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2017 PMI AIRS KENYA END OF SPRAY REPORT

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**PMI | AFRICA IRS (AIRS) PROJECT
INDOOR RESIDUAL SPRAYING (IRS
2)
TASK ORDER SIX**

**2017 PMI AIRS KENYA
END OF SPRAY REPORT**

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ACRONYMS

AIRS	Africa Indoor Residual Spraying
BMP	Best Management Practice
CHA	Community Health Assistant
CHMT	County Health Management Team
CHV	Community Health Volunteer
DEC	Data Entry Clerk
DFID	U.K. Department for International Development
DOS	Directly Observed Spray
ECC	Environmental Compliance Coordinator
ECO	Environmental Compliance Officer
FEFO	First Expire First Out
IEC	Information Education Communication
IRS	Indoor Residual Spraying
KHMIS	Kenya Health Management Information System
LLIN	Long Lasting Insecticide Treated Net
M&E	Monitoring and Evaluation
mHealth	Mobile Health
MOH	Ministry of Health
mPesa	Mobile money
NEMA	National Environmental Management Authority
NMCP	National Malaria Control Programme
PMI	Presidential Malaria Initiative
PMT	Performance Management Tracker
PPE	Personal Protective Equipment
PSECA	Pre-Season Environmental Compliance Assessment
SCCSFP	Sub-County Community Strategy Focal Person
SCH	Sub-County Hospital
SCHMT	Sub-County Health Management Team
SCHPO	Sub-County Health Promotional Officer
SCMCC	Sub-County Malaria Control Coordinator
SCPHO	Sub-County Public Health Officer

SEA	Supplemental Environmental Assessment
SOP	Spray Operator
TL	Team Leader
UNHCR	United Nations High Commission for Refugees
WHOPES	WHO Pesticide Evaluation Scheme

EXECUTIVE SUMMARY

For the first time in five years, Indoor Residual Spraying (IRS) was implemented in Kenya. The PMI AIRS Project implemented IRS in six sub-counties in Migori County: Awendo, Nyatike, Rongo, Suna East, Suna West and Rongo. The main goal of the campaign was to contribute to the reduction of malaria burden in one of the highly affected Counties in Kenya. This was done through high quality spraying of structures, compliance with environmental regulations, establishment of effective M&E systems and entomological surveillance on a monthly basis.

The program began with a strong planning roadmap that included macro-planning at the national and micro-planning at the County and sub-County levels. AIRS Kenya conducted geographical reconnaissance and pre-season environmental compliance assessment to establish the appropriateness of the selected sites for IRS operations. Appropriate warehouse for massive storage of items and insecticide were identified. A number of items needed for the campaign were procured both locally and internationally depending on need and availability. A total of 2,270 seasonal workers (48% female and 52% male) and 106 vehicles were hired in Migori County to support the IRS activities. All hired staff were subjected to intense training that spanned all focal areas of the program including gender awareness.

IRS operations began on 6th February 2017 with door-to-door mobilization at village level. A total of 193,632 structures were found during mobilization and 96.7% were sensitized on IRS and 96.9% accepted the services. Consequently, in total, 362,973 people were reached with mobilization messages. The spray campaign itself started on the 13th February 2017 and information was generated through CommCare reporting tools and data reporting tools. Based on the supervision reports, strategies to improve operations were formulated. As this was the first campaign in five years, many challenges were experienced during the campaign including the rains interfering with operations, many refusals due to myths and misconceptions, locked structures in many urban areas, data quality, depletion of the IRS cards and financial constraints from the use of mPesa mobile payment system. However, through supportive supervision and weekly meetings at the sub-County level, many of these challenges were resolved. By the third to the last week of the campaign, steady and consistent improvement was seen across the sub-counties.

To determine quality of spray of insecticide on the walls, wall bioassay was conducted within two weeks of spraying using a laboratory-reared, susceptible colony of *An. gambiae* s.s. Kisumu strain. In each sub-County, a village with already sprayed houses was identified for wall bioassays. High mortality of laboratory-reared susceptible *An. gambiae* was observed in all sites for both mud and cement walls. Similarly, 100% mortality was recorded for wild collected adult *An. funestus*. Results from cone bioassay tests demonstrated high potency of the insecticide used in the IRS program.

By the end of the campaign on the 18th March 2017, 70,553 bottles of insecticide had been used to protect 906,388 people, including 16,932 pregnant women and 127,157 children below five years of age. This was as a result of spraying 212,029 structures out of the 217,100 structures found and 226,827 targeted structures, resulting in spray coverage of 97.7% and spray progress of 93.5% for the 2017 IRS campaign.

I. INTRODUCTION

I.1 BACKGROUND OF IRS IN KENYA

The U.S. President's Malaria Initiative (PMI) supported Indoor Residual Spraying (IRS) programs annually in Kenya beginning in June 2008. From 2008 to 2009, PMI-supported IRS focused in two highland districts (Nandi North and Nandi South) and one lowland area bordering the endemic areas (Rachuonyo District). From 2010-2011, PMI-supported IRS expanded to cover three lowland districts along Lake Victoria which border highland, epidemic-prone districts: Nyando, Migori, and Rachuonyo. In 2012, PMI-supported IRS operations expanded to a total of four lowland districts (i.e., Homa Bay was added). These districts have the highest *P. falciparum* prevalence rates in the country.

Despite this early success and expanded interest from other donors such as the U.K. Department for International Development, IRS has not been implemented in Kenya since 2012 except in the Kakuma Refugee Camp managed by the United Nations High Commissioner for Refugees (UNHCR). While PMI and the Kenya National Malaria Control Programme (NMCP) have supported IRS at Kakuma, no mass IRS campaigns for public health benefit have taken place in Kenya since 2012. Through 2012, the pyrethroid class of insecticides were used in all IRS conducted in Kenya, and a subsequent pyrethroid resistance was detected in *An. gambiae* s.s. in western Kenya. In 2010, observed resistance in this species ranged from 72 to 84% for permethrin and 37 to 58% for deltamethrin. *An. gambiae* s.s. was most common in areas near the Ugandan border. As of late 2012, however, the range of *An. gambiae* s.s. was expanding eastward. Furthermore, pyrethroid resistance was observed in *An. arabiensis* in the areas that had been sprayed for four consecutive years. Among other factors, insecticide resistance, delayed decisions to shift to an alternative insecticide and the termination of the PMI-funded bilateral Kenya IRS 2 Project resulted in no IRS since 2012.

In 2017, PMI supported the restart of IRS operations in Kenya through the PMI Africa Indoor Residual Spraying (AIRS) Project. Specifically, the PMI AIRS Project – working as AIRS Kenya – supported NMCP's planning, facilitation, delivery, supervision and post-spray assessments of IRS operations. The overall goal of 2017's IRS campaign was to reduce malaria morbidity and mortality in six targeted sub-counties in Migori County while simultaneously building the capacity of the NMCP, Migori County and sub-County staff to deliver an effective IRS intervention.

The main objectives of the campaign were to:

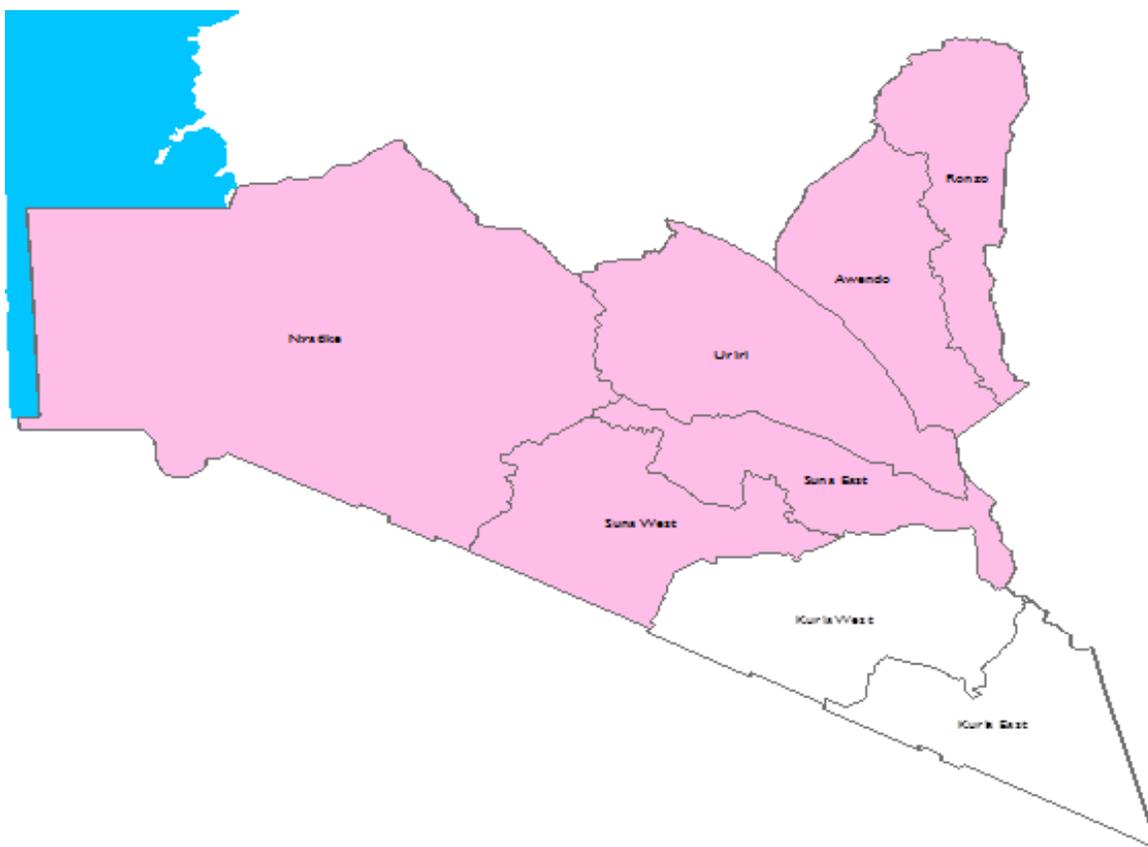
- Achieve spray coverage of at least 85% of the estimated 226,827 targeted structures. This estimate was determined through Community Health Volunteer (CHV)-led enumeration exercise conducted in late 2016;
- Ensure compliance with environmental regulations and establish best practices for IRS insecticide handling and usage;
- Establish effective monitoring and evaluation of all activities in order to measure the effect(s) of IRS; and
- Conduct monthly entomological surveillance to inform vector control decision making.

The campaign started on 13 February 2017 and ended on 18 March 2017. Table I and Figure I below summarize the spray campaign's results and coverage respectively:

TABLE 1: SUMMARY OF 2017 IRS CAMPAIGN RESULTS

Result	Migori County
Number of Sub-Counties covered by IRS	6
Insecticide class	Organophosphate
Number of structures treated	212,029
Estimated number of structures targeted	226,827
Number of structures found	217,100
Spray coverage (<i>number of structures treated divided by number of structures found</i>)	97.7%
Spray Progress (<i>number of structures treated divided by number of structures targeted</i>)	93.5%
Population protected	906,388
Pregnant women protected	16,932
Children under five protected	127,157
Number of people receiving training to conduct IRS	2,270

FIGURE 1: LOCATION OF SPRAY AREAS COVERED DURING THE 2017 IRS CAMPAIGN



2. PRE-SPRAY ACTIVITIES

2.1 IRS CAMPAIGN PLANNING

In collaboration with PMI, NMCP and Migori County, AIRS Kenya developed the implementation plan for the 2017 IRS campaign and disseminated it to all the relevant malaria implementing partners, staff and stakeholders. The plan enabled County and NMCP staff to plan accordingly and ensured IRS activities did not conflict with any other activity that could hinder operations. Timing of the campaign was done to ensure spraying was conducted before the rains to protect the population during peak transmission seasons occurring after the long and short rains. The plan stipulated timelines for micro-planning meetings, sensitization meetings, recruitments, procurement, pre-season assessment of operations sites, medical checkups, various training dates and the IRS launch. Logistics arrangement, commodity distribution, mobilization dates and other post IRS activities were also well indicated in the plan.

The spray campaign was planned for a period of 30 operational days between 13 February and 18 March 2017 with a six day working week from Monday to Saturday. The campaign is expected to cover both long rains and short rains peak transmission periods which occur in the lake endemic region from April-June and October-November, respectively. However, this is subject to confirmation from the ongoing entomology studies in the region.

2.2 SPRAY AREA AND INSECTICIDE SELECTION

IRS implementation in Kenya is guided by NMCP's IRS Business Plan and PMI's Malaria Operational Plan. Migori County was selected for IRS as it was on the periphery of the Lake Endemic Zone. All sub-counties with estimated parasite prevalence greater than 20% were included, leaving out two sub-counties (Kuria East and West) with estimated prevalence below 20%.¹ These two sub-counties are included in the project's entomology activities as controls carried out by AIRS Kenya entomologists.

Given the increasing pyrethroid resistance in western Kenya, NMCP advocated a shift from the pyrethroid class of insecticides, which are now being used solely for LLINs and not in IRS to mitigate the development of resistance. For the 2017 IRS campaign, organophosphates – specifically, Actellic® 300CS – was selected for spray since it was registered by Pest Control Products Board for IRS in Kenya (PCPB (CR) 1233).

2.3 GEOGRAPHICAL RECONNAISSANCE IN MIGORI COUNTY

In collaboration with Migori County, AIRS Kenya conducted geographic reconnaissance coupled with operations sites assessments from 7th to 15th November 2016. The main objectives were as follows:

1. To assess the location of the proposed operations sites – soak pits, wash areas and stores – and ascertain their distances from the sensitive eco-systems (e.g., water bodies, public amenities, schools, farming areas, etc.);
2. To assess the physical state of the proposed stores and document the deficiencies to assist in developing a work plan to address any deficiencies;

¹ Estimated prevalence from the Ministry of Health (2016). The epidemiology and control profile of malaria in Kenya: reviewing the evidence to guide the future vector control. National Malaria Control Programme, Ministry of Health. Nairobi, Kenya, April 2016

3. To establish the different wall surface types in eligible structures in Migori County and the approximate distance between structures in different locations;
4. To establish road distances between operations sites and villages as well as their accessibility and terrain; and
5. To assess availability and accessibility of water sources for spraying.

Table 2 below shows the list of sub-counties targeted; the total population targeted and proposed class of insecticide for use

TABLE 2: LIST OF SUB-COUNTIES TARGETED IN MIGORI COUNTY

Sub-County	Targeted Population	Estimated Number of Structures Targeted
Rongo	127,865	34,127
Awendo	138,504	36,511
Uriri	147,202	42,440
Suna East	123,509	32,021
Suna West	119,701	30,664
Nyatike	183,919	51,064
Total	840,700	226,827

2.4 MICRO-PLANNING

AIRS Kenya led a micro-planning meeting from 12-13 October 2016 working with NMCP and Migori County representatives. The meeting's main objective was to agree on the IRS implementation plan and finalize the quantification of equipment, materials and personnel per operations site. Participants were drawn from NMCP, Migori County and six targeted sub-counties officials which included members of the County Health Management Team (CHMT), Sub-County Medical Officers of Health (SCMOH), Sub-County Public Health Officers (SCPHO), Sub-County Health Promotion Officers (SCHPO), Sub-County Community Strategy Focal Persons (SCCSFP) and Sub-County Malaria Control Coordinators (SCMCC). These participants were engaged as the County and sub-County steering committees during IRS campaign. The total number of participants was 49 (39 male and 10 female), with three officers from NMCP, seven CHMT members, nine AIRS staff and thirty members of SCHMT.

The main agenda of discussion during the meeting was the IRS implementation plan broken down as below:

- Quantification of equipment, materials and personnel per operations site;
- Specific timelines and duration for the spray campaign;
- Roles and responsibilities of NMCP, County and AIRS;
- Recruitment of seasonal workers and their payment rates;
- Community mobilization strategy;
- Role of County government in provision of storage facilities in proposed health facilities;
- Assessment construction and repairs of the selected operations sites.

2.5 LOGISTICS NEEDS AND PROCUREMENT

AIRS Kenya conducted a needs assessment in November 2016 to establish the quantity of IRS equipment and material available for use and determined the quantity to be procured. Procurement of

IRS campaign supplies were separated into international and local procurements to guarantee cost efficiency and timely delivery of supplies.

2.5.1 LOCAL PROCUREMENT

Local procurement involved an open competitive bidding process in which AIRS Kenya had an open solicitation for quotes for services and goods. The project had a procurement committee who managed the vendor competition and source selection process. The procurement committee based awards on the lowest cost, quality of goods, timely delivery and technically acceptable bid according to the solicitation criteria. Services and/or materials procured locally included the following:

- Printed materials for IEC, IRS data collection, and commodity tracking;
- Personal protective equipment materials (e.g., neck hoods and socks);
- Food for spray teams' breakfast at the operations sites;
- IT equipment, including laptops and mobile phones for M&E data collection;
- Operation site refurbishment materials, including materials for soak pits; and
- Transportation services for IRS distribution, operations, and supervision.

Annex J and Table 3 provides details of local purchases, indicating quantities procured for each item.

TABLE 3: LOCAL PURCHASES

Item Description	Quantity Before Campaign	Quantity Procured	Quantity After Campaign
IRS Transportation	1	106	1
Hardware Materials and Equipment	2014	18160	11967
Stationery items	0	30966	9230
Consumable Items	0	6579	60
Printing Materials – Logistics Data Materials	0	51920	347
IEC Materials	0	292326	4029
IT Equipment/ Mobile phone	0	106	104

2.5.2 INTERNATIONAL PROCUREMENT

Prior to the spray campaign, AIRS Kenya received 27,755 bottles of insecticides from NMCP. AIRS Kenya procured 91,584 additional bottles of Actellic® 300CS to cover the spray campaign in all the six sub-counties in Migori county. Of this total, 8,634 bottles were used in Rongo, 10,949 used in Awendo, 12,462 used in Uriri, 9,759 in Suna East, 8,629 used in Suna West and 20,120 in Nyatike.

In addition to insecticide, services and/or materials procured internationally included the items in Table 4 below:

TABLE 4: INTERNATIONAL PURCHASES

Item	Stock before the Campaign	Quantities Purchased	Quantity Used	Quantity in Stock after the Campaign	Notes
Actellic® 300CS	27,755	91,584	70,553	48,786	27,755 was provided by NMCP
Control flow valves (CFV)	0	1,041	30	1,011	46 new. 965 used but in good condition.
Spare parts Kits	48	5	8	45	45 in stock have been fully reconstituted.
Male fitting for strainer housing	150	58	57	151	
Lance Extension Tube	0	208	67	141	
Nitrile coated rubber gloves	0	288	21	267	146 new, 121 used but in good condition.
Pressure gauge	13	91	39	65	

2.6 WAREHOUSES AND INSECTICIDE STOCK MANAGEMENT

AIRS Kenya secured two storage facilities: one central warehouse in Kisumu and a distribution center in Migori County. The Kisumu warehouse stored all IRS commodities inherited from the previous implementer. After purchase and delivery of materials required for use during the campaign, all the required materials and equipment were moved to the Migori distribution center which created more space for insecticide storage in the Kisumu warehouse. Since the Migori distribution center was not ideally located to store insecticides, three other facilities were secured free of charge for temporary storage and field distribution of insecticides to the operations sites and temporary storage of contaminated wastes. One field insecticide distribution point which was an improved 40ft container was located at Kochola dispensary in Rongo sub-County and served Rongo, Awendo and Uriri sub-counties. The other one was unoccupied health facility staff house located in Arombe dispensary in Suna West sub-County and served Suna West, Suna East and Nyatike sub-counties. The two field distribution points also served as a temporary storage for empty insecticide bottles on transit to Kisumu warehouse. All contaminated waste – nose masks, contaminated soil from spill response and used batteries – were stored in a third storage space which was a 40ft container located at Rabondo dispensary in Awendo sub-County.

AIRS Kenya carefully tracked insecticide, equipment stocks and other materials from the central warehouse in Kisumu to the Migori County storage facility and subsequently to the operation sites' storage facilities. The team tracked empty insecticide bottles daily at the operations sites and insecticide distribution centers. Storekeepers accounted for them by recording how many insecticide bottles were received by each team leader and used by the Spray Operators (SOPs). They documented stock records on goods issued notes, stock cards, insecticide distribution tracking sheets and commodity ledger books.

All IRS waste generated during the campaign was collected on weekly basis to the distribution centers and subsequently transported to Kisumu central warehouse for storage awaiting final disposal. After the campaign, all empty plastic insecticide bottles were packaged in their original paper boxes and transported to Nairobi for recycling. Upon arrival to the Vintz Plastics, all the empty bottles were loaded into a receptacle. The empty boxes were collapsed at Vintz Plastics and transported to Kamongo Waste Paper Recyclers Ltd in Nairobi.

2.7 HUMAN RESOURCE REQUIREMENTS

Human resource requirements were categorized into two groups: permanent and seasonal staff.

2.7.1 RECRUITMENT OF PERMANENT STAFF

Recruitment of permanent staff started in 2016 and was done in three phases. In February 2016, Phase One included the recruitment of senior staff namely the operations manager, finance manager, and logistics and program coordinator. Phase Two included the recruitment of the environmental compliance officer, county coordinator, procurement officer, IT specialist and IEC/BCC coordinator and was completed by September 2016. All other staff were recruited in Phase Three in December 2016, including the technical manager, M&E manager, database coordinator, staff accountant, and all entomology staff.

2.7.2 HIRING OF SEASONAL STAFF

Following micro-planning deliberations, seasonal staff positions including finance assistants, IEC assistants, logistics assistants, M&E assistants, data entry clerks (DECs), site managers and storekeepers were advertised in a local website and posted widely in the County, sub-County and ward level public places for qualified personnel to apply. AIRS Kenya vetted applications and shortlisted qualified candidates for interviews and final candidates were selected after the interviews. Annex C shows the distribution of seasonal workers hired for each position, broken down by gender and targeted sub-County.

