



PMI | Africa IRS (AIRS) Project

Indoor Residual Spraying (IRS 2) Task Order Four

RWANDA

END OF SPRAY REPORT

SPRAY CAMPAIGN: FEBRUARY 10 - MARCH 8, 2014

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ACRONYMS

AIRS	Africa Indoor Residual Spraying
BCC	Behavior Change Communication
CHW	Community Health Worker
COP	Chief of Party
CTC	Client Technology Center
DCV	Data Collection Verification
DEV	Data Entry Verification
EE	Error Eliminator
EPEDR	Entreprise pour la Protection de l'Environnement et Development Rural
HLC	Human Landing Catch
IEC	Information, Education and Communication
IRS	Indoor Residual Spraying
M&E	Monitoring & Evaluation
MOH	Ministry of Health
MOP	Malaria Operational Plan
MOPDD	Malaria and Other Parasitic Diseases Division
MPDD	Medical Procurement and Distribution Division
PERSUAP	Pesticide Evaluation Report and Safer Use Action Plan
PMI	President's Malaria Initiative
PPE	Personal Protective Equipment
PSC	Pyrethrum Spray Catch
RBC	Rwanda Biomedical Center
REMA	Rwanda Environmental Management Authority
RHCC	Rwanda Health Communication Center
SACCO	Savings and Credit Cooperatives
SEA	Supplemental Environmental Assessment
SOP	Spray Operator
TL	Team Leader
ToT	Training of Trainers
USAID	United States Agency for International Development
WG	Wetable Granules
WHO	World Health Organization
WP	Wetable Powder

EXECUTIVE SUMMARY

Abt Associates supports the implementation of indoor residual spraying (IRS) in Rwanda on a three-year Africa Indoor Residual Spraying (AIRS) project funded by USAID under the President's Malaria Initiative (PMI). The objective of the project is to limit exposure to malaria and reduce the incidence and prevalence of malaria. To achieve this objective, AIRS Rwanda conducted IRS from February – March 2014 targeting 124,012 structures in 20 of 42 sectors in three districts, Bugesera (6 sectors), Gisagara (6 sectors), and Nyagatare (8 sectors), using Bendiocarb (a carbamate).

The following are project achievements and key highlights of the February 2014 spray campaign (see Table 1), which lasted 24 operational days:

- A total of 123,919 structures were sprayed out of 125,629 structures found by spray operators in the targeted districts, accounting for a coverage rate of 98.6%. In total, 512,789 residents were protected, including 75,753 (14.8 %) children under five years old and 8,547 (1.7 %) pregnant women.
- A total of 121,574 structures were mobilized and 83,811 brochures were distributed during the mobilization exercise.
- A total of 3,398 individuals were trained using PMI funds to support IRS activities in the three districts. Of these, 877 were spray operators (SOPs) (360 males and 517 females), 165 were team leaders (92 males and 73 females), and 1,791 were village IEC mobilizers (1,663 males and 128 females). Almost 60% of all SOPs trained to implement IRS were female. Overall, 27.2% (n=924) of all IRS trained personnel in February 2014 were female.
- A total of 95,922 sachets of insecticide were used to spray 123,919 structures in the three IRS districts, with a utilization ratio of approximately 1:1.3 (sachet to structures sprayed).
- A total of 209 dormitories in 21 schools, 3 prisons and 2 refugee camps were sprayed in the target districts protecting 4,571 residents. A total of 262 sachets of insecticide were used.
- All (1,632 kg) IRS insecticide contaminated wastes, including 96,184 empty sachets and 25,572 used masks, were incinerated at three different incineration plants- Gahini Hospital incineration plant for wastes from Nyagatare, Kibilizi Hospital incineration plant for wastes from Gisagara and Gatsata incineration plant for wastes from Bugesera. Other solid wastes, including used gloves, worn-out boots, damaged barrels and other plastic items were recycled at the Entreprise pour la Protection de l'Environnement et Developement Rural (EPEDR) Recycling plant. A total of 1,572 uncontaminated paper cartons were donated to Cards from Africa Company at Samuduha in Kigali. Other uncontaminated wastes, such as empty boxes and papers, were disposed of at the Nduba dumping site.
- Wall bioassays conducted within one week of spraying in February 2014 to assess the quality of spraying in the target districts recorded mosquito mortalities ranging from 99 to 100%. One month post-IRS, average percentage mortalities of 100%, 98.3% and 100% were recorded for Gisagara, Bugesera and Nyagatare, respectively.

TABLE 1: AIRS RWANDA IRS CAMPAIGN SUMMARY: FEBRUARY 2014

Number of districts covered by PMI-supported IRS	3 districts (Bugesera, Gisagara, and Nyagatare)
Insecticide	Carbamates
Number of structures covered by PMI-supported IRS	123,919
Number of structures targeted by PMI-supported IRS	125,629
Spray coverage	98.6%
Population protected by PMI-supported IRS	512,789 (8,547 pregnant women, 75,753 children less than 5 years old)
Dates of PMI-supported IRS campaign	February 10 - March 8, 2014
Length of campaign	24 days
Number of people trained with USG funds to deliver IRS	1,180

I. COUNTRY BACKGROUND

Rwanda covers an area of approximately 26,338 square kilometers with a population of approximately 11 million people. The entire population is at risk of malaria, including an estimated 1.8 million children under five years of age and 450,000 pregnant women per year.¹ The country has two distinct malaria epidemiological strata: in two thirds of the districts, malaria is characterized by seasonal peaks of transmission, and in the remaining one-third of the districts, malaria transmission is comparatively stable year-round.² Climate and altitude are major factors that influence malaria prevalence in the country. Other contributors are: high human concentration, population movement (especially from areas of low transmission to high transmission), irrigation schemes (especially in the eastern and southern parts of the country), and cross-border movement of people (especially in the eastern and southeast parts of the country). Based on the insecticide resistance management (IRM) plan and the Malaria Strategic Plan 2013 -2018, the Malaria and Other Parasitic Diseases Division (MOPDD) intends to target interventions based on the changing malaria epidemiology given the significant decline in the burden of malaria in Rwanda and the accompanying high coverage of malaria control interventions nationwide.³

Among the malaria control strategies applied in Rwanda, IRS has been featured since 2007. Beginning in 2008, declining malaria incidence in some areas prompted adjustments, from district-wide blanket IRS coverage, to more targeted focal spraying to cover high risk areas. With time, the focal targets were reconsidered because of generalized increases in malaria caseloads, but the expansion to cover entire districts depended on the availability of resources. Much of the IRS in Rwanda has been funded by the President's Malaria Initiative (PMI). In August 2011, Abt Associates was contracted by PMI to implement IRS in Rwanda under the Africa Indoor Residual Spraying (AIRS) Project. PMI and the Rwanda Ministry of Health (MOH), through MOPDD, identified three high-burden malaria districts in which to implement IRS. The three IRS districts were Bugesera, Gisagara and Nyagatare, with a total of 242,461 structures. A total of 236,610 structures in 42 sectors were sprayed in August - September of 2012 using a pyrethroid (Deltamethrin WG 250). Considering that malaria transmission takes place year round and peaks during the periods of October - December and March - May, a second spray round was conducted in February 2013 using a pyrethroid (Deltamethrin WG 250) to supplement the August - September 2012 spray round. This was done in order to ensure protection for the population during the two major transmission seasons. Twenty sectors were selected for the February 2013 IRS campaign in the three IRS districts. The sector selection was based on their high malaria prevalence, as was evidenced from malaria cases reported in 2012 from the health facilities serving the sectors. In September 2013, a total of 37 sectors were selected in the same three districts for IRS.

¹ 2012 Population and Housing Census, Nov 2012

² Trends in malaria cases, hospital admissions and deaths following scale-up of antimalarial interventions, 2000-2010, Rwanda, (Karema *et al*, 2012)

³ Malaria Strategic Plan 2012-2017

Working in collaboration with the MOH/MOPDD and other stakeholders, Abt Associates was tasked to achieve at least 85 percent spray coverage in the IRS target districts targeting 219,462 structures using a carbamate in Nyagatare and a pyrethroid in Bugesera and Gisagara districts.

In February 2014, a total of 20 out of 42 sectors in the three IRS districts were selected with a total 124,012 structures. In addition, the project provided technical support in the following activities:

- Training, capacity building, and advocacy at the national and district level as a means of achieving IRS sustainability. This included building the capacity of government officials and partners to undertake high-quality IRS.
- Daily and weekly monitoring of the IRS program via supervision of spray quality and data collection and data entry using the *AIRS M&E Supervisory Tools*.
- Logistics assessment and coordination of all procurement, shipping, delivery, and storage of spray pumps, spare parts, insecticides, and personal protective equipment (PPE).
- Safe and correct insecticide application, thus minimizing human and environmental exposure to IRS insecticides, in compliance with the Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) and Supplemental Environmental Assessment (SEA).
- Coordination of information, education and communication (IEC), sensitization, and mobilization activities with other stakeholders to raise the populations' awareness of IRS and to encourage ownership.

2. PRE-SEASON ACTIVITIES

2.1 SELECTION OF IRS DISTRICTS AND SECTORS

Three districts, Bugesera, Gisagara and Nyagatare, were selected for IRS during the February 2014 campaign (see Figure 1 below). The IRS districts were selected based on the malaria burden as was reported in the epidemiological data from health facilities. A total of 125,629 structures were targeted for spraying in 20 sectors.

