August 2019. The participants included three cadres of NMCP staff and one VectorLink staff.

The government partners contributed significantly to the 2019 IRS achievements; NMCP and DNACPN capacity to carry out key IRS activities independently from VectorLink while maintaining PMI standards, has grown appreciably. However, per the FY19 PMI Malaria Operational Plan, VectorLink Mali will evaluate the performance of individual NMCP and DNACPN staff. The findings will help determine which activities should be transferred to the government representatives in the PMI VectorLink Mali 2020 Project Work Plan.

# 10. POST-SPRAY ACTIVITIES

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## 10.1 POST-SPRAY INVENTORY

The VectorLink Mali team conducted post-spray inventory activities for all IRS equipment and materials. It returned all IRS materials and equipment, leftover insecticides, and insecticide-contaminated wastes to the two central warehouses from the operations sites. The VectorLink Mali logistics and procurement manager and warehouse managers inventoried them and identified defective IRS equipment for repair before the 2020 IRS campaign.

The detailed results of the inventory are included in Annex A.

Leftover insecticides will serve as opening stock in the 2020 IRS spray season and will be exhausted before any newly procured insecticide is dispatched, per the First Expiry First Out (FEFO) policy. The VectorLink team has checked the quantity and functionality of all other IRS materials and equipment and documented any issues to help plan for the next spray season. The project will dispose of all unsalvageable equipment, such as plastic sheets and insecticide-contaminated waste, according to environmental compliance protocols by December, 2019, using disposal facilities available in Bamako. Please see Section 7.11 for details on disposal.

## 10.2 POST-SPRAY REVIEW MEETINGS

VectorLink Mali, in collaboration with the NMCP, convened the 2019 IRS Review Meetings on September 11–16, 2019, in each of the three spray districts and at Regional level. In total, 205 people (163 men and 42 women) participated in the meeting. Participants were from the following organizations/cadres: district health officials (9); DTCs (35); ASACO leaders (35), village chiefs coordinator (3), and representatives from community women's and youth associations and local NGOs (23); mayors (23) and prefects/sub-prefects (18); radio (12); the NMCP (12), DNACPN (12); Regional Health officials (6), SDES (4), DRACPN (4); SACPN (3), SLDES (3) and representatives from Ministry of Women (3).

The overall aim of the IRS Review Meetings was to:

- Present data from the 2019 spray campaign,
- Review the overall IRS implementation process, experiences, and achievements in 2019, and,
- Discuss IRS challenges in the 35 operations sites and identify recommendations for the next spray cycle.

The meetings enabled community members to jointly assess the 2019 involving group discussions that focused on mobilization and other topics. These areas of discussion were chosen because they had significant challenges during the 2019 campaign. Discussions centered on successes, challenges, and recommendations for improving IRS programming in 2020.

## 10.3 POST-SPRAY ENVIRONMENTAL ASSESSMENT

The post spray assessment took place from August 19 to September 2, 2019. The assessment confirmed all IRS items, including insecticides and IRS waste, were collected from the operations sites and returned to the central warehouses of Sévaré and Bandiagara. The assessment also confirmed that the soak pits and their surroundings areas assessed had been cleaned and cleared of any waste and IRS items. The soak pits were secured with locks and the wash areas were covered with plastic sheets and a layer of soil to protect them from vandalism as well as contamination by humans and animals. The floors of the operations site stores were decontaminated with soap and water and the keys were returned to the owners/landlords

# 11. CHALLENGES AND LESSONS LEARNED

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Despite being implemented in a context marked by unstable security conditions across Mopti Region, the VectorLink Mali 2019 IRS campaign was very successful overall. However, as with any IRS campaign, the VectorLink team faced some challenges. These challenges and the lessons learned produced concrete recommendations for improving IRS implementation in 2020.

## 11.1 CHALLENGES

Security issues:

- During the campaign, the leadership team had to ensure the security and safety of all IRS seasonal workers, as well as the project staff.
- Security risks still existed in certain villages and hamlets, and they prevented the senior supervisory team (from national and regional levels of government and VectorLink) from conducting supervision there. In these cases, supervision was done at the district level and ensured by the DTC. Upon receipt of data collected on IRS activities in these locations or 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) these locations. District authorities provided official notification not to travel to or deliver IRS to these areas (see Annex C). However it is to note that the eligible structures of these locations were not removed from the targets.
- 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. The DTC and coordinator contacted the chief of the village 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 negatively impacted daily SOP output; even when spray teams could visit these villages, they found poor household preparation as a result of the schedule change.

Structure counting and marking issues:

- As described in Section 6.7.2 of this report, SOPs did not record systematically all found and unsprayed structures. This was particularly true of compounds in the towns of Mopti and Djenné, with larger multi-unit buildings with insufficient courtyards or other space into which residents can move household items during spraying. When an entire multi-unit building cannot be sprayed, the information cannot be easily recorded in the SOP form. While there was overall much better documentation of unsprayed structures in 2019 than in 2018, but the number of unrecorded unsprayed structures is likely underestimated in the database due to compound-level refusals.
- Properly marking eligible structures also was a challenge because it was difficult for SOPs to adopt the new marking syntax; as a result, they did not comply with it. The improper marking made it difficult to correctly fill out certain supervision forms via smartphones.

- Since IRS campaigns began in Mali in 2008, and according to the local context, a “structure” is defined as an independent construction. It might have only a single room, or several rooms. Indoor partitioning indicates the number of rooms. In Mopti Region, and particularly in its urban areas, there are many large multi-unit structures that create huge variations in insecticide use rates and SOP daily output if considered a single structure, and make it challenging to accurately characterize refusal rates.

CommCare utilization by supervisors:

- Inaccurate supervision data that supervisors collected using smartphones generated false red flags. Some questions on the supervisory checklists were unclear to supervisors, and so they did not respond correctly. There is a need for improved translation and reinforced training.
- There were delays in reporting of spray data sent by SMS. The delays were due to limited mobile phone network in some areas, but also to some supervisors struggling with the PMT syntax, and this negatively affected PMT reporting early in the campaign, resulting in discrepancies in the data on the of the insecticide use sent by community supervisors and by secondary storekeepers. Over the course of the campaign, accuracy of the PMT SMS syntax improved.

Insufficient community sensitization and mobilization in some areas. This included:

- Continued low acceptance of IRS, despite the efforts of the VectorLink team and other stakeholders to mobilize communities.
- Reluctance of local authorities to honor the commitments they made during microplanning meetings to complement project efforts with their own community mobilization strategies and approaches before and during the campaign, in order to increase people’s acceptance of IRS. This was especially true in urban areas, where IRS refusals limited spray operations throughout the campaign.
- Unavailability of IRS cards in certain structures as observed by supervisors, due to some SOPs failing to distribute cards to homeowners after spraying their houses.

Gender:

- Need to continue to increase the number of women seasonal workers, in particular, SOPs. Despite project efforts, the percentage of female SOPs has remained virtually unchanged.

Other issues experienced during spraying operations:

- House preparation did not go well in some urban areas in Mopti and Djenné towns, because homeowners were reluctant to remove all moveable household items during spraying. This might be due to complacency, or to lack of space in their compounds in which to temporarily store the items. This resulted in high refusal rates and lowered SOPs’ daily output in these areas.
- Properly filling out data collection was challenging for some SOPs.

## 11.2 LESSONS LEARNED

- Maintaining an effective constant and clear chain of communication among people involved in the IRS campaign and most importantly, complying scrupulously with government officials and local authorities, made it possible to reduce spray teams’ exposure to risks and insecurity.
- Migration of the Vectorlink Collect database to DHIS 2 improved the collection, management, and reporting of high-quality data, and enhanced transparency to PMI and government partners, who were able to access to real-time data, including campaign progress and insecticide consumption by district.
- Successful supervision and an innovative tool for improving insecticide management includes:
  - The implementation of updated guidance for SOPs to mix the day’s first unit of insecticide only after they confirmed the assigned compounds’ structures were ready to be sprayed. As a result, they

- avoided returning large quantities of prepared insecticide because they were not able to operate in rain or because structures not prepared due to lack of mobilization.
- Effective communication between team leaders and SOPs before they mixed a unit of insecticide toward the end of the day significantly rationalized use of insecticide by the SOPs.
  - The insecticide tracking system developed and implemented in 2019 made insecticide consumption more efficient. The team was able to see when overall consumption was on track and there was no risk of an insecticide shortage. Conversely, they could easily identify areas that were consuming more insecticide than planned and send a supervisor to verify the proper application of insecticide, so that overconsumption ceased.
- The project implemented a reinforced supervisory system that consisted of daily transmission by supervisors of verified PMT data via SMS or phone calls to the IRS coordinator, and to the data center for entry. This, along with mandatory site leadership meetings of the DTC, supervisor, and storekeeper to review supervision forms every other day helped detect any deviation from best practices and take corrective measures. This significantly increased supervisors' accountability for monitoring campaign progress, including insecticide consumption; it also resulted in fewer cases of insecticide mismanagement and allowed the team to reach 98.9% progress by the end of the campaign.
  - Engaging local authorities (village chiefs and neighborhood leaders) in community sensitization and mobilization enhanced the acceptability of IRS in both rural and urban parts of the districts
  - Close collaboration with government partners, including in the form of weekly meetings during the IRS campaign, strengthened oversight and improved the performance of spray teams, in particular in rural areas such as Soufouroulaye and Sofara, where refusal rates were previously high.
  - Community radio was an effective means of supporting mobilization efforts and complementing other community mobilization strategies.

### 11.3 RECOMMENDATIONS

- For future rounds of IRS campaigns, systematically engage village chiefs and neighborhood leaders in mobilization, especially in urban areas, in order to reduce the amount of refusals.
- Consider updating the structure definition for Mali to better fit the Mopti context.
- Ensure supervisors are able to use CommCare and understand supervisory forms. This calls for improved translation of and additional training on the forms.
- Continue to advocate for increased participation by women in IRS activities. During district microplanning meetings, the VectorLink team will discuss this with stakeholders and together they will define a quota representation of female seasonal workers for the 2020 IRS campaign. The quota, which can vary from one health area to another, should be fixed above the 2019 percentage of female seasonal workers, and should be mandatory. Health area selection committees will be accountable for recruiting the targeted percentage. The committees also will be encouraged to promote (e.g., from SOP to team leader) all high-performing female workers.
- Exclude certain urban neighborhoods from 2020 IRS targets. For years, spray teams have had difficulty in meeting their spraying targets in the urban centers of Mopti and Djenné, where there are many compounds and large apartment complexes that lack space into which residents can move their belongings during spraying. Furthermore, the efficacy of IRS may be compromised in households where large portions of the sprayed wall surfaces are blocked by large furniture, which teams found to be common in these areas. Excluding such areas offers potential savings in time, cost, and so forth, and could enable more cost-efficient IRS deployment elsewhere.
- Update recommendations in the national capacity assessment that empower the NMCP and DNACPN in implementing IRS activities when PMI VectorLink project is over. Use the updated findings to guide VectorLink Mali support and future capacity building of the NMCP and DNACPN.