2.8 PAYMENT OF SEASONAL WORKERS

Before the start of spray operations, AIRS Kenya conducted two-day training for the finance assistants, payroll officer and finance clerk. The participants were briefed on their responsibilities to ensure efficient management of funds and facilitation of logistical support. Their responsibilities included:

- Distribution and collection of signed contracts from all the seasonal staff (Spray Operators, TLs, washers, security guards and mobilizers);
- Collection of all timesheets for seasonal staff before preparing payrolls;
- Preparation and submission of payroll based on the schedule of payments created by the Finance Manager at the start of the IRS campaign;
- Collection of invoices from food vendors and conveyance to the AIRS Kenya finance office for payment; and
- Collection and reconciliation of IRS vehicle logs sheets.

AIRS Kenya paid IRS support staff through their personal bank accounts on monthly basis. Other seasonal workers including Spray Operators, TLs, supervisors, mobilizers, washers, pump technicians and security guards were paid through Safaricom's mobile money platform – *mPesa*. *mPesa* was the preferred money platforms because of its wider coverage and use in Kenya.

The advantages of *mPesa* payments as opposed to cash payments were:

- Seasonal worker did not have to travel to collect their money. Money was sent directly to their phone. (Time saving) Seasonal workers could receive their pay even while at work;
- No need to transport large sums of cash to different sites to pay workers. (Reduction of cash loss); and
- Women had full control over their use of the money to improve their household standard of living since money was wired directly to their phone.

2.9 TRAINING OF SEASONAL STAFF

AIRS Kenya organized and hosted 67 training sessions in Migori County for the seasonal staff. The training sessions ensured all seasonal workers had a solid understanding of how to implement all IRS campaign activities. The training sessions also included safety, precautions and emergency measures (in case of insecticide poisoning). All training sessions were conducted by AIRS Kenya's staff in collaboration with NMCP and representatives from the Ministry of Health at the County and sub-County levels. The trainings took place from 16th January to 11th February 2017.

Annex D shows a summary of the people trained in the program.

2.10 IRS VEHICLES

AIRS Kenya contracted 106 vehicles for IRS operations in the six targeted sub-counties in Migori County. The vehicles were sourced from the local vendors within Migori County. All the Spray Operator vehicles were hired for 30 days except the logistics vehicles were hired for 15 days and on need basis. Table 5 shows the number of vehicles assigned to each County.

TABLE 5: DISTRIBUTION OF VEHICLES IN THE SUB-COUNTY

30 Days of Operations				
County Vehicles	Sub-County Vehicles	Vehicles for Spray Operators	Vehicles for Supervision	Total
County Supervisors			3	3
Logistics			2	2
AIRS M&E and NMCP			13	13
	Rongo	10	2	12
	Awendo	12	2	14
	Uriri	14	2	16
	Suna East	11	2	13
	Suna West	11	2	13
	Nyatike	17	3	20
Total		75	31	106

3. IEC MOBILIZATION

3.1 ADVOCACY

AIRS Kenya partnered with the Ministry of Health and Department of Health at County and Sub-County levels to steer the advocacy agenda across the entire program in the six Sub-Counties of Migori. The IRS launch event was held on the first day of the campaign (13 February 2017) in Awendo Sub-County. It was attended by not only senior Ministry of Health personnel, including the Director of Health from Migori County and the Minister of Health from the County government, but also National Malaria Control Program staff. Speeches were read by, the Sub-County Deputy Commissioner, Migori County Malaria Control Coordinator (Florence Ngere), Josephat Deya from Aphia Plus, PMI AIRS Chief Of Party (Brad Longman), NMCP Representative (Solomon Karoki), Migori County Community Strategy Focal Person (Tom Odhong), Migori County Deputy Director of Health (Dr. Elizabeth Mugambi), Migori County Director of Health (Dr. Gregory Ganda), Migori County Minister of Health, CEC, (Mr. James Nyamita), and the Chief Executive Health Officer (Mr. Dalmas Oyugi). A road show visiting all the Sub-Counties informing them about IRS and its importance was held the day before the launch and on the material day of the launch. After the speeches, the guests went to directly observe a household that was being sprayed. Branded T-shirts were also given out to all the participants who came for the function.

3.2 MOBILIZATION METHODOLOGY

AIRS Kenya worked very closely with the Ministry of Health and the National Malaria Control Program (NMCP) to employ various mobilization methodologies in order to prepare the community for IRS. This began in October 2016 and continued until the spray exercise ended on March 18th 2017. Mobilization was mainly conducted by Community Health Volunteers (CHVs) who were recruited and assigned to villages. For the initial five days, each of them was expected to mobilize all the households in their village. Once they got into a household, the mobilizers introduced themselves and gave an overview of IRS including demystifying myths. Afterwards, the mobilizer would duly complete the IRS card and leave the card behind after signing his/her details. The household door would then be marked on the outside indicating whether the house was sensitized or not. The household marking format was: **date/ IRS card number/Mobilizer code/ M or NM** whereby 'M' indicated Mobilized and 'NM' indicated Not Mobilized. The mobilizer also had a data tool which he/ she filled while in the household, based on responses from the household occupant.

Guided by the spray and mobilization calendar, the mobilizers went back to the households a day or two before the spray operators came to remind beneficiaries of the actual spray dates, that they needed to ensure the presence of an adult and remove household items on the material day.

Specific mobilization strategies adopted included:

3.2.1 SENSITIZATION MEETINGS

Sensitization meetings were conducted between 24th and 31st October 2016. Sensitization begun at the County level where the key stakeholders were sensitized about IRS and their concerns addressed. Key stakeholders targeted here were key representatives from various government departments, such as the Ministry of Health, (MOH), the Ministry of Education, the environment sector and other implementing partners directly or indirectly involved in malaria control. The next stage of sensitization was at the Sub-County level where six meetings were held and then at the ward level where twenty eight meetings were held. In total 1,339 participants were reached in these forums.

3.2.2 IEC MATERIALS

IEC materials were developed with input from the Ministry of Health and the National Malaria Control Program. The IEC materials developed were 2,200 T-shirts, 30 banners, 1,500 Posters. 296,827 IRS structure cards were developed with key messages for the communities. Mobilizers were also given pocket guides developed by the AIRS team together with the NMCP. These guides had brief guidelines on the key messages that mobilizers needed to emphasize during household visits together with frequently asked questions and possible responses. Pocket guides were also printed for Spray Operators, Team Leaders and Store Keepers. These guides were issued to the teams to support their work and remind them of key things that they needed to lay emphasis on.

3.2.3 RADIO PRESENTATIONS

Radio Mayienga, a local FM radio station popular among Migori communities, ran a radio advertisement for three weeks. This advertisement package was a daily activation of IRS for five minutes. The breakdown of the daily activation included a daily presenter who mentioned IRS for 45 seconds, four minutes of advertisements per week, five promotions of 15 seconds each per day, with a competition whereby listeners were asked questions on IRS and the first caller with the correct answer won a T-shirt. The competition ran for two weeks. Two radio talk shows at a local radio station, Radio Milambo (only aired in Migori County) were held and lasted for about two hours each. Listeners were informed about IRS and were allowed to call in and ask questions which were promptly answered by the County and Sub-County Ministry of Health team who were at the station. The PMI AIRS IEC Coordinator also had an interview with Radio Milambo aired for two minutes reminding Migori residents of the end date of the spray campaign and encouraging residents to ensure that their structures are sprayed before the exercise ended.

3.2.4 CAPACITY BUILDING FOR MOBILIZERS

Seven hundred and sixty seven mobilizers together with twenty eight mobilizer team leaders were trained for a period of two days between January 31st and 1st February 2017 across the 28 wards in the six Sub Counties where the spray exercise was to take place. The mobilizers and their leaders were trained on (a) how to conduct door to door mobilization, (b) the key messages to relay to the households, (c) how to demystify myths and misconceptions, (d) how to mark households visited, identify eligible structures for spraying and issue IRS structure cards, (e) promotion of understanding and acceptance of IRS, (f) informing households on how to prepare for the spray exercise and (g) how to fill the mobilization household form.

3.2.5 DOOR TO DOOR MOBILIZATION

Door to door mobilization was conducted by the mobilizers. The mobilizers drawn from the various villages were able to reach out to a number of households with the key messages on IRS. Some of the households that were not reached by the mobilizers were reached by the site supervisors and team leaders during the spray exercise.

All the trained mobilizers were branded with reflector jackets and issued with IRS structure cards to give to all households visited, whether the occupants accepted the spray exercise or not. The mobilizers also had mobilization forms which they filled as they interacted with household occupants. A spray and mobilization plan for all the sub counties were prepared in advance and shared with the supervisors' way before the spray exercise begun.

The recruited mobilizers were initially contracted to work for a total of ten days. During the first five days, they were expected to visit all the households assigned and issue IRS structure cards and provide key messages on pre, during and post-spray exercise. Over next three days, they were expected to go ahead of the spray operators to remind the households of the exact day that households would be sprayed and remind them of how to prepare their households. The remaining two days were set aside for the mobilizers report writing and clearance.

This strategy did not work because by the end of the initial five days, more than half of the areas assigned had not been mobilized. This was due to a number of hitches, including lack of close supervision, lack of clear targets for the mobilizers and delays in getting IRS cards from the vendor and hence late dispatch to field. The mobilizers also had to cover very vast distances with no provision for transport. A decision was therefore made to have the mobilizers work for the ten days continuously, to try to mobilize as many households as possible. An additional two days (on top of the initial 10) were added so that mobilizers could go ahead of the spray operators and ensure the households were ready for the spray exercise.

At the end of the twelve days, some households had still not been mobilized, and this forced the site supervisors and team leaders to mobilize households as they moved along.

Most households accepted the spray operators to spray their structures, but a few others declined due to one reason or another. In many cases, AIRS engaged the local administration to help promote acceptance. This worked well as evidenced by many of initial refusals being converted to acceptances and households were sprayed.

3.2.6 USE OF MEGAPHONES

Megaphones were used to alert the communities on the spray exercise and reminded them to prepare the households. Team leaders used the megaphones ahead of the spray team to inform household owners to start preparing their households for spraying.

Table 6 provides details on the mobilization results.

TABLE 6: MOBILIZATION RESULTS

Area	Structures			Population Reached			Structures		Materials Distributed
	Found	Sensitized	Not Sensitized	Total	Male	Female	Accepted Spraying	Not Accepted Spraying	
Awendo	34,597	33,865	732	70,250	30,584	39,666	33,444	421	30,852
Nyatike	36,919	34,787	2132	65,669	28,381	37,288	34,287	500	27,370
Rongo	25,425	24,328	1097	46,852	21,102	25,750	24,099	229	17,686
Suna East	29,920	29,266	654	59,124	27,161	31,963	29,022	244	23,318
Suna West	31,583	30,476	1,107	54,568	22,654	31,914	30,221	255	23,180
Uriri	33,428	33,167	261	64,256	28,450	35,806	32,987	180	32,381
TOTAL	191,872	185,889	5,983	360,719	158,332	202,387	184,060	1,829	154,787

3.3 IEC ACTIVITIES

AIRS Kenya hosted, Sonia Gloss, the Health Communication and Project Design Specialist – USAID, from PMI Nairobi office, who conducted a photo shoot of the IRS spray exercise starting from an operation site where she chronicled storage facilities and spray operators at morning mobilization and the villages where the household preparation and spray exercise actually took place. She interviewed families and returned to an operation site to capture the end of the day activities. AIRS Kenya hosted Jessica Scranton, a photojournalist, hired by Abt US office to take photos of the beneficiaries. AIRS Kenya took advantage of the visit and documented success stories from the beneficiaries for our records. The stories came from spray operators, mobilizers (mostly women), household owners (mostly women with children) and elderly beneficiaries (over 80 years) who were very happy with the spray exercise and confirmed that they were now having peaceful nights.

4. IRS IMPLEMENTATION

4.1 IRS CAMPAIGN SCHEDULE

IRS trainings began on 16 January 2017 for training of trainers (TOT) and ended on 11 February with Spray Operator, team leader training and M&E personnel training after which IRS implementation began. The spray campaign was implemented from 13 February to 18 March 2017 in all the six sub-counties in Migori County. Annex B represents the implementation plan and the timelines the activities were implemented.

4.2 ORGANIZATION OF THE IRS CAMPAIGN

The 2017 IRS campaign leveraged existing MOH community strategy structures. In community strategy, each sub-location comprises a community unit (CU) of community health volunteers (CHVs) and thirteen-member community health committee whose members are selected from the community with the help of local leaders and community members. Each CU is led by a trained community health assistant (CHA). AIRS Kenya recruited seasonal workers including spray operators and mobilizers from the established CUs with the help of CHAs. In instances where there were no CUs, community members were recruited with the support of local authorities. After recruitment, a meeting was held in every Sub-County to agree on the numbers selected per ward based on the agreed figures during micro planning. The meeting was attended by the CHAs from every ward and the SCHMT members. The team leaders were selected during trainings based on their performance. The supervisors were selected from the MOH team based on their familiarity with the ward. AIRS Kenya ensured all the required processes were followed during recruitment and that the selected seasonal workers per ward were correct.

At micro-planning stage, it was agreed an operations site would be established per ward. A total of 28 operations sites were established. All operations sites were located at the health facilities except one which was located at the Chief's camp. Each operations site had a soak pit and a storage facility large enough to serve the required spray teams. A total of 28 permanent soak pits and storage facilities were established in Migori County for IRS 2017 campaign (see Table 7 below for number of Spray Operators, Spray Teams and Operations Sites distributed per sub-County).

The NMCP team was tasked with overall supervision and technical advice to the operations of the campaign. The general supervision structure was organized into steering committees at the County and Sub County levels. The seven-member County steering committee was tasked to provide support supervision and oversee IRS activities at the County. Each of the County members was allocated a Sub-County to focus on. Each Sub County had a five member steering committee which was tasked to coordinate, supervise and address any arising issues in the operation sites within their Sub-County.

During the campaign, SOPs were grouped into teams of six each being led by one team leader (TL). Three TLs were supervised by one site supervisor. Where there was more than three teams, two supervisors were hired. In regions where there was more than one supervisor, the other would double up as the site coordinator.

Every day a debrief meeting was held between AIRS team, County and NMCP officials to discuss arising issues from supervision and chat way forward. Each site store was managed by one storekeeper. Each site was managed by a site manager who was an Abt support staff with the main role of coordinating and providing oversight on all the logistics, site requirements and team operations at the site.

Every morning, before departure to the field, breakfast was provided to the SOPs, TLs, supervisors, washers, pump technicians and stores personnel. After breakfast, spray personnel would wear PPEs, collect insecticides from the store as well as pick three liters of the rinse water from barrel 1, 3, 5 and 7 and would have a morning briefing from the supervisors and site managers to address any arising issues and communicate the way forward. After morning mobilization, the SOPs and their team leaders would board a vehicle and would be dropped off at designated areas as advised by the site supervisor that morning.

On arrival to the household, the SOP would greet the household owner and inspect whether the structure was ready for spraying. S/he would then request for 10L of water for insecticide mixing in the presence of the household owner. The SOP and team leader would enter the structure and would ensure that all windows and doors were closed. The SOP would begin to spray. The SOP would ensure that his/her nozzle was 45 cm away from the wall and would begin spraying from the top of the wall towards the floor while maintaining the correct rhythm as trained to ensure adequate cover. After covering the first swathe, the SOP would take a step to the right and resume spraying from top to bottom while ensuring a 5 cm overlap with each successive swathe. In poorly lit houses, SOPs used a spotlight issued by AIRS Kenya. The team leader or supervisor would closely monitor the SOP to ensure that s/he was applying the correct spray technique. Once the structure was sprayed, the SOP would exit the home and would instruct the household owner to keep the home closed for two hours to allow the insecticide to dry. The SOP would further instruct the household owner to aerate the home for an hour thereafter.

TABLE 7: NUMBER OF SPRAY TEAMS AND OPERATIONS SITES PER SUB-COUNTY

Sub-County	Number of Spray Teams	Number of SOPs	Number of Operations Sites
Awendo	23	135	4
Nyatike	32	189	7
Rongo	21	126	4
Suna East	20	120	4
Suna West	19	114	4
Uriri	26	157	5
Total	141	841	28

4.3 IRS CAMPAIGN SUPERVISION AND MONITORING

Monitoring progress during the campaign was done through the use of CommCare supervision tools, in partnership with Dimagi Inc.² A detailed explanation on the CommCare supervision tools is narrated in Section 8 of the report below.

On a daily basis, data was submitted to the CommCare platform through SMS by the operations site managers and through digitized checklists by the supervisors. Data was summarized and circulated via email to all supervisors in the program at all levels: National, County and Sub County levels. Debrief meetings were conducted regularly to assess progress and make decisions on strategies that would gear the program towards achieving its targets. Supervisors used digitized checklists to monitor daily operations starting from morning mobilization before the teams left for field, homeowner preparation before the spray, storekeeper performance at the operations site, end of day clean up and data collection verification. These reports were equally shared to all supervisors on email and any alarming issues were tackled immediately.

² Dimagi Inc is a software development company that offers customized solutions through mobile platforms.

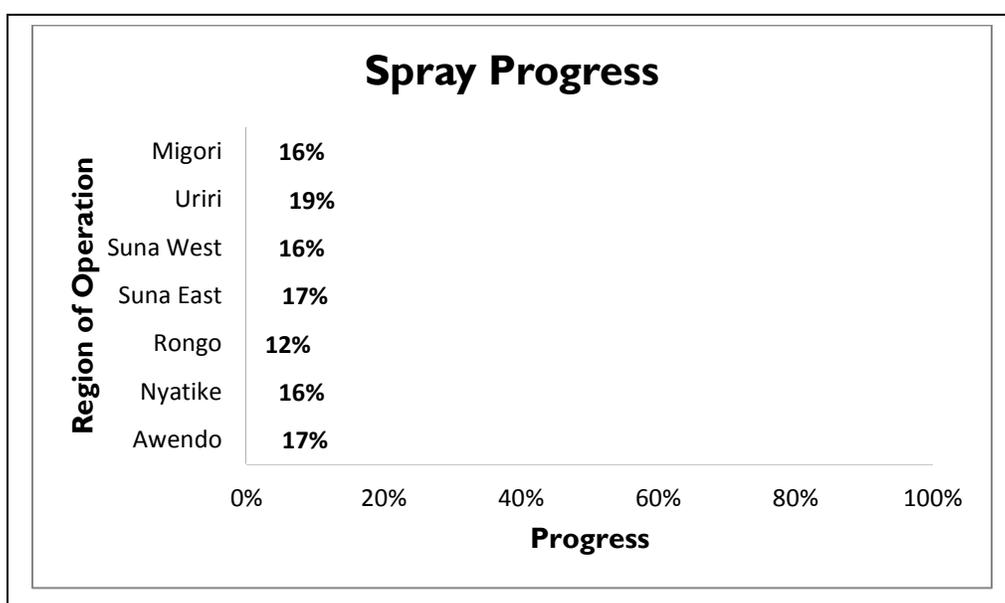
Each spray operator had a daily target tracked for their individual performance. This was monitored on a daily basis to track overall performance towards the overall final target of the campaign. Progress in performance across the five weeks is outlined in the graphs below:

4.3.1 WEEK ONE SPRAY PROGRESS

Many of the spray operators were new to the IRS program which had not been conducted since 2012 in Kenya. The quality of data in Week 1 therefore revealed a need for follow-up training on data collection for supervisors, team leaders and spray operators to ensure all data was complete and of high quality. This was done during the field supervision and morning mobilization where the need for complete and accurate data was reiterated and through a check for completion and accuracy during end of day clean-up. Correcting these errors created a longer-than-usual delay in Week 1 data entry, since the forms had to be returned to the field for corrections.

Figure 2 below represents progress in each Sub County in the first week of spray.

FIGURE 2: SPRAY PROGRESS IN WEEK ONE OF THE CAMPAIGN



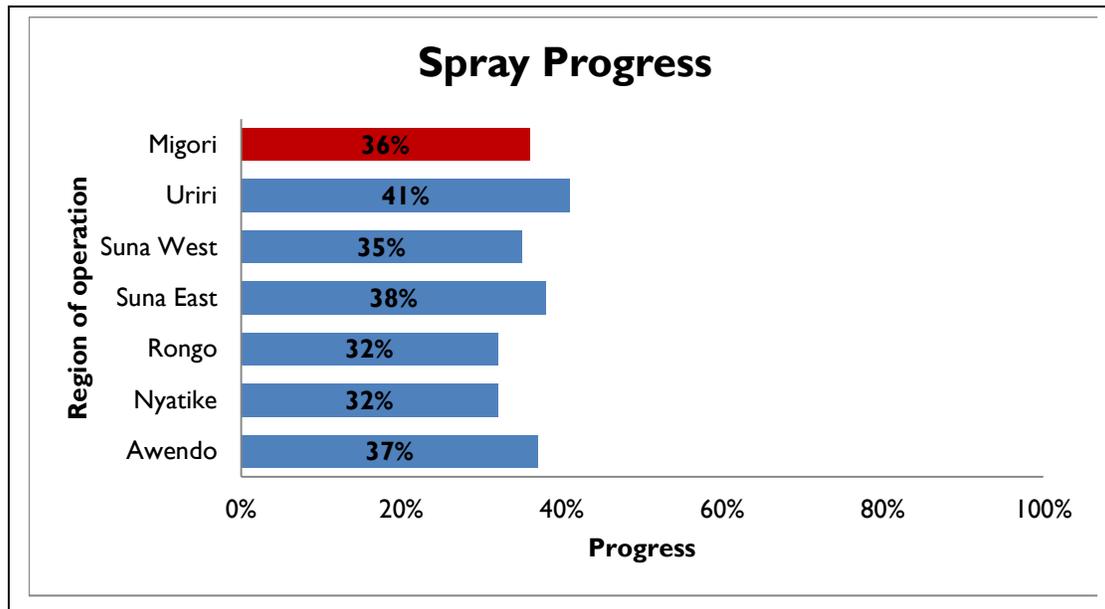
By the end of the first week, the program had achieved an overall spray progress of 16.2% and spray coverage of 95.4% for the six operational days across the 28 sites. Much of the progress was affected by refusals due to the misconception that the insecticide attracts bedbugs. However, this was demystified by mobilizers and testimonies from communities that had already been sprayed. In areas with gold mining as the main economic activity, many houses were locked by the time the spray teams arrived on the ground. Spray teams had to adjust schedules in these areas to accommodate such scenarios including spraying in the evenings. The early season rainfall affected the daily target. As a remedy, spray teams were encouraged to time the rains and start spraying either earlier or later in the day in order to be able to achieve the targets despite the rains. On a dry day, spray operators were encouraged to exceed the target of ten structures so as to compensate for other potentially rainy days.