FIGURE 1: MAP OF RWANDA SHOWING THE THREE IRS TARGET DISTRICTS

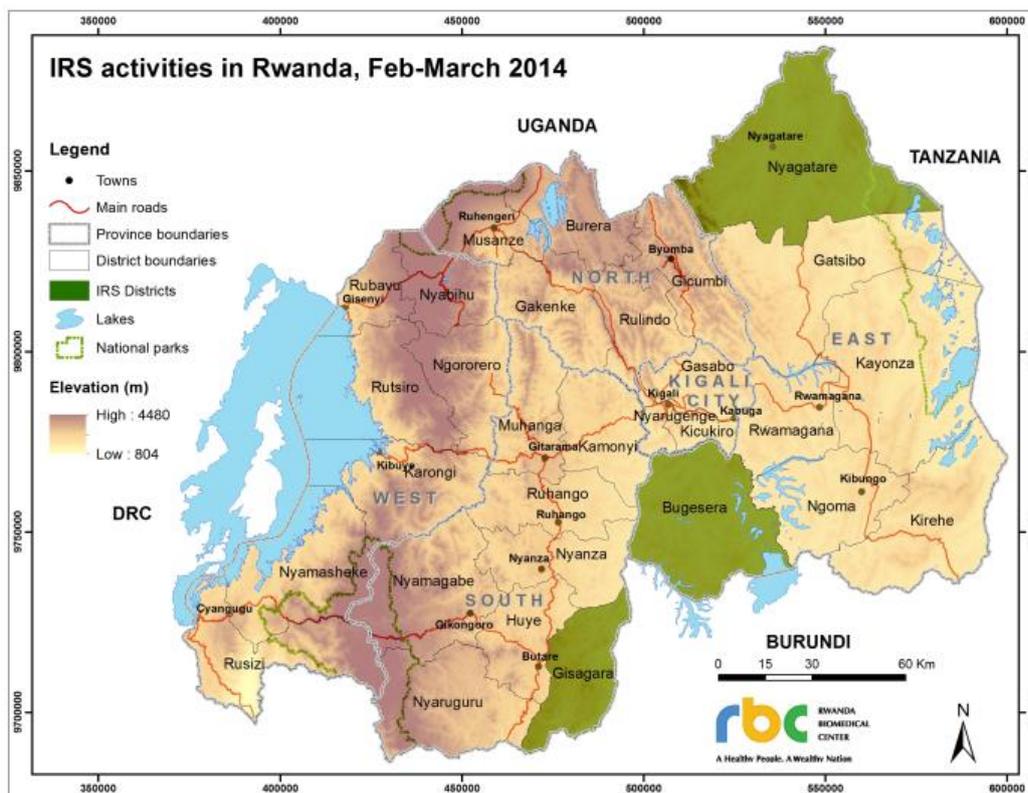


Table 2 shows a summary of the number of target structures and the target population in the 20 sectors.

TABLE 2: TARGET STRUCTURES FOR IRS ROUND II

District	Number of Sectors	Number of Target Structures	Target Population	
			Females	Males
Bugesera	6 of 15	32,260	66,314	60,577
Gisagara	6 of 13	35,800	79,184	70,323
Nyagatare	8 of 14	55,952	119,599	111,656
Total	20 of 42	124,012	265,097	242,556

2.2 DISTRICT PLANNING MEETINGS

Following the choice of the target sectors in the three IRS districts, collaboration and coordination between stakeholders was intensified. Micro-planning meetings with district and sector authorities in the three districts and 20 sectors were conducted in December 2013. In total, 119 participants (91 males and 28 females) attended micro-planning meetings in Bugesera, Gisagara and Nyagatare districts. In each of the districts, a one-day planning meeting was organized to discuss and develop an IRS operational plan with local leaders. In addition, the roles and responsibilities of each of the partners were discussed and agreed upon. The issues discussed during the micro-planning meetings included:

- Recruitment of IEC Mobilizers and SOPs;
- Community mobilization plan for IRS;
- Role of districts/sectors in the provision of IRS operational site offices and stores;
- Role of local leaders in supervision of IRS activities during the IRS operations; and
- Participation at weekly meetings at the sector level.

2.3 INSECTICIDE SELECTION

A carbamate, Bendiocarb (Ficam 80 WP), was used during the February 2014 IRS campaign in the three districts. The selection was based on data obtained from insecticide susceptibility assays that were carried out in 2013. The susceptibility assays showed that the predominant local vector species (i.e. *Anopheles gambiae*) exhibited varying levels of susceptibility to the different classes of insecticides (see Annex 1). Within the carbamate class, the local vector species in the IRS target districts sites showed between 84% and 100% mortalities.

In addition, the Rwanda insecticide resistance management (IRM)⁴ plan states that in a bid to manage the development of insecticide resistance, specifically pyrethroid resistance, IRS will be conducted with a phased transition to a carbamate for two years (2013 and 2014) followed by a phased transition to organophosphate (pirimiphos methyl-Actellic CS) for two years in 2015 and 2016. Rotation will be the main strategy implemented in the mid-term of four years with a hope that IRS will graduate from sector-wide spraying to focalized cell-level spraying by 2017. A switch to carbamates was thus implemented (see Annex 2, MoH Letter on Insecticide Choice for 2013/2014, dated 22 March 2013).

⁴ Rwanda Strategic Plan for Insecticide Resistance Management in Malaria Vectors.(2013–2017)

2.4 LOGISTICS NEEDS AND PROCUREMENT

The central AIRS warehouse at the Kicukiro Small Scale Industrial area in Kigali served as the hub for storage of IRS commodities, including housing insecticides before distribution to the target districts. Besides reference to the inventory records from the previous IRS campaign, a logistics needs assessment was conducted in November 2013. During the logistics needs assessment the following were considered:

- Available stock of materials, consumables, and equipment;
- Transport arrangements, including vehicle hiring for spray operations and supervision;
- Estimation of insecticide, PPE, and spray equipment required to meet the needs of spraying; and
- Mobilization and distribution of equipment, materials, and supplies (see Annex 3).

2.4.1 INTERNATIONAL PROCUREMENT

Internationally procured commodities included 104,986 sachets of carbamate insecticide (Ficam VC 80 WP). Table 3 shows the items and quantities that were procured internationally.

TABLE 3: INTERNATIONAL PURCHASES

Description	Quantity in Stock Before Campaign	Quantity Received	Total Quantity	Quantity Used	Quantity Damaged	Quantity in Stock after the Campaign
Spray pump repair kits	13	30	43	4	0	39
USAID stickers	637	853	1,490	396	0	1,094
Respiratory masks	20,784	51,720	72,504	25,662	0	46,842
First aid kits	23	177	200	101	0	99
Latex nitrile gloves	3,575	6,192	9,767	1,923	1,829	7,938
Insecticide sachets (Ficam VC 80WP)	16,886	104,986	121872	96,184	1	25,687
Pressure gauges	7	89	96	70	0	26
Shutoff valves	0	200	200	50	0	150
Spray control valves	0	500	500	50	0	450
Shutoff cocks	0	50	50	0	0	50
Male fittings for strainer	253	197	450	20	0	177

housing						
Nozzle gaskets	81	919	1,000	769	0	231
Pump strainers	161	839	1000	200	0	800
Aprons	87	96	183	73	73	110
Digital thermometers	10	45	55	27	1	54

2.4.2 LOCAL PROCUREMENT

Local procurement involved an open competitive tendering process in which a solicitation for quotes for the services of items was performed. The selection was done by the Abt Associates Rwanda procurement committee based on the lowest technically acceptable bid according to the criteria given in the solicitation for the quotations. The services/items procured locally included the following. Please see Annex 3 for the detailed list.

- Transportation services for IRS planning, operations and supervision;
- Printed materials for IEC, IRS data collection and commodity tracking;
- Operation site refurbishment materials, including materials for soak pits; and
- Food vendors for SOP breakfasts and training.

2.4.3 MATERIAL DISTRIBUTION TO THE DISTRICTS AND OPERATION SITES

Following the September 2013 IRS campaign, IRS materials, such as coveralls, boots, helmets and pumps, were retained in the district storage facilities. Other items, such as respiratory masks, gloves and insecticide, were distributed from the central warehouse to the district stores in January and February 2014. Further distribution of the materials to the operation sites was done based on the number of target structures to be sprayed and the number of support staff (see Table 4).

TABLE 4: IRS COMMODITY DISTRIBUTION

District	Coveralls	Boots	Helmets	Gloves	Respiratory Masks	Carbamate Sachets	Pumps
Bugesera	667	320	290	722	8973	26,400	283
Nyagatare	1,125	606	510	888	13,540	45,926	464
Gisagara	721	351	328	576	9,847	29,280	269

2.5 HUMAN RESOURCE REQUIREMENTS

The project recruited and deployed a total of 151 seasonal staff that provided support during the IRS operations across the three districts. Seasonal staff were comprised of 1 district coordinator, 3 district IEC assistants, 14 data clerks, 4 district storekeepers, 20 sector store keepers, 3 logistics assistants, 3 pump technicians, 3 finance assistants, 20 sector coordinators, 55 sector supervisors, 20 sector IEC assistants, and 3 office cleaners.

The implementation of IRS operations in the sectors was conducted by spray operators (835), team leaders (165), washers (71), cell IEC supervisors (111), and village IEC mobilizers (1,752). A total of 57 nurses (side effect managers) and security guards (48) provided IRS support at the sector level. Staff was recruited at the district level with assistance from local authorities and health centers, including the District Vice-Mayors, District Health Directors, Sector authorities and Health Center Chiefs. AIRS Rwanda hired 26.6% (n=849) females as seasonal staff. It is noteworthy that more than half of hired spray operators and team leaders (56.0 %) were female. Table 5 enumerates the IRS seasonal support staff by gender and district.

TABLE 5: SEASONAL IRS STAFF HIRED BY DISTRICT

Staff Position	Bugesera		Gisagara		Nyagatare		Total		% Females Hired
	Male	Female	Male	Female	Male	Female	Male	Female	
District Coordinators	1	0	0	0	0	0	1	0	0.0%
District IEC Assistants	1	0	1	0	0	1	2	1	33.3%
Data Clerks	2	2	2	2	2	4	6	8	57.1%
District Storekeepers	1	1	1	0	0	1	2	2	50.0%
Sector Storekeepers	3	3	4	2	4	4	11	9	45.0%
Logistics Assistants	0	1	0	1	1	0	1	2	66.7%
Finance Assistants	0	1	0	1	0	1	0	3	100.0%
Sector Coordinators	4	2	2	4	5	3	11	9	45.0%
Sector Supervisors	6	8	6	9	14	12	26	29	52.7%
Sectors IEC Assistants	1	5	5	1	7	1	13	7	35.0%
Spray Operators	80	139	118	124	150	224	348	487	58.3%
Team Leaders	24	19	33	14	35	40	92	73	44.2%
Cell IEC Supervisors	27	2	17	10	33	22	77	34	30.6%
Village IEC Mobilizers	472	28	486	40	683	43	1,641	111	6.3%
Security Guards	20	0	11	1	16	0	47	1	2.1%
Adverse effect Managers	6	7	11	5	15	13	32	25	43.9%
Washers	1	17	11	10	12	20	24	47	66.2%
Pump	1	0	1	0	1	0	3	0	0.0%

Technicians									
Cleaners	0	1	1	0	1	0	2	1	33.3%
Total	650	236	710	224	979	389	2,339	849	26.6%

2.6 IRS TRAININGS

Prior to the commencement of IRS activities, a team of Abt Associates staff members reviewed and updated the IRS training manuals and materials, including IRS brochures, data forms, supervision checklists and the IRS structure cards. In addition, training sites and external trainers were identified in advance of the trainings. The trainings covered the following key topics:

- Introduction to malaria control;
- IRS planning and logistics management;
- Spray techniques and processes;
- Environmental compliance and personal safety;
- Advocacy and social mobilization;
- IRS monitoring and evaluation; and
- Supervision of IRS activities.