# ANNEX A: 2019 POST-IRS INVENTORY

Item Description	Balance after 2018 IRS Campaign	Number of Items Procured 2019	Stock Before 2019 Campaign	Consumed/ Unusable Stock after 2019 IRS Campaign	Usable Stock Remaining for 2020
<b>International Procurement</b>					
Insecticide, Actellic 300CS / Exp Feb 2021	00	60993	60993	51347	9646
Insecticide, Sumshield 50WG /Exp Jan 2022	00	10583	10583	10270	313
Spray Pump Goizper	985	00	985	07	978
Helmet	862	112	974	57	917
Red Bright Vest	119	00	119	00	119
Green Bright Vest	243	00	243	08	235
Gumboots	1500	00	1500	59	1441
Coverall	2532	00	2532	36	2496
Tyvek Coverall /Mobile Soak Pit Teams	1616	288	1904	00	1904
Wipes / “lingette”	7653	1536	9189	00	9189
Thermometer, Simple /or Electronic	75	00	75	03	72
Gloves	1289	792	2081	1064	1017
Respirator Mask	16440	10920	27360	23040	4320
Face Shield	491	900	1391	700	691
Support Face Shield	2473	00	2473	206	2267
Complete Handle /Goizper	221	195	416	183	233
Handle	01	195	196	90	106
Hose /Goizper	145	20	165	27	138
Team Leader Survey Kit 7.5 /Goizper	329	80	409	168	241
Pressure Regulator /Goizper	186	200	386	159	227
Fan Even Nozzle /Goizper / Buse	418	225	643	114	529
Filter Simple /Goizper	75	150	225	01	224
Safety Valve 2.5 Bar /Goizper	494	175	669	300	369
Assembly (583,1175,19) /Goizper	179	220	399	191	208
Filter with Gaskets /Goizper / Round Gasket AN8	850	400	1250	14	1236
Lance Tube /Goizper	299	90	389	36	353
DISC HC 80 0.2 /3/Goizper /Ref1236	516	00	516	01	515
Valve /Goizper /Ref 165	222	240	462	116	346
Collar Seal /Goizper /Ref 613	520	230	750	344	406
Chamber Cover(158)	00	300	300	37	263

Item Description	Balance after 2018 IRS Campaign	Number of Items Procured 2019	Stock Before 2019 Campaign	Consumed/ Unusable Stock after 2019 IRS Campaign	Usable Stock Remaining for 2020
Cover Screw (180)	00	500	500	28	472
Completed Lid (Couvercle Ref 1486)	07	00	07	07	00
Key for Pompe Goizper / To Tighten Chamber	17	03	20	00	20
Activated Carbon /Kg	103	00	103	00	103
<b>Local Procurement</b>					
Steel Container (for waste)	03	00	03	00	03
Motorbike /YBR125G	15	00	15	00	15
Solar Mobile Lamp	73	20	93	40	53
Mobile Soak Pit	17	00	17	00	17
Ventilator /Wall	23	00	23	00	23
Bucket Plastic 60/ 40/30 Liters	445	00	445	120	325
Bucket Metal 10/15 liters	284	00	284	10	274
Bucket Plastic /15-10-20 Liters	61	00	61	06	55
Waste Bin Hard plastic	103	05	108	07	101
Cup /Metal /Plastic 1 Liter	854	00	854	37	817
Calibration Cup	766	00	766	113	653
Wood Seat	97	00	97	07	90
Scoreboard	65	00	65	03	62
Shovel with Short Handle	321	00	321	01	320
Fire Extinguisher	83	00	83	00	83
Operator Bag	824	00	824	126	698
Monitor Bag	37	02	39	03	36
Tent for Mobile Sites	110	00	110	05	105
Life Jacket	14	00	14	00	14
Tarpaulin Simple	287	00	287	26	261
Tarpaulin for Mobile Soak Pit Floor	21	00	21	00	21
Raincoat	848	00	848	136	712
Head Lamp	1326	168	1494	384	1110
Lamp Guard	129	04	133	13	120
Whistle for Guard	93	12	105	11	94
Water Filter	609	00	609	00	609
Plastic Drum/160/200/55 Liters/	685	00	685	57	628
Bar Angle	164	00	164	129	35
Fence	70	00	70	32	38
Metal String 1mm /Roll	36	00	36	17	19
Metal String 2.5mm/Roll	00	00	00	00	00
Pincer	19	10	29	02	27
Adjustable Wrench	18	02	20	00	20
Screw Driver	42	00	42	05	37
Binata/"daba"	43	00	43	01	42

Item Description	Balance after 2018 IRS Campaign	Number of Items Procured 2019	Stock Before 2019 Campaign	Consumed/ Unusable Stock after 2019 IRS Campaign	Usable Stock Remaining for 2020
Knife "couteau"	10	00	10	02	08
Tape 10m	24	00	24	00	24
Matt/Straw/Plastic	72	00	72	16	56
Flipchart	03	00	03	00	03
Empty Barrel/Metal 200 Liters.	16	00	16	03	13
Plastic Drum /20L	106	10	116	04	112
Metal Digger /"bramine"	26	00	26	06	20
Mobile Smartphone / M&E+ENV	71	36	107	33	74
Mobile Basic Phone	328	0	328	10	318
Plastic Operator	260	205	465	77	388
Electric stabilizer	03	00	03	00	03
Empty cartoon box	15	50	65	45	20
Bouillord / plastique	16	00	16	02	14
Raccord pour eau /Rouleau	01	02	03	00	03
Moustiquaire	08	00	08	00	08
Against Plated / Wood	07	00	07	06	01
Swinging Isoplane /For Door	01	00	01	00	01
Mattress /01place	05	00	05	00	05
Waste Plastic Bag	530	240	770	440	330
Light's Engine 1.20m source Generator	12	00	12	00	12
Bulb1.20m Source Genset/ Ampoule 1.20 Source Generateur	10	00	10	00	10
Light's Engine 0.60m Source Genset /Moteur Reglette Source Generateur	06	00	06	00	06
Oval Bulb Holder /Porte Ampoule Ovale	10	00	10	00	10
Oval Bulb Genset /Ampoule Ovale Source Generator	13	05	18	18	00
Oval Bulb Solar Panel /Ampoule Ovale Source Paneau Solaire	09	00	09	00	09
Towel	1061	468	1529	1379	150
Teflon	34	00	34	03	31
Sweeper Traditional	25	00	25	08	17
Sweeper Industrial	314	20	334	66	268
Stapler	80	10	90	11	79
Envelope A4	300	100	400	175	225
Glue Stick	79	00	79	00	79
Chrono Hard Folder	63	00	63	02	61
Cartoon Folder	280	6000	6280	980	5300
Fine Folder	1280	00	1280	470	810
Flashdrive	04	00	04	00	04
Ruler 1m	07	00	07	02	05

Item Description	Balance after 2018 IRS Campaign	Number of Items Procured 2019	Stock Before 2019 Campaign	Consumed/ Unusable Stock after 2019 IRS Campaign	Usable Stock Remaining for 2020
Ruler 30 Cm	58	40	98	10	88
Paper Punch	03	00	03	01	02
Pin Box of 45 Pins	99	10	109	39	70
Staples Box "Agraphes"	73	50	123	54	69
Calculator	210	20	230	14	216
Copybook	00	00	00	00	00
Bloc Notes	231	00	231	67	164
Book Register	72	70	142	100	42
Paper Ream A4	18	05	23	07	16
Sticker for Notes/ pack of 100 Sheet	14	00	14	01	13
Permanent Marker	3138	400	3538	1788	1750
Pen Blue	326	700	1026	1026	00
Pen Red	179	00	179	34	145
Plastic Folder with Cover	268	500	768	369	399
Tape Transparent GF	88	00	88	45	43
Tape / Paper	05	40	45	16	29
Pregnancy Test /Exp 11-2019	190	00	190	171	19
First Aid Kit	97	200	297	113	184
Soap Piece	8400	720	9120	8160	960
Soap Powder/Sachet	63300	6000	69300	56400	12900
Bleach/"Javel" 1L	602	192	794	299	495
Battery /R20	56	90	146	123	23
Battery AAA /For Lampe SOP	4034	5760	9794	6979	2815
Battery AA /For Calculator	767	00	767	277	490
Lubricant Box "graisse"1Kg	01	00	01	00	01
Distilled Water 1L	26	00	26	00	26
Glue Liquid Box 1Kg	08	00	08	00	08
Oil Motorbike/ quartz 5000 Total /Liter	70	80	150	50	100
Mixing Oil Motorbike 15W40 Shell/liter	180	00	180	10	170
Motorbike Helmet	15	02	17	00	17
Vilebrequin and Rod Assembly /YB100	10	00	10	00	10
Tyre Motorbike Front /YB100	08	00	08	00	08
Tyre Motorbike Back /YB100	05	00	05	00	05
Tyre Motorbike Front /YBR125	13	00	13	01	12
Tyre Motorbike Back /YBR125	14	00	14	03	11
Tube Motorbike /YBR125	81	00	81	19	62
Wheel /YB100	01	00	01	00	01
"Segment" YB100	04	00	04	00	04
"Disque" YB125	01	00	01	00	01
Odometer /YB100	01	00	01	00	01
Direction Light Single /YB100	05	00	05	00	05