4.3.2 WEEK TWO SPRAY PROGRESS

Following the performance in week one, the program started the weekly performance review meetings at the Sub County to discuss performance, challenges and strategies to improve. The meetings were attended by the operations site managers, Sub County and County supervisors and the AIRS technical

team. Performance review meetings and a reorientation on the data tools resulted in a progressive overall improvement in data quality with lesser forms returning to field for review. The supervision system was also strengthened further by the County team taking full charge to ensure each supervisor performed as expected. Figure 3 below represents progress in each Sub County in the second week of spray.

FIGURE 3: SPRAY PROGRESS IN WEEK TWO OF THE CAMPAIGN

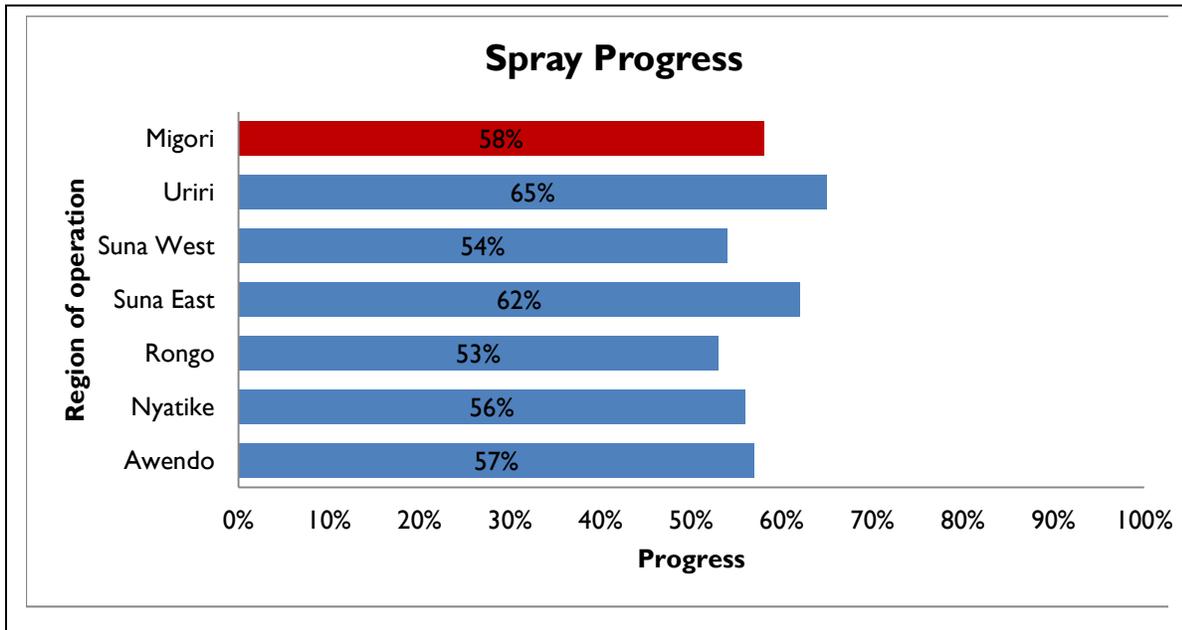


By the end of the second week, the program had achieved an overall spray progress of 36% and spray coverage of 96.5% for the 12 operational days across the six Sub Counties. In the second week of the campaign, progress was also boosted by the testimonies from communities that had been sprayed with some refusals converting to accept the spray. However, progress had not picked up as expected since the program experienced challenges early on with SOPs inaccurately recording of structures sprayed and team leaders and supervisors lack of proper verification of the data forms. Supervisors and team leaders received follow-up training on data collection and verification that drastically improved these issues. However, sending forms back for correction in weeks 1-2 created a corresponding backlog for data entry.

4.3.3 WEEK THREE SPRAY PROGRESS

In week three, the gap between the sprayed structures against the target was narrowing down as the program registered improved performance across all sites. This is backed by the fact that there were reduced volumes of data forms being returned to field for error checks following the application of the Error Eliminator and a general improvement in the understanding of what is expected by the teams when recording and verifying data.

FIGURE 4: SPRAY PROGRESS IN WEEK THREE OF THE CAMPAIGN

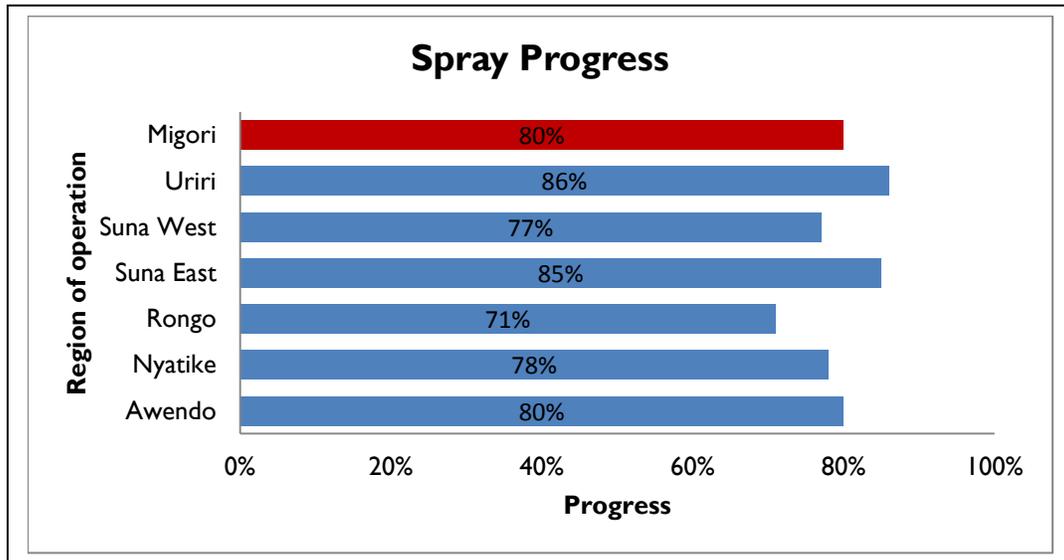


The third week closed with an overall spray progress of 58% and spray coverage of 97.1% for the 18 operational days across the six Sub Counties. Supervisors and team leaders assisted with sensitizing the community whenever they came across structures that were not sensitized. Testimonies from communities that had been sprayed resulted in many of the refusals demanding for the services and thus more structures sprayed. Additionally, at the data center, several forms that had been previously missed for entry were recovered and entered into the database following a data quality audit process. On

4.3.4 WEEK FOUR SPRAY PROGRESS

In order to improve progress, site managers were sensitized on the need to plan their future movement with reference to the targets and the structures left. In addition, enhanced mobilization strategies such as use of the mega phones and the radio talk show were employed resulting in a high demand for the services. Movement between the mobilization and the spraying teams was enhanced by the mobilizers adopting the spraying calendar to inform their movement for the targeted mobilization. Nyatike Sub County, which initially had challenges of daily data submission from all the sites by the end of a day's spray activity in the earlier days, had all the reports getting to the data center on a daily basis through the support of the site supervisors and the IEC Officer by this week.

FIGURE 5: SPRAY PROGRESS IN WEEK FOUR OF THE CAMPAIGN



The overall spray progress was at 80% while spray coverage was at 97.4%. At the start of the campaign, the teams started spraying far-off villages that were more rural compared to the areas covered in week four. In urban areas such Suna West, the program faced a challenge of many refusals due to preference for the long lasting insecticide treated bed nets as a way to prevent malaria. Both Nyatike and Suna West (Wiga ward - Still Masara village) Sub Counties have gold mining as the key economic activity which resulted in locked houses and/ denials for service. Supervision challenges in some areas in Rongo

site supervisors at Sub County and ward levels resolved to reshuffle some of the supervisors to improve spray teams from highly performing sites in nearby sub-counties were sent to slower performing sites in Rongo and Nyatike to scale up spraying.

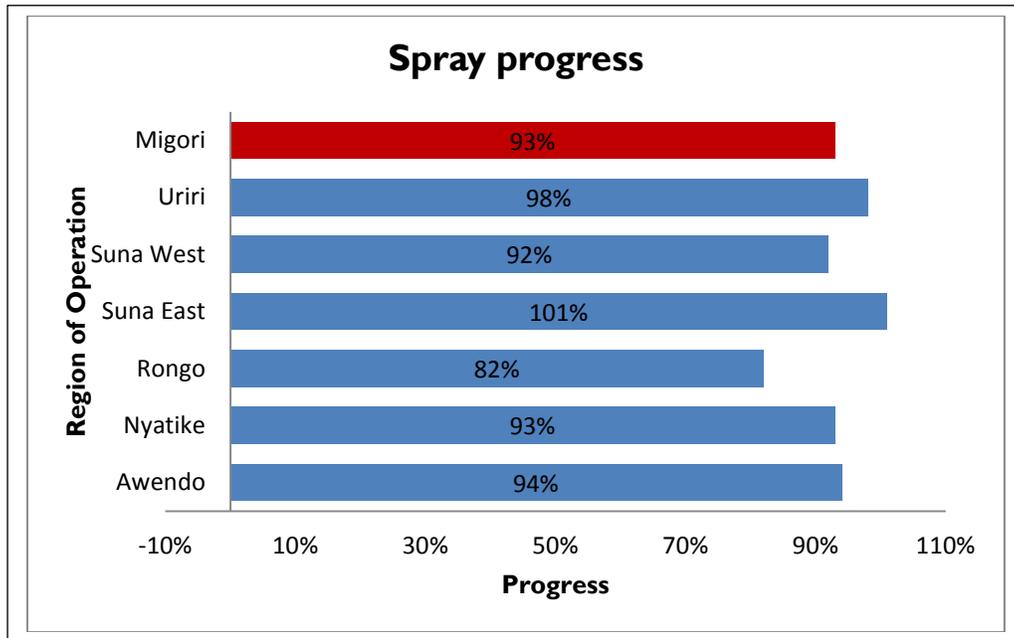
The program continued to involve the community gatekeepers to convince the community to accept the spray services.

4.3.5 WEEK FIVE SPRAY PROGRESS

In the last week, the spray teams focused on the pending structures in the villages that required mop-up and spraying of institutions towards the last day of the campaign. Eligible institutions included boarding schools, universities, hospitals and prisons. The site managers and supervisors were keen on maximizing the resources at their disposal. As such, the program had teams from different regions stepping in to support areas that were still lagging behind their targets.

The efforts in the last week also faced the challenge of refusals in some areas and lack of access to educational institutions e.g. schools had ongoing examinations.

FIGURE 6: SPRAY PROGRESS IN WEEK FIVE OF THE CAMPAIGN



The campaign was closed at a spray progress of 93.4% and spray coverage of 97.7% across the six Sub Counties. During the last week, some household members in Central Kanyamkago in Uriri Sub County were engaged in tobacco farming which gave spray operators difficult time in household preparation. These households were not willing to remove the bails of tobacco from the house. The start of the rainy season also made it difficult for the household items to be carried outside the structures. Some refusals by some communities were triggered by the recruitment of some of the SOPs from outside the ward they were working in. This was noted especially in Uriri Sub-County. Supervision challenges in some areas in Rongo Sub County contributed to the lag in performance in the region. The County team, which oversees all the site supervisors at Sub County and ward levels, shuffled some of the supervisors to improve the situation. This however was done in the middle of the campaign and even though there was improvement in the last few days, the overall performance in Rongo Sub County was still pulled

5. POST-SPRAY ACTIVITIES

5.1 IRS MATERIALS AND EQUIPMENT

During implementation IRS personnel collected all the required insecticides, spray pumps, PPEs and a bag containing assorted items from their operations site stores in the morning and returned them back to the operations site store in the evening. On the last day of the IRS campaign, SOPs, team leaders, mobilizers, drivers, site supervisors, sub-County and County supervisors returned all spray equipment, PPEs and other IRS materials back to the stores from where they were issued. Each seasonal worker signed a clearance form upon returning the assigned items and any losses recorded clearly indicating the total cost for surcharge. All items were inspected and recorded on the final stock records and each site manager and storekeeper provided a closeout summary.

Thorough cleaning commenced on 20-22 March 2017 after which AIRS Kenya staff collected all the items back to the Migori central warehouse with the help of the logistics assistant, warehouse assistant, county coordinator and operations manager following a closeout plan. All AIRS staff was allocated specific sites to assist in clearing. All the solid wastes were collected back to the field distribution points at Rabondo, Kochola and Arombe operations sites for subsequent collection to the Kisumu warehouse and respective disposal facilities.

5.2 POST-SPRAY INVENTORY

In September 2016, three bottles of insecticide from the NMCP donated insecticide were taken for quality assurance testing at CEM Analytical Services in the United Kingdom. The findings revealed that the insecticide was effective for use.

All the insecticides received from NMCP were marked with a red mark on the cartons and were distributed and sprayed first following the first-to-expire, first-out (FEFO) stock management principle. A total of 42,798 procured bottles of insecticides were used during the spray campaign (i.e., in addition to the 27,755 bottles contributed by NMCP). In total, AIRS Kenya used a total of 70,553 bottles of Actellic® 300CS leaving closing stock of 48,786 bottles. The closing stock in the warehouse is in two batches **BSN6K 2480 MANUF: 11/16** and **BSN6L 0181 MANUF: 12/16**, each with a shelf life of two years. Therefore, these batches shall expire in November and December 2018 respectively.

Empty bottles and other plastics were recycled by VINTZ Plastics Ltd in Nairobi to produce plastic sheeting for construction. The company is registered with National Environment Management Authority (NEMA) to recycle plastics. The non-contaminated carton boxes and other paper wastes were recycled at Kamongo Ltd. All the nose masks, other contaminated wastes and dry cell batteries will be incinerated at Kenya Medical Research Institute (KEMRI), Kisumu County.

5.3 POST-SPRAY REVIEW MEETING

IRS Kenya held a post-spray review meeting on 20-21 April 2017 with key external stakeholders including MOH, NMCP and PMI. The objective of the meeting was to discuss the spray results, best practices, lessons learned, challenges and recommendations for the next spray campaign. The meeting was attended by 50 participants drawn from Migori County, NMCP, PMI and AIRS staff.

6. ENVIRONMENTAL COMPLIANCE

6.1 ENVIRONMENTAL COMPLIANCE DOCUMENTATION

AIRS Kenya conducted IRS in Migori County under a nationwide Supplemental Environmental Assessment (SEA) approved by the USAID in December 2016. The SEA authorized the use of four classes of pesticides; pyrethroids, organophosphates, carbamates and chlorfenapyr (when recommended by WHOPEs).

Kenya Environmental Management and Coordination Act (CAP 387 Rev 2012, Part VI Section 58) make Environmental Impact Assessments (EIA) mandatory to all projects specified in the Act. The Act requires that an EIA is conducted by Environmental Impact Assessment Experts legally registered by the National Environment Management Authority (NEMA). The assessment shall be conducted and the report shall be written in accordance with EIA & Audit Regulations, 2003. As required by law, AIRS Kenya, engaged Safe Global Consultancy Limited to carry out an Environmental Impact Assessment (EIA) for the IRS exercise in accordance with the EIA & Audit Regulations, 2003

The EIA project report was submitted to the National Environment Management Authority (NEMA) on the 6th of December 2016. NEMA provided a written approval to begin on IRS on 12th February 2017 and issued the formal license on the 12th of April 2017. Annex I2 represents a copy of the license.

6.2 PRE-SEASON ENVIRONMENTAL COMPLIANCE ASSESSMENTS

AIRS Kenya conducted a geographical reconnaissance and needs assessment in Migori County from 7th to 11th November 2016. The visit involved identifying potentially compliant storage facilities for IRS pesticides, PPEs and other commodities, determining the best available routes for transportation of pesticides and SOPs, determining the suitability of soak pits/wash areas used in the previous IRS rounds and locations for new soak pits, wash areas and water collection points especially from roof catchments. The GPS location of AIRS Kenya operations sites is in Annex A.

The AIRS Kenya technical team refurbished the operations sites from 22 November-6 December 2016, guided by the information gathered from the geographical reconnaissance.

TABLE 8: CONSTRUCTION AND REFURBISHMENT OF IRS OPERATIONS SITES IN MIGORI COUNTY

Sub-County	No. of Operations Sites	Site Refurbishment (Soak Pit/Wash Area, Storeroom, Roof Catchment and Water Storage, etc.)
Suna East	4	<ul style="list-style-type: none"> All the four soak pits and wash areas in the four sites (MCRH, Anjogo, Osingo, Suna Rabuor) were newly constructed to meet the PMI BMP requirements. All the four pesticide/PPE storage facilities were availed to AIRS Kenya by the respective health centers where the sites are located. Three water tanks, 3000 liters each and the associated guttering works were provided for roof catchment in MCRH, Osingo and Anjogo sites.
Suna West	4	<ul style="list-style-type: none"> Three soak pits and wash areas were newly constructed at Suna Ragana, Bondo and Nyamaraga while one soak pit was renovated at Arombe operations site. All the four pesticide/PPE storage facilities were availed to AIRS Kenya for IRS operations by the respective health centers. Two water tanks each with a capacity of 3000 ltrs and the associated gutter

Sub-County	No. of Operations Sites	Site Refurbishment (Soak Pit/Wash Area, Storeroom, Roof Catchment and Water Storage, etc.)
		works were provided in Suna Ragana and Bondo sites.
Awendo	4	<ul style="list-style-type: none"> • Three soak pits and wash areas were newly constructed in Awendo SCH, Dede and Rabondo sites. One wash area was renovated and its soak pit reconstructed at Mariwa Site. • All storage facilities were availed by the respective health centers. • Two water tanks (3000 ltrs each) were provided at Awendo SCH and Rabondo sites for storage of water supplied by the health centers.
Rongo	4	<ul style="list-style-type: none"> • All the four soak pits and wash areas were newly constructed at Rongo SCH, Minyenya, Ongo and Kochola operations sites. • All storage facilities were also availed to AIRS Kenya by the respective health centers. • Three water tanks (3000 ltrs each) and guttering works were provided for roof catchment in Minyenya, Rongo SCH and Kochola sites.
Uriri	5	<ul style="list-style-type: none"> • Three soak pits and wash areas at Bware, Lela and Oyani operations sites were newly constructed whereas two soak pits/wash areas at Othoro and Uriri HC were renovated. • All the storage facilities in the five operations sites were availed by the respective health centers. • Two water storage tanks (3000 liters each) and associated gutter works were provided for roof catchment in Bware and Lela operations sites.
Nyatike	7	<ul style="list-style-type: none"> • Four soak pits and wash areas were newly constructed at Agenga, Macalder, Alendo and Sori Karungu sites whereas three soak pits/wash areas were renovated in Bande, Muhuru and Wathong'er sites. • All IRS storage facilities were availed by respective health centers. • Three water storage tanks (3000 ltrs each) and associated gutter works were provided at Wathong'er, Agenga and Alendo operations sites.

The AIRS Kenya environmental compliance officer (ECO) conducted the first round of the pre-season environmental compliance assessment (PSECA) on smartphone at all the selected 28 operations sites from 7-15 December 2016. A number of issues were identified for both the store rooms and wash areas/soak pits as follows:

- Need for the delivery of PPE, soap and wash tubs to the site stores prior to receipt of chemical and commencement of IRS operations.
- Provision of current pesticide(s) Health and Safety sheets as well as Spill and Emergency response procedures for storehouse and pesticide transport vehicles.
- Need for the delivery of fire extinguishers, thermometers, first aid and spill response kits for the site stores.
- Need for the delivery of labelled containers for storage of contaminated wastes at the site stores as well as rinse barrels.
- Training of storekeepers prior to IRS Operations.
- Need for the delivery of antidotes (atropine) ampoules to health facilities nearest to the operations sites.
- Need for a medical examination and pregnancy testing for the seasonal workers.
- Need for securing adequate water supply at each site. Roof catchment was not sufficient.
- The construction of drying lines for overalls over the wash areas.
- Delivery and installation of danger signs on soak pit fence and at the entrance to the pesticide stores.

The ECO developed a work plan to address the above deficiencies. Several action points were proposed in the work plan in order to prepare the operations sites for IRS. The procurement office promptly availed the fire extinguishers, first aid kits, safety and warning signage required at the operations sites. By the end of January 2017, AIRS Kenya had made progress in addressing many of issues identified during the first round of the PSECA. This paved way for the carrying out the second round PSECA which was conducted between 7th and 10th February 2017. All pending non-compliance issues identified in the second PSECA were addressed within the same time period and AIRS Kenya received a green light to conduct IRS in all the six sub-counties of Migori on 11 February 2017. The green lighting process was facilitated by the AIRS Home Office in Bethesda, MD.

FIGURE 7: TYPICAL AIRS KENYA OPERATIONS SITES



The ECO also conducted a pre-contract transport vehicle inspection on 3-12 February 2017 to ensure that the drivers hired had attended the IRS drivers' safety training, possessed valid licenses and that their vehicles had valid insurance and technical inspection documents. The inspection was a general assessment of the condition of vehicles used for IRS operations as per the requirements of the PMI-BMP. A total of 106 vehicles were inspected and certified by the ECO to support IRS operations.

In addition, a medical examination for IRS seasonal workers with direct contact with the insecticide was carried out on 3 February 2017 as well as a pregnancy test for the female workers to ensure their fitness prior to participation in the campaign. This group of workers included SOPs, washers and storekeepers. They were examined by medical officers at selected health centers, gave a declaration on their medical and occupational histories as well as underwent checkups on their general health, visual acuity, allergic reactions, cardiovascular and respiratory conditions. The health officers then made recommendations based on the fitness levels of each individual. This information guided AIRS Kenya in the allocation of specific duties. Those found unfit to carry out their specific roles with a direct interaction with the insecticide were re-allocated to mobilization roles. (See Table 9)

TABLE 9: MEDICAL CHECK UP FOR IRS SEASONAL WORKERS

Sub-County	SOPs, Washers and Storekeepers Examined		Workers Found Unfit	
	Male	Female	Male	Female
Suna East	86	66	0	2
Suna West	58	86	0	0
Uriri	120	88	0	0
Awendo	98	84	1	0
Rongo	78	75	0	1
Nyatike	135	113	1	2
Total	575	512	2	5

6.3 TRAINING AND CAPACITY BUILDING

Various aspects of environmental compliance according to PMI-BMP for IRS were incorporated in the training of cadres recruited to implement the project. The training of trainers' workshop was the first to be conducted and was designed such that the supervisors who received that training would disseminate the lessons and the provided materials in the subsequent training of team leaders, pump technicians, mobilizers and spray operators. AIRS Kenya in turn trained security guards, health workers and drivers who were to transport SOPs and the insecticide. Details of the trainings for IRS seasonal workers are in Annex D.