2.6.1 TRAINING OF TRAINERS

A refresher training of trainers (ToT) was organized and conducted in collaboration with MOPDD on January 13-15, 2014. Since all participants had gone through the ToT during the February and/ or September 2013 IRS rounds, the ToT was mainly aimed at refreshing the participants' skills and knowledge of IRS. During the training, they received instructions on methods to conduct IRS training and supervision of the IRS implementers. The training consisted of both theory and practical sessions through group discussions, demonstrations, lectures and question and answer methods. The participants included 20 IRS sector coordinators and 61 IRS sector supervisors. After the ToT, the participants were assigned to different training sites in the IRS target districts to conduct IRS training for SOPs and Team Leaders (TLs). The number of trainers deployed to each of the training sites was based on the number of participants to be trained at each of the training sites. The number of trainers is shown in Table 6.

TABLE 6: NUMBERS OF TOT PARTICIPANTS, BY GENDER

IRS Role	Number of Participants		Total
	Male	Female	
Sector Coordinators	11	9	20
Sector Supervisors	30	31	61
Total	41	40	81

FIGURE 2: IRS PRACTICAL TRAINING SESSION



2.6.2 SPRAY OPERATOR AND TEAM LEADER TRAINING

The SOP and TL training was organized and conducted in close collaboration with district and sector authorities for five days during the period of March 3 - 7, 2014. In the three target districts, training sites were provided by sector authorities or rented by Abt Associates. The major objective of the training was to equip the SOPs and TLs with skills to conduct quality IRS.

Prior to training, all the SOPs and TLs went through a medical examination in their respective district hospitals to ensure that they were medically and physically fit to perform IRS activities. The females exposed to insecticide, including SOPs, TLs, storekeepers, sector supervisors, and sector coordinators, were also screened for pregnancy.

In addition, the SOPs and TLs had to fully meet the selection criteria to be eligible for training and IRS operations. The selection criteria required an SOP or TL to be:

- A native of the sector;
- A community health worker (CHW);
- Able to read and write; and
- Below 40 years of age.

The SOPs and TLs were taken through intensive five-day theory and practical sessions (see Annex 4) which covered content in:

- Introduction to malaria control;
- Spray techniques;
- Handling and managing insecticides;
- Handling and maintaining spray pumps;
- Personal and environmental safety;

- Leading a spraying team;
- Data collection and filling out data collection forms; and
- Basics of IEC for IRS.

A total of 1,042 SOPs were trained and details are provided in Table 7. A total of 95 facilitators (TOT participants) conducted the training.

TABLE 7: NUMBER OF SPRAY OPERATORS TRAINED TO IMPLEMENT IRS

District	Training Sites	Spray Operators - Newly Trained			Spray Operators - Previously Trained			Facilitators		
		Male	Female	% Female	Male	Female	% Female	Male	Female	% Female
Nyagatare	8	16	52	76.5%	176	227	56.3%	26	16	38.1%
Gisagara	6	43	60	58.3%	110	87	44.2%	13	14	51.9%
Bugesera	6	33	60	64.5%	74	104	58.4%	11	15	57.7%
Total	20	92	172	65.2%	360	418	53.7%	50	45	47.4%
		264 (25.3%)			778 (74.7%)			95		

2.6.3 DATA COLLECTION TRAINING

Between January and February 2014, the AIRS Rwanda team, led by the M&E and Database Managers, facilitated data collection training sessions during the ToT for sector coordinators, supervisors and sector IEC assistants. They also facilitated the data collection training for spray operators, team leaders, IEC mobilizers and data entry clerks. The training focused on the following key topics:

- Familiarity with data collection forms (spray operator and team leader forms, IEC village and cell mobilizer forms) and the AIRS Supervisory Toolkit;
- Understanding key IRS definitions (e.g. eligible structure) and indicators;
- Supervisory roles and responsibilities;
- Reviewing collected data and spotting irregularities;
- Timely, consistent, and accurate reporting;
- Setting appropriate and realistic reporting timelines;
- Establishing a backup reporting/ communication protocols;
- AIRS database and security protocols; and
- Data Quality Assurance and Control.

2.6.4 LOGISTICS TRAINING

All the staff who would be involved in logistics and storekeeping during the implementation of IRS was trained. Sector coordinators, sector supervisors and IEC assistants were given

basic skills in logistics and stores management during the ToT sessions. A comprehensive, one-day training was conducted for 29 logistics assistants and storekeepers (16 males and 13 females). Participants were trained on the following topics:

- Individual roles and responsibilities in logistics;
- Warehouse and commodity management;
- IRS transport management;
- Management of food vendors;
- IRS water management for cleaning of PPE and progressive rinsing;
- Soak pit management;
- Environmental compliance; and
- Understanding and preparing for post IRS activities.

2.6.5 WASHER TRAINING

A total of 71 washers were given a one-day refresher training/orientation at 20 operational sites in the three IRS districts before the commencement of IRS operations. Sector coordinators and sector supervisors were responsible for this refresher training at their respective operational sites. The washers were instructed on the use of PPE, soak pit maintenance, effluent waste disposal, and insecticide effects on humans and the environment. They were also advised on how to respond to insecticide adverse effects that they might experience. Table 8 shows the numbers of washers trained by gender per district.

TABLE 8: WASHERS TRAINED BY GENDER PER DISTRICT

District	Male	Female	% Females
Nyagatare	12	20	62.5%
Gisagara	11	10	47.6%
Bugesera	1	17	94.4%
Total	24	47	66.2%

Forty-eight security guards were given an orientation on fire security and a general security protocol for IRS stores. Sixty-two IRS drivers were given an orientation on safety procedures while transporting insecticides and the use of first aid kits. They were also trained on measures to take:

- while transporting spray operators to and from the field; and
- in case an accident occurs leading to an insecticide spill.

Table 9 shows the number staff in all roles trained to deliver IRS.

TABLE 9: PEOPLE TRAINED TO DELIVER IRS

Categories of Persons Trained	Training on IRS Delivery										Other Trainings														Total
	Training of Trainers		Spraying Operations		Data Capture		Logistics Training		Technical Maintenance		Structure Enumeration/ IEC TOT		Structure Enumeration/ IEC Training		Poison Control/ Environmental Compliance		Coveralls Washing		Fire Security		Finance		Transport Security		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Sector Coordinators	11	9																							20
Sector Supervisors	30	31																							61
Spray Operators			360	517																					877
Team Leaders			92	73																					165
Data Entry Clerks					8	8																			16
Logisticians							1	2																	3
District Store Keepers							2	2																	4
Sector Store Keepers							13	9																	22
Finance Assistants																					3	3			6
Pump Technicians									3	0															3
District IEC Assistants											2	1													3
Sector IEC Assistants											41	32													73
Cell IEC Mobilizers													77	35											112
Village IEC Mobilizers													1,663	128											1,791
AE Teams (Clinicians)															32	25									57
Envir. Comp Officers															3	1									4
Washers																	24	47							71
Security Guards																			47	1					48
Drivers																							62	0	62
TOTAL M/F	41	40	452	590	8	8	16	13	3	0	43	33	1,740	163	35	26	24	47	47	1	3	3	62	0	3,398
TOTAL/Training	81		1,042		16		29		3		76		1,903		61		71		48		6		62		3,398

3. INFORMATION, EDUCATION AND COMMUNICATION

To ensure effective community mobilization, AIRS Rwanda worked in close collaboration with MOPDD and district and sector authorities to train implementers and use diverse approaches and channels of communication to sensitize and mobilize communities.

3.1 TRAINING

3.1.1 TRAINING OF TRAINERS

A one-day ToT on mobilization was conducted in Kigali on January 16, 2014 by AIRS Rwanda in collaboration with MOPDD. The trainees included the District Coordinators, District IEC Assistants, Sector IEC Assistants, Sector Supervisors and Sector Coordinators. They were trained on how to conduct training of IEC mobilizers at the cell and village level, and to be in charge of coordinating and supervising all IEC/IRS activities. A total of 76 candidates (43 males and 33 females) participated in this training, 3 District IEC Assistants, 20 Sector IEC Assistants, 20 Sector Coordinators, and 33 Sector Supervisors.

The main objective of the training was to strengthen participants' knowledge and capacity to train and disseminate IEC and behavior change communication (BCC) messages to IEC community mobilizers and to also effectively plan, coordinate and supervise IEC IRS activities. The training included both theory and practical sessions among which were mock sessions to practice IRS mobilization and filling of data collection tools. The trainees were also taught how to develop and update a community mobilization plan.

3.1.2 TRAINING OF IEC COMMUNITY MOBILIZERS

The training of IEC mobilizers was conducted on January 28-29, 2014 in Bugesera, Gisagara and Nyagatare districts in designated training sites in the sectors. The trainees were village and cell leaders who were recruited based on the following criteria: one had to be a cell or village leader and/or in charge of security at the village level, was of good conduct, respectable, able to read and write, and known by the community. The trainings, which were held at the sector level, were facilitated by the Sector IEC Assistants together with Sector Coordinators and Sector Supervisors with help from District Coordinators, District IEC Assistants and local leaders at the sector and cell levels. Overall coordination was done by AIRS Rwanda staff. The IEC mobilizers were trained on the basics of malaria control and IRS and how to:

- Identify eligible structures for IRS in the three targeted districts;
- Promote understanding and acceptance of IRS by educating the community about the purpose of the IRS campaign;
- Inform beneficiaries about the benefits of IRS;
- Address common myths and misconceptions about IRS;
- Discuss with structure owners their role before, during and after spray operations to ensure a safe and successful IRS campaign; and

- Create a more long-term or sustainable awareness of the program by involving and engaging key community stakeholders.