Item Description	Balance after 2018 IRS Campaign	Number of Items Procured 2019	Stock Before 2019 Campaign	Consumed/ Unusable Stock after 2019 IRS Campaign	Usable Stock Remaining for 2020
Kit Motorbike "(Chain, petit pion, Grand Pion)"/YBR125	09	00	09	06	03
Spare Trailer for Motorbike (roulement) / YB100	05	00	05	00	05
Motorbike Piston / YB100	01	00	01	00	01
Boogie /YB100	00	00	00	00	00
Boogie YB125	64	00	64	14	50
<b>IEC and Best Practices Tools ,IRS Cards</b>					
IRS Card	95758	24000	119758	49226	70532
IRS Leaflet	70696	00	70696	11439	59257
Metal sign "not allowed drink eat smoke"	92	00	92	04	88
Metal danger sign "Skull"	90	00	90	07	83
Sticker "not allowed drink eat smoke"	1146	00	1146	18	1028
Danger Sticker "Skull"	366	00	366	65	301
Sticker /Anopheles	680	00	680	290	390
Procedures for Insecticide Transportation	442	00	442	98	344
Procedures for Insecticide Storage	605	00	605	06	599
Booklet Store Good Pratices /Livret bonnes pratiques Magasin	12	35	47	16	31
Booklet Guide Team Leader /chef Equipe	154	00	154	64	90
Booklet /Guide Spray Operator	120	00	120	62	58
Booklet on Structure Definition	1559	00	1559	08	1551

# ANNEX B: NUMBER OF SUPERVISION FORMS BY DISTRICT

**Table B-1: Number of Inspections Recorded On CommCare In 2019**

District	Number of Inspections/Number of Sites Concerned				
	Spray Operator Transportation Vehicle Inspection	Morning Mobilization	Homeowner Preparation and SOP Performance	Storekeeper Performance	End-of-Day Clean-up
<b>Supervisory target</b>	<b>809</b>	<b>831</b>	<b>870</b>	<b>815</b>	<b>804</b>
Bandiagara	126/12	216/12	420/13	105/11	199/11
Djenne	97/6	121/6	130/6	24/6	99/6
Mopti	136/15	248/15	391/15	141/15	181/15
<b>Total</b>	<b>359/33</b>	<b>585/33</b>	<b>941/34</b>	<b>270/32</b>	<b>479/32</b>

These forms were used only by community supervisors in addition to the staff of NMCP and DNACPN in 2019

# ANNEX C: CORRESPONDENCES FOR NON- SPRAYED AREAS

**REGION DE MOPTI**  
**CERCLE DE BANDIAGARA**  
**CENTRE DE SANTE DE BANDIAGARA**  
Dr Abdoul Karim DOUMBIA Médecin Chef  
District Sanitaire de Bandiagara

**REPUBLIQUE DU MALI**  
**UN PEUPLE – UN BUT – UNE FOI**

Le Médecin Chef du District Sanitaire de Bandiagara

A

Mr le Directeur du Projet PMI/ VectorLink Mali

**Objet :** Information sur la situation sécuritaire de certains villages du District Sanitaire de Bandiagara

**Monsieur**

Je viens par la présente vous faire part de la situation sécuritaire de certains villages du District Sanitaire de Bandiagara

En effet, certains villages du District Sanitaire de Bandiagara sont confrontés à un problème de sécurité depuis un certain temps dû à la présence d'individus armés dans ces villages. Toute chose qui a entraîné une psychose et qui s'est soldée par le départ massif de certaines populations dans les aires de santé de Kendié et d'Iby dont les villages sont listés dans le tableau ci-dessous :

District	Aire de Santé	Village	Observations
Bandiagara	Kendié	Biri	
		Somme-Sissongo	
		Banguel-Toupe	
		Diamangolo	
	Amba	Ces deux hameaux incendiés lors de l'attaque dans la nuit du 09 au 10 Juin 2019 sont du village de Koundou-ando dans la commune Rurale de Sangha	
	Soban-Da		
	Soban-Dou		

Nous avons toujours espéré une amélioration de la situation mais jusqu'à présent ces zones sont à risque. Vu ce contexte et par mesure de prudence nous avons jugé utile à ce que les équipes de pulvérisation évitent ces zones suscitées.

Veuillez agréer, Monsieur le Directeur, l'expression de nos considérations les plus distinguées

**Bandiagara le 18 Juillet 2019**

Médecin Chef

Dr Abdoul Karim DOUMBIA



REGION DE MOPTI  
CERCLE DE MOPTI  
\*\*\*\*\*  
CENTRE DE SANTE DE REFERENCE

REPUBLIQUE DU MALI  
UN PEUPLE-UN BUT- UNE FOI  
\*\*\*\*\*

**Lettre d'information dans le cadre de la PID 2019**

Je soussigné Dr Issa DIARRA, Médecin-chef du District Sanitaire de Mopti, atteste que suite aux événements sécuritaires survenus dans l'aire de Somadougou en Mai 2019, il y'a eu des mouvements de population.

Ce qui a engendré un déplacement de plusieurs ménages des villages de Nianangaly et de Diaby (aire de santé de Soufouroulaye) vers d'autres aires surtout la ville de Mopti et Sevaré. Lors de la campagne PID 2019, plusieurs concessions n'ont pas été pulvérisées car abandonnées par ces déplacements internes influençant négativement le taux de couverture de la PID au niveau de l'aire de santé de Soufouroulaye impactant aussi la couverture globale du district.

En foi de quoi, cette lettre d'information est élaborée pour servir et valoir ce que de droit

Mopti, le 02 Aout 2019



Le Médecin-chef

Dr Issa DIARRA

# ANNEX D: M&E PLAN MATRIX

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results										
				Year 1 <sup>10</sup>		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>														
1.1	Successfully execute IRS and other malaria vector control programs													
1.1.1	Annual country work plan developed and submitted on-time	Project records Annually		1; 100%	1; 100%	1; 100%	1; 100%							
1.1.2	Number of eligible structures targeted for spraying	Project records Annually		205,612 <sup>11</sup>	167,598	146,694	149,919							
1.1.3	Number of eligible structures sprayed with IRS	Project records Annually		183,225	160,723	124,690	148,198							
1.1.4	Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)	Project records Annually		85.0%	95.9%	85.0%	96.7%							
1.1.5	Number of people protected by IRS	Project records Annually	Male 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							
1.1.6	EOSR submitted within 45 days after the end of spray (including completing MEP and EMMR) <sup>12</sup>	Project Annually		1; 100%	Completed	1; 100%	Completed							

10 The only VC intervention that VectorLink Mali will be undertaking in year one is IRS. As such all targets and results in year one are only relevant to IRS programming.

11 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 Djéne, were excluded due to security concerns, the IRS campaign target was further adjusted to 205,612 structures.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.1.7	Post-spray Data Quality Audit conducted within 90 days of spray completion <sup>13</sup>	Data Collection Forms Annually		1; 100%	Completed	N/A	N/A						
1.1.8	Number of Insecticide Treated Nets (ITNs) distributed, by channel	Project Records Annually	Channel	N/A	N/A	N/A	N/A						
1.1.9	Conducted at least one process assessment of the quality of ITN distribution planning, the quality of household registration, and/or ITN distribution implementation during a mass ITN distribution campaign	Project Records Annually	Channel	N/A	N/A	N/A	N/A						
1.1.10	Operational routine monitoring systems for continuous ITN distribution established and disaggregated by channel	Project Records Annually	Channel	N/A	N/A	N/A	N/A						
1.1.11	ITN durability monitoring data collection completed on time as planned in a given project year	Project Records Annually		N/A	N/A	N/A	N/A						
1.2	Provide technical assistance and planning support for IRS and other integrated malaria vector control activities												
1.2.1	Number of VC project training workshops targeting NMCP and other host country staff	Project Training Records <sup>14</sup> Annually	Technical Area Job Function	1	1 <sup>15</sup>	1	1 <sup>16</sup>						

12 Once approved by PMI, the Mali EOSR will be translated into French and shared with NMCP for dissemination

13 The NMCP will participate in conducting the Post-Spray Data Quality Assessment (PSDQA). Once approved by PMI, the Mali PSDQA report will be translated into French and shared with NMCP for dissemination. As noted in the 2018 Work Plan, conducting the Mali PSDQA is contingent on the security situation.

14 Project training records will be maintained by VectorLink Mali and shared with NMCP/MOH counterparts. This applies to all subsequent references to project training records in this MEP.

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

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

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.2.2	Number of NMCP and other vector control host country staff accessing DHIS2	DHIS2 Logs Annually	Job Function	N/A	N/A	2 <sup>17</sup>	4 <sup>18</sup>						
1.3	Ensure safe and judicious use of insecticides and other malaria vector control products												
1.3.1	Number of vector control personnel trained in environmental compliance and personal safety standards in vector control implementation	Project Training Records Annually	Sex (# and %) Male Female Job Function	1,043 <sup>19</sup>	1,020 <sup>20</sup> 792; 77.6% 228; 22.4%	711 <sup>21</sup>	766 <sup>22</sup> 591; 77.2% 175; 22.8%						
1.3.2	Number of health workers receiving insecticide poisoning case management training	Project Training Records Annually	Sex (# and %) Male Female	47	46 39; 84.7% 7; 15.2%	35	35 <sup>23</sup>						
1.3.3	Number of adverse reactions to pesticide exposure documented	Incident Report Forms Annually	Type of Exposure	0	0	0	0						

17 NMCP M&E Manager and Epi Surveillance Officer.

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

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

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

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

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

23 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.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results										
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5		
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result	
1.4	Strengthen capacity of NMCPs, vector control personnel, and other institutions to implement and manage IRS and other vector control activities													
1.4.1	Total number of people trained to support VC in targeted areas	Project Training Records Annually	Sex (# and %) VC Intervention Type Government Affiliation Male Female	2,711 <sup>24</sup>	824 <sup>25</sup>	824 <sup>26</sup>	616 <sup>27</sup>							
					719; 87.3% 105; 12.7%		541; 78.8% 75; 12.2%							
1.4.2	Number of people trained during IRS Training of Trainers	Project Training Records Annually	Sex (# and %) Government Affiliation Male Female	51 <sup>28</sup>	50 <sup>29</sup>	41 <sup>30</sup>	41 <sup>31</sup>							
					43; 86% 7; 14%		34; 82.9% 7; 17.1%							
1.4.2b	Number of government staff serving as trainers in IRS TOT <sup>32</sup>	Project Training Records Annually	Sex (# and %) Male Female	12 <sup>33</sup>	12 11; 91.7% 1; 8.3%	12 <sup>34</sup>	12 12; 100%							

24 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).