6.4 ENVIRONMENTAL COMPLIANCE ACTIVITIES DURING THE CAMPAIGN

Field inspections for IRS in all the six Sub Counties in Migori were structured such that MOH supervisors from the County and Sub-County, the NMCP and AIRS Kenya teams would conduct daily morning mobilization and transport vehicle inspections, home owner inspections, spray operator performance checks, end of day clean up inspection as well as storekeeper performance checks on allocated smartphones. The entire supervisory team also met regularly (daily for the first week of the campaign and thrice a week thereafter) to give feedback on best practices as well as non-compliance observed in the field and the appropriate corrective measures taken to address the issues observed.

TABLE 10: ENVIRONMENTAL COMPLIANCE ISSUES NOTED DURING SUPERVISION

Difficulties	Sub-County	Measures Taken by AIRS Kenya
Periodic effluent puddles on three soak pits (at Bware, Mariwa and Bande sites)	Uriri, Awendo and Nyatike	Washers were advised to reduce water wastage during cleaning of PPE and only draw water from the tanks when needed instead of having running water through hose pipes.
Formation of pesticide paste in barrel No. 1	All	Site managers were advised to ensure any leftover insecticide content in barrel No. 1 was stirred every morning before being taken for reuse in the field by the SOPs.
Team leaders not supervising end of day clean ups regularly	Nyatike, Rongo, Awendo, Uriri	AIRS Kenya field supervisory team constantly instructed team leaders to monitor the end of day clean ups.
Separation of uncontaminated wastes during the first week of the campaign	All	Gunny bags were provided for waste collection and storekeepers instructed to segregate paper and carton wastes from polythene and plastic wastes. They were also required to properly label each waste bag.

AIRS Kenya supervisory team regularly visited the spray operators at their respective food stations each morning to ensure they were given a heavy breakfast and plenty of water to prevent the need to carry food and water to the field. The supervisors would then accompany the SOPs to the sites to ensure they donned their PPEs and that team leaders completed the SOPs daily health checklist. The supervisors also ensured that the SOPs collected all the previous day's left over chemical (if any) prior to boarding an IRS vehicle. The vehicles also underwent an inspection to ensure that the driver was in possession of a valid license as well as a mobile cell phone and that the vehicle was equipped with firm benches, a spill response kit, first aid kit, fire extinguisher, an emergency response procedure and other IRS health and safety sheets including the material safety data sheet for Actellic 300 CS. Vehicle carrying capacity was also inspected to ensure that the SOPs were not overcrowded but instead sat comfortably with sprayer pumps between their legs.

The supervisory team also assessed the use of PPE during spraying and washing activities and inspection of stores records and arrangement including a daily physical verification of pesticide inventory, proper display and observation of warning signs, fire extinguishers and first aid kits. They also checked on the correct handling and storage of wastes at the site stores during operations in preparation for collection and temporary storage at the field distribution centers. Storekeepers were also interviewed to confirm if they were trained on the symptoms of pesticide exposure and measures to take in case of any exposures. In the field, the teams monitored household preparation to ensure that items were removed from the homes and the immovable ones covered with polythene sheeting before spraying. The SOP performance was also monitored to ensure correct swathing and application of the insecticide on eligible surfaces. The homeowners were also interviewed to confirm that they had been given the correct instructions on what to do before, during and after spraying. At the end of the day, when the SOPs return to their respective sites, the team of supervisors would also perform an inspection to ensure that the SOPs continued to use their PPEs in the wash areas and were correctly performing the progressive rinsing of the sprayer pumps and at the very least washed their hands and faces with soap and water. Temporary bathing units covered with canvas sheets were also provided separately for male and female spray operators where they took a shower and had a change of clothes.

FIGURE 8: TEMPORARY BATHING STRUCTURE FOR SOPs



Separate male and female bathrooms at Uriri operations site



A: Front view of a typical bathroom



B: Back view of a typical bathroom

6.5 PERMANENT SOAK PITS

All the fixed soak pits used for IRS in Migori were constructed as per the current guidelines. In addition to the standard PMI BMP requirements for soak pits, AIRS Kenya also specially designed a perforated plastic T-pipe system that connected the wash area to the soak pit allowing for uniform effluent distribution over the gravel and through the filter materials. Throughout IRS operations, AIRS Kenya closely monitored the performance of the all the pits specifically checking for their flow and drainage. Out of 28 soaks pits, three soak pits at Bware, Mariwa and Bande operations sites were reported to have periodically formed an effluent puddle. Spillage outside the soak pit was reported at Bande site while seepage was observed outside the wash area at Mariwa and Bware sites. Soil and water samples were taken for analysis from the three sites (Annex I-5A-B, I-6A-B and I-7). Necessary corrective measures were taken to address the situations including collection of excess effluent on stand-by barrels to avert overflows and allow time for gradual infiltration as well as instructing the washers (those washing overalls, neck clothes and gumboots) to minimize water wastage from running taps. The three soak pits will be reconstructed during site refurbishment in preparation for the next spray round and any possible design error corrected. No spillage outside the soak pit was reported or observed in the other 25 sites.

FIGURE 9: AIRS KENYA PERMANENT SOAK PITS



6.6 AIRS KENYA INCIDENTS MANAGEMENT

IRS operations in Migori encountered incidents related to loss of an insecticide bottle at Alendo operations site, loss of three empty bottles at Rongo Sub-County Hospital site and two cases of dog bites at Kochola and Rabondo operations sites. There was also an incident at Lela operations site where three Spray Operators escaped with minor injuries while evading a “runaway” sugar cane transportation tractor that had a park-to-reverse defect. Table I I below shows a summary of the incidents that occurred during the campaign:

TABLE I I: SUMMARY OF INCIDENTS DURING IRS CAMPAIGN IN MIGORI

Date	Operations Site	Nature of Incident	Corrective Action Taken by AIRS Kenya
13/2/2017	Bande	Poor stock receipt leading to claim of missing bottle; no loss found	Reinforced that on receipt and dispatch of insecticide, a physical count of bottle to account for actual bottles must occur.
17/2/2017	Kochola (Rongo)	Dog bite	Enhanced mobilization efforts that ensured IRS beneficiaries caged their pets/animals before spraying of their structures.
28/2/2017	Alendo (Nyatike)	Lost insecticide bottle	Storekeepers were instructed to perform a daily physical verification of full and empty insecticide bottles returned by SOPs.

Date	Operations Site	Nature of Incident	Corrective Action Taken by AIRS Kenya
1/3/2017	Lela (Uriri)	Tractor with Park-to-reverse defect caused physical injury to three SOPs	SOPS were advised to board their vehicles at designated pick up points and not to wait anywhere by the roadside.
2/3/2017	Rabondo (Awendo)	Dog bite	SOPS were advised to be on the watch out for stray dogs and avoid passing near them while on movement from house to house.
7/3/2017	Rongo SCH	Loss of three empty bottles	Site managers were reminded to restrain any SOP from carrying the IRS bag home and to perform a daily physical verification of full and empty insecticide bottles returned by SOPs.

The two SOPs who sustained dog bites received full medication and anti-rabies treatment at Lwala Community Health Centre in Rongo sub-County whereas the three injured SOPs at Lela site received treatment at the Lela dispensary. All medical expenses for the five individuals were covered by AIRS Kenya.

The lost insecticide bottle at Alendo site was reported at Luanda Police station in Nyatike sub-County on the 28th of February 2017. The loss is still under investigation by the local authorities. The loss of the three empty insecticide bottles at Rongo SCH was reported at Central Kamagambo police station on the 7th of March 2017 and is also under investigations by the local authorities. No concrete leads have been established yet for both the two incidents.

6.7 POST-SEASON ENVIRONMENTAL COMPLIANCE ACTIVITIES

At the end of the spray operations, AIRS Kenya embarked on the close out of IRS site stores ensuring all such stores were emptied of materials and equipment used during the spraying. All commodities from the site stores were transported to the Migori Central warehouse except the unused insecticide, empty bottles and all non-contaminated wastes which were transported to the Kisumu main warehouse. All contaminated wastes were transported to Rabondo site and safely stored awaiting final disposal and incineration.

Prior to the handing over of the stores to the management of the respective health facilities, AIRS Kenya cleaned and decontaminated them by washing floors with soap and water. Those stores whose walls had been damaged by the installation of pump hangers were repaired and painted. AIRS Kenya made a formal request to the health facility in-charges to provide adequate security for the locked up wash areas and soak pits to ensure against vandalism during the non-spraying season.

AIRS Kenya conducted a post season environmental compliance assessment of all the 28 operation sites between the 3rd and 5th May 2017 after all soak pits were covered with tarpaulin and soil.

6.8 IRS CAMPAIGN WASTE COLLECTION AND DISPOSAL

All effluent generated during AIRS Kenya operations was handled at the 28 wash areas that had specially constructed soak pits whose media filtered out the chemical content through infiltration. The soak pits were lined with high density polythene sheet on the walls to eliminate percolation of the effluent and maximize the filtration process.

Source segregation of IRS solid wastes at the operations site level was a key compliance requirement expected to be met by all storekeepers. Waste generated at the sites were classified either as contaminated or uncontaminated. The contaminated wastes primarily composed of used paper nose

masks and spill control soil/sand/sawdust. All used dry cells were also stored together with the contaminated wastes. The uncontaminated wastes were further separated and stored in labelled waste bags either as polythene/plastic wastes or paper/carton wastes. All empty Actellic 300 CS bottles were cleaned a second time by the washers after being triple rinsed in the field by the SOPs, then punctured and stored as uncontaminated plastic wastes in their cartons.

FIGURE 10: AIRS KENYA WASTE SEGREGATION



At the end of spray operations, all uncontaminated wastes collected from all the sites were transported to the Kisumu main warehouse for temporary storage before final disposal. All the contaminated wastes were transported to an isolated and ideally located IRS store in Rabondo, Awendo Sub-County for temporary storage before final disposal.

From 31 March through to 2 April 2017, a total of 70,553 empty and cleaned insecticide bottles as well as other assorted plastic wastes were recycled at VINTZ Plastics Ltd to produce plastic dust bins and the DPC black polythene sheets used in building/construction to prevent rising dampness. The recycling process was witnessed by AIRS Kenya ECO and two officials from NMCP. (Annex 1-3)

Within the same time period, 3940kgs of IRS carton and paper wastes were recycled at Kamongo waste paper Ltd to produce strawboards. A certificate of destruction of the wastes was issued to AIRS Kenya. (Annex 1-4) At the Rabondo store, the 662 kgs of contaminated wastes and 220 kgs of used dry cells under temporary storage will be incinerated Kenya Medical Research Institute (KEMRI) in Kisumu County, a government facility licensed by NEMA as a hazardous waste disposal site and one that meets the PMI BMP requirements for incineration of such wastes.

7. MONITORING AND EVALUATION

7.1 INTRODUCTION

The AIRS Kenya M&E team comprised of the M&E Manager, Database Coordinator and seasonal workers (M&E Assistants and Data Entry Clerks). The main objectives of the M&E department were to:

- Ensure and verify the accuracy of data collection and the data entry process through comprehensive trainings and supervision at all levels
- Streamline and standardize data flow to minimize errors and facilitate timely reporting
- Ensure IRS data security and storage for future reference through establishment and enforcement of proper protocols (documentation)

7.2 FUNCTIONS OF THE M&E DEPARTMENT

The M&E department had five main functions during the campaign as discussed below.

7.2.1 FORM DEVELOPMENT

Several forms were designed and used for data collection at the various reporting levels.

- Mobilization phase: CHVs visited the households with **IRS cards** and household mobilization forms. Mobilization forms captured information on the household members, sensitization data and any IEC materials left at the household. The form was filled by the mobilizer at every visit to the households before the actual spraying. After sensitization, the mobilizer left the IRS cards which captured details of the date the household was mobilized, the mobilizer number and the IRS number which was one of the key details for the database. Further, the IRS card had sections for the SOP and the supervisor to fill and append a signature once the household was sprayed.

FIGURE 11: IRS CARD FRONT AND BACK VIEW



A. IRS Card Front view

B. IRS Card back view

- Spraying Phase: The SOPs visited sensitized structures with SOP forms that collected further details on the household members, the population protected and the details on the nets in the household. If the

household was not sprayed for any reason, the details were documented as well. During the actual spraying, team leaders supervised the SOPs as they filled the Directly Observed Spray (DOS) form to assess the quality of spraying.

- End of Day Phase: After a day’s spray activity, the team leader was to summarize the details of the SOP form on the Team Leader Summary after applying the Error Eliminator. The data reports would then be submitted to the site manager who would update the Performance Management Tracker (PMT). The PMT was displayed at every site to give a summary of the performance.

7.2.2 DATA COLLECTION

The SOPs and the mobilizers were the primary starting point for data collection. All data from the field spray activity was collected at the operations site by the team leader. This data would then be verified by the site supervisor who would then submit the forms to the site manager. The site managers together with the M&E Assistants were tasked with ensuring the forms were submitted to the data center in Migori within 24 hours. Due to the field operations and logistics, this could not happen for all the sites. Therefore, it was resolved that data reports would be submitted to the data center no later than the following day.

TABLE 12: SUMMARY OF DATA FLOW DURING THE CAMPAIGN

	Data Flow	Data Collection Tools
1	CHV sensitizes the community through door to door visits	Mobilization form and IRS card
2	SOP visits a mobilized structure for spraying	Daily Spray Operator Form
3	Team leader directly observes SOP during spray. M&E Assistants move with the spray team to verify data at structure level.	Directly Observing Spray Form and Data Collection Verification forms
4	Team leader reviews the SOP and Mobilization forms daily after end of day activity and submits forms to site supervisor	Team Leader Summary form and Error Eliminator
5	Site supervisor verifies form and hands over to site manager	Error Eliminator
6	Site manager summarizes data on the PMT and sends the report via CommCare	Performance Management Tracker
7	M&E Assistant collects, verifies and submits to data center	Error Eliminator
8	Data received at the data center and entered into the database	Error Eliminator

7.2.3 DATA QUALITY ASSURANCE AND VERIFICATION

AIRS Kenya adopted several tools to monitor data quality at different levels of reporting. These included:

- Error Eliminator: This tool applies all logic checks on the SOP form. It was filled by the team leader during verification of the data submitted by the SOPs, by the field supervisor during field checks, by the M&E Assistants before submitting forms to the data center and at the data center when the data clerks received field reports.
- Team Leader Summary: This tool summarized the key indicators from the SOP form namely the eligible structures found and sprayed and the insecticide bottles issued, used, returned or damaged at the end of the each day.
- Directly Observed Spray Form: This was a set of quality indicators spanning from the mixing of the insecticide to the actual spraying activity. It was used by the team leader during supervision. It also provided a guide on what to check for during field supervision of the spraying.
- Data Collection Verification form: This tool focused on verifying the details of a household one to two days after it had been sprayed. The tool was filled primarily by the M&E Assistants and field supervisors during field visits. This form was digitized and reported via CommCare.

7.2.4 DATA ANALYSIS AND REPORTING

Data was entered and analyzed on a daily basis through the database reports. Any noted discrepancies within the database or the data quality were communicated for action immediately.

7.2.5 DATA MANAGEMENT AND PROCESSING

The team leader summary (which carried both team leader and DOS information), error eliminators and SOP forms were all brought to the data center at the end of the day. At the data center, SOP forms were received and verified using the Error Eliminator. The three box system was used where (i) Step I: all forms from field are placed in a box, (ii) Step II: Forms are taken from the first box, the data totals are entered into the database and forms are dropped into a second box and (iii) Step 3: Forms are taken from the second box and the data details are entered into the databases. As the data details are entered, the database auto calculates the totals and flags any discrepancy between the auto calculated totals and entered totals. Once a discrepancy is flagged, the form is re-checked for errors. After entry, all forms were to be authenticated by the specific DEC that entered the data. During receipt of the forms, the DEC and M&E Assistants filled the data center tracking sheet to enable quick follow up of any forms not submitted to the data center. All data that was received was entered in the AIRS Kenya database. The database was robust with built-in cleaner and collector that were used daily to check data errors and discrepancies. At the end of each day, the collector report was circulated to update progress in data.

7.2.5.1 DATA ENTRY

AIRS Kenya identified and set up a central place for data entry and management. The twenty four employed data clerks worked from this center. The center was located at Migori town, which was easily accessible from all Sub Counties where spray exercise was ongoing. Each data clerk had a computer assigned to them with the AIRS 2017 database and drop box installed. Each DEC entered the mobilization and spray data as per the AIRS protocol, by totals first and then by details. By the end of each day, every DEC synchronized their data to the cloud server after a data cleaning exercise. Data entry exercise was completed a week after the spray campaign.

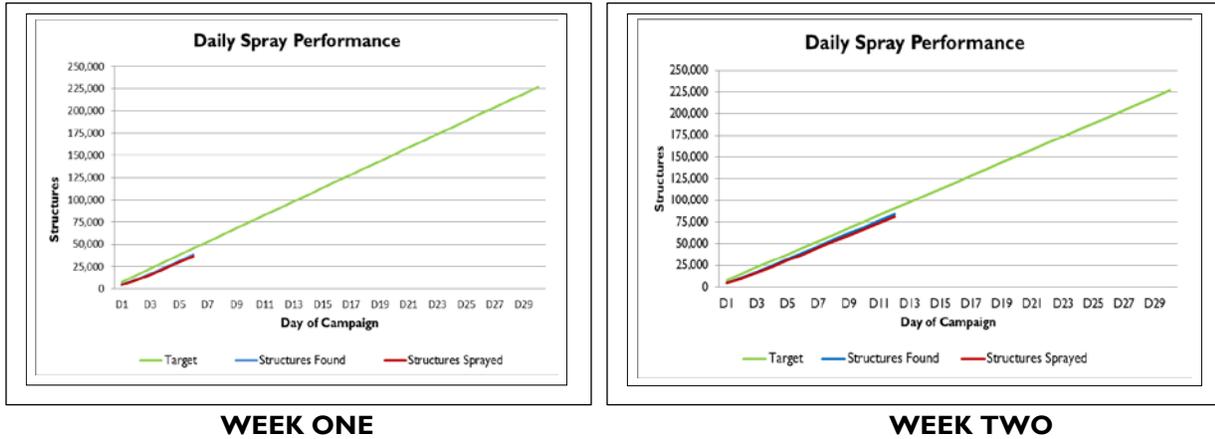
7.2.5.2 DATA STORAGE

AIRS Kenya project data was stored both electronically (in the cloud server and each DEC computer) and conventionally (in box files). After the spray campaign, the project moved the data forms in the files to Kisumu office in a lockable archival room where there is limited access. The forms were arranged as per the wards in each Sub-County by the different spray teams for every date of spray. The DEC computers were also cleaned and the data can only be accessible from the server or the files in the cabinets.

7.3 DAILY PROGRAM MONITORING

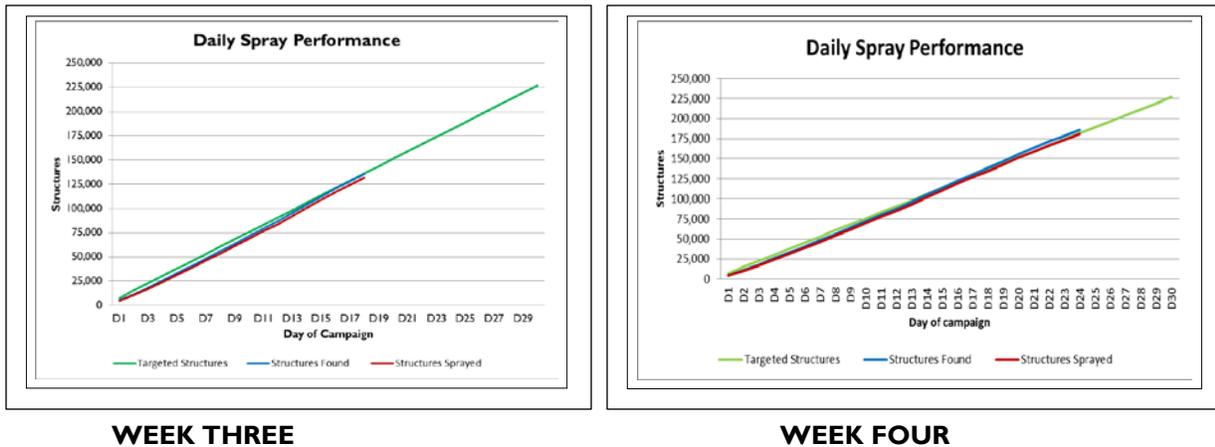
AIRS Kenya project activities were monitored on a daily basis through active field supervisions as well as mHealth data and reports which provided real time information for quick decision making. Section 8 below, gives more details on the mHealth tools that were adopted. Performance against targets was monitored closely and relevant feedback provided to the teams. The graphs below are a summary of the weekly performance monitoring performance:

FIGURE 12.1: DAILY PERFORMANCE MONITORING WEEK ONE AND TWO



Data quality was poor in these two weeks characterized by inaccurate recording of information, failure to use the error eliminator and lack of checking of the forms by the supervisors and the team leaders. Most of the forms that were submitted at the data center were returned back to the field resulting in slow data entry. Performance review meetings were scheduled at Sub County level to address data quality among other issues with the supervisors and site managers. The M&E team together with the supervisors conducted regular mentorship on data capture especially during the morning mobilization and the end of day clean up. The mentorship exercise targeted the team leaders, spray operators and site managers as well as the supervisors at the site.