A total of 1,903 mobilizers (163 females and 1,740 males) at the cell and village level were trained. Each sector and cell team also developed an individual community mobilization implementation plan. Table 10 below shows the number of mobilizers trained by district.

TABLE 10: NUMBER OF IEC MOBILIZERS TRAINED TO IMPLEMENT IRS

District	Number of IEC Mobilizers Trained				TOTAL	% Females Trained
	Cell		Village			
	Male	Female	Male	Female		
Bugesera	27	2	481	34	544	6.6%
Gisagara	10	10	492	46	565	9.9%
Nyagatare	33	23	690	48	794	8.9%
TOTAL	77	35	1,663	128	1,903	8.6 %

3.2 DOOR-TO-DOOR MOBILIZATION⁵

Door-to-door mobilization of structures was conducted for two to four days in each village during the period of February 8 - March 7, 2014. During this exercise, village mobilizers reached eligible structures with IRS messages and distributed IRS structure cards to those who lost/never received cards, and brochures to eligible structures. They also collected data using the IEC Mobilizer Form and communicated the dates of spraying to the structure owners. They marked the outside doors of the structures that were mobilized with the IRS structure number located on the IRS card (Figure 3). A total of 121,574 structures were mobilized with a 99.0% IRS acceptance rate recorded. Some 83,811 brochures were distributed. Table 11 shows the results of the mobilization activity during the IRS spray round. Sector IEC Assistants, with support from the sector and cell social affairs officers, oversaw the implementation of this activity. They also reviewed the data collected and IRS cards issued to the structures to ensure accuracy and completeness of the data collected.

FIGURE 3: MOBILIZATION



⁵ Mobilization results were calculated using *totals* data (vs. *details* data.)

TABLE II: RESULTS OF IRS MOBILIZATION ACTIVITY

District	Structures Sensitized	Adults Reached with IRS Messages		Structures Accepting IRS	% Structures Accepting IRS	Brochures Distributed
		Male	Female			
Bugesera	32,864	32,152	39,679	32,345	98.4%	28,942
Gisagara	34,356	33,130	42,519	34,293	99.8%	25,912
Nyagatare	54,354	51,495	62,921	53,718	98.8%	28,957
TOTAL	121,574	116,777	145,119	120,356	99.0%	83,811

3.3 IEC COORDINATION

During the entire period of spraying, local leaders at all levels readily provided support. Sector executives and social affairs officers were very instrumental in linking spray operations teams to target communities. Each of the IRS districts had a district IEC staff member who coordinated and supervised district IEC activities. They worked closely with the District Vice-Mayors in charge of social affairs and district health officers to supervise the district IEC activities. Sector IEC staff worked closely with sector and cell social affairs, and sector coordinators to supervise the sector IEC activities. The Sector IEC supervisors issued the village mobilizers the materials (structure cards, brochures and IEC data collection tools) a day before the mobilization date of the village. The supervision team ensured that the cell and village mobilizers mobilized all eligible structures; all structure owners were informed of the date of spraying, at least a day in advance; and that the data collected was accurate. IEC teams worked according to the updated IRS schedule each day.

On the actual spraying date, the IEC mobilizers directed spray operators to the mobilized structures. The IEC mobilizers also noted structures that were not sprayed on the planned day and coordinated with spray operators to have them sprayed the following day.

3.4 OTHER IEC ACTIVITIES

3.4.1 COMMUNITY MOBILIZATION MEETINGS BY LOCAL LEADERS

Local leaders actively participated in mobilization activities. This was due to early advocacy and engagement from both Abt and the MOPDD. The District Health Director of Nyagatare District visited Katabagemu and Mimuli Sector in the field on February 18 -19, 2014 and Nyagatare Sector on March 4, 2014 to mobilize local people to participate in IRS. The sector executive secretaries and social affairs officers supervised the IRS activities and occasionally led IRS teams to mobilize the community, especially in cases where the communities tended to resist. The cell social affairs were in charge of supervising the mobilization activities in their respective cells.

3.4.2 MONTHLY COMMUNITY WORK (UMUGANDA)

In order to promote community cohesion, Rwanda has set aside the last Saturday (8 am to 11 am) of each month as a community service day, locally referred to as 'Umuganda'. On

this day, all other activities are usually halted except for the Umuganda activities. During Umuganda the community conducts communal activities and also takes time to discuss ways of promoting development activities in the society. During the spray campaign period Umuganda was conducted on February 22, 2014.

AIRS had earlier collaborated with the local leaders to include IRS as part of the Umuganda agenda to sensitize the community on the ongoing IRS activities. The IRS district and sector support teams participated in Umuganda at various sites and shared IRS messages with the community through the local authorities, specifically the cell and villages leaders who are also the IEC mobilizers for IRS. The main message was to encourage the community members to prioritize the spraying of their houses, since the spraying season coincided with the season in which they prepare their farms for planting and harvesting. The Vice Mayors and Sector Executive secretaries helped deliver the IRS message to the population in the IRS districts.

3.4.3 MASS MEDIA COMMUNICATION

Radio spots were aired twice daily from February 3 - 19, 2014 for Gisagara, Bugesera and Nyagatare District. The key messages relayed during the radio spots were the importance of IRS in the fight against malaria, the IRS campaign dates, the role of the community in IRS activities (before, during and after spraying), adverse effects management, and information on the funding agency.

Mass media communication was further enriched using 23 banners which were placed at IRS district offices (3) and at sector administrative offices (20). The message printed on the banners was “Birakureba” (Kinyarwanda for “This concerns you”) (see Figure 4). Table 12 presents details on the mass media communication activities done during the IRS operations.

FIGURE 4: IRS BANNER



TABLE 12: MASS MEDIA COMMUNICATION ACTIVITIES

Dates	Type of IEC Activity/Material	Frequency/Number Produced
February 3 - 19, 2014	Radio spots aired 2 times per day for each radio station	32 times on Radio Huye station, Gisagara 32 times on Radio Huguka, Bugesera 32 times on Radio Nyagatare station
February 3 - March 3, 2014	IRS Banner	1 banner at each IRS District office and 1 at each sector administrative office.

4. IMPLEMENTATION OF IRS

The 11th round of IRS implementation was carried out over a 24-day period from February 10 - March 8 in Bugesera and Gisagara, and Nyagatare districts.

4.1 IRS SUPERVISION

IRS supervision was conducted by a team from Abt Associates, MOH/MOPDD, PMI, and local authorities at both the district and sector levels. During the IRS campaign, supervision of the spray operations was ensured at all levels. To achieve this, a structure was set up such that:

- Spray operators were grouped into teams of five. Each team was supervised by a team leader.
- A sector supervisor was responsible for supervising three such teams. Supervisors reported directly to the sector coordinator, who in turn reported to the district coordinator.
- A full-time AIRS staff member was appointed to be in charge of each district to coordinate routine daily supervision by working closely with the district staff and all other supervisors (from AIRS and other stakeholders). At least three AIRS staff was in the field Monday through Thursday every week in each district to provide supportive supervision to the district staff.
- A supervision plan was put in place to ensure consistency and coordination of supervision and proper follow-up of corrective measures in order to improve the spray operations performance.
- Local government officers (sector social affairs officers and district environmental officers) dedicated two days each week to IRS supervision. The District Vice Mayors and Sector Executive secretaries occasionally visited the teams in the field to supervise the operations.
- Supervision was also augmented by use of supervision checklists (see Annex 5), which were used as tools to assess the daily performance of spray operators and team leaders, adherence to environmental compliance requirements, data collection and data entry.
- Regular meetings were held at all levels (national, district and sector) to review the progress of IRS and check on implementation of recommendations reached during the operations.

Table 13 summarizes the institutions/stakeholders which participated in supervision.

TABLE 13: INSTITUTIONS/ STAKEHOLDERS THAT PARTICIPATED IN IRS SUPERVISION

Level	Institution	Responsibilities
National Level	MOH/MOPDD/Rwanda Biomedical Center (RBC), USAID/PMI Abt Associates	Overall supervision for IRS activities
District and Sector Level (Local Authorities)	District Vice-Mayor/Social Affairs District Health Director District Environmental Health Officer Sector Social Affairs	Close supervision in districts and environmental protection

As part of supervision activities, AIRS supervisors convened at the Abt Kigali office every Friday during the IRS operations period for a feedback meeting to review the progress of IRS activities. Staff from MOPDD joined Abt staff in three of the progress review meetings. During these interactions, MOPDD representatives and the Abt Kigali team discussed the issues at hand and provided guidance to the district coordinators and the teams in the field.

4.2 LOGISTICS

4.2.1 IRS STORAGE AND INSECTICIDE STOCK MANAGEMENT

District level storage facilities in each district served as distribution centers for IRS materials, equipment, and supplies which were used during the IRS operations. The district storage facilities were attended by a logistics assistant and a storekeeper who also ensured distribution and close supervision of supplies and materials at the operation sites storage facilities. There were 20 storage facilities at the operation sites in the three districts, 7 of which were provided at the sector offices at no cost, as the district/sector authority's contribution to the IRS campaign. The other 13 facilities were rented at premises near the sector offices. Each of the Sector storekeepers was in charge of storage management at the sector level with oversight from the District Logistics Assistant and storekeeper.

Insecticide, other materials, and equipment stocks were carefully tracked and managed from the central warehouse to the district storage facility and subsequently to the operation sites storage facilities. Empty insecticide sachets were tracked daily at the sector and district stores. They were accounted for by recording how many insecticide sachets each spray operator or team or sector had received and used. All stock records were documented on stock cards.

4.2.2 IRS VEHICLES

A total of 70 vehicles were contracted for the support of the IRS operations in the three districts. Table 14 shows the number of vehicles assigned to each district.