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

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

27 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.

28 DTC (47) and IRS Focal Point (4).

29 DTC (46) and IRS Focal Point (4).

30 DTC (35) and IRS and Malaria Focal Points (6).

31 DTC (35) and IRS and Malaria Focal Points (6); the IRS and Malaria Focal Points are government employees.

32 Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

33 NMCP (3), DNACPN (3), DRS (2), DRDSES (2), DRACPN (2)

34 NMCP (3), DNACPN (3), DRS (2), DRDSES (2), DRACPN (2)

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results										
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5		
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result	
1.4.3	Total number of people hired to support VC in target districts	Project Records Annually	Sex (# and %) Job Function Government Affiliation VC Intervention Type Male Female	2,368 <sup>35</sup>	2,622 <sup>36</sup>	2,622 <sup>37</sup>	1,102 <sup>38</sup>							
1.4.4	Number of government/district officials who acted as supervisors during VC campaigns	Project Records Annually	VC Intervention Type	35 <sup>39</sup>	33 <sup>40</sup>	33 <sup>41</sup>	21 <sup>42</sup>							
1.5	Promote gender equality in all facets of planning and implementation													
1.5.1	Number of women hired to support VC campaigns	Project Records Annually	Returning female seasonal workers hired in a more senior capacity Government Affiliation	TBD; 35%	573 <sup>43</sup> , 22%	25%	289 <sup>44</sup> , 22%							

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

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

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

38 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.

39 NMCP (10), DNACPN (2), DRS (3), DRDSES (3), DRACPN (1), CSREF (8), SLDSES (4), SACPN (4).

40 NMCP (2), DNACPN (3), DRS (3), DRDSES (3), DRACPN (2), CSREF (12), SLDSES (4), SACPN (4).

41 NMCP (2), DNACPN (3), DRS (3), DRDSES (3), DRACPN (2), CSREF (12), SLDSES (4), SACPN (4).

42 NMCP (2), DNACPN (1), DRS (2), DRDSES (2), DRACPN (2), CSREF (6), SLDSES (3), SACPN (3). The number of health areas was reduced from 46 in 2018 to 35 in 2019, resulting in a decrease in seasonal workers.

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

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

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results										
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5		
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result	
1.5.2	Number and percentage of women hired in supervisory roles in target areas for vector control activities	Project Records Annually	VC Intervention Type Job Function Government Affiliation	TBD; 50%	8 <sup>45</sup>	26; 13%	13 <sup>46</sup> , 15%							
1.5.3	Number and percentage of staff (permanent and seasonal) who have completed gender awareness training	Project Training Records Annually	Sex Job Function Government Affiliation Male Female	2,727; 100%	2,671  2,091; 78.3% 580; 21.7%	1269; 100%	1,00147; 100%  781; 78% 220; 22%							
1.5.4	Number and percentage of women in senior leadership roles in VectorLink country offices	Project Records Annually	Sex (# and %)	N/A	N/A	N/A	N/A							
1.6	Implement and support social behavioral change communication and mobilization activities													
1.6.1	Number of radio spots and talk shows aired	Project Records Annually	VC Intervention Type	7,560 <sup>48</sup>	7,560	6,930 <sup>49</sup>	6,930							
1.6.2	Number of print materials disseminated	Project Records Annually	VC Intervention Type	83,000	83,000	0	0							
1.6.3	Number of people reached with vector control and/or SBCC messages via door-to-door messaging	Project Records Annually	VC Intervention Type Sex Male Female	772,376	N/A <sup>50</sup>	N/A <sup>51</sup>	N/A							

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

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

47 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).

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

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

50 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.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.6.4	Number and percentage of people who feel that the proposed action (sleeping under an ITN/accepting IRS) will reduce their risk of malaria	Project Records Annually		N/A	N/A	N/A	N/A						
1.6.5	Number and percentage of people with a favorable attitude toward the practice/product (i.e., ITNs, IRS)	Project Records Annually	VC Intervention Type	N/A	N/A	N/A	N/A						
1.6.6	Number and percentage of people who believe that the majority of their friends and community members practice the behavior	Project Records Annually	VC Intervention Type	N/A	N/A	N/A	N/A						
1.7 Environmental compliance													
1.7.1	SEAs (with EMMPs) or Letter Report submitted at least 60 days prior to the commencement of vector control campaigns	Project Records Annually		1; 100%	1; 100%	1; 100%	1; 100%						
1.7.2	Number and percentage of permanent and mobile soak pits inspected and approved prior to IRS campaigns	Project Records Annually	Soak Pit Type  Affiliation of inspectors	63; 100% Mobile Soak pits: 20	62; 100% Mobile Soak pits: 12 10 <sup>52</sup>	47; 100% Mobile Soak pits: 9	45; 100% Mobile Soak pits: 13 9 <sup>53</sup>						
1.7.3	Number and percentage of storehouses inspected and approved prior to IRS campaigns	Project Records Annually	Storehouse Type  Affiliation of inspectors	Storehouse: 49; 100%	49 <sup>54</sup> ; 100% 10 <sup>55</sup>	37; 100%	37 <sup>56</sup> ; 100% 9 <sup>57</sup>						

51 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.

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

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

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.7.4	Number and percentage of fixed soak pits that are compliant with PMI's Best Management Practices	Project Records Annually	Affiliation of inspectors	43; 100%	50 <sup>58</sup> ; 100%	38; 100%	3859; 100%						
<b>2. Entomological and Epidemiological Data to Drive Decision-Making</b>													
2.1	Vector control activities monitored via entomological and epidemiological data												
2.1.1	Number and percentage of project-supported entomological sentinel sites established to monitor vector bionomics and behavior (vector species, distribution, seasonality, feeding time, and location)	Entomological Reports <sup>60</sup> Annually	VC Intervention Type	14; 100%	17; 100%	6; 100%	4 <sup>61</sup> ; 100%						

54 47 storehouses and 2 warehouses

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

56 35 storehouses and 2 warehouses

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

58 Inspectors are the same as those listed in indicator 1.7.2.

59 Inspectors are the same as those listed in indicator 1.7.2.

60 Entomological Reports will be submitted to PMI per the schedule outlined in the corresponding year's work plan. Once approved by PMI, reports will be translated into French and shared with NMCP for dissemination.

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

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		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 entomological monitoring sentinel sites measuring all five basic PMI entomological monitoring indicators (i.e., species composition, abundance, and seasonality of malaria vector; insecticide susceptibility and resistance intensity; mechanism of resistance; quality assurance and residual efficacy monitoring of IRS programs; or vector behavior: feeding time &, location)	Entomological Reports Annually	VC Intervention	14;100%	7; 100%	14;100%	4 <sup>62</sup> ; 100%						
2.1.3	Number and percentage of entomological monitoring sentinel sites measuring at least one advanced PMI indicator (i.e., identification of mosquito infectivity; parity rates; or blood-meal analysis)	Entomological Reports Annually	VC Intervention	14; 100%	7; 100%	6; 100%	4 <sup>63</sup> ; 100%						
2.1.4	Number and percentage of insecticide resistance testing sites that tested at least one insecticide from pyrethroid, organophosphate, carbamate, clothianidin, and chlorfenapyr insecticides	Entomological Reports Annually	Insecticide Type	14;100%	14;100% Pyrethroid 14 Organophosphate 13 Carbamate 7 Clothianidin 4	14;100%	In progress <sup>64</sup>						
2.1.5	Number of wall bioassays conducted within 2 weeks of spraying to evaluate the quality of IRS	Entomological Reports Annually		20 walls	24 walls	19 walls	20 walls						

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

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

64 Twelve out of 14 sites (85%) completed as of September 2019.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		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 cone bioassays conducted within two weeks of spraying with greater than 98% test mortality recorded	Entomological Reports Annually		20; 100%	24; 100%	19 walls; 100%	20 walls; 100%						
2.1.7	Number of wall bioassays conducted after the completion of spraying at monthly intervals to evaluate insecticide decay	Entomological Reports Annually	Insecticide Type	4 districts; 20 houses; Actellic and Sumishield	4 districts; 10 walls for Actellic and Sumishield	3 districts; 19 walls for Actellic and Sumishield	3 districts; 20 walls for Actellic and Sumishield						
2.1.8	Number of vector susceptibility tests for different insecticides conducted in selected sentinel sites	Entomological Reports Annually	Insecticide Type	4 replicates per 6 insecticides	13 tests for 5 insecticides <sup>65</sup>	4 replicates per 6 insecticide	4 replicates per 6 insecticide						
2.1.9	Integrated vector control analytics dashboard available for decision making	Project Records Annually		N/A	N/A	1; 100%	1; 100%						
2.1.10	Number of staff (VectorLink-contracted or non-VectorLink) trained in entomological monitoring	Project Training Records Annually	Sex (# and %) Job Function Government Affiliation Female Male	18	18 <sup>66</sup> 4; 22,2% 14; 77.8%	18 <sup>67</sup>	18 <sup>68</sup> 4; 22,2% 14; 77.8%						

65 Permethrin (Diagnostic Concentration [DC], Piperonyl Butoxide [PBO] + DC, 5xDC, 10xDC); Deltamethrin (DC, PBO+DC, 5xDC, 10xDC); Alphacypermethrin (DC, 5xDC, 10xDC); Bendiocarb; Pirimiphos-methyl

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

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

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

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.2	NMCPs develop country-level IRS and other malaria vector control strategies												
2.2.1	Developed an integrated malaria vector control strategy, including a plan for monitoring and managing insecticide resistance supported by the project	Project Records Annually		1	Not Completed <sup>69</sup>	N/A	N/A						
2.2.2	Completed integrated data and visualization landscaping for vector control decision making complete	Project Records Annually		1; 100%	Not Completed	1; 100%	In Progress						
2.2.3	Implemented sub-national insecticide rotation as part of an IRM strategy	Project Records Annually		Completed;	Completed	1; 100%	Completed						
2.3	Build capacity of NMCPs and local institutions to collect, analyze, and use data for strategic malaria control decision-making												
2.3.1	Number of individuals trained from NMCPs and national institutions to review and interpret data for integrated vector control decision making	Project Training Records Annually	Job Function Government Affiliation	N/A <sup>70</sup>	N/A	3 <sup>71</sup>	3 <sup>72</sup>						
2.3.1b	Number of government-affiliated staff participating in entomological monitoring activities (insecticide resistance testing and IRS quality assessment) <sup>73</sup>	Project Records Annually	Sex (# and %) Job Function	1 <sup>74</sup>	1	3 <sup>75</sup>	2 <sup>76</sup>						

69 With the support of WHO, the draft of the document exists but is waiting to be validated by the NMCP during a National workshop.