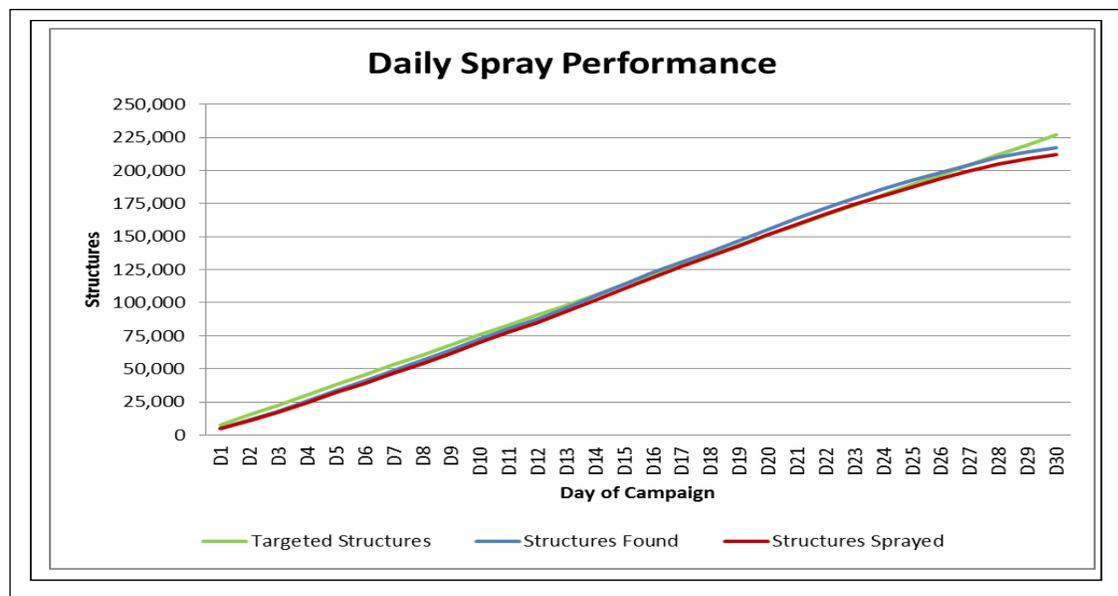
FIGURE 12.2: DAILY PERFORMANCE WEEK THREE AND FOUR



Following the stop gap measures in weeks one and two, tremendous improvement was registered in weeks 3 and 4. At this stage, most of the teams understood what was required the supervisors and team leaders verified the forms before submitting them to the data center and the error eliminator was widely adopted. As a result, fewer forms were returned to the field from the data center. The program's focus shifted largely towards the targets and coming up with strategies to spray the remaining structures. During these weeks, decisions were made to shift personnel from high performing teams to those lagging in performance. Despite the improvement in data quality, there was a depletion of the IRS structure cards which started in the third week of the campaign. This posed a challenge to the data center as the unique IRS card number was critical data point in the database. To cater for this, an order

was placed to the vendor and as an interim measure, AIRS Kenya made print outs that were manually coded to enable the campaign operations to continue. .

FIGURE 12.3: DAILY PERFORMANCE WEEK FIVE



Week five marked the last week of the campaign with many of the challenges identified sorted out and/mitigated except the lack of IRS cards and duplication of IRS numbers. Duplication occurred when spray operators assigned numbers to the manual print outs used as stop gap measure. This was realized in time and team was advised to get all the cards from the main office in Migori. Assignment of the IRS numbers and issuance of the cards was therefore coordinated at a central point which made it easier to track the sequence of the unique IRS card numbers. Data forms returned to the field for corrections in week one and two created massive backlog on return to the data center. This required the data team to work for an extra one week to manage the entry of all the forms. Finally, the campaign was closed with an achievement of 93.5% for Spray progress and 97.7% for spray coverage.

7.4 KEY RESULTS

The key indicators tracked throughout the campaign included structures targeted, structures found and out of these (targeted and found) the proportion sprayed to reflect the progress and coverage respectively. This information was consumed by the sites on a daily basis via the CommCare reports and informed strategic decision making at site level all the way to the County level. During spraying, population details were collected to establish the populations protected. This included the total population disaggregated by gender as well as special groups of pregnant women and children below five years of age. Insecticide usage was also closely tracked both by the CommCare tools, e-inventory and the AIRS Kenya database.

7.5 NUMBER OF ELIGIBLE STRUCTURES SPRAYED AND SPRAY COVERAGE

The thirty day campaign ended on 18th March 2017, with a total of 212,029 structures having been sprayed out of the found 217,100 structures. The population protected was a total of 906,388. Two (2) percent of this population was pregnant women while fourteen (14) percent were children below five years of age. Table 13 below, gives a summary of the results by Sub-County.

TABLE 13: SUMMARY OF SPRAY RESULTS, MIGORI COUNTY

County	Structure Found by SOPs	Structures Sprayed	Spray Coverage	Population Protected	# Pregnant Women	# Children <5 Years
Awendo	34,955	34,282	98.1%	149,953	2,218	19,058
Nyatike	48,720	47,648	97.8%	195,696	5,081	29,755
Rongo	29,318	28,318	96.6%	126,578	2,187	17,116
Suna East	32,976	32,123	97.4%	135,317	2,209	17,892
Suna West	29,271	28,175	96.3%	117,360	2,182	17,090
Uriri	41,860	41,483	99.1%	181,484	3,055	26,246
TOTAL IRS 2017	217,100	212,029	97.7	906,388	16,932	127,157

7.6 USE OF INSECTICIDE AND PERFORMANCE OF SPRAY OPERATORS

Spray operators were given daily targets of 10 structures at the start of the campaign. Their performance was monitored on a daily basis. As the team worked towards achieving targets, the daily target was raised for some of the SOPs. Spraying activities started with far off structures while progressing closer to the operations sites in the field. Towards the last days of the campaign, many of the SOPs were spraying urban regions which had bigger structures. Institutions were targeted for the last day of the campaign. A total of 70, 553 insecticide bottles were used to spray 212,029 structures.

Table 14 below summarizes the Insecticide Use and SOP Performance per Sub-County.

TABLE 14: INSECTICIDES USED PER SUB-COUNTY AND SOP PERFORMANCE, MIGORI COUNTY

Sub-County	Structures Sprayed	Insecticide Used	Average Number of Structures Sprayed by SOP per Day	Average Number of Structures Sprayed per Bottle
Awendo	34,282	10,949	8.8	3.1
Nyatike	47,648	20,122	8.8	2.4
Rongo	28,318	8,631	8.1	3.3
Suna East	32,123	9,759	9.3	3.3
Suna West	28,175	8,629	8.5	3.3
Uriri	41,483	12,463	9.2	3.3
Grand Total	212,029	70,553	8.8	3.0

7.7 REASONS FOR NON-SPRAY, 2017

During the campaign, the program experienced refusals in certain parts of the County. This was mainly rampant in gold mining communities that resulted in locked structures during the spray days. Some communities expressed misconceptions and myths surrounding the spray exercise including the belief that the spray attracted bedbugs. As the spraying exercise progressed towards the urban areas, many of the communities refused the spray since they expressed that they had other options for protection from the vectors. With these challenges, the program continued to use CHVs for door to door mobilization, community gatekeepers to convince the community to accept the spray and radio presentations for demystification of myths.

TABLE 15: REASONS FOR NON SPRAY

Sub-County	Sick	Locked	Funeral	Denied	Missed	Other	Total
Awendo	135	257	25	300	70	86	873
Nyatike	214	391	43	527	110	66	1,351
Rongo	171	184	36	535	82	176	1,184
Suna East	170	296	45	393	112	67	1,083
Suna West	209	181	16	621	83	114	1,224
Uriri	111	78	32	154	56	46	477
Total	1,010	1,387	197	2,530	513	555	6,192³

³ Total structures that were not sprayed were 5071. However, there were 1121 structures that were revisited during mop up after being missed for spray in the first instance. Out of these, 100 got sprayed. The remaining 1021 remained unsprayed and fall within the 6192 total in the table.

8. MHEALTH

8.1 COMM CARE SUPERVISION TOOLS

In conjunction with Dimagi Inc., AIRS Kenya adopted mHealth solutions and tools for program monitoring and reporting. Dimagi Inc. is a for profit social enterprise that delivers open source software for low resource settings and underserved communities. The company designs clinical interfaces, health information systems and mobile technologies to perform patient level disease management, clinical decision support and health system monitoring. (www.dimagi.com).

CommCare, Dimagi's software products (www.CommCarehq.org), is the most widely adopted, technically advanced, and evidence-based mobile platform for low-resource settings. CommCare is easily customizable, open source, and supports frontline workers (FLWs) across 200+ projects in over 50 countries. Dimagi, and AIRS Kenya combined CommCare with telerivet for broadcast messages to further customize the tools for SMS reporting and SMS job aide alert. Telerivet is an innovative mobile messaging platform that instantly connects businesses and organizations with their customers, employees and community. Using a cloud based management system, it routes messages to and from any number of mobile devices, allowing you to reach anyone who has a mobile phone with SMS. (www.telerivet.com; <https://telerivet.com/about>).

The supervision tools comprised of three main components that involved:

FIGURE 13: REPORTING AND SUPERVISION USING COMM CARE SUPERVISION TOOLS



- Supervision Component – The component is digitized supervision checklists to be used during field visits. The forms included vehicle inspection, morning mobilization, storekeeping, and end of day clean up. These forms were submitted daily to the CommCare platform and later shared to different stakeholders via email. During the debrief meetings, results from these platforms were used to inform decision making among supervisors at the National, County, Sub-County and the AIRS Kenya team.
- Performance Tracking Management – Each of the 28 site managers were given phones to submit the daily reports to CommCare platform via telerivet. After data verification with the SOP, team leaders and site supervisors, the site manager would submit the data as summarized on the team leader

forms to the CommCare platform. The same data was also updated on the performance tracker sheet that was at the site. The report format that was used via SMS was:

A.X.Y.W.Z where;

- A was a constant
 - X was the number of SOPs that worked for the day
 - Y was the number of structures found
 - W was the number of structures sprayed
 - Z was the number of insecticide bottles used during the campaign
- Daily Job Aide Alert Messages – Making use of the daily supervision reports, the M&E Manager together with the technical team were able to design corrective messages that were sent out as job alert aides. These messages were scheduled and sent out daily at different times to different cadre of staff in the spray team including supervisors, site managers, team leaders and spray operators.

8.2 CAPACITY BUILDING ON COMMCARE REPORTING TOOLS

Together with Dimagi, AIRS Kenya oriented 60 (43 male and 17 female) participants on the use of the CommCare reporting tools. These included nine AIRS staff, six M&E Assistants, 17 Supervisors (National-2, County - 2, Sub County 3 and ward-10) and 28 site managers. These became ToTs who oriented the rest of the team in the field on the use of the application.

One hundred mobile phones (Samsung Galaxy J2) were procured and installed with CommCare application as well as the application lock software. Two phones were put aside as backup for any coming visitors while one was set as the gateway. The gateway was the phone that relayed messages from the senders (Site managers) to the CommCare server. The phones were issued to twenty eight site managers and seventy supervisors. The site managers used the phones for performance tracking management while the supervisors used the supervision checklists.

CommCare reporting tools were very useful during the campaign. Apart from viewing the performance of the day real time, it enabled quick intervention in situations that required immediate attention. The daily reports received from the server also were used during the debrief meetings to inform decision making in terms of supervision visits, County management intervention and strategy setting.

8.3 E-INVENTORY

AIRS identified which critical items required daily stock monitoring to avoid stock outs. Typically, these items would be initial insecticide, resupply insecticide, empty insecticide bottles returned, unused bottles returned, and consumables that get damaged, used or lost frequently like dust masks and gloves. The E-inventory could be as simple as an excel sheet and this is what was used by AIRS Kenya in 2017. Using SMS text, the storekeeper sent a text each day reporting on the different inventory levels being tracked to central warehouse. Once the stock level reaches the minimum amount, E-inventory highlights that a specific site needs replenishment immediately.

AIRS Kenya used the e-inventory to keep track of the insecticide and mask. The E-inventory was programmed with minimum amount of stock that AIRS Kenya was willing to tolerate per site before the system triggers re-supply (e.g., a minimum of a two-day supply of stock). Reorder points were determined by how long it would take to replenish stock. Storekeepers sent daily SMS updates to the warehouse manager in Migori. The structure of the SMS submission was as follows:

- A Store ID number
- B Number of insecticide bottles issued

- C Number of empty bottles returned
- D Number of unused bottles returned
- E Total number of empty bottles in stock
- F Total number of full bottle in stock
- G Number of boxes of dusk masks in stock

The data was then updated in an excel spreadsheet which was then shared to the relevant teams via email. The spreadsheet had color coded targets automatically showing areas that required intervention. The program was able to resolve low stock levels on a real time basis.

9. ENTOMOLOGY

9.1 INTRODUCTION

The 2017 IRS campaign was the first round of spraying with a non-pyrethroid insecticide in western Kenya, where widespread pyrethroid resistance had been reported in malaria vectors. To determine quality of spray of insecticide in the walls, wall bioassay was conducted within two weeks of spraying using a laboratory-reared, susceptible colony of *An. gambiae* s.s. Kisumu strain. In each sub-county, a village with already sprayed houses was identified for wall bioassays. In every village, seven houses of mud and three cemented walls were selected for cone bioassay.

In each sprayed house, laboratory susceptible *Anopheles* mosquitoes were exposed on three different walls at varying heights 0.5 m, 1.0 m and 1.5 m from the floor. A fourth cone of field collected adult *An. funestus* was used alongside the susceptible colony whenever the samples were available. A control cone was set on a plywood board outside of each sprayed house on a shaded area close to the house.

9.2 RESULTS

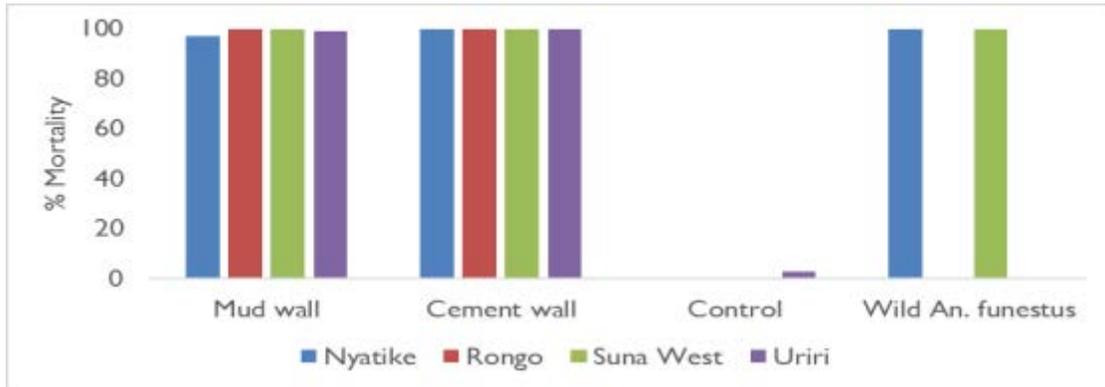
The number of mosquitoes tested is presented in Table 16.

TABLE 16: NUMBER OF MOSQUITOES USED IN CONE ASSAYS

Sub county	Wall type	Test - <i>An. gambiae</i> s.s. Kisumu strain				Control		Wild <i>An. funestus</i>	
		Height 0.5	Height 1	Height 1.5	24Hrs Mortality N (%)	Number Exposed	24 Hrs Mortality N (%)	Number exposed	24 Hrs Mortality N (%)
Nyatike	Mud	69	70	70	203(97.13)	70	0 (0)	70	70 (100)
	Cement	30	30	30	90 (100)	30	0 (0)	30	30(100)
Rongo	Mud	70	70	70	210(100)	70	0 (0)	0	-
	Cement	30	30	30	90 (100)	30	0 (0)	0	-
Suna West	Mud	70	70	70	210 (100)	70	0 (0)	40	40(100)
	Cement	30	30	30	90 (100)	30	0 (0)	0	-
Uriri	Mud	70	70	70	208(99.05)	70	3(4.29)	0	-
	Cement	30	30	30	90(100)	30	0 (0)	0	-
Totals		399	400	400	0	400	0	140	0

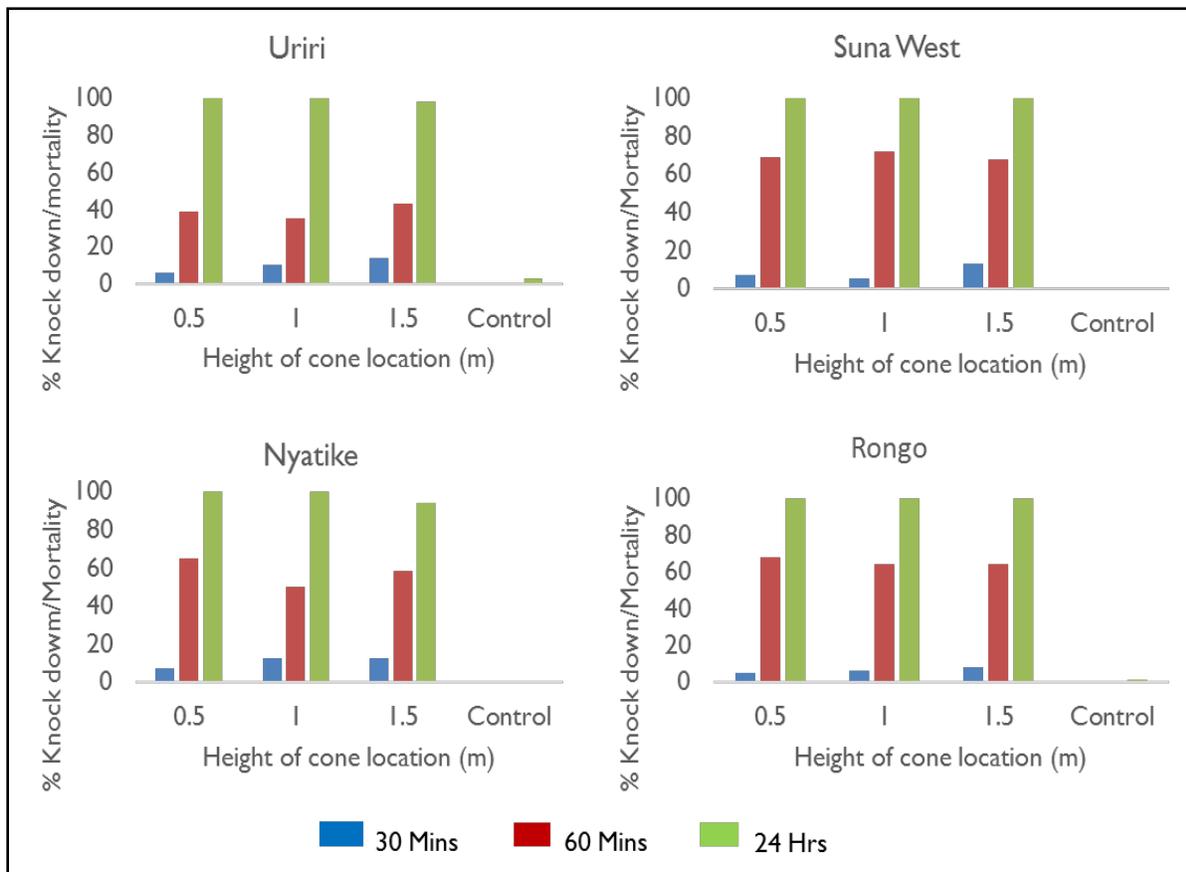
High mortality of laboratory-reared susceptible *An. gambiae* was observed in all sites for both mud and cement walls. Similarly, 100% mortality was recorded for wild collected adult *An. funestus* exposed to both cemented and mud walls (Figure 14). Mortality was very low in control samples.

FIGURE 14: 24-HOUR MORTALITY OF SUSCEPTIBLE *AN. GAMBIAE* S.S. *KISUMU* STRAIN WITHIN TWO WEEKS OF SPRAY



Similar trends in knock down at 30 and 60 minutes post exposure were observed across all Sub Counties. No differences in knock-down and motility were observed between the different heights of cone location on the wall.

FIGURE 15: KNOCK DOWN AND 24-HOUR MORTALITY RATES FOR *AN. GAMBIAE* S.S. *KISUMU* STRAIN EXPOSED AT DIFFERENT HEIGHTS FROM THE FLOOR WITHIN TWO WEEKS OF SPRAY



9.3 DISCUSSION

Results from cone bioassay tests demonstrated high potency of the insecticide used in the IRS program. Similar results were recorded across different sub counties and at varying heights on the wall, demonstrating good quality of spraying.

9.4 CHALLENGES

Some mud walls were quite weak making it hard to attach the cones with masking tape. We are considering using pins on such surfaces.

10. GENDER

As part of gender inclusiveness, AIRS Kenya emphasized recruitment of at least thirty percent of women per category during 2017 campaigns and plans to use the figures as baseline for subsequent campaigns. In total, 48% of all seasonal workers were women including 45.5% of SOPs, 37.1% of TLs and 44.9% of site supervisors.

All stakeholders were sensitized on the importance of recruiting women in IRS campaigns and priority was given to women who met the requirements. It was a requirement that all the spray operators, storekeepers and washer are tested for pregnancy before being involved in the campaign. After testing, two women were found pregnant in Nyatike and were swapped with mobilizers who were not expectant. To make women comfortable to do their work, AIRS Kenya:

- Ensured every woman got the correct sizes of coveralls and boots;
- Provided in collaboration with K-MET, an organization working with vulnerable communities, re-usable sanitary towels for use while in the field;
- Constructed two separate bath shelters for male and female which were properly labeled and well separated for privacy; and
- Ensured at least two women worked per team.

Gender awareness and sexual harassment training was incorporated in all the trainings conducted before the campaigns started.

During the campaign, gender awareness and sexual harassment guidelines (see Annex F) were posted in each operations site. In addition, the project sent a daily SMS reminder to each SOP, team leader and site supervisors on gender awareness and sexual harassment. There were no complaints regarding sexual harassment reported to the project gender focal point.