TABLE 14: DISTRIBUTION OF VEHICLES IN THE DISTRICTS

District	Vehicles for SOPs	Vehicles for Supervision	Total
Bugesera	18	1	19
Gisagara	18	1	19
Nyagatare	30	2	32
Total	66	4	70

4.3 IRS PAYMENTS

Before the start of the spray operations, one-day refresher training was conducted bringing together District Coordinators (3) and Finance Assistants (3). The participants were briefed on responsibilities to ensure efficient management of funds and facilitation of logistical support. The responsibilities of the District Coordinator and the Finance Assistant included:

- Distribution and collection of signed contracts from all the seasonal staff (SOPs, TLs, washers, security guards and mobilizers).
- Collection of all timesheets for seasonal staff before preparing payrolls.
- Preparation of payrolls that were approved and submitted by the District Coordinator based on the schedule of payments made by the Finance Manager at the start of the IRS campaign.
- Follow up with the Savings and Credit Cooperatives (SACCO) banks (Microfinance Banks) to ensure that all the seasonal staff received their payments and signed the payroll.
- Collection of invoices from food vendors and sending them to the Abt Associates' Rwanda finance office for payments.
- Collection and reconciling of IRS vehicle logs sheets.

IRS support staffs hired by AIRS at the district level were paid through their bank accounts by electronic transfer. Other seasonal staffs at the sector level including SOPs, Team Leaders, Mobilizers, Washers and security guards were paid by transfer of funds to SACCO micro finance institutions in each sector. An agreement was established between each SACCO and AIRS in order to have this service made. After each payment, a copy of payroll signed by recipients was returned to the AIRS main office in Kigali as proof of payment.

5. Post-Season Activities

5.1 POST SEASON REVIEW MEETINGS

IRS evaluation/review meetings were conducted at the district level in order to:

- Review the overall IRS programmatic implementation process for the February 2014 spray round, experiences and achievements of the IRS round;
- Review IRS challenges in the three IRS target districts and come up with recommendations for the next spray cycle; and
- Reach a consensus on the recommendations and way forward for next spray cycles.

The review meetings were convened by district authorities in collaboration with the Abt Associates district teams. The aim of these meetings was to review the implementation of the IRS operations at the district level and to share experiences, challenges, and lessons learned in order to generate ideas on improving future spray operations. These meetings were attended by the following categories of people:

- District and Sector Authorities, including Army and Police Commanders in the district;
- Hospitals;
- MOH/MOPDD representatives; and
- Abt Associates staff.

The number of participants who attended the review meetings is shown in Table 15.

TABLE 15: EVALUATION MEETINGS PARTICIPANTS

District	Review Meeting Dates	Participants		Total
		Male	Female	
Bugesera	March 14, 2014	17	8	25
Gisagara	March 12, 2014	20	6	26
Nyagatare	March 13, 2014	14	9	23
Total		51	23	74

The summary of recommendations from review meetings were:

- Conduct training for district and sector authorities to enhance their knowledge and capacity for conducting and supervising IRS.
- Sector authorities and other stakeholders should use supervision checklists whenever they go out for supervision.
- The district/ sector authorities should enhance oversight of the recruitment process of SOPs so that only CHWs with previous IRS experience are considered and that

such recruitment should strictly adhere to all criteria laid down by the MOH.

- The agreed plan for the recruitment of SOPs whereby the President in-charge of CHWs at the sector takes overall responsibility for recruiting and list verified by the health facility in-charge, Sector Social Affairs and signed off by the Sector Executive Officer should be enhanced.
- The sector and district IRS support staff coordinates closely with the Sector Authorities so that IRS activities are not disrupted without sufficient notice. Cell and village leaders should dedicate more time and effort to IRS mobilization and implementation and each should provide feedback on structures in their villages that may have been missed by SOPs.

5.2 INVENTORY

Following completion of the IRS operations, all the commodities at the sector stores were transported to the district stores. The sector storekeepers updated their stock records and handed them over to the district storekeepers/logistics assistants. At the district stores, stock records were updated to show the remaining stock including the commodities that were retrieved from the sector stores and the district inventories were updated accordingly. One insecticide sachet was lost in Bugesera district in this spray round. The loss was reported to the local authorities and the police. The spray operator who reported the loss recorded a statement with the police. She was asked to retrace her movements on the spray day together with the village head and sector coordinator but this effort did not yield anything. She was relieved of her duties as a spray operator. Table 16 shows a summary of the remaining stock. See Annex 6 for detailed inventory.

TABLE 16: STOCK OF IRS COMMODITIES

Item	Quantity Before the Campaign	Unit	Quantity Used	Remaining Stock after the Campaign
Coveralls	5,485	Piece	2,513	5,485
Boots	1,980	Pair	1,277	1,829
Helmets	3,072	Piece	1,128	3,052
Head Gear	3,349	Piece	1,128	3,163
Inner part for Helmets	3,187	Piece	1,128	3,139
Face Shields	2,230	Piece	1,128	2,230
First Aid kits	200	Piece	101	99
Latex Nitrile Gloves	9,767	Pair	1,829	7,938
Respiratory Masks	72,504	Piece	25,662	46,842
Spray Pumps	1,772	Piece	1,016	1,772
Spray Pump Repair Kits	43	Kit	4	39
Nozzle Tips 8002E	113	Piece	40	73
Pump Hoses	70	Piece	0	70
Pressure Gauges	96	Piece	70	26
Extension Assembly	53	Piece	7	46
Bendiocarb Sachets	121,872	Sachet	96,184	25,687

6. MONITORING AND EVALUATION

Monitoring and evaluation for the February 2014 IRS campaign closely followed the processes outlined in the annual AIRS Rwanda Work Plans and the AIRS M&E Concept Paper developed by the AIRS Home Office team.

6.1 KEY OBJECTIVES

The key objectives of AIRS Rwanda M&E activities are:

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

6.2 DATA MANAGEMENT

All AIRS M&E protocol updates, including enhancements to the data collection tools, were incorporated before the start of mobilization and spray to ensure the collection, management, and reporting of high-quality data. The database served as a tool for implementation and management by tracking key performance and output indicators. The database also helped M&E and technical staffs produce “real-time” reports for quick feedback and to reconcile and prevent additional errors in data collection and entry through programmed audit checks and other data quality assurance measures.

Spray data were collected by spray operators, verified by team leaders and supervisors, and transmitted to the data centers for entry. Data clerks performed a final verification of spray form data and arithmetic before entering into the database. At the end of each day, the Database and M&E Managers reviewed the data entered for anomalies and addressed issues with data center staff. For quality control purposes and timely generation of weekly client spray progress reports, all data were entered within 48 hours of spraying. Daily Spray Operator and IEC/Mobilizer Forms were filed and archived at each of the data centers. A daily electronic back-up was performed to the AIRS Rwanda server and to an external hard drive for data safety and storage.

6.2.1 DATABASE PREPARATION

The AIRS Rwanda M&E team performed the following activities in preparation for the spray campaign:

- Reviewed the database, based on challenges and lessons learned from the last spray campaign, to make sure that data quality assurance and control of IRS data are upheld at all levels.

- Ensured IRS data security and storage for future reference through establishment and enforcement of proper protocols.
- Streamlined and standardized data information flow to minimize errors and facilitate timely reporting.
- Emphasized accuracy of both the data collection/verification and the data entry process through comprehensive trainings and supervision at all levels.
- Recruited and trained data clerks in data entry and data management.
- Facilitated training of data entry clerks, data cleaners, and M&E Assistants on the database.

Spray coverage was calculated with *details* data and is based on the total number of structures sprayed (numerator) against structures found by spray operators (denominator). A final count of “structures found” from the last spray campaign served as targets for tracking spray progress and performance at the sector- and district-levels.

6.3 DATA QUALITY ASSURANCE AND CONTROL

During the February 2014 spray round, AIRS Rwanda used the AIRS M&E Supervisory Toolkit, which consists of the following three tools to standardize and improve IRS supervision:

- Error Eliminator (EE) forms for mobilizer and spray data verify the completeness and correctness of data collected while in the field. These forms were used to ensure that data collection forms were filled out completely and properly. They highlight common errors that had been recorded in previous spray campaigns, to make it easier for supervisors to identify and make corrections where necessary. During the spray campaign, the EE for spray data were completed daily by team leaders, sector supervisors and coordinators, district IEC Assistants and Coordinators, M&E Assistants and Abt staff. The EE for mobilizer data was completed on daily basis by cell IEC Supervisors, Sector IEC Assistants, District IEC Assistants, District Coordinators, M&E Assistants and Abt staff.
- Data Collection Verification (DCV) forms check the accuracy of data collected in the field. Supervisors used the DCV to ensure that the data written on the Daily Spray Operator Forms matched the information reported by households. Sector Coordinators, District IEC Assistants, District Coordinators, M&E Assistants and Abt staff visited villages and interviewed households using the DCV form a few days after spraying.
- Data Entry Verification (DEV) forms verify data entry accuracy. The DEV forms were used by District Coordinators, M&E Assistants and Abt staff at each data center. (See Annex 5: Summary of M&E Supervision Checklists Completed by AIRS Staff).

Data quality assurance measures were performed daily during the IRS campaign by a variety of AIRS staff (i.e., team leaders, supervisors, sector coordinators, sector and district IEC Assistants, district coordinators, M&E Assistants and Abt staff). Annex 7 lists the number of spray operator and mobilizer forms checked for both data collection and data entry with the new supervisory tools. We provide more detail below about the specific activities we performed to ensure high-quality data, regarding physical data verification (spray and mobilization), database quality control, and random spot checks.

6.3.1 PHYSICAL DATA VERIFICATION

Physical data verification was performed at three different levels:

- Spray Operator/Mobilizer and Village IEC Level: 100% of spray and mobilizer data collected on SOP and Village IEC forms were reviewed, arithmetically verified, and signed off by the team leaders and sector supervisors.
- District Level: Sector and District Coordinators collected the Daily Spray Operator and Village IEC forms from team leaders and checked the accuracy of the spray and mobilizer data (100% of forms). Spray and mobilizer forms were then handed over to the M&E Assistant for data entry. Data forms were transmitted from the sectors to the district office every evening.
- Data Entry Level: Data clerks reviewed each form (100%) for typos and transcription errors and verified the arithmetic before entering the data into the database.