70 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.

71 NMCP (3).

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

73 Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

74 NMCP (1).

75 Contingent on NMCP agreement to assign more than one focal point to IRS, in the interest of strengthening national capacity to conduct IRS.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.3.2	Proportion of targeted individuals who report using new analytical tools and/or skills in their planning, resourcing, implementation, or measurement activities	Capacity Assessments Thrice Over Project Life	Job Function Organization	N/A	N/A	50%	50% <sup>77</sup>						
<b>3. Procure insecticides for IRS and support the delivery and storage of IRS and other malaria vector control products</b>													
3.1	Cost-effective procurement mechanism established												
3.1.1	Number and percentage of insecticide procurements that had a pre-shipment QA/QC test at least 60 days prior to spray campaign	Procurement Records Annually	Insecticide Type	2; 100%	1; 100% SumiShield	2; 100%	2; 100% SumiShield and Actellic						
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	Insecticide Type	2; 100%	1; 100% SumiShield	2; 100%	2; 100% SumiShield and Actellic						
3.1.3	Number and percentage of international equipment procurements, including PPE, received on-time to allow for the initiation of vector control campaigns as scheduled	Procurement Records Annually	VC Intervention Type	1; 100%	1	1; 100%	1; 100%						
3.1.4	Number and percentage of local procurements for PPE received on-time to allow for the initiation of spray operations as scheduled	Procurement Records Annually		1; 100%	1	1; 100%	1; 100%						
3.1.5	PPE procured according to workforce composition	Procurement Records Annually		N/A	N/A	1; 100%	1; 100%						

76 NMCP Entomologists.

77 NMCP Entomologist and Sentinel Site Officer

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
3.2	Robust inventory management and logistics systems established												
3.2.1	Number and percentage of logistics and warehouse managers trained in vector control supply chain management	Project Training Records Annually	VC Intervention Type Sex	1	1	1	1						
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	Insecticide Type	49; 100%	48 100%	37; 100%	37; 100%						
3.2.3	Successfully completed spray operations without an insecticide stock-out	Inventory and Stock Records Annually	Insecticide Type	1; 100%	Not completed	1; 100%	Completed SumiShield Actellic						
<b>4. Innovation</b>													
4.1	Conduct operational research or monitoring to scale up new tools, methods, and approaches												
4.1.1	Number of operational research studies on promising new tools or new methods/approaches to existing tools that are implemented	Project Records Annually	Type of Innovation	N/A	N/A	N/A	N/A						
4.2	Create and share knowledge through dissemination of best practices and lessons learned												
4.2.1	Number of innovations, best practices, and other data or lessons learned shared with other partners or international institutions for global reporting on the Vector Learning Exchange	Project Records Annually	Technical Area	N/A	N/A	1	1 <sup>78</sup>						
4.2.1b	Number of times innovations, best practices, and other data or lessons learned are presented by and/or shared with in-country partners <sup>79</sup>	Project Records Annually	Technical Area	1 <sup>80</sup>	1 <sup>81</sup>	1	2 <sup>82</sup>						

78 M&E Tracking Insecticide Usage during campaign

79 Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

80 Share with in country partners ours e-Inventary.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
4.2.2	Number of individual members who use the Vector Learning Exchange	Project Records Annually	N/A	TBD	N/A	13 <sup>83</sup>	13						
4.2.3	Number of symposia and/or presentations submitted to and accepted at global conferences	Project Records Annually	Technical Area	TBD	1 <sup>84</sup>	1	In progress						
4.2.4	Number of success stories written or videos produced and shared on the VectorLink project website	Project Records Annually		TBD	0	1	In progress						
4.2.5	Number of peer-reviewed journal articles submitted and accepted	Project Records Annually	Technical Area	1 <sup>85</sup>	1 <sup>86</sup>	1	0						
4.2.6	Number of critical guidance, standards, or plans that incorporate disseminated findings/best practices and are shared with national stakeholders	Project Records Annually	Technical Area	1 <sup>87</sup>	1	1	In progress						
4.3	Develop and deploy cost-savings approaches												
4.3.1	Number of innovative or novel approaches implemented to achieve cost savings in IRS and integrated malaria vector control programs	Project Records Annually	VC Intervention Type	N/A	N/A	3	3 <sup>88</sup>						

81 Epidemiology

82 Use of VectorLink Collect for monitoring campaign progress and use of insecticide consumption tracker during campaign.

83 Permanent staff VL Mali.

84 VL Mali Entomologist participated in ASTMH.

85 Submit one entomological article.

86 Entomology

87 Share IRS impact in Mopti.

88 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

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 <sup>10</sup>		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
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	VC Intervention Type	N/A	N/A	1	In progress						
4.4	Cultivate public-private partnerships												
4.4.1	Number of private sector entities engaged with to establish public-private partnerships to increase the quality and coverage of malaria vector control activities globally	Project Records Annually	Private Sector Organization	1	1 <sup>89</sup>	1	1 <sup>90</sup>						

<sup>89</sup> UMAPLAST (Unite Malienne des Plastiques)

<sup>90</sup> BNSS (Bi Niama Sini Sanou)

# ANNEX E:

## SPRAY PROGRESS AND COVERAGE BY DISTRICT AND HEALTH AREA

**Table E1: 2019 IRS Results by Health Area**

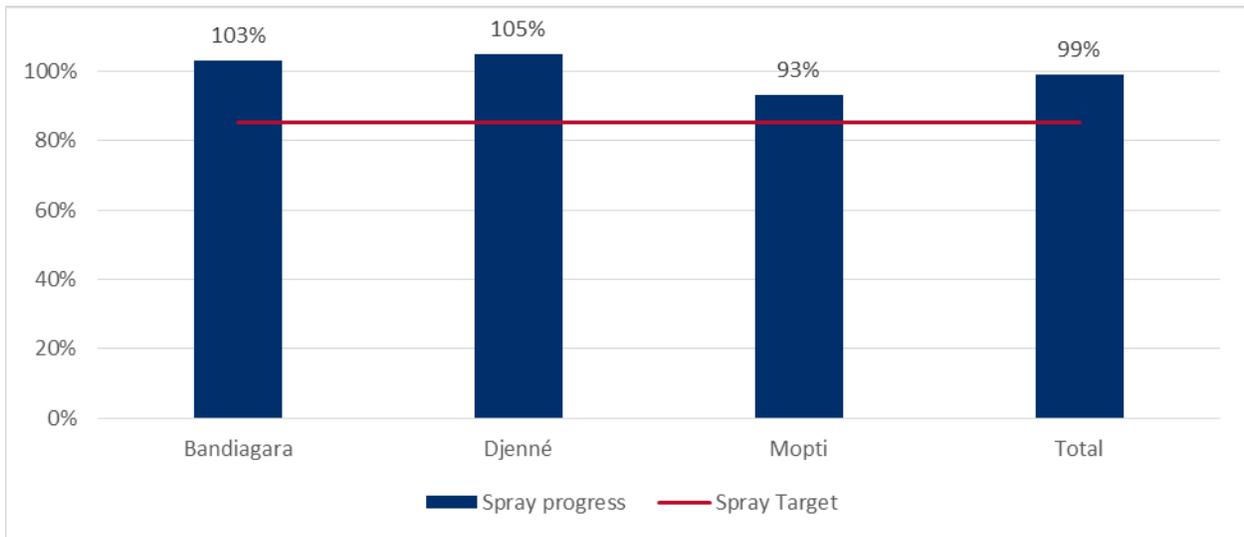
District	Health Area	Spray Progress	Target	Found	Sprayed	Spray Coverage	Total Population Protected			
							Male	Female	Pregnant Women	Children under 5
Bandiagara	Kani-Gougouna	93.9%	8,272	7,906	7,772	98.3%	15,770	14,548	1,144	4498
	Kendie	103.5%	9,932	10,337	10,278	99.4%	20,053	19,187	1,281	5,351
	Ningari	97.9%	6,183	6,201	6,052	97.6%	13,613	12,277	605	3,420
	Bendiely	94.4%	1,997	1,946	1,886	96.9%	3,394	3,234	169	1,148
	Kamba	112.4%	1,611	1,863	1,821	97.7%	3,517	4,468	352	1,151
	Songho	94.5%	3,029	2,916	2,869	98.4%	7,974	7,585	579	2,203
	Irely	154.4%	2,338	3,641	3,613	99.2%	5,017	5,036	300	1,920
	Sangha	100.4%	5,076	5,125	5,125	100%	9,633	10,481	401	2,763
	Kori-Maounde	102.5%	2,278	2,368	2,336	98.6%	4,872	5,364	627	1,023
	IBY	147.1%	1,016	1,502	1,500	99.9%	3,140	2,866	71	962
	Bandiagara Central*	105.1%	8,566	9,020	9,000	99.8%	22,862	23,099	2,632	6,447
	Goundaka	101.3%	6,099	6,201	6,179	99.6%	13,451	13,469	1,435	3,458
	Djiguibombo	88.9%	2,297	2,086	2,043	97.9%	3,995	3,957	354	1,150
	<b>Total</b>	<b>102.9%</b>	<b>58,694</b>	<b>61,112</b>	<b>60,474</b>	<b>99%</b>	<b>127,291</b>	<b>125,571</b>	<b>9,950</b>	<b>35,494</b>
Djenné	Bounguel	82.7%	2,852	2,520	2,360	93.7	4,873	4,685	415	1,562
	Djenne Central*	116.4%	5,810	7,286	6,761	92.8%	17,402	15,866	2,476	6,098
	Konio	104.5%	3,676	3,943	3,856	97.8%	9,661	9,082	1,689	3,492
	Madiama	105%	3,889	4,031	4,031	100%	9,496	8,415	1,014	3,060
	Senossa	97.2%	3,248	3,244	3,145	96.9%	7,624	6,868	863	2,400
	Sofara	110.6%	4,551	5,239	5,042	96.2%	11,143	11,167	1,525	3,958
	Torokoro	100.4%	1,406	1,416	1,416	100%	3,005	2,767	274	999
	<b>Total</b>	<b>104.8%</b>	<b>25,432</b>	<b>27,679</b>	<b>26,611</b>	<b>96.1%</b>	<b>63,204</b>	<b>58,850</b>	<b>8,256</b>	<b>21,569</b>