II. CAPACITY BUILDING

AIRS Kenya worked closely with government officers from both the NMCP at the national level and Ministry of Health at the County and sub-County level. Following the political devolution in Kenya, AIRS Kenya's capacity building strategy seeks to build IRS capacity equally at the local and national levels. Beginning at the micro-planning, AIRS Kenya invited a delegation of NMCP to not only receive training on how to deliver IRS, but to be active participants and co-trainers in resource planning, spray techniques, data collection strategies and tools, and other key areas. Subsequently, AIRS Kenya hosted a consistent delegation of at least eight NMCP officers throughout the spray campaign, and actively involved them in daily supervision and troubleshooting. NMCP officers proved very able to support AIRS Kenya's spray campaign, and by the end of the campaign all participating officers received certificates in IRS competence. Lastly, the Head of NMCP – Dr. Waqo Ejersa – himself participated in IRS supervision, accompanying the COP for the penultimate day of spray operations.

Officers from the Ministry of Health at the County and sub-County levels received a similar emphasis, likewise being both active participants and in isolated cases co-presenters during the micro-planning. The Migori County Malaria Control Coordinator and six Sub-County Malaria Control Coordinators worked closely with AIRS Kenya staff to recruit seasonal workers, lead trainings at operations sites and provide daily supportive supervision. In addition, Ministry of Health staff joined AIRS, NMCP and PMI staff at the regularly held debrief meetings to discuss challenges and best practices observed during supportive supervision and to collectively troubleshoot and identify effective strategies to overcome challenges on-the-ground. Lastly, to consolidate feedback and strengthen capacity at the sub-County level, AIRS Kenya led weekly debrief meetings at sub-County offices with all sub-County MOH officers, site managers and site supervisors. These meetings ensured coordinated strategy across the County and built sub-County level capacity.

12. CHALLENGES AND LESSONS LEARNED

- mHealth as a reporting and supervision tool is a **plus**. Handmade summaries are time consuming and prone to errors while data management and processing of paper collected data takes time before the final product can be consumed. The use of mHealth for daily reporting, supervision and job aide alert messages enhanced quick response to field occurrences and educated the team on IRS key concepts and best practices. Based on these reports teams could decide on the next performance strategies on a real time basis.
- Strong record keeping and consistent physical counts of insecticide at the stores added value to stock accountability. As a result of this, a small amount of the insecticide was lost and by the close of the campaign only one pair of gumboots was missing. At the start of the campaign, there were instances of late updating of the ledger book and stock cards, which was addressed immediately on a daily basis by site supervisors through physical verification of pesticide stocks. In a few site stores where records of physical verification did not tally with those on the stock cards/ledger, the main issue was primarily as a result of inexperienced storekeepers, most of them being new to IRS. Through supportive supervision and regular record review by AIRS, these storekeepers were coached on how to record stock information thereby remedying this situation.
- Rainy weather does not favor IRS operations. The campaign was planned, according to the weather experienced in Kenya, to take place between February and March 2017 just before the rainy season as from April to June. However, the rains started earlier than usual and expected. The early onset of the rainy season hindered the campaign in some areas especially when it rained for most of the morning. However, during this time Spray Operators were encouraged to leave early to the field so as to start work early before the rains began and when it rained in the morning, they were encouraged to stay longer to meet their targets. The early onset rains ended by Week 3.
- Undefined geographic boundaries affected targets. Due to unclear boundaries, some structures in Kisi and Homa Bay Counties were reportedly targeted for spraying during household mapping at Rongo sub-county, but were not sprayed. At some point during spray, Awendo team crossed the border to Rongo sub-county, a place called Kwoyo, and sprayed the area. When Rongo team reached the area, they could not spray. This contributed to a relatively low performance in Rongo sub-county. During next year's geographic reconnaissance, the program will pay special focus on identifying the sub-county boundaries to correctly identify structures for target within sub-county borders. Prior to spraying, borders will be identified to spray teams to ensure movement within designated boundaries.
- Some sites had supervision challenges at the levels of site supervisors and team leaders resulting in laxity in SOP performance. This especially affected the performance in Rongo sub-county forcing the Migori County supervision team to re-shuffle the site supervisors and replace others.
- Data quality was not adequate in the first week of the campaign. Regular review meetings with the teams each week at Sub-County level and mentorship at the site levels enhanced the quality of data.
- Towards the end of the campaign, some teams were lagging behind in performance. As a mitigation strategy, teams were imported from other sites to these areas to support coverage of more

structures in a day. While this was a good strategy and improvement was observed, logistics need to be properly thought through as this could affect data reports and accounting for insecticide by reassigned teams. In the first case where a team was imported from Mariwa and Kochola sites to Ongo site in Rongo Sub County, there was confusion as to which site of both spray data and days' insecticide use would be reported. The teams were however encouraged to record this information at the site they are going to support and leave all data reports at that site before returning to their original sites.

- Replacement of spray personnel and codes: Spray personnel replacement was done in the field by the site managers and site supervisors resulting in confusion in allocation of SOP codes which are unique per person. Unfortunately, when spray personnel were replaced, the new recruit used the same code as the former spray operator or mobilizer instead of being issued with his/ her own unique code. Reusing codes affected the database because duplicated Spray Operator codes with different data could not be entered. The database was designed in a way that the spray operators code and information were tied to an individual to make it easier to track the details. A new recruit should have a new code. In future, all replacements of seasonal workers shall go through the County Coordinator, who in turn shall liaise with the M&E team to ensure a issuance of unique code to minimize database errors.
- Due to the lecturers' strike that was experienced between 16th February and 13th March 2017 in Kenya, most of the structures used by the students around Rongo University were locked and could not be sprayed. AIRS Kenya contacted the university administration to mobilize students to come back to have their structures sprayed, but very few were willing to comeback only for IRS.
- Mobilization Challenges;
 - Some households were not reached during mass mobilization just before spraying started. This was remedied with targeted mobilization where the CHV in charge of villages went ahead of SOPs two days before the actual spray day to inform the community to have their houses ready for spraying. In the future campaign, the program will ensure mobilizers operate with targets that are closely monitored per day and are supervised right from the beginning. IRS cards will also be tracked closely against the number of households reported to be mobilized. Similarly, mass mobilization will be limited to mass media.
 - During the campaign AIRS Kenya experienced quick depletion of the IRS cards and sometimes duplication of IRS numbers. Since mobilizers did not have a clear supervision structure in the beginning, many of them were not closely monitored, and consequently several unused IRS cards were retrieved from mobilizers' households during closeout meetings. IRS cards will be tracked closely against the number of households reported to be mobilized. Spray team supervision was weak in some of the sites resulting in Spray Operators issuing cards to already sprayed structures and reporting them resulting in duplicate IRS numbers. Close monitoring and supervision of the SOPs and mobilizers as well as tracking of the IRS cards via stock check, mHealth reports and against data submitted will help to reduce the issue. This further resulted in poor data quality reported as well as duplication of IRS numbers.
 - Some villages and sub-locations experienced mass refusals.
 - Refusals were noted in Muslim communities in Suna West. As a negotiation strategy, AIRS Kenya deployed fellow Muslim staff to talk to them in the mosque and discuss the benefits of IRS. The Chief Kadhi assisted in mobilizing these communities and the community finally agreed to have their houses sprayed. In future campaigns, there is need to involve Muslim leaders (or those from any other religious minority) in pre-spray social mobilization.

- Other refusals e.g. Rongo were encountered with main reason being the beneficiaries' unwillingness to remove household items. The local leaders attempted to convince the community to have their houses sprayed. However it is difficult to achieve high coverage targets in peri-urban areas where beneficiaries have large quantities of household items which they are unwilling to remove. These semi-urban areas also tend to be relatively wealthier with greater access to malaria diagnostic and treatment than rural communities, making semi-urban areas more difficult to convince of the need for additional protection provided by IRS.
 - Early refusals cited that previous spray rounds resulted in an infestation of bed-bug. AIRS Kenya remedied this by carrying out intensive mobilization in these areas and shared testimonies from other beneficiaries who witnessed bedbugs dying as well. In future, IEC materials shall include messages about bedbugs.
 - In mining and urban areas, household owners frequently left their houses by 8.00am leaving children at home or houses locked. AIRS Kenya earmarked these communities and mobilized them for early morning spraying and even a separate arrangement for spraying on Sunday.
- mPesa is the best mode of payment for spray teams as it is fast, safe and can easily be accounted for. However, missed payments due to wrong phone numbers demotivated some seasonal workers who were not able to be paid on time. Similarly, finance department was slow to respond to payment issues in terms of getting F&A assistants out to sites to follow up and to address each case individually and directly communicate to the affected person. AIRS Kenya reassured them that their pay was going to be made as soon as the phone numbers were sorted out. To further curb this, the AIRS team and supervisors were oriented through the requirements to effect *mPesa* payments. A follow up was done for teams that missed payments, records were rectified and payments were dispatched.
 - Early in the campaign, AIRS Kenya supervision and mHealth tools reported improper use of PPE and triple rinsing at the sites. SMS alert messages to the all spray personnel combined with constant supervision and remedial training greatly improved the use of PPE and triple rinsing.
 - Use of the pre-contract transport vehicle inspection ODK tool: The pre-contract transport vehicle inspection tool was designed to be used at the sub-County level. However, the hiring process was done at the County level and therefore vehicle inspections had to be centralized as well. Replacements were done at the sub counties hence tracking such changes had to be decentralized, posing a challenge in the use of the tool. This forced the AIRS Kenya ECO to resort to the use of a paper checklist in order to effectively track the changes.
 - Some of the trained drivers failed to turn up once their vehicles were replaced. However, the ECO conducted on job safety training for all the new replacement drivers.
 - Initially, the plastic containers provided as part of the spill response kit were too big to fit in the vehicles and were sometimes tied on the vehicle metallic carriers. After supervisory discussions, the containers were replaced with sizeable metallic/plastic ones that could fit below the benches in the Spray Operators transport vehicles.
 - Equipping more people with pump maintenance skills adds to the quality of spray: Out of 1,128 homeowner preparedness and spray operator performance inspections that were conducted during the campaign, 37 reported issues related to correct pesticide mixing while 121 inspections reported issues related to pump leaks. Team leaders and their supervisors were also trained on spray pump maintenance.

- Reluctance by a few SOPs to take a bath at the bathing units citing cooler weather conditions. Site managers and team supervisors were tasked with ensuring that all SOPs, at the least wash off their hands and faces with soap and water. The risk of not washing off the chemical was also emphasized to the teams.
- Most of the reported faulty pumps used by AIRS Kenya for the campaign in Migori were inherited from previous IRS implementers and have served their life. There is need for replacement with new ones. However, efforts will be made to ensure that leak points on the tank, where possible, are completely sealed before the next campaign.
- During the first week of the campaign, waste segregation was a key noncompliance issue. However, with constant information regarding waste separation at the source, all the store keepers were able to separate all wastes generated at their sites which eased collection and transportation to the central stores. Next year, AIRS plans to use of labelled gunny bags for waste segregation and storage in place of the polythene waste bags used in this year's campaign and which contribute more as sources of waste since they cannot be reused.

Annex A: Location of AIRS Kenya Operations Sites

Sub-County	Ward	#	Operations Site	Latitude-S/ Longitude-E	Elevation (m)
Rongo	Central Kamagambo	1	Rongo Sub-County Hospital	S0 45.449 E34 35.991	1355
	East Kamagambo	2	Kochola Dispensary	S0 42.473 E34 33.759	1353
	North Kamagambo	3	Minyanya Dispensary	S0 41.523 E34 37.184	1433
	South Kamagambo	4	Ongo Health Centre	S0 54.594 E34 36.500	1591
Awendo	Central Sakwa	5	Awendo Sub-County Hospital	S0 53.923 E34 32.096	1454
	South Sakwa	6	Mariwa Health Centre	S0 58.334 E34 34.485	1488
	West Sakwa	7	Rabondo Dispensary	S0 50.812 E34 29.066	1443
	North Sakwa	8	Dede Dispensary	S0 49.012 E34 31.916	1428
Uriri	Central Kanyamkago	9	Uriri Health Centre	S0 57.128 E34 30.777	1531
	North Kanyamkago	10	Othoro Sub-County Hospital	S0 53.437 E34 23.208	1297
	West Kanyamkago	11	Lela Dispensary	S0 56.824 E34 24.988	1358
	East Kanyamkago	12	Oyani Health Centre	S1 02.264 E34 35.226	1475
	South Kanyamkago	13	Bware Dispensary	S1 00.055 E34 31.626	1523
Suna East	God Jope	14	Osingo Dispensary	S1 04.675 E34 32.099	1546
	Kwa	15	Suna Rabuor Health Centre	S1 05.185 E34 35.119	1492
	Kakrao	16	Anjego Dispensary	S1 00.963 E34 26.592	1368
	Suna Central	17	Migori County Referral Hospital	S1 03.836 E34 28.572	1382
Suna West	Suna Wasimbete	18	Nyamaranga Health centre	S1 06.971 E34 20.852	1389
	Wasweta 2	19	Bondo Dispensary	S1 05.899 E34 24.071	1400
	Oruba Ragana	20	Suna Ragana Dispensary	S1 06.334 E34 28.317	1381
	Wiga	21	Arombe Dispensary	S1 02.086 E34 21.056	1331
Nyatike	East Kadem	22	Agenga Dispensary	S0 55.130 E34 14.044	1165
	Kanyarwanda	23	Macalder Sub-County Hospital	S0 57.788 E34 17.144	1387
	Got Kachola	24	Wath Onger Dispensary	S0 57.068 E34 12.487	1148
	Kachieng	25	Karungu Sub-County Hospital	S0 50.844 E34 09.413	1137
	Kanyasa	26	Alendo Chief's Camp	S0 48.679 E34 13.110	1301
	Muhuru	27	Muhuru Health Centre	S1 00.775 E34 07.888	1154
	Kaler	28	Bande Dispensary	S1 02.107 E34 11.862	1246

Annex B: 2017 IRS Implementation Schedule and Timeline

Component	Activity	Person/Partner Responsible	Planned Date	Output	Implementation date	Remarks
Pre-spray activities/ mobilization	Micro-planning meetings	Abt/NMCP	October to December 2016	Sub-County IRS plans, stores and locations and recruitment modalities concluded	12 to 13th October 2016	On Schedule
	Recruitment of spray personnel	Abt/NMCP	December 2016	List of shortlisted personnel	February, September and December 2016	Recruitment was done in three phases. On Schedule
	Training of trainers	Abt/NMCP	23rd to 27th January 2017	Trained spray personnel	16th to 20th January 2017	Done earlier because of mass net distribution exercise
	Medical fitness tests for spray personnel	Abt/NMCP	1st to 3rd Feb 2017	List of shortlisted personnel	1st to 3rd Feb 2017	On Schedule
	SOP/spray personnel training		6th to 10th February 2017	Trained spray personnel	6th to 10th February 2017	On schedule
	Training of health workers on insecticide poisoning	Abt/County MoH	30th January 2017	Trained clinicians on insecticide poisoning	2nd February 2017	Due to unavailability of facility incharges
	Geographical Reconnaissance, logistics Needs assessment and	Abt/MoH	31st October to 11th November 2016	Pre spray assessment report showing specific requirements per site	7th to 11th November 2016	On schedule
Procurement and logistics	Local and Offshore procurement		October 2016 to 3rd Jan 2017	Insecticides, PPE and equipment procurement	October 2016 to 9th Jan 2017	Delayed clearance of insecticides at the port
	Deliver insecticide, PPE, and equipment to targeted sub-counties	Abt	27th January to 3rd February 2017	IRS commodities delivered to sub-counties	27th January to 3rd February 2017	On schedule

Component	Activity	Person/Partner Responsible	Planned Date	Output	Implementation date	Remarks
IEC development & implementation	Advocacy meetings with key regional and sub-County stakeholders	Abt/NMCP	October 2016	Buy in of regional and sub-County government	24th October to 1st November 2016	On Schedule
	Disseminate IEC messages via radio, including community dialogues	Abt	December 2016 to January 2017	IEC activities conducted	December 2016 to March 2017	On Schedule
Environmental Compliance	Conduct pre-season environmental assessment	Abt /NEMA	31st Oct to 11th November 2016	EC pre-inspection done	7th to 15th December 2016	Delay in onset of operational sites refurbishments
	Refurbishment of operation sites stores, offices and soakpits	Abt	15th to 30th November 2016	Soak pits and warehouses rehabilitated	22nd Nov to 15th Dec 2016	Delays in getting the right local contractors to do the work
	Conduct mid-season environmental inspection	Abt/NEMA	February 13th to March, 18th 2017	EC mid-season inspection done	February, 13 to March, 18 2017	On Schedule
	Post-season inspection	Abt/NEMA	27th to 31st March 2017	Post-season inspection done	May 3rd to 5th 2017	Delayed removal of waste from storage site for incineration due to faulty incinerator
	IRS waste disposal	Abt/NEMA	April 10th to April 13th 2017	IRS waste incinerated and recycled – Disposal certificates obtained	Recycling – 31st March to 2nd April 2017 Incineration – anticipated before 18th may 2017	On Schedule
Spray operations	Conduct spray operations	Abt	February, 13 – March, 18 2017	Spraying completed	February, 13 – March, 18 2017	On Schedule
	Supervision of spray operation	Abt/NMCP/County officials	February, 13 – March, 18 2017	Supervision of IRS campaign	February, 13 – March, 18 2017	On Schedule
Monitoring & Evaluation	Data collection and reporting	Abt	6th February – 18th March 2017	IRS data collected & reporting done	6th February – 18th March 2017	On Schedule
	Conduct entomology surveillance	Abt	October 2016 to August 2017	Entomology surveillance reports submitted to PMI	Ongoing	On Schedule
Post-spray Operations	IRS operations closeout	Abt	March 19th to 31st 2017	Equipment and supplies recaptured	March 20th to 31st 2017	On Schedule

Component	Activity	Person/Partner Responsible	Planned Date	Output	Implementation date	Remarks
	Maintenance of equipment	Abt	March 20th to 25th 2017	IRS spray pumps repaired and stored	March 20th to 25th 2017	On Schedule
	Inventory assessment	Abt	March – April 2017	Post-spray inventory completed	March –April 2017	On schedule
	County IRS evaluation meetings	Abt/NMCP/County officials	March – April 2017	IRS review meetings held	April 2017	On Schedule
	Demobilization of short-term sub-County personnel	Abt	March 17	Spray operations teams demobilized	March 2017	On Schedule

Annex C: Number of Seasonal Workers Hired

Position	County		Awendo		Nyatike		Rongo		Suna East		Suna West		Uriri		Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Site Managers			3	1	5	2	2	2	3	1	3	1	5	0	28
Store Keepers			3	1	6	1	3	2	3	1	4	1	4	1	30
Security Guards			7	1	13	1	7	1	8	0	7	1	10		56
Supervisors			10	4	15	1	6	6	13	5	9	3	12	2	86
SOP Team Leaders			15	8	23	9	14	7	12	8	8	11	16	10	141
Spray Operators			67	68	106	83	76	50	71	49	51	63	87	70	841
Standby SOPs			5	3	8	6	5	3	0	0	6	2	9	2	49
Drivers			15	0	22	0	13	0	26	0	14	0	16	0	106
Washers			0	12	1	17	2	10	1	7	0	11	3	10	74
Mobilizers			29	98	64	102	32	85	48	72	46	66	47	78	767
Mobilizer TL			3	1	5	2	3	1	2	2	3	1	4	1	28
Pump technicians			4	0	7	0	4	0	4	0	4	0	5	0	28
Logistics Assistant		1													1
Finance Assistants									2	1					3
IEC Assistant										1					1
M&E Assistant			1			1	1			1	1			1	6
Warehouse Assistant	1														1
Data Entry Clerks (DECs)			2	2	2	2	3	1	1	3	2	2	2	2	24
Total	1	1	164	199	277	227	171	168	194	151	158	162	220	177	2270
Percentage women	50%		55%		45%		50%		44%		51%		45%		48%
TOTAL	2		363		504		339		345		320		397		2270

Annex D: Number of Seasonal Workers Trained

Migori County

Categories of Persons Trained	Training on IRS Delivery										Other Trainings																		
	ToT for SOPs		SOP		Data Entry		Logistics		IEC Mobilization		Public Health Training		Data Collection		PPEs Washers		Financial Training		Store Keepers		Security		Environmental Compliance Training		mHealth				
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			
Spray Operators (SOPs)			458	383										458	383	458	383									458	383		
Standby SOPs			33	16										33	16	33	16									33	16		
SOP Team Leaders			88	53												88	53									88	53		
Training of Trainers ⁴	54	16												54	16	54	16									54	16		
M&E Assistants					3	3							3	3														3	3
DECs					14	10																							
Store Keepers							23	7					23	7					23	7						23	7		
Site Managers							21	7					21	7												21	7	21	7
Site Supervisors																												15	2
Logistics Assistants								1					1														1		

⁴ ToT numbers include: 27 SCHMT, 30 site supervisors, 7 County supervisors and 6 NMCP

Migori County

Categories of Persons Trained	Training on IRS Delivery										Other Trainings																
	ToT for SOPs		SOP		Data Entry		Logistics		IEC Mobilization		Public Health Training		Data Collection		PPEs Washers		Financial Training		Store Keepers		Security		Environmental Compliance Training		mHealth		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Warehouse Assistant																											
IEC Mobilizers										266	501	266	501	266	501										266	501	
IEC Assistant																										1	
Mobilizer Team Leaders										20	8	20	8	20	8										20	8	
Washers												7	67			7	67								7	67	
Drivers												106	0												106	0	
Security Guards												52	4								52	4			52	4	
Health Workers for Poisoning Case Management												45	30												45	30	
Financial Assistants																		2	1								
Pump Technicians												28	0												28	0	
% of Women Trained																											48%
% of Men Trained																											52%
Grand Total																											2270

Annex E: Migori County Site Repairs

Sub-County	Operations Sites	# of Permanent Soak Pit	# of Store Rooms	Repairs Made
Awendo	Awendo SCH	1	2	Windows reinforcements pump hangers installations, wash area, tank stand and soakage pit establishment. Bathing units for male and female put up, grilled doors.
	Mariwa	1	3	Refurbishment of old wash area/soakage pit, installation of pump hangers. Bathing units for male and female put up.
	Rabondo	1	3	Wash area, soakage pit and tank stand established. Extension of water line to the tank. Shelves and pump hangers put up. Bathing units for male and female put up. Replacement of louvers on two windows.
	Dede	1	1	Wash area/soakage pit put up. Installation of pump hangers. Bathing units for male and female put up, tank stand and installation of a grilled door. Guttering works.
Nyatike	Agenga Dispensary	1	2	Wash area and soakage pit put up. Tank stand constructed and windows secured. Bathing units for male and female put up. Guttering works and security guard shelter.
	Macalder SCH	1	2	Wash area/soakage pit put up. Grilled door put up at the store. Extension of water line to the tank area. Bathing units for male and female put up. Sealing of wide ventilation holes.
	Wath Onger	1	1	Repair of old wash area/soak pit. Pump hangers put up. Bathing units for male and female put up. RepalRS and alignment of existing gutters.
	Karungu SCH	1	1	Construction of new soak pit and wash area. Male and female bathing units put up.
	Alendo Chiefs camp	1	2	Two grilled doors and a window put up. Tank stand, wash area/soak pit and male and female bathing units put up.
	Muhuru	1	2	Repair of old wash area/soak pit. Three metallic doors grills and panes fitted. Bathing units for male and female put up. Pump hangers installed.
	Bande Dispensary	1	4	New toilet/pit latrine, repair of old soak pit/wash area. Male and female bathing units constructed. Metallic door installed.