6.3.2 DATABASE QUALITY CONTROL

As in previous spray campaigns, the Access database used programmed audit checks and data locks that prevent data clerks from mis-entering data. For this particular campaign, however, Abt Associates' Client Technology Center (CTC) introduced SQL Servers to centralize and connect data clerk computers and avoid duplicate entries at each data center. The SQL servers also have the capacity and speed to process large amounts of data (more than 80,000 structures per data center). CTC also developed the IRS cleaning/reporting tool to help data clerks to clean and reconcile data. We hired sufficient data clerks this campaign to allow enough time for one clerk to use the IRS cleaning/reporting tool every day to clean data. As a result, data cleaning was completed immediately one day after data entry of all spray data. The cleaning/reporting tool also enabled them to generate local reports for each district.

Finally, data clerks performed double-data entry, whereby they initially entered spray *totals* data or a summary of each daily spray operator form in order to produce "real-time" reporting of spray progress. Thereafter, they entered spray *details* data (i.e. line-by-line or structure-by-structure), from which this End of Spray Report and all other client-submitted reports are generated. During a thorough cleaning process using the IRS cleaning/reporting tool, discrepancies between spray *totals* and *details* data were investigated and reconciled before finalizing and reporting campaign results. Corrections were made to the paper spray forms and the database, where necessary.

6.3.3 RANDOM SPOT CHECKS

The M&E and Database Managers performed daily data verification activities of the Access database to guarantee the quality of the data. They scanned the database and ran spray progress reports to identify anomalies and data entry errors. AIRS supervisory staff also retrieved paper spray forms and randomly crosschecked these with the data that had been entered into the database using the DEV in each data center. On average, 50 lines of data were verified by supervisory staff at each data center using the DEV on a daily basis. In the event they found discrepancies between data collected and data entered that could not be reconciled at the data center level, the M&E Manager contacted the field supervisor for clarification to resolve the issue. At the end of every day, the M&E Assistant used the DEV and IRS cleaner/reporter to identify data entry errors and provided corrections and feedback to the data clerks.

Finally, AIRS supervisory staff conducted field checks by visiting random structures found by spray operators (based on spray form records) and interviewed the residents to collect spray campaign information. Using the DCV, supervisory staff visited ~2,500 structures (2%) and compared the data collected from the field checks with data collected by spray operators on the data collection forms. Any discrepancies were addressed and rectified with the appropriate AIRS staff.

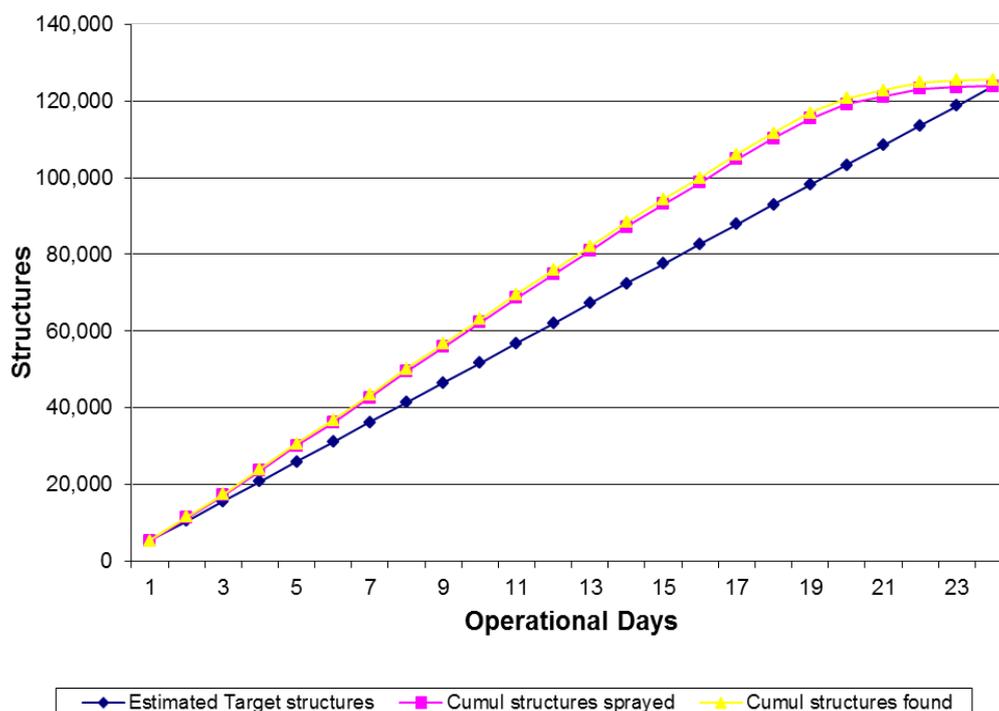
6.4 IRS RESULTS

During the spray campaign, 123,919 structures of the 125,629 structures found were sprayed, resulting in 98.6% spray coverage. A total of 512,789 people were protected, including 8,547 pregnant women and 75,753 children under five years old (see Table 17).

TABLE 17: SUMMARY OF RWANDA IRS RESULTS FOR FEBRUARY 2014 CAMPAIGN

District	Total Structures Found	Total Structures Sprayed	Spray Coverage (%)	Total Population Protected			
				Male	Female	Pregnant Women	Children <5 Years
Bugesera	33,620	32,825	97.6	63,100	68,264	2,355	20,163
Gisagara	35,185	34,671	98.5	69,830	77,539	2,329	22,719
Nyagatare	56,824	56,423	99.3	112,892	121,164	3,863	32,871
Total	125,629	123,919	98.6	245,822	266,967	8,547	75,753

FIGURE 5: IRS DAILY TRACKER



6.4.1 SCHOOLS, PRISONS AND REFUGEE CAMPS IN IRS TARGET DISTRICTS⁶

During the February 2014 spray campaign, a total of 209 dormitories were sprayed in 21 schools, 2 prisons and 3 refugee camps in the three IRS target districts, protecting 4,571 people. Two hundred and sixty two (262) insecticide sachets were used (see Table 18).

TABLE 18: IRS RESULTS FOR SCHOOLS, PRISONS AND REFUGEE CAMPS IN IRS DISTRICTS

District	Targets for schools/prisons	# Schools sprayed	# Refugee Camps sprayed	# Prisons sprayed	# Dormitories sprayed	Population Protected				Found Rooms	Sprayed Rooms	Mosquito Nets Available	Insecticide Used
						Male	Female	Pregnant Women	Children < 5 years				
Bugesera	4	5	-	-	15	646	457	0	0	37	37	420	116
Gisagara	5	2	1	1	26	381	402	2	21	32	29	607	27
Nyagatare	15	14	2	1	168	1,352	1,333	0	22	215	207	1,312	119
Total	24	21	3	2	209	2,379	2,192	2	43	284	273	2,339	262

6.4.2 INSECTICIDE USAGE

The total number of sachets used during the February 2014 campaign was 96,184 (95,922 and 262 sachets for structures and schools in the three target districts). On average, one sachet sprayed 1.3 structures (see Table 19). The average number of sachets used by a spray operator per day was 5.6, and each operator, on average, sprayed 7.2 structures per day in the three target districts.

TABLE 19: INSECTICIDE USAGE

District	Total Structures Sprayed	Total Sachets Used	Average Number of Sachets per Sprayed Structure	Average Number of Sachets per SOP per Day	Number of Structures sprayed per day per SOP
Bugesera	32,825	25,488	1.3	5.2	6.7
Gisagara	34,671	28,359	1.2	5.8	7.1
Nyagatare	56,423	42,075	1.3	5.7	7.7
Total	123,919	95,922	1.3	5.6	7.2

⁶ Spraying of special structures such as dormitories in schools, prisons and refugee camps is only reported in the EOSR, not in the weekly spray progress reports sent to PMI. Pregnant women and children under five were found in refugee camps sprayed.

7. ENVIRONMENTAL COMPLIANCE

7.1 PRE-SEASON ENVIRONMENTAL ASSESSMENT

During the period of January 26 - February 7, 2014, the Rwanda AIRS team conducted pre-spray environmental assessments in the three IRS districts at the operation sites at the sector level. This was done using smartphones which were pre-programmed with environmental assessment checklists. Data was entered in the e-forms on the smartphones while at the field operational sites and submitted to a central database on an automated server at Abt Associates' Bethesda office. A work list was generated which was then instantly shared with the AIRS Chief of Party (COP), Technical Manager and the Environmental Compliance Manager to guide them on the actions to be taken in preparing the operation sites for IRS. The assessments involved identifying storage facilities and determining the suitability of soak pits that were used in the previous IRS round. In total, 13 storage facilities were rented while 7 were provided by the sector authorities at the sector office premises. The refurbishments generally included fixing double locks on stores, reinforcing doors and windows, clearing bushes in and around the soak pits, adding compacted murrum, fixing a polythene sheet to the murrum, and fixing poles to further stabilize the fence. Table 20 shows the details of the refurbishments that were done at the operation sites.

TABLE 20: CONSTRUCTION AND REFURBISHMENTS AT IRS OPERATION SITES

District/Province	Number of Operation Sites	Site Refurbished (soak pit, storeroom, fence, etc.)
Bugesera/ Eastern Province	6	6 soak pits refurbished 1 office and storage facility provided by sector authorities 5 office and storage facilities rented
Nyagatare/ Eastern province	8	8 soak pits refurbished 1 new soak pit constructed 1 office and storage facility provided by sector authorities 7 offices and storage facilities were rented
Gisagara/ Southern Province	6	4 soak pits refurbished 2 new soak pits constructed 5 offices and storage facilities provided at the sector offices 1 office and storage facility rented

The 2012 SEA that was amended in 2013 in preparation for the February 2013 IRS campaign was sufficient for the February 2014 IRS campaign.