District	Health Area	Spray Progress	Target	Found	Sprayed	Spray Coverage	Total Population Protected			
							Male	Female	Pregnant Women	Children under 5
Mopti	Ascotamb*	82.2%	6,724	6,301	5,525	87.7%	13,319	13,370	983	2,600
	Komoguel*	76.8%	7,388	5,960	5,670	95.1%	15,429	15,806	2,050	5,190
	Sévare 2*	100.5%	7,133	7,295	7,178	98.4%	23,861	22,818	2,436	6,370
	Sévare 3*	64.7%	4,035	3,156	2,640	83.7%	7,866	7,724	941	2,128
	Toguel*	108%	2,609	3,202	2,819	88%	5,702	7,425	649	2,063
	Niacongo	92.8%	1,663	1,550	1,532	98.8%	2,880	3,618	108	176
	Fatoma	90.6%	3,669	3,445	3,325	96.5%	6,610	8,472	1,178	2,883
	Konna	108.2%	5,278	5,743	5,704	99.3%	12,797	11,963	1,466	3,513
	Manako	96.3%	1,206	1,155	1,155	100%	3,229	2,898	483	732
	Medina Coura*	103.8%	3,670	4,097	3,800	92.8%	8,877	8,333	886	2,569
	Sampara	90.6%	2,827	2,658	2,552	96%	6,069	5 82,5	588	1,730
	Tongorongon	101.1%	3,695	3,950	3,732	94.5%	10,832	9,496	1,980	2,350
	Socoura*	110.6%	9,087	10,247	10,027	97.9%	29,365	30,642	2,189	6,408
	Somadougou	83.1%	4,449	3,691	3,688	99.9%	6,303	6,001	920	1,343
	Soufouroulaye	74.5%	2,360	1,950	1,766	90.6%	4,271	4,076	421	1,099
<b>Total</b>	<b>92.9%</b>	<b>65,793</b>	<b>64,400</b>	<b>61,113</b>	<b>94.9%</b>	<b>157,410</b>	<b>158,467</b>	<b>17,278</b>	<b>41,154</b>	
<b>Total</b>	<b>98.9%</b>	<b>149,919</b>	<b>153,191</b>	<b>148,198</b>	<b>96.7%</b>	<b>347,905</b>	<b>342,888</b>	<b>35,484</b>	<b>98,217</b>	

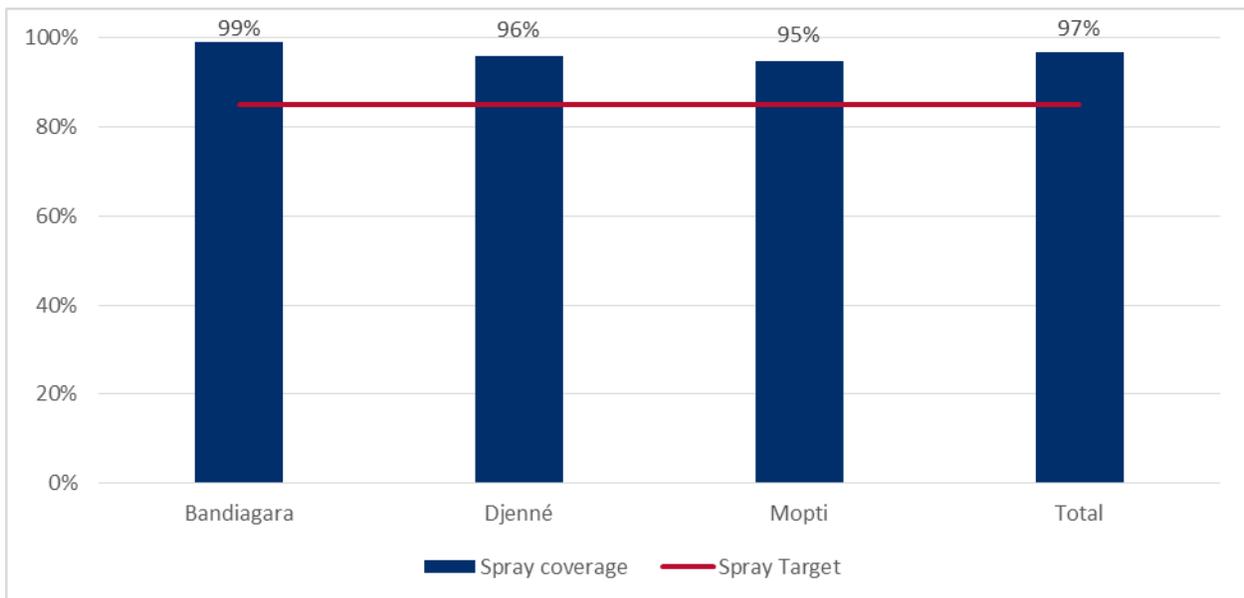
\* Health areas that are considered urban are marked by an asterisk

**Note:** Spray progress is the proportion of structures sprayed among target structures, whereas spray coverage is structures sprayed over structures found.

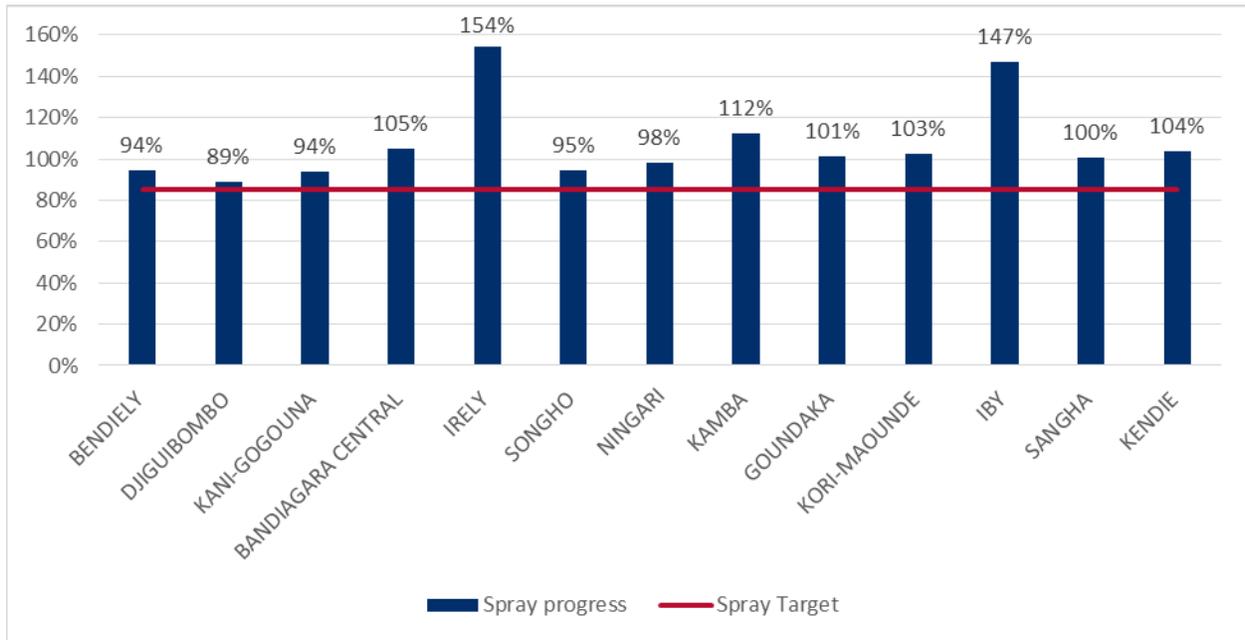
**Figure E-1: Spray Progress per District**



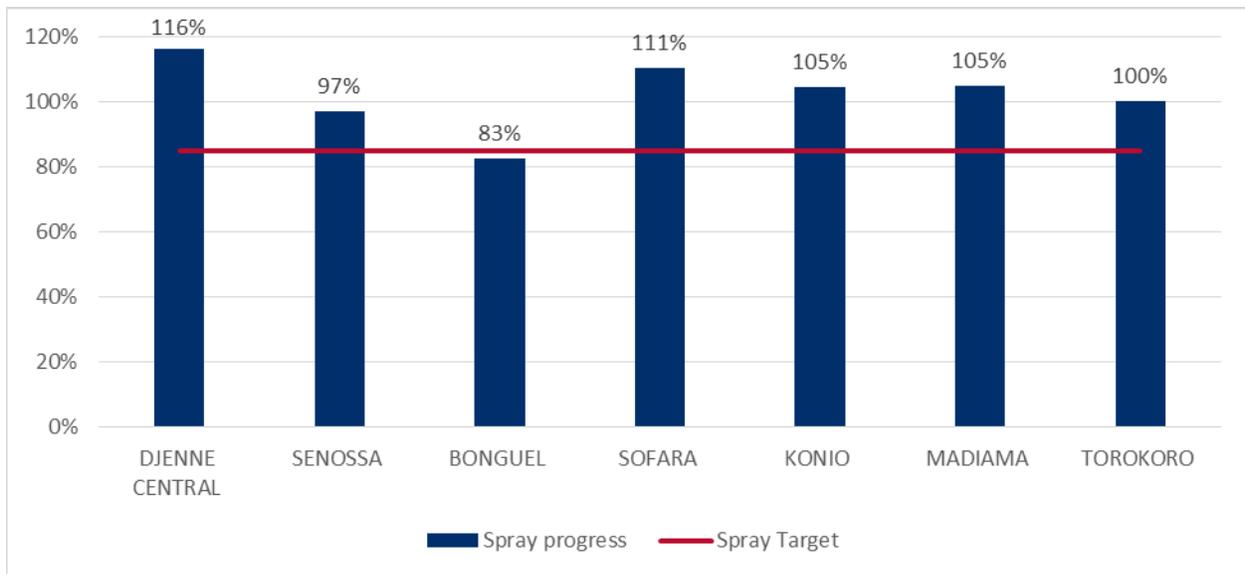
**Figure E-2: Spray Coverage per District**