Sub-County	Operations Sites	# of Permanent Soak Pit	# of Store Rooms	Repairs Made
Rongo	Rongo	1	3	Fitting of pump hangers on the container wall. Rehabilitation of old wash area/soak pit and construction of male and female bathing units.
	Ongo	1	1	Fitting of pump hangers on the container wall. Rehabilitation of old wash area/soak pit and construction of male and female bathing units.
	Kochola	1	2	Refurbishment of the container for chemical storage, construction of wash area/soak pit. Male and female bathing units constructed. Water tank and guttering works carried out. Pump Hangers fitted.
	Minyenya	1	2	Partitioning of the storage space, tank stand put up. Wash area/soak pit constructed, male and female bathing units put in place. Pump hangers fitted.
Suna East	Suna Rabuor	1	1	Sealing of heaves, fitting of window panes. New wash area/soak pit established. Male and female bathing units put up.
	Osingo	1	3	Wash area and soak pit constructed. Male and female bathing units established. Pump hangers put up, Water harvesting means put in place. Tank stand built.
	MCRH	1	2	Roof repair due to leakage. Partitioning of the store for chemical storage. Pump hangers installed. New wash area/soak pit and male and female bathing units installed. Guttering works.
	Anjego	1	2	Construction of wash area/soak pit, female and male bathing units installed, tank stand constructed. Guttering works.
Suna West	Nyamaraga SCH	1	2	Metallic door fitted, new wash area/soak pit built, male and female bathing units built, pump hangers put up and repair of gutter works undertaken.
	Suna Ragana Dispensary	1	2	Wash area/soakage pit put up. Installation of pump hangers. Bathing units for male and female put up.
	Arombe Dispensary	1	4	Fitting of pump hangers on the container wall. Rehabilitation of old wash area/soak pit and construction of male and female bathing units. Window panes fitted into the chemical store windows.
	Bondo Dispensary	1	2	Wash area/soakage pit put up. Installation of pump hangers. Bathing units for male and female put up. Sealing of eaves and open roof partitions.

Sub-County	Operations Sites	# of Permanent Soak Pit	# of Store Rooms	Repairs Made
Uriri	Uriri SCH	1	2	Fitting of pump hangers on the container wall. Rehabilitation of old wash area/soak pit and construction of male and female bathing units.
	Bware Dispensary	1	2	Partitioning of the storage space, putting up pump hangers, wash area/soak pit built and tank stand put up. Gutter works, Male and female bathing units constructed.
	Oyani Maasai	1	2	Wash area/soakage pit put up. Installation of pump hangers. Bathing units for male and female put up. Metallic grill installed on two windows and one door.
	Lela Dispensary	1	1	Wash area/soakage pit put up. Installation of pump hangers. Bathing units for male and female put up. Partitioning of the storage space for chemical store. Tank stand built and gutters installed.
	Othoro SCH	1	2	Rehabilitaion of the old soakpit and wash area. Instabllation of pump hangers. Bathing units for male and female put up. Sealing of partitions of rooms upto roof.

Annex F: Gender Awareness and Sexual Harassment Guidelines



REPUBLIC OF KENYA



AIRS
President's Malaria Initiative
Africa's Integrated Response Strategy



US President's Malaria Initiative

PMI AIRS Project Anti-Sexual Harassment Guidelines

The PMI AIRS Project is committed to creating a work place that is safe for all of its employees.

Sexual Harassment

To ensure a safe workplace, the project will not tolerate sexually-oriented conduct, whether it is intended or not, that is unwelcome. Sexual Harassment has the effect of creating a workplace environment that is hostile, offensive, intimidating, or humiliating to male or female workers.

These guidelines specifically prohibit sexual harassment as well as other types of harassment based on:

- ❖ Race
- ❖ Color
- ❖ Sex
- ❖ Marital Status
- ❖ Ethnic Or Tribal Status
- ❖ Religion
- ❖ Sexual Orientation
- ❖ Gender Orientation
- ❖ Age
- ❖ National Origin
- ❖ Disability

Any retaliation against an individual who has complained about harassment will not be tolerated.

Definition of Sexual Harassment

These guidelines cover all forms of sexual harassment. Sexual harassment is defined as: Sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when:

- Submission to or rejection of such advances, requests or conduct is made either explicitly or implicitly a term or condition of an individual's employment or as a basis for employment decisions; or,
- Such advances, requests or conduct have the purpose or effect of unreasonably interfering with an individual's work performance by creating an intimidating, hostile, humiliating or sexually offensive work environment.

Definition of Other Work-Related Harassment

Other work-related harassment is the unwelcome, deliberate or repeated unsolicited verbal, physical, or visual contact or solicitation of favors that are offensive, abusive, intimidating, hostile, denigrating, or demeaning. It includes, but is not limited to, the following:

- Verbal harassment such as derogatory remarks, slurs, accusations or negative stereotyping;
- Physical harassment such as assault, impeding or blocking movement, or any physical interference with normal work or movement which is directed at an individual;
- Visual forms of harassment such as graphic materials, derogatory posters, cartoons or drawings.

Sexual Harassment Complaints

The PMI AIRS Project takes any allegations of sexual harassment seriously. All complaints should be made to your Gender Focal Point. *Your focal point will address your complaint and if deemed necessary will work with Abt Associates Human Resources team to investigate and take appropriate action.*

*Complaints can also be directed to: **Abt Helpline at 888-928-4231 or www.integrity-helpline.com/abtassoc.jsp***

Please also contact *Migori County Government office* that focuses on gender based violence for further support

Annex G: Monitoring and Evaluation Plan Indicator Matrix

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
Component 1: Establish Cost-Effective Supply Chain Mechanisms and Execute Logistical Plans								
1.1 Procurement								
1.1.1 Number and percentage of insecticide procurements that had a pre-shipment QA/QC test at least 60 days prior to spray campaign	Data source: Project records – insecticide procurements Reporting frequency: Each spray campaign	By Spray Campaign	1; 100%	1; 100%	TBD; 100%		TBD; 100%	
1.1.2 Number and percentage of international insecticide procurements delivered in country, at port of entry, at least 30 days prior to the start of spray operations	Data source: Project records – international procurements Reporting frequency: Each spray campaign	By Spray Campaign	1; 100%	1; 100%	TBD; 100%		TBD; 100%	
1.1.3 Number and percentage of international equipment procurements, including PPE, delivered in country, at port of entry, at least 30 days prior to start of spray operations	Data source: Project records Reporting frequency: Each spray campaign	By Spray Campaign	1; 100%	1; 100%	TBD; 100%		TBD; 100%	
1.1.4 Number and percentage of local procurements for PPE delivered 14 days before the start of spray operations	Data source: Project records Reporting frequency: Each spray campaign	By Spray Campaign	1; 100%	1; 100%	TBD; 100%		TBD; 100%	1; 100%

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
1.1.5 Successfully completed spray operations without an insecticide stock-out	Data source: Project records Reporting frequency: Each spray campaign	By Spray Campaign	Completed	Completed	Completed		Completed	Completed
1.2 In-Country Exemption and Custom Clearance Process								
1.2.1 Complete exemption and clearance process within the minimum 2 weeks	Data source: Project records Reporting frequency: Each spray campaign	By Spray Campaign	Completed	Completed	Completed		Completed	Completed
1.3 In-Country Logistics, Warehousing, and Training								
1.3.1 Number and percentage of logistics and warehouse managers trained in IRS supply chain management	Data source: Training records Reporting frequency: Each spray campaign	By Spray Campaign By Gender	34 ⁵ ; 100%	62 ⁶ ; 179%	TBD; 100%		TBD; 100%	
1.3.2 Number and percentage of base stores where physical inventories are verified by up-to-date stock records	Data source: Project records Reporting frequency: Each spray campaign	By Spray Campaign	32 ⁷ ; 100%	31 ⁸ ; 97%	TBD; 100%		TBD; 100%	
1.3.3 Submit up-to-date inventory records 30 days after the end of each spray campaign	Data source: Project records Reporting frequency: Each spray campaign	By Spray Campaign	Completed	Completed	Completed		Completed	

⁵ 28 sites storekeepers and 1 central warehouse manager

⁶ 28 Site managers, 30 store keepers, 1 warehouse manager, 1 Logistics Coordinator, 1 Logistics Assistant, 1 Warehouse assistant

⁷ 30 site stores and 2 central stores

⁸ 28 site stores, 2 Central distribution stores in the site, 1 main warehouse

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
Component 2: Implement Safe and High-Quality IRS Programs and Provide Operational Management Support								
2.1 Planning and Design of IRS Programs								
2.1.1 Annual PMI AIRS country work plan developed and submitted on time	Data source: Project records Reporting frequency: Annually	By Spray Campaign	Completed	Completed	Completed		Completed	
2.1.2 Percentage reduction in project operational expenses per structure from the previous year, excluding insecticide costs	Data source: Project financial records Reporting frequency: Annually	By Spray Campaign	N/A ⁹	N/A	5%		5%	
2.2 Support of Safety and Health Best Practices and Compliance with USAID and Host Country Environmental Regulations								
2.2.1 SEA/letter reports submitted on time based on schedule agreed upon with the-PMI COR team	Data source: Project records – submitted SEAs/ letter reports Reporting frequency: Each spray campaign	By Spray Campaign	Completed	Completed	Completed		Completed	
2.2.2 Number of spray personnel trained in environmental compliance and personal safety standards in IRS implementation	Data source: Project records – Training reports Reporting frequency: Each spray season	By Spray Campaign By Gender	1,303	2,311 ¹⁰	TBD		TBD	
2.2.3 Number of health workers receiving insecticide poisoning case management training	Data source: Project records – Training reports Reporting frequency: Each spray season	By Spray Campaign By Gender	75	75	TBD		TBD	

⁹ For year 1 we are at baseline, hence we have no comparison expenses from the previous year

¹⁰ 86 Supervisors, 56 Security Guards, 75 HCWs, 141 SOP Team leaders, 841 SOPs, 49 standby SOPs, 767 Mobilizers, 28 Mobilizer team leaders, 28 Pump technician, 74 washers, 28 Site managers, 30 store keepers, 106 drivers, 1 Logistics Assistant and 1 Warehouse Assistant (The 75 HCWs were not among hired staff. 24 DECAs, 6 M&E Assistants and 3 Finance Assistants were not trained)

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
2.2.4 Number of adverse reactions to pesticide exposure documented	Data source: Incident report forms Reporting frequency: Each spray campaign	By Spray Campaign By Residential/occupational exposure	0	0	0		0	
2.2.5 Number and percentage of soak pits and storehouses inspected and approved prior to spraying	Data source: Project records – Reports submitted by County environmental officers Reporting frequency: Each spray season	By Spray Campaign By Soak Pit By Storehouse	30 Soak pits; 100% 32 Storehouses; 100%	28 Soak pits; 93% 31 Storehouses; 97%	28 Soak Pits (0 Mobile Soak Pits); 28 Storehouses; 100%		TBD; 100%	
2.3 Conduct Communications Activities and Community Mobilization								
2.3.1 Number of radio spots and talk shows aired	Data source: Project records Reporting frequency: Per spray campaign	By Spray Campaign	40 Radio Spots 5 Talk Shows	18 (16 radio spots and 2 talk shows)	TBD		TBD	
2.3.2 Number of IRS print materials disseminated	Data source: Project records Reporting frequency: Semi-annually	By Spray Campaign By Type of printed material and message(s)	14,000	158,517 ¹¹	NA		NA	
2.3.3. Number of people reached with IRS messages via door-to-door mobilization	Data source: Mobilization Data Collection Forms Reporting frequency: Daily per mobilization conducted	By Spray Campaign By Gender	840,700	362,973 Male 159,278 Female 203,580	NA		NA	

¹¹ IRS cards 154,787, T shirts 2,200, Banners 30 and Posters 1,500

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
2.4 Spray Targeted Structures According to Technical Specifications								
2.4.1 Number of structures targeted for spraying	Data source: Previous spray campaign data, enumeration data (targets); Daily Spray Operator Forms (results) Reporting frequency: Daily per spray campaign	By Spray Campaign	226,827	217,100	TBD		TBD	
2.4.2 Number of structures sprayed with IRS	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign	192,803 ¹²	212,029	TBD		TBD	
2.4.3 Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign	85%	98%	85%		85%	
2.4.4 Number of people residing in structures sprayed (Number of people protected by IRS)	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By Spray Campaign By Gender By pregnant women By children <5 years old	714,595	906,388 ¹³	TBD		TBD	

¹² 85% of the 226,827 targeted structures

¹³ Male, Female, Pregnant women, Children < 5 years

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
Component 3: Ongoing Monitoring and Evaluation and Quality Control Measures								
3.1 Submit AIRS country M&E Plan to PMI for approval	Data source: Project records Reporting frequency: Semi-annual	By Spray Campaign	Completed	Completed	Completed		Completed	
3.2 Conduct a post-spray data quality audit within 60 days of completion of spray operations	Data source: Spray operations reports Reporting frequency: Per spray campaign	By Spray Campaign	Completed or N.A.	Planning phase	Completed or N.A.		Completed or N.A.	
Component 4: Contribute to Global and Country-Level IRS Policy Setting and Develop and Disseminate Experiences and Best Practices								
4.1 Number of guidelines/checklists/tools related to IRS operations developed or refined with project support	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign By guideline/checklist/tool	11 ¹⁴	15 ¹⁵	TBD		TBD	
4.2 Number of articles/best practices documents published	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign By IRS Technical Area	1	1 ¹⁶	TBD		TBD	
4.3 Number of best practice presentations given at national/ regional/international workshops and conferences	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign By IRS Technical Area	1	1 ¹⁷	TBD		TBD	
4.4 Number of enterprises engaged through public-private partnerships	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By Spray Campaign	1	4 ¹⁸	TBD		TBD	

¹⁴ Structure definition document, EE forms, DVC forms, 4 supervision forms, PSECA forms, IRS cards, Mobilization forms and SOP forms.

¹⁵ Structure definition document, EE form, DCV, DOS, 4 CommCare supervision forms, 2 PSCEA forms, IRS Cards, Mobilization form, SOP form, TL Summary, Performance tracker sheet

¹⁶ Fighting the bite in Kenya: What we've learnt about malaria control by Bradley Longman

¹⁷ Post-Spray Review meeting

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
Component 5: Contribute to the Collection and Analysis of Routine Entomological and Epidemiological Data								
5.1 Support entomological monitoring activities and insecticide resistance strategies								
5.1.1 Number of entomological sentinel sites supported by the PMI AIRS Project established to monitor vector bionomics and behavior (vector species, distribution, seasonality, feeding time, and location)	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	12 ¹⁹	12	TBD		TBD	
5.1.2 Number and percentage of entomological monitoring sentinel sites measuring all the five primary PMI entomological monitoring indicators	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	12; 100%	12; 100%	TBD		TBD	
5.1.3 Number and percentage of entomological monitoring sites measuring at least one secondary PMI indicator	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign	12; 100%	12; 100%	TBD		TBD	
5.1.4 Number and percentage of insecticide resistance testing sites that tested at least one insecticide from each of the four classes of insecticides recommended for malaria vector control	Data source: Entomological reports Reporting frequency: Annually	By Spray Campaign By Insecticide class	50%	NA ²⁰	TBD		TBD	

¹⁸ Dimagi Inc for CommCare, KMET for reusable pads, NMCP for insecticide donation and MOH for atropine and operations sites

¹⁹ 8 Trial for Bionomics (of which 3 will include feeding time and location), 2 Control for Bionomics.

²⁰ Yet to begin in May 2017

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
5.1.5 Number of wall bioassays conducted within 2 weeks of spraying to evaluate the quality of IRS	Data source: Entomological reports Reporting frequency: Per spray campaign	By Spray Campaign	40	40	TBD		TBD	
5.1.6 Number of wall bioassays conducted after the completion of spraying at monthly intervals to evaluate insecticide decay	Data source: Entomological reports Reporting frequency: Per spray campaign	By Spray Campaign	40	40	TBD		TBD	
5.1.7 Number of vector susceptibility tests for different insecticides conducted in selected sentinel sites	Data source: Entomological reports Reporting frequency: Per spray campaign	By Spray Campaign	30 ²¹	NA	TBD		TBD	
5.2 Support Epidemiological Malaria Data Collection and Analysis								
5.2.1 Collect routine epidemiological data	Data source: Project Reports Reporting Frequency: Annually	By Spray Campaign	N/A		TBD		TBD	
5.2.2 Number of targeted health facilities with routine epidemiological malaria data collection supported by the PMI AIRS Project	Data source: Epidemiological reports Reporting frequency: Annually	By Spray Campaign	N/A		TBD		TBD	

²¹ 5 insecticides for each of the 16 sentinel sites

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
Component 6 (Cross-Cutting): Capacity Building, Knowledge Transfer, Gender Inclusion								
6.1 Increasing the Role of Women and Addressing Gender Barriers								
6.1.1 Number of people trained to deliver IRS in target Countys	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Spray Campaign By Gender Percentage of Women Trained	1,269	1,986 ²² Male 991 Female 1010 50% women	TBD		TBD	
6.1.2 Total number of people trained to support IRS in target Countys	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Spray Campaign By Gender Percentage of women trained	3,536	2,270 ²³	TBD		TBD	
6.1.3 Number and percentage of women recruited (i.e., number/percentage of women on the selection list) for IRS employment	Data source: Project records – Recruitment reports Reporting frequency: Semi-annually	By Country	1,061; 30%	1,085; 102%				
6.1.4 Number of people trained as IRS Training of Trainers	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of women trained	N/A	70 Male 54 Female 16 23% of women				

²² 86 Supervisors, 841 SOPs, 49 Standby SOPs, 141 SOP TLs, 6 M&E Assistants, 30 Storekeepers, 28 Site managers, 1 Logistics Assistant, 1 Warehouse Assistant, 24 DECs, 767 mobilizers, 28 Mobilizer TLs

²³ 86 Supervisors, 841 SOPs, 49 Standby SOPs, 141 SOP TLs, 6 M&E Assistants, 30 Storekeepers, 28 Site managers, 1 Logistics Assistant, 1 Warehouse Assistant, 24 DECs, 767 mobilizers, 28 Mobilizer TLs, 74 Washers, 56 Security Guards, 106 drivers, 3 Financial Assistants

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
6.1.5 Total number of people hired to support IRS in target County	Data source: Project records – Contracts signed Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of women hired	3,536	2,270 ²⁴				
6.1.6 Number of women hired in supervisory roles in target Countys (this number includes site supervisors, team leaders, M&E assistants and others who supervise seasonal staff)	Data source: Project records – Contracts signed Reporting frequency: Semi-annually	By Spray Campaign Percentage of women hired By role	49	99 ²⁵				
6.1.7 Number of staff (permanent and seasonal) who have completed gender awareness training	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of women	33,570	2,255 ²⁶				

²⁴ 28 Site managers, 30 Storekeepers, 56 security guards, 86 supervisors, 141 SOP team leaders, 841 SOPs, 49 standby SOPs, 106 drivers, 74 washers, 767 mobilizers, 28 mobilizer team leaders, 28 pump technicians, 1 logistics assistant, 3 finance assistants, 1 IEC assistant, 6 M&E Assistants, 1 warehouse assistant, 24 DECs

²⁵ 7 Site managers, 21 site supervisors, 53 SOP team leaders, 8 Mobilizer team leaders, 3 M&E Assistants

²⁶ 28 Site managers, 30 Storekeepers, 56 security guards, 86 supervisors, 141 SOP team leaders, 841 SOPs, 49 standby SOPs, 106 drivers, 74 washers, 767 mobilizers, 28 mobilizer team leaders, 28 pump technicians, 1 logistics assistant, 3 finance assistants, 1 IEC assistant, 1 warehouse assistant, 15 AIRS staff

Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregate	Annual Targets and Results					
			Year 1		Year 2		Year 3	
			Target	Results	Target	Results	Target	Results
6.2 Capacity Building								
6.2.1 Number of government officials trained in IRS oversight	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of Women	46	70 54 male 16 Female 23% women	TBD		TBD	
6.2.2 Implement all activities outlined in their yearly Capacity Building Action Plan	Data source: Project records – Capacity assessment reports Reporting frequency: Semi-annually	By Spray Campaign	Completed	Completed	Completed		Completed	
6.2.3 Kenya government implements at least one aspect of the IRS program independently	Data source: Project records – MOUs Reporting frequency: Semi-annually	By Spray Campaign	Completed	None	Completed		Completed	

Annex H: IEC Messages

Key Messages

- It is important that all community mobilizers and stakeholders have and are able to share factual and consistent information.