7.2 SAFETY AND ENVIRONMENTAL COMPLIANCE DURING

Prior to the start of operations, all spray operators, washers and supervisors underwent medical tests to ensure their fitness to participate in the IRS operations. The tests were comprised of a routine physical examination, pregnancy tests for all females including storekeepers, sector supervisors, sector coordinators, and hematocrit and liver function tests (AST, ALT). Anyone who was found unfit did not participate in the operations. During the medical examinations conducted in January 2014, 16 SOPs and washers were found unfit for IRS operations and were replaced immediately before IRS training and operations. The disqualified candidates either exhibited high levels of transaminases (7), low hematocrit levels (2) or were found to be pregnant (7). Table 21 shows the number of SOPs, washers and supervisors that underwent medical checkup in each IRS district.

Table 21: Medical Checkup for IRS staff

District	SOPs, Washers and supervisors examined		SOPs, Washers and supervisors found unfit	
	Male	Female	Male	Female
Nyagatare	199	324	5	6
Bugesera	106	197	0	1
Gisagara	167	173	0	4
Total	472	694	5	11

During IRS operations, all staff who took part in IRS was required to adhere to the requirements for environmental and human safety related to IRS. Mitigation measures were instituted through the provision of appropriate PPE to all spray personnel. PPE included coveralls, gloves, boots, helmets, face shields, and dust masks for use throughout the spray period.

Transportation of insecticides from the central warehouse to the district warehouses was accomplished using enclosed trucks. Distribution from the district warehouse to the operations sites was done using trucks covered with tarpaulins. Each vehicle was equipped with kits for spill management and first aid, Material Safety Data Sheets and accident/emergency procedures sheets. Spray operators were transported from the operational sites to the field using Daihatsu/Toyota trucks that were retrofitted with railings on the periphery and seating benches. Prior to their engagement, all the vehicles were inspected against the PMI BMPs to ensure compliance with safety and environmental requirements.

Soak pits were monitored throughout operations. Plastic sheeting used at the wash areas to ensure that insecticide contaminated effluent does not pollute the environment was replaced where and when it was deemed necessary. The soak pit and wash areas were fenced and gated to ensure that non-authorized entities did not access the premises. The progressive (triple) rinsing system was used at each soak pit for washing spray pumps. Trained washers washed the PPE over the soak pits at the end of each spray day. The spray operations teams also washed their bodies in the provided washrooms at the end of every work day to decontaminate themselves.

Mid-spray environmental compliance inspections were carried out during the spray operations in the three IRS districts to ensure that mitigation measures put in place during spray operations were adhered to. The inspection was done by Abt AIRS staff in conjunction with the district environmental officers using smartphones as well as paper checklists.

The inspection teams assessed the use of PPE during spraying and washing activities, stores records and arrangement, transportation of SOPs, and use of warning signs and first aid kits. Additionally, fire extinguishers in storerooms were inspected. The inspection teams also ensured that wastes were correctly handled and packed during the operations in preparation for disposal at the end of the operations. Preparations of households for spraying and the instructions given to residents on what to do during and after spraying operations were monitored. Part of the inspections also involved observing the spray operators in the field.

7.3 MANAGEMENT OF INSECTICIDE ADVERSE EFFECTS

Each of the three IRS districts had a team in charge of adverse effects. The team was comprised of a coordinator, a doctor who was based at the district hospital and two nurses based at each health center affiliated with each IRS operation site. These teams were responsible for addressing any adverse effects experienced by community members and/or the spray operations support staff during the spray operations. Before the start of the IRS operations, this team received refresher training at each district on management of IRS adverse effects. A total of 5 cases involving 2 SOPs and 3 residents were reported throughout spray operations. The associated symptoms of the reported cases were mild, limited to localized irritations of eyes or dermal corrosion and headaches. All of the cases were attended to appropriately and the persons affected recovered within a few hours of attention. Table 22 below provides a summary of the adverse effects that were reported in all districts and were attended to at either a health center or district hospital.

TABLE 22: NUMBER OF ADVERSE EFFECTS CASES

District	Number of Cases	Symptoms
Bugesera	5	Dermal irritation Eye irritation Headache
Nyagatare	0	
Gisagara	0	

7.4 POST-SEASON ENVIRONMENTAL ASSESSMENT

The post-season environmental assessment was conducted in the three districts using smartphones. During the assessment it was confirmed that all IRS items were collected from the operation sites and that insecticides and IRS wastes were taken to district storage facilities. Soak pits and their surroundings were well cleaned, covered, and the doors securely locked. AIRS agreed with the district and sector authorities that the sectors would provide security for the soak pits and wash areas to ensure that they are not vandalized during the non-spraying season. Stores were cleaned/ decontaminated before being handed over to the owners.

7.5 IRS WASTE DISPOSAL

IRS wastes were disposed at different sites according to the type generated during the IRS operations. Contaminated wastes were sent to 3 different incineration plants whose combustion temperature is 1100° Celsius for incineration. A total of 650 kg of contaminated wastes from Nyagatare district, comprising of 42,194 empty insecticide sachets and 10,754 used masks were sent to the Gahini Hospital incineration plant. A total number of 496 kg of contaminated wastes from Bugesera district comprising of 25,604 empty insecticide sachets and 7,298 used masks were sent to Gatsata incineration plant; 28,386 empty insecticide sachets and 7,520 used masks from Gisagara District were sent to Kibilizi Hospital incineration plant. Incineration certificates were issued by each of the incineration plants (Annex 7). Other wastes, including 145 pairs of worn-out boots, 1,829 used gloves, and assorted plastics items (13 damaged barrels, 1 jerry can and 28 basins) were disposed of at the Entreprise pour la Protection de l'Environnement et Développement Rural (EPEDR) Recycling plant. A total of 1,572 uncontaminated carton boxes were donated to Cards from Africa Company at Samuduha. Other uncontaminated wastes such as papers were disposed of at the Nduba dumping site.

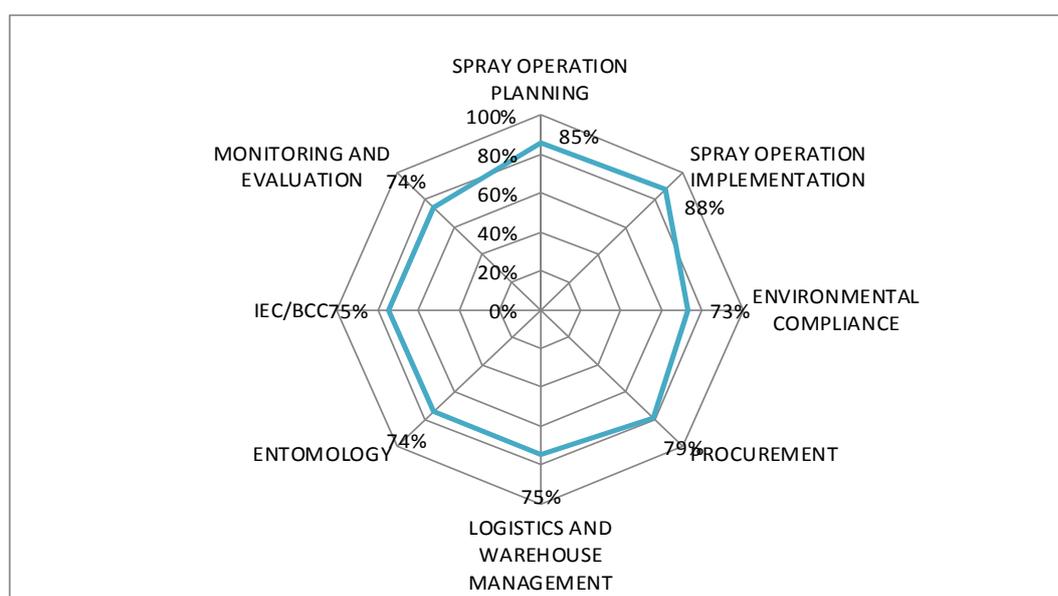
8. CAPACITY BUILDING OF THE MINISTRY OF HEALTH

IRS implementation was conducted in close collaboration with the MOH and district staff to promote sustainability. The MOPDD staff participated in the facilitation of the IEC and SOP ToTs. These trainings created a pool of trainers who will be very useful in the future depending on their availability. The trained IEC and SOP ToTs in turn facilitated the trainings for the IEC implementers and spray operators at the district and sector levels. The beneficiaries of these two trainings (IEC implementers and SOPs) were the cell and village heads, and community health workers (SOPs) who were involved in IEC and spraying activities respectively. Supervision of IRS operations was conducted in collaboration with MOPDD, district/sector staff (Vice Mayor-Social Affairs, District Health Director, District Environmental Health Officer, and Sector Social Affairs Officers). This staffs were all given orientations on IRS supervisory activities.

In addition, training was conducted in the districts bringing together environmental health officers and clinicians who would in turn play an important role in ensuring adherence to environmental compliance procedures and management of side effects, respectively.

In 2013, AIRS Rwanda initiated the IRS country capacity assessment framework analysis and engaged in the review and formalization process a majority of key in-country stakeholders including MOPDD, PMI Advisors and District Health Directors, among others. The joint review and discussions assessed capabilities of the MOH/ MOPDD in different IRS technical areas and came up with a capability matrix (Figure 6).

FIGURE 6: RESULTS OF RWANDA COUNTRY IRS CAPACITY ASSESSMENT



Subsequent to this formative assessment, AIRS Rwanda in collaboration with MOPDD and PMI Rwanda has, in January and February 2014, developed a draft capacity building plan to help mitigate the capacity gaps identified. Among the priority areas identified and which will be implemented in next 3 months include:

- Training of IRS focal points at district and sector levels in IRS implementation, supervision and management with focus on sustainability.
- Training of focal points at the MOPDD and districts in IRS M&E with focus on data collection, management, analysis and storage.
- Training of MOPDD and district staff in IRS logistics including warehouse and commodity management.

In 2014, AIRS Rwanda will continue to work with MOPDD and PMI to finalize the capacity building plan.