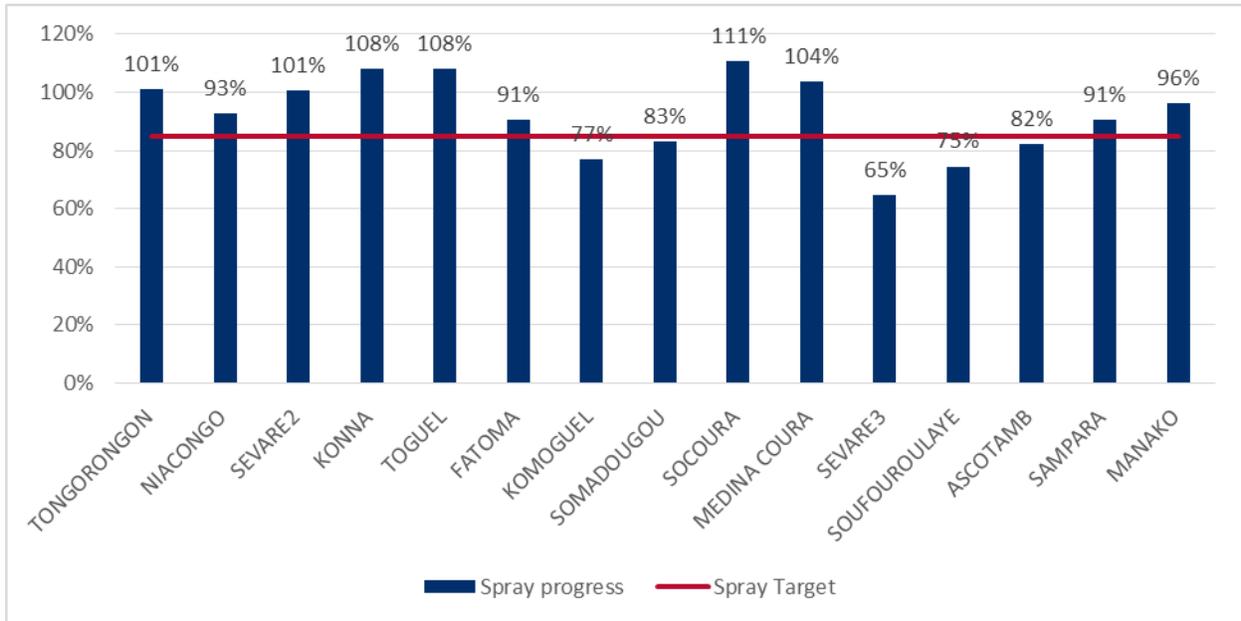
**Figure E-3: Bandiagara District Spray Progress, by Health Area**



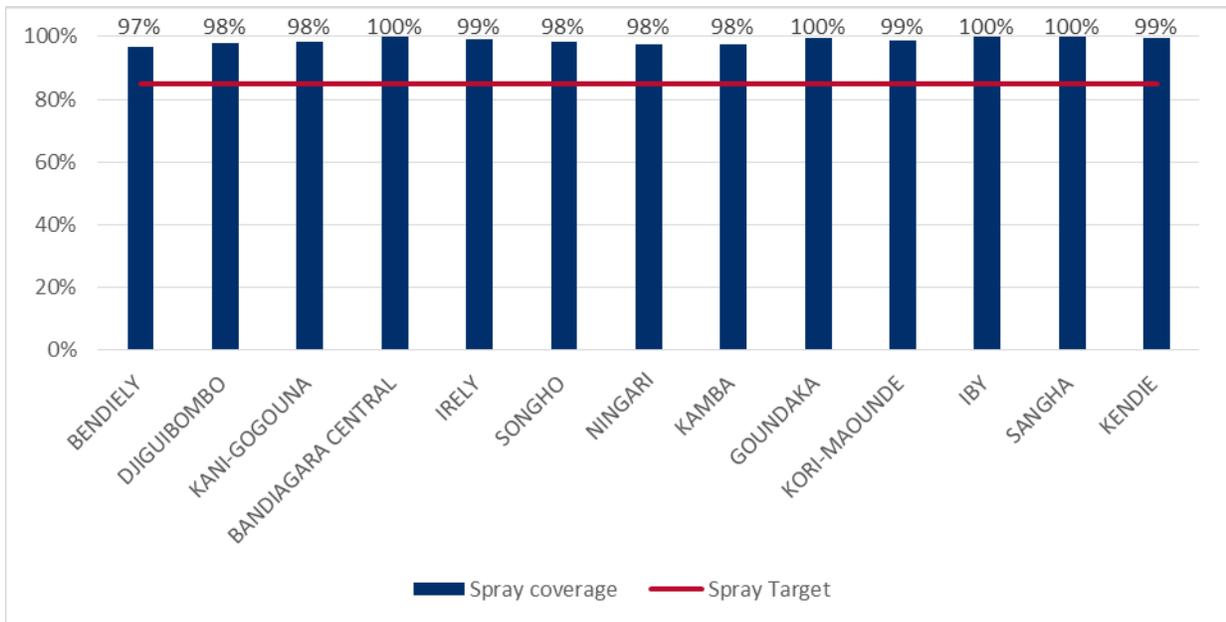
**Figure E-4: Djenné District Spray Progress, by Health Area**



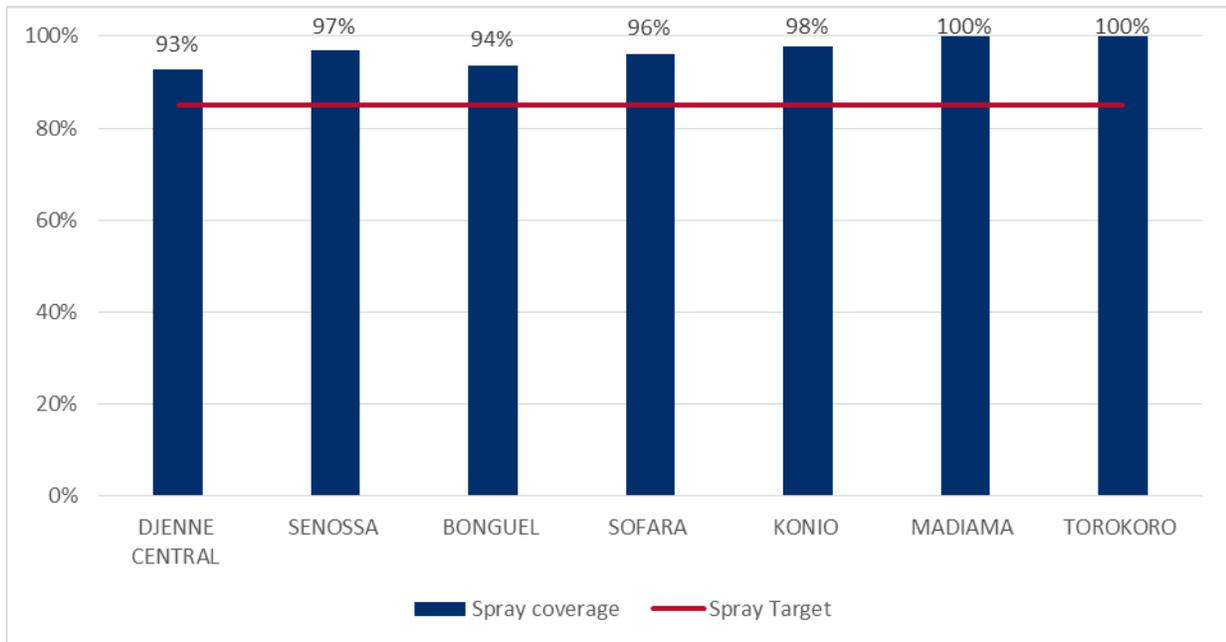
**Figure E-5: Mopti District Spray Progress, by Health Area**



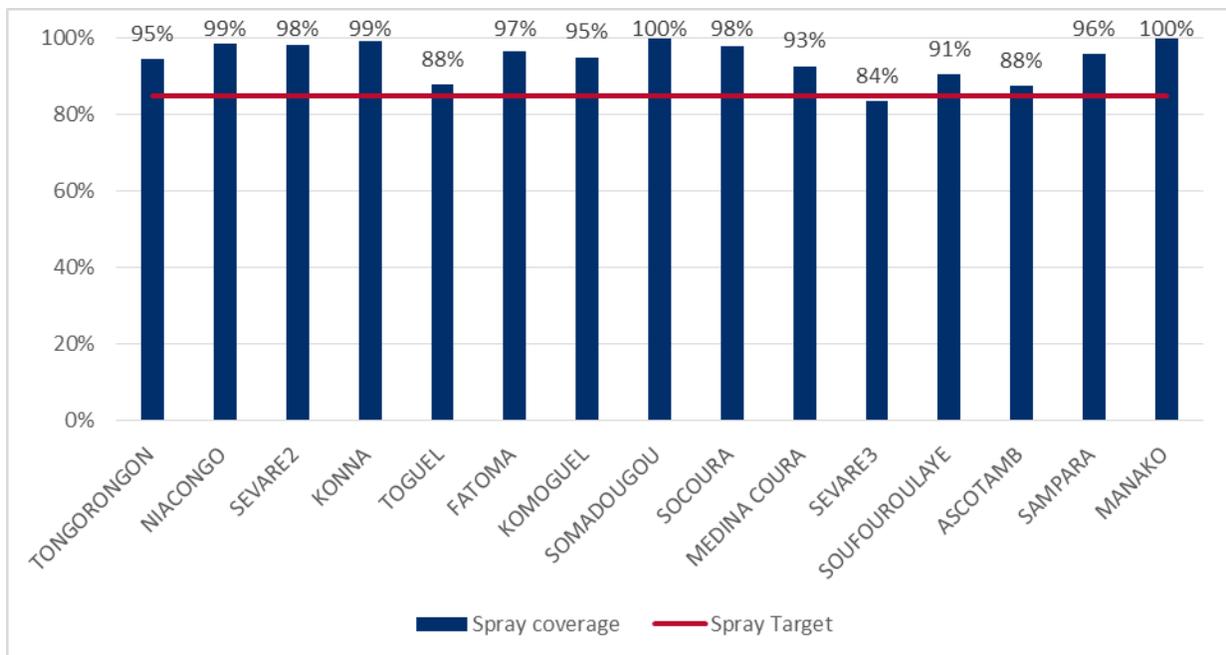
**Figure E-6: Bandiagara District Spray Coverage, by Health Area**