General Messages

- IRS is part of the Government of Kenya's comprehensive program to fight malaria.
- The chemical to be used for the 2017 campaign is Actellic 300CS. It has been tested and found effective in killing the mosquito that causes malaria
- It is not the same chemical used for storing grains. This one specifically targets mosquitoes that cause malaria
- Indoor spraying kills the mosquitoes that transmit malaria.
- You must continue to use treated mosquito nets even after your house has been sprayed.
- If you or your children suspect you have malaria seek help at the local nearest clinic.
- IRS does not cost anything to the family. It is free and voluntary.
- IRS operators will spray the insecticide on the interior walls of your house.
- IRS is safe for you, your family, and domestic animals if you follow the precautions. It only kills mosquitoes and some non-targeted insects.
- If you see increased number of other insects, it is because the insecticide has disturbed them. They will settle down or die after sometime.

Before Spraying

- Painting, plastering or cleaning of walls should be done BEFORE the house is sprayed.
- On the morning of the spray operations, all movable household items should be removed outside. This includes all utensils, drinking water and foodstuff.
- Pets and animals should also be removed from the households and tethered.
- Items that cannot be moved outside should be moved to the center of the house and covered with a nylon paper to be provided by the spray operators.
- Every household should provide 10 liters of water to help in mixing the chemical.
- On the day of spraying, an adult should be at home to open the door for the spray operator.

During Spraying

- An adult should be around to ensure all moveable stuff is outside the house.
- The adult should observe the mixing of the chemical with the water however the SOP might not have exhausted all the chemical in the previous household, the adult therefore needs to confirm with the neighbor if actually some chemical remained.
- People and animals must stay away from the sprayed structure for 2 hours.

- Ensure that the windows and doors remain closed for 2 hours after spraying.
- **EATING, DRINKING or SMOKING** while spraying is going on is strictly prohibited and Community members should be discouraged from offering food or drinks to the spray operator. It is for the safety of the spray operator. If the spray operator **MUST** drink water, he /she should wash his or her hands several times with soap and water first and remove his/her protective clothing as instructed during the training.

After Spraying

- Open doors and windows for another 30 minutes after the 2 hours closure to allow fresh air to circulate.
- Do not paint, plaster or clean walls for 9 months after the spraying.
- Sweep the house and clear all dead insects. Bury them or throw in a pit latrine.
- Continue to sleep under a mosquito net.
- Pregnant women to continue visiting the clinic for further advice.
- Uncover items that could not be removed and wipe them with a damp cloth.
- If there is any itching or soreness observed after the spraying, visit the local health facility for further advice.

Annex I-I: Environmental Mitigation and Monitoring Report

Implementing Organization: Abt Associates
 Geographic location of USAID-funded activities: Migori County, Kenya
 Period covered by this Reporting Form and Certification: 2017

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
<p>Ia. Pre-contract inspection and certification of vehicles used for pesticide or spray team transport.</p>	<p>Pre-contract inspection and certification of vehicles used for IRS operations in all the six sub-counties of Migori was centrally conducted between 3rd and 12th February 2017. A total of 106 supervision/SOP transportation/logistics vehicles were hired to support IRS operations.</p>	<p>During the first week of the campaign, SOPs transport vehicle replacement was a problem observed in almost all the six sub counties of Migori. However, appropriate stop gap measures were put in place by AIRS Kenya and the County MOH team ensuring all new vehicles were certified after undergoing a thorough inspection conducted by the ECO. The vehicle replacements jeopardized the use of the pre-contract transport vehicle inspection ODK tool, making the AIRS Kenya ECO resort to the use of a paper checklist in order to effectively track the changes. The pre-contract transport vehicle inspection tool was designed to be used at the sub-County level. However, the hiring process was centralized (at the County level) and therefore vehicle inspections had to be centralized. Replacements were done at the sub counties hence tracking such changes had to be decentralized, posing a challenge in the use of the tool.</p>	<p>Recommendation for a decentralized pre-contract inspection and certification of vehicles to be used for future IRS campaigns.</p>

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
Ib. Driver training	The IRS drivers' safety training took place on 11th February 2017. All the 106 drivers were trained on safety issues related to IRS operations including observing speed limits, maximum vehicle carrying capacity, proper use of PPE as well as the IRS spill and emergency response procedures.	Some of the trained drivers failed to turn up once their vehicles were replaced. However, the ECO conducted on job safety training for all the new drivers.	
Ic. Cell phone, personal protective equipment (PPE) and spill kits on board during pesticide transportation.	All vehicle owners were asked to provide their drivers with mobile phones and the contacts were kept by the site managers in all the 28 operation sites. Initial inspection reports for spray operator transportation vehicles indicated that some vehicles lacked spill response kits on board. In addition, some drivers were observed not having PPE on board. However, the central warehouse manager was tasked to ensure that all site storekeepers issued the spill kits and PPEs to each SOP transportation vehicle.	The plastic containers provided as part of the spill response kit were too big to fit in the vehicles and were sometimes tied on the vehicle metallic carriers. After supervisory discussions, the containers were replaced with sizeable metallic/plastic ones that could fit below the benches in the SOPs transport vehicles.	Out of the 647 morning mobilization and transport vehicle inspections that were conducted during the campaign, 97 reported issues related to the availability of spill kits on board; 17 inspections reported issues related to the use of PPE and cell phones by the drivers.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
Id. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact.	All female SOPs, storekeepers and washers underwent an initial pregnancy test on the 3rd of February 2017 at selected health centers in all the six sub counties of Migori. Those who were found pregnant were substituted with others in positions that did not expose them to the insecticide, mostly as IRS mobilizers.		
Ie. Health fitness testing for all operators.	All SOPs, washers and storekeepers underwent a medical fitness testing at the selected health centres on the 3rd of February 2017 where the examining medical officers generally checked on physical fitness of the individuals, signs of respiratory problems and allergic reactions to the insecticide.		Recommendation for inclusion of pump technicians in the list of seasonal workers who need to undergo pregnancy and medical testing in future IRS campaigns in Kenya.
If. Procurement of, distribution to, and training on the use of PPE for all workers with potential pesticide contact.	All local and international procurement were carried out in good time prior to the IRS trainings.	Delivery of CFVs and the neck protection delayed, coming in late during the TOT workshop but were eventually availed during the SOPs training.	
Ig. Training on mixing pesticides and the proper use and maintenance of spray pumps.	The correct insecticide mixing procedure as well as triple rinsing of insecticide bottles was included in all the training sessions right from the TOT workshop through to the SOPs training. On the 26th and 27th February 2017, all the pump technicians were trained on pump maintenance and repair.	Out of 1128 homeowner preparedness and spray operator performance inspections that were conducted during the campaign, 37 reported issues related to correct pesticide mixing while 121 inspections reported issues related to pump leaks.	Team leaders and their supervisors were also trained on spray pump maintenance.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
<p>Ih. Provision of adequate facilities and supplies for end-of-day cleanup,</p>	<p>Fenced off wash areas with concrete slabs and adjacent soak pits were put up in all the 28 sites prior to the IRS campaign in Migori. Temporary bathing units covered with canvas material were also provided, separately for male and female SOPs. At the beginning of each spray day, seven progressive rinse barrels were set at each wash areas and supervised by the site managers. An additional barrel was put over the soak pit with enough soap and water to facilitate cleaning of rubber hand gloves, face shields and helmets. Enough plastic basins, soap and water were also provided for SOPs to take a shower as part of end of day cleanup.</p>	<p>Reluctance by a few SOPs to take a shower at the bathing units siting cooler weather conditions. However, site managers and team supervisors were tasked with ensuring that all SOPs, at the least wash off their hands and faces with soap and water.</p>	<p>Provision of slippers in future IRS campaigns would ease the whole process of taking a shower while standing on gravel, which was placed at the top of the pits dug in the bathing units. Out of the 680 end of day clean up inspections that were conducted during the campaign, two reported issues related to provision of wash facilities equipped with adequate soap and water. Two inspections also reported issues related to the availability of sufficient water in barrels Number 2, 4 and 6 prior to the cleaning of spray pumps by the SOPs.</p>
<p>Ii. Enforce spray and clean-up procedures.</p>	<p>Spray and clean up procedures were to be supervised daily by team leaders and often by field supervisors from AIRS Kenya, the Sub-County, County and national MOH teams. Out of the 680 End of day cleanup inspections 17 were reported to have taken place without direct supervision from team leaders.</p>	<p>mHealth Supervision reports indicated that at such times, most team leaders were busy compiling daily summary reports instead of monitoring their team members.</p>	<p>Emphasis on the need for team leaders and their supervisors to closely monitor spray and clean up.</p>

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
<p>2a. IEC campaigns to inform homeowners of responsibilities and precautions.</p>	<p>IEC campaigns were carried out using two primary approaches; house to house visits by mobilizers and information through media. Local Dholuo radio stations played a key role in disseminating key information. (Radio Mayienga & Radio Milambo). All IRS structure cards also contained key messages for homeowner responsibilities before, during and after spraying. Cases of IRS refusals were reported in all the six sub counties (145 cases out of the 1128 Home owner/SO performance inspections conducted). These cases were attributed to inefficient mobilization.</p>	<p>A change in the IEC/BCC strategy was proposed for future IRS campaigns.</p>	<p>The success of IEC campaigns for AIRS Kenya was aided by the distribution of materials that included close to 1,500 posters, 30 banners, 2,200 t-shirts, 30 megaphones and close to 296,827 IRS structure cards.</p>
<p>2b. Prohibition of spraying houses that are not properly prepared.</p>	<p>Spray operators underwent a thorough 5 days training where they were directed on how to identify eligible structures and were given clear instructions on homeowner preparedness for IRS; removal of food and other belongings, covering of immovable household items as well as not spraying houses with sick people who cannot be moved outside. Out of the 1128 homeowner and spray operator inspections conducted during IRS operation, 18 cases were reported where the Spray operators carried out IRS without covering immovable household items.</p>		<p>All such noncompliance issues were addressed during morning briefs to the SOPs.</p>

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
2c. Two-hour exclusion from house after spraying.	Mobilizers, SOPs, Team leaders, and field supervisors constantly reminded homeowners to stay away from sprayed structures for two hours and only re-enter to open doors and windows then stay away for an additional 30 minutes before occupying such structures again.		Out of the 1128 homeowner preparedness and spray operator performance inspections that were conducted during the IRS campaign, 7 reported issues related to meeting the post-spray requirements including the two hour exclusion from house after spraying.
2d. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.	Mobilizers, SOPs, Team leaders, and field supervisors worked together to instruct homeowners to wash itchy skin then go to the nearest health center if symptoms persist. However, among all the 1128 homeowner/SO inspections conducted, 14 cases were reported for potential insecticide exposure.	Supervisory errors in using the mHealth tools contributed close to 90% of all reported cases of potential insecticide exposure to both SOPs and homeowners.	
3a. Indoor spraying only.	AIRS Kenya and the National/County/sub-County MOH teams emphasized on indoor residual spraying of eligible structures and surfaces throughout the IRS campaign period. However, there were 19 reported cases (out of a total of 1128 inspections) of SOPs spraying wrong surfaces.		More emphasis to be put on eligibility of structures and surfaces for IRS in future spray operator trainings.
3b. Training on proper spray technique.	SOP training on proper swathing, spray distance, Spray speed, pump agitation and 5cm spray overlap was conducted between the 6th to 10th February 2017. There were a total of 24 cases of SOP not complying with the proper spraying techniques. The issues identified were addressed by field supervisors as well as during SOPs morning briefs.		

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
3c. Maintenance of pumps	<p>Each of the 28 IRS operations sites in Migori had a pump technician whose main role was to service spray pumps and fix any pump related problems. The pump technicians were equipped with a spares kit and tools for their work including screw drivers, screw spanners, pliers and oil.</p> <p>121 cases of leaking pumps were reported out of all the 1128 inspections that were conducted on pump maintenance. Some of the problems identified in these reported cases were fixed immediately through replacement of the whole spray tank or provision of spare parts.</p>		<p>Most of the reported faulty pumps used by AIRS Kenya for the campaign in Migori were inherited from previous IRS implementers and have served their life. There is need for replacement with new ones. However, efforts will be made to ensure that such leak points on the tank are completely sealed before the next campaign.</p>
4a. Choose sites for disposal of liquid wastes, including mobile soak pit sites, according to PMI BMPs.	<p>The AIRS Kenya technical team carried out a geographical reconnaissance in all the six sub counties in liaison with the respective Sub-County Malaria control coordinators, between the 7th and operations sites were proposed out of which the 28 sites used for IRS were selected.</p>		
4b. Construct fixed and mobile soak pits with charcoal to adsorb pesticide from rinse water.	<p>Out of the 28 wash areas/fixed soak pits used for IRS in Migori, 21 of them were newly constructed while only 7 underwent major renovations. The AIRS Kenya technical team in liaison with the respective Sub-County malaria control coordinators supervised the workmanship in all constructions and refurbishments based on the guidelines provided in the PMI-BMP for IRS. No mobile soak pit was used by AIRS Kenya.</p>		

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
4c. Maintain soak pits as necessary during season.	<p>All soak pits and wash area surroundings were cleared of vegetation and each perforated plastic T-pipe extension on the soak pits unclogged regularly to ensure uniform distribution of effluent over the filter media.</p> <p>There were three reported cases of soak pits not adequately draining the effluent at Bware, Mariwa and Bande operations sites. The puddle on the soak pits was primarily as a result of excessive use and wastage of water during cleaning of pumps and PPE as well as an unanticipated soil-water retention behavior.</p>		The soak pits at Mariwa and Bware will be redesigned in line with recommendations from the post IRS environmental assessment. The one at Bande will be reconstructed and priority placed on excavation of the pit to refill it with new filter materials; sawdust, charcoal, hardcore stones and gravel.
4d. Inspection and certification of solid waste disposal sites before spray campaign.	<p>The ECO and ECC inspected two proposed sites/facilities for IRS solid wastes disposal on the 4th and 5th October 2016.</p> <p>The ECO carried out a further inspection of two other waste disposal sites on the 30th and 31st March 2017</p>	The second inspection of IRS solid waste disposal sites was vital since at the end of spray operations in Migori, the first two sites inspected on the 4th and 5th October 2016 were experiencing social as well as mechanical challenges. Hence the need for finding alternatives that met the PMI BMP requirements for IRS solid waste disposal.	The initial facilities inspected by the ECO and the ECC were ECO Post Limited and Environmental Combustion Consultants Limited. Both were found adequate to handle IRS Solid wastes for recycling and incineration respectively. The two other solid waste disposal sites/facilities inspected by the ECO and where AIRS Kenya non contaminated Solid wastes were recycled are VINTZ Plastics Limited and Kamongo paper waste Limited.
4e. Monitoring waste storage and management during campaign.	The wastes that were generated during IRS operations were segregated and stored separately at the satellite stores. Proper documentation for the wastes was also kept including stock/bin cards and use of goods issue notes when transferring them from such stores to the main warehouse.	During the first week of the campaign, waste segregation was a key noncompliance issue. However, with constant information regarding waste separation at the source, all the store keepers were able to separate all wastes generated at their sites and eased collection and transportation to the central stores.	Recommendation for the use of labelled gunny bags for waste segregation and storage in place of the polythene waste bags used in this year's campaign and which contribute more as sources of waste since they cannot be reused.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
4f. Monitoring disposal procedures post-campaign.	The ECO and two NMCP officials witnessed the destruction and recycling process for all IRS uncontaminated paper and carton wastes at Kamongo waste paper Ltd, a private company registered by NEMA to recycle all forms of paper and carton wastes. All the empty clean Actellic bottles together with other assorted plastic wastes were recycled at VINTZ Plastics limited which is also licensed by NEMA and certified by the Directorate of occupational health and safety. All IRS contaminated wastes will be incinerated at KEMRI in Kisumu County, a government facility licensed by NEMA to incinerate all types of hazardous wastes at high temperatures.		
5a. Maintain records of all pesticide receipts, issuance, and return of empty sachets/bottles.	Storekeepers maintained records of all pesticide receipts from the central stores, issuances and returns of empties were kept on the GRN, Delivery notes, GIN, stock card and insecticide trackers with backups in ledger books at all the 28 satellite stores. From the 771 storekeeper performance inspections conducted during the IRS campaign, 18 reported issues related to the updating of stocks cards and ledger books.	Late updating of the ledger book and stock cards was a key noncompliance issue which was addressed on a daily basis by site supervisors who carried out physical verification of pesticide stocks.	
5b. Reconciliation of number of houses sprayed vs. number of sachets/bottles used.	Field supervisors and site managers carried out a daily check of the spray performance tracker sheet to verify insecticide usage rate.		

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating to Required Conditions	Remarks
5c. Visual examination of houses sprayed to confirm pesticide application.	AIRS Kenya technical staff as well as MOH supervisors from the County and National levels conducted physical and visual examination of sprayed houses looking out for traces of the applied insecticide on the walls, ceilings and eaves.		
5d. Perform physical inventory counts during the spray season.	A total of 771 inventory checks were completed by AIRS staff, site supervisors and government officials from the County and national levels with emphasis put on insecticide inventory as well as physical verification.	In a few site stores where records of physical verification did not tally with those on the stock cards/ledger, the main issue was primarily as a result of inexperienced storekeepers, most of them being new to IRS. However such anomalies were corrected by site supervisors and the concerned storekeepers tasked to update their records.	There is need for sufficient training on record keeping for IRS storekeepers as well as focused supervision in performing physical inventory verification for future campaigns.

Annex I-2: Environmental Impact Assessment License

Annex I-3: Certificate of Recycling

Annex I-4: Certificate of Destruction

Annex I-5A: Certificate of Analysis – Bware Borehole Water

Annex I-5B: Certificate of Analysis – Bware Site Soil

Annex I-6A: Certificate of Analysis – Mariwa Well Water

Annex I-6B: Certificate of Analysis – Mariwa Site Soil

Annex I-7: Certificate of Analysis – Bande Site Soil

Annex J: Local Purchases

Item Description	Quantity Before Campaign	Quantity Procured	Quantity After Campaign
IRS Transportation			
Rented Vehicles used in IRS implementation	1	106	1
Hardware Materials and Equipment			
Hard Rake with a handle	0	33	32
Water proof Apron (Washers)	0	150	146
Neck protection Hoods	0	2428	2436
Calibrated Jugs	0	1272	1056
Haversack/Spray operator bags	0	1363	1318
Reflective Jackets	1323	148	1370
Socks (pair)	0	2796	540
Towel (Small)	0	2796	1200
Nylon rope (30 M) – (A roll)	0	33	24
Barrel (210 ltrs Water Storage)	96	66	100
3000 ltrs water tanks for rain harvest	15	17	32
Jerry can (20-litre)	0	132	230
Jug (2-litre)	175	56	146
Polythene sheet (3 meters) – Spray Operators	0	1206	800
Tool kit (Flat Screw driver)	0	154	134
Oil dispenser	0	154	0
10 ltr metallic Bucket for sand	8	33	39
Shovel	0	33	33
Hazardous warning sign with skull and cross bones	0	58	73
Restricted area warning sign – soak pit	0	58	26
Padlock (pcs) (Tri-cycle – 264)	0	86	84
Spill Kit (Vehicles – Plastic container with a lid and dust pan)	0	103	103
Dust pans	0	100	99
Thermometer (Digital Thermometers)	0	30	29
Adjustable Spanners	82	6	85
Pliers	48	39	80
Tooth Brush – Stiff Bristles	0	1041	68
Megaphone	65	48	59
Batteries for megaphones (pairs) and spotlights	0	504	20
Tape measures	8	231	239
Tape measure (tailor type)	91	0	91
Spotlights – Solar rechargeable	0	40	39

Item Description	Quantity Before Campaign	Quantity Procured	Quantity After Campaign
Baby Powder	0	173	0
Chalk (box of 150 pcs)	0	918	760
Lubricating oil (1-litre)	10	77	0
Liquid soap (20-litre jerry can)	0	198	62
Gunny bags for waste collection and storage	0	1000	39
Long Handle brush (Stores and Vehicles spill kits)	0	115	114
Brooms	0	60	60
Mopper	0	60	59
Mopping Buckets	18	33	42
Hand washing facilities-Tubs	0	33	33
Fire Extinguisher servicing	75	75	67
First Aid kits	0	176	0
Sanitary Bin Hire	0	28	0
Stationery items			
A 5 Notebook (pcs)	0	3146	632
Clear pocket file	0	789	0
Pencils	0	4863	996
Chalk	0	2286	760
Clear document folder/bag	0	2432	1608
Box Files	0	867	620
Sharpeners	0	4863	2600
Rubber	0	4863	1600
Pen (pcs)	0	2857	300
Flip chart (pcs)	0	33	2
Masking tape (roll)	0	330	40
Marker (pcs)	0	396	0
Rubber bands (pkg)	0	66	30
Hard cover book	0	66	2
Toilet rolls	0	3109	40
Consumable Items			
Re Usable Sanitary Towels	0	1191	60
Protex Medicated Soap Complete 12 100g	0	3537	0
Washing soap (bar of 5 pcs)	0	1456	0
Tidy 40 Refuse Sacks Extra Value B2471	0	395	0
Printing Materials – Logistics Data Materials			
Delivery note book printed in triplicate	0	120	44
Request Forms book printed in triplicate	0	120	76
Goods Issued Note Book Printed in triplicate	0	60	6
Daily Insecticide Tracking and Distribution Card	0	924	0
Ward Store Commodities Ledge book	0	120	67
Goods Received Note Book Printed in triplicate	0	120	44
Stock Card	0	1432	80

Item Description	Quantity Before Campaign	Quantity Procured	Quantity After Campaign
Performer Tracker Sheet	0	35	0
Gender Policy	0	34	30
Daily Mixed Insecticide Returned from field Tracking Form	0	792	0
Daily Health Term Leader Checklist	0	4610	0
Data Collection Verification Form	0	396	0
Error Elimination Form – Spray Data	0	6191	0
Daily Team Leader Summary Form (Both sides)	0	9220	0
Daily Spray Operator Form	0	27746	0
IEC Materials			
A2 Posters full colour	0	1500	0
Banners printed full colour	0	30	28
Street Banners printed full colour	0	1	1
IRS card printed on cover board in A5 size with single fold	0	287827	4000
Mobilizer booklet printed in full colour in A5 and saddle	0	768	0
Round neck T-shirts printed one colour assorted sizes cotton	0	2000	0
Polo T-shirts printed one colour cotton	0	200	0
IT Equipment/ Mobile phone			
Samsung Galaxy J2	0	100	98
Lenovo T440p	0	5	5
HP LaserJet Printer	0	1	1