9. ENTOMOLOGY

Entomological monitoring is essential in any insecticide-based vector control intervention such as IRS. It ensures the quality of the vector control intervention as well as its efficacy. The entomological monitoring data is used to justify decisions such as the type of insecticide and selection of target areas. Working in collaboration with MOPDD, the IRS program implemented entomology activities aimed at:

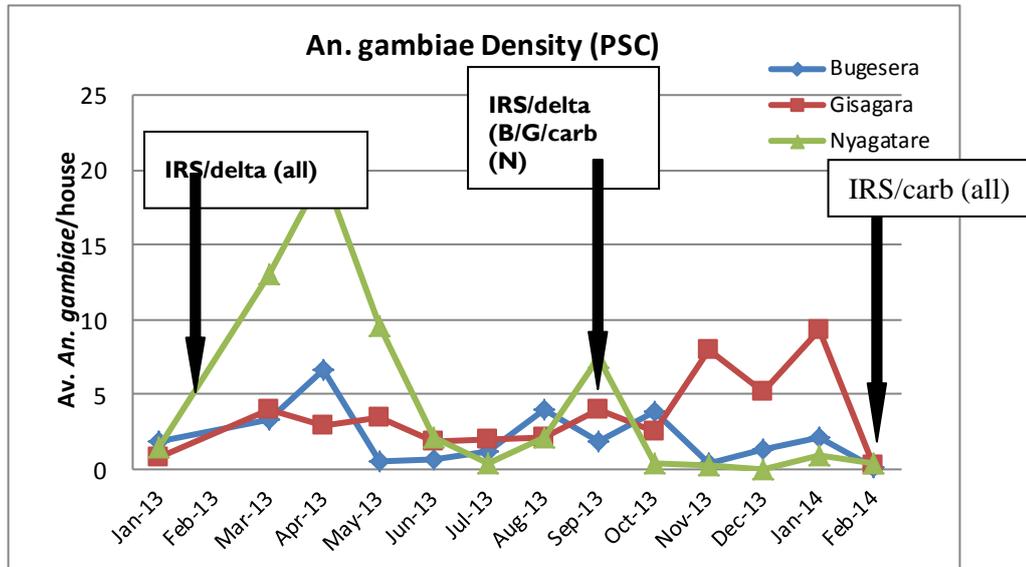
- Assessing malaria vector density and species composition in intervention areas;
- Establishing vector feeding time and location;
- Monitoring the quality of insecticide application and insecticide decay rates; and

9.1 VECTOR SPECIES COMPOSITION, DENSITIES, FEEDING TIME AND LOCATION

Monthly vector collections were done to assess the vector species composition, density and behavior in the three IRS districts using human landing collections (HLC) and pyrethrum spray catches (PSC). Vector density was calculated as the average number of *An. gambiae s.l.* collected per house per day from PSC data. The anopheles densities were highest during the periods March, to May and September 2013. The densities remained generally high in Gisagara during the period November 2013 to January 2014 but remained relatively low in Bugesera and Nyagatare during the same period (see Figure 7 and Annex 8). Of all the anophelines collected during this period, *Anopheles gambiae s.l.* was the predominant (96.14%) vector species. During the February 2013 IRS, all three districts used Pyrethroid (Deltamethrin 250 WG); in 2013 September, Deltamethrin 250 WG was used in Bugesera and Gisagara while Nyagatare sprayed using a carbamate (Ficam 80 WP). In February 2014, all the three districts used a carbamate (Ficam 80 WP).

Human biting rates were estimated using data from human landing catches. The data trends varied across the study sites. In each of the districts, both indoor and outdoor biting was observed to be almost equivalent (see Annex 9 and Annex 10). Ovary dissection of the *An. gambiae s.l.* collected by HLC was performed to determine the parity rates. Results did not show any definite trend across the study sites during the study period (see Annex 11).

Figure 7: ANOPHELES DENSITY



9.2 WALL BIOASSAYS

Cone bioassays were conducted in 36 sprayed structures in the three districts: within one week of spraying to assess the quality of spraying in February 2014 and monthly to determine the insecticide decay rate. In each district, two different sectors were sampled and in each sector, six structures were sampled. The structures sampled were of three different wall surfaces, namely: plastered and painted, plastered and not painted, and mud. For each of the three different wall surfaces, two structures were used for the tests in each sector.

Monthly WHO cone bioassay tests which were conducted following the September 2013 IRS campaign showed average mortality rates of 50.4% of susceptible *Anopheles gambiae* s.l. at four months post-spray (see Figure 8). During the February 2014 IRS campaign; the cone bioassays conducted for quality assurance showed mortality rates of 99-100% using susceptible *An. gambiae* s.l, indicating a good spray quality. One month post-spray (March) the cone bioassay assessments conducted in the three districts showed average percentage mortalities of 100, 98.3 and 100 for Gisagara, Bugesera and Nyagatare respectively (see Figure 9).

FIGURE 8: WALL BIOASSAY TEST RESULTS (SEPT 2013 – JAN 2014)

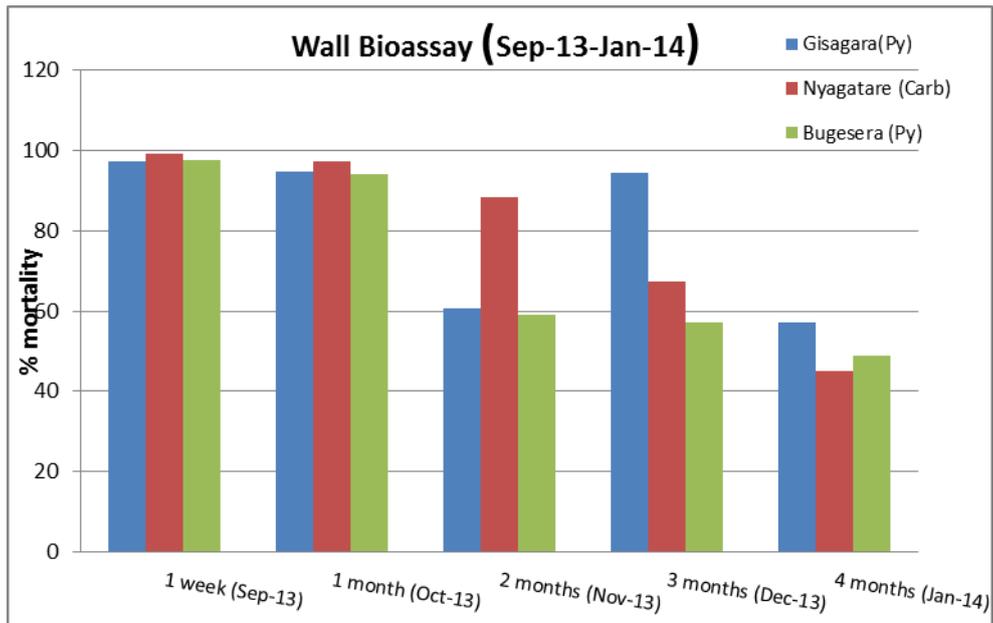
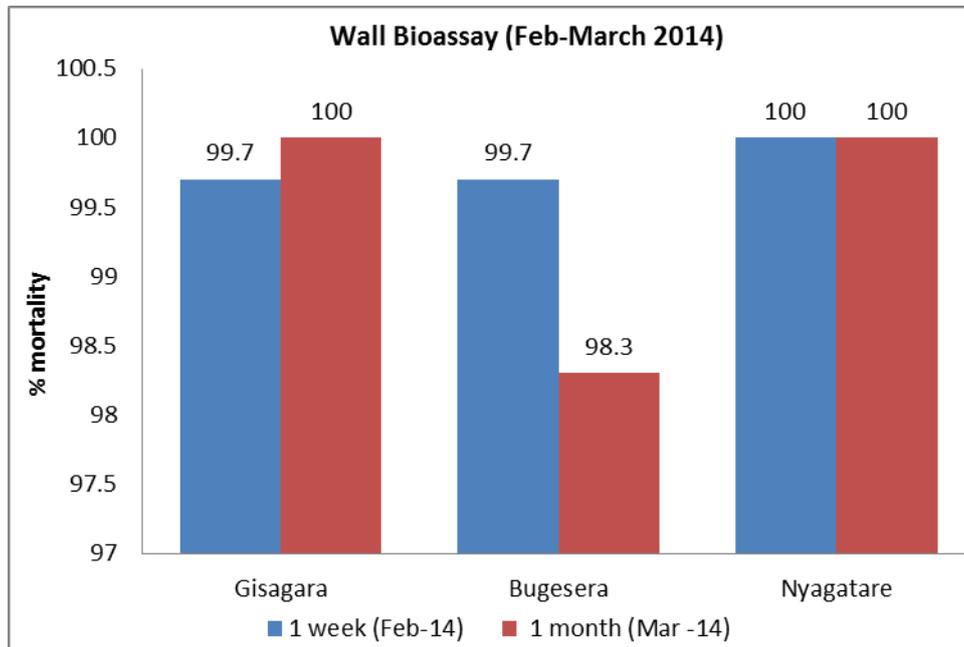


FIGURE 9: WALL BIOASSAYS (FEBRUARY 2014 IRS CAMPAIGN)



10. CHALLENGES, LESSONS

10.1 CHALLENGES

The main challenges experienced during the IRS campaign included:

- Migration/ relocation of people within or between sectors/ villages resulted in changes in the numbers of target structures.
- Local leaders at the district and sector level do not have enough knowledge of spraying techniques; hence their supervision is centered mainly on mobilization.
- Rainfall and bad terrain occasionally affected IRS operations and resulted in low coverage by SOPs on specific days.
- Absence of some households (1.4%) during time of spraying because of farming, market days, work days, funerals and some refusals meant that some structures could not be covered, even after mop-up.
- Competing government activities such as the ‘*Ndi Umunyarwanda*’ program during IRS at the sector level requiring the mobilizers (village leaders) to attend to other functions led to occasional interruption of spraying operations in some instances.

10.2 LESSONS LEARNED AND RECOMMENDATIONS

- Training of IRS focal persons at the district and sector levels is needed to strengthen their skills and knowledge in IRS operations, supervision and reporting.
- Recruitment of CHWs (SOPs) with past IRS experience as per the MOH recruitment protocol was instrumental in completion of the spray activities within the stipulated spray period and the procedure should be enhanced.
- The procedure for recruitment of SOPs by the in charge of CHWs at the Health Center, followed by verification and approval by the Head of Health Center, Sector Social affairs and the Sector Executive Officer should be adhered to.
- Enhanced supervision by the AIRS staff, MOPDD, district and sector staff and regular feedback meetings were instrumental to the smooth implementation and