**Figure E-7: Djenne District Spray Coverage, by Health Area**



**Figure E-8: Mopti District Spray Coverage, by Health Area**



# ANNEX F: INSECTICIDE CONSUMPTION BY HEALTH AREA

District	Health Area	# structures sprayed	# rooms sprayed	units insecticide used	Average # structures sprayed per unit insecticide	Average # rooms sprayed per unit insecticide	Average # rooms per structure
Bandiagara	Kani-Gogouna	7, 772	18752	3647	2.13	5.14	2.41
	Kendie	10,278	23915	3340	3.08	7.16	2.33
	Ningari	6,052	15439	3539	1.71	4.36	2.55
	Bendiely	1,886	4543	658	2.87	6.90	2.41
	Kamba	1,821	3598	742	2.45	4.85	1.98
	Songho	2,869	7101	1320	2.17	5.38	2.48
	Irely	3,613	5045	1284	2.81	3.93	1.40
	Sangha	5,125	10779	2206	2.32	4.89	2.10
	Kori-Maounde	2,336	5906	887	2.63	6.66	2.53
	IBY	1,500	2846	963	1.56	2.96	1.90
	Bandiagara Central*	9,000	19065	3607	2.50	5.29	2.12
	Goundaka	6,179	13520	2445	2.53	5.53	2.19
	Djiguibombo	2,043	4155	876	2.33	4.74	2.03
<b>Total</b>	<b>60,474</b>	<b>134,664</b>	<b>25,514</b>	<b>2.37</b>	<b>5.28</b>	<b>2.23</b>	
Djenné	Bounguel	2,360	4,411	679	3.48	6.50	1.87
	Djenne Central*	6,761	14,816	2,909	2.32	5.09	2.19
	Konio	3,856	8,388	1,800	2.14	4.66	2.18
	Madiama	4,031	7,655	1,342	3.00	5.70	1.90
	Senossa	3,145	7,154	1,380	2.28	5.18	2.27
	Sofara	5,042	9,319	1,800	2.80	5.18	1.85
	Torokoro	1,416	2,898	360	3.93	8.05	2.05
	<b>Total</b>	<b>26,611</b>	<b>54,641</b>	<b>10,270</b>	<b>2.59</b>	<b>5.32</b>	<b>2.05</b>

District	Health Area	# structures sprayed	# rooms sprayed	units insecticide used	Average # structures sprayed per unit insecticide	Average # rooms sprayed per unit insecticide	Average # rooms per structure
Mopti	Ascotamb*	5,525	10,134	1,760	3.14	5.76	1.83
	Komoguel*	5,670	11,672	2,358	2.40	4.95	2.06
	Sévare 2*	7,178	22,388	3,816	1.88	5.87	3.12
	Sévare 3*	2,640	8,755	1,311	2.01	6.68	3.32
	Toguel*	2,819	5,496	1,104	2.55	4.98	1.95
	Niacongo	1,532	3,110	432	3.55	7.20	2.03
	Fatoma	3,325	8,013	1,308	2.54	6.13	2.41
	Konna	5,704	10,416	1,884	3.03	5.53	1.83
	Manako	1,155	2,868	414	2.79	6.93	2.48
	Medina Coura*	3,800	7,508	1,188	3.20	6.32	1.98
	Sampara	2,552	4,902	769	3.32	6.37	1.92
	Tongorongon	3,732	8,780	1,356	2.75	6.47	2.35
	Socoura*	10,027	29,118	5,997	1.67	4.86	2.90
	Somadougou	3,688	6,927	1,428	2.58	4.85	1.88
	Soufouroulaye	1,766	3,599	708	2.49	5.08	2.04
	<b>Total</b>	<b>61,113</b>	<b>143,686</b>	<b>25,833</b>	<b>2.37</b>	<b>5.56</b>	<b>2.35</b>
<b>Total</b>		<b>148,198</b>	<b>332,991</b>	<b>61,617</b>	<b>2.41</b>	<b>5.40</b>	<b>2.25</b>

\* Health areas that are considered urban are marked by an asterisk

# ANNEX G:

## REFURBISHMENTS AT IRS OPERATIONS SITES, BY DISTRICT

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District	Number of Operations Sites	Site Refurbished (soak pit, storeroom, fence, etc.)
Mopti	15	<ul style="list-style-type: none"> <li>• 18 soak pits refurbished and all are in new design.</li> <li>• 3 mobile soak pits</li> <li>• 15 offices and storage facility are provided by the community</li> <li>• A warehouse rented</li> </ul>
Bandiagara	13	<ul style="list-style-type: none"> <li>• 12 soak pits refurbished and all are in news design.</li> <li>• 2 new soak pits constructed in new design</li> <li>• 9 mobile soak pits</li> <li>• 12 offices and storage facility are provided by the community</li> <li>• A warehouse and an office are rented</li> </ul>
Djenné	7	<ul style="list-style-type: none"> <li>• 8 soak pits refurbished and all are in news design.</li> <li>• 7 offices and storage facility are provided</li> </ul>

# ANNEX H: 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 2019

<b>Mitigation Measure List each Mitigation Measure from column 3 in the EMMP (EMMT Part 2 of 3)</b>	<b>Status of Mitigation Measures</b>	<b>Outstanding Issues Relating To Required Conditions</b>	<b>Remarks</b>
1. Education, Technical Assistance, Training	N/A		
2. Research and Development	N/A		
3. Public Health Commodities	N/A		
4. Small-Scale Construction	N/A		
5. Small-Scale Water and Sanitation	N/A		
6. Nutrition	N/A		

Mitigation Measure List each Mitigation Measure from column 3 in the EMMP (EMMT Part 2 of 3)	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
7. Vector Control	Inspection of all vehicles and taxinis involved in IRS campaign done. ECO certification given to compliant vehicles. The inspection took place on June 25, 2019. The 88 drivers selected received the training on June 26, 2019.		The ECO inspected and approved all vehicles and taxinis before their use in the 2019 IRS campaign. All the drivers involved signed the Abt policy on motor vehicles and received their certificate from the ECO
	Every driver and vehicle used to distribute insecticides were provided with PPE, a spill kits, and a first aid kit.		Drivers were required to use their personal cell phones while transporting insecticides
	DTCs administered a pregnancy test to every female candidate for SOP, team leader, local supervisor, storekeeper, and washer positions.	Only the names of women with negative tests are reported. DTCs do not give the names of pregnant women	All test results were sent to the ECO. The tests were completed one day before the SOP training started, to ensure pregnant women were not recruited for positions with potential pesticide contact.
	Health fitness testing is done for every SOP, washer, storekeeper, team leader, and supervisor.		All test results were sent to the ECO before the campaign started.
	All workers with the potential to come in contact with pesticides were provided with PPE and trained on the proper use of the PPE.		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.
	SOP training on topics including pesticide mixing, pump maintenance, and proper use of spray pumps took place June 25–30, 2019.		Homeowners and/ or team leaders oversaw the pesticide mixing
	The ECO inspected all wash areas and soak pits for end-of-day clean-up prior to the start of the campaign. The inspections included coordinating with the operations manager to ensure the provision of adequate facilities and supplies.		The initial and final preseason environmental compliance assessments are designed to ensure facilities and supplies are appropriate for campaign activities.
	Spray and clean-up procedures are enforced by the team leaders and supervisors. Need for enforcement is often captured using supervisory checklists.		Storekeepers have an additional responsibilities overseeing SOPs' end-of-day activities.

Mitigation Measure List each Mitigation Measure from column 3 in the EMMP (EMMT Part 2 of 3)	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
	VectorLink Mali used radio broadcasts to ensure wide dissemination of IRS spray campaign information.		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 refusal cases.
	SOPs are instructed during training to not spray unprepared homes.		Team leaders oversaw structure preparation before spraying. The role of local mobilizers is important for assisting homeowners with preparation before the sprayers arrive.
	Homeowners are informed during mobilization and after spray, to wait two hours before entering the home and to open the door along with the windows. They are reminded by SOPs and team leaders to wash itchy skin and go to health clinic if symptoms do not subside.		The homeowners waited two hours before opening the door and windows of their houses
	SOPs are trained to spray inside walls of homes only. This training is reinforced by the project teams and onsite supervision. The SOP training includes proper spray technique and methods to overcome challenging spray areas. Training is managed by the project teams, COP, and operations manager. Inspections to ensure proper technique are completed by supervisors and the ECO.		Team leaders, supervisors, and the ECO use the Homeowner Preparation and Spray Operator Performance Supervisory Form to note spray technique inspections.
	Pump mechanics were recruited in each district for pump maintenance during the spray campaign.		VL Mali increased the number of pump mechanics during the campaign to assist SOPs with pump maintenance.
	The initial and final PSECAs completed by the ECO are designed to ensure site locations according to PMI BMP.		
	Mobile soak pits were built and repaired with charcoal to absorb pesticide from rinse water.		Mobile soak pits were built with a combination of activated charcoal

Mitigation Measure List each Mitigation Measure from column 3 in the EMMP (EMMT Part 2 of 3)	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
	Team leaders and supervisors completed daily inspections to ensure the proper drainage and good condition of soak pits.		Supervisors and team leaders used the End-of-Day Supervisory Form to note soak pit inspections.
	The ECO inspects and certifies solid waste disposal sites during the PSECA's. The ECO supervised the collection and the storage of waste at the central warehouses in Mopti and Bandiagara.		The MOE representative were involved in supervising waste management.
	Monitoring disposal procedures post-campaign ended September 2, 2019, according to the waste management plan in each health center.		
	Records of all pesticide receipts, issuance, and return of empty bottles/sachets are recorded in the project stock card and dispatch record for insecticides and empty bottles/sachets.		The ECO and logistic supervisors inspected the insecticide stores to ensure stock card and dispatch records are maintained
	Inspection and toolkit forms are used by supervisors for reconciliation.		The MOE representative were involved in supervising waste management.
	Visual examinations of the houses sprayed were done by the team leader, COP, operations manager, entomological coordinator, and ECO.		
	7.24 Physical inventory counts were completed by the COP and operations manager during the spray campaign		MOE representative was involved in this supervision
8. Emergency Response	N/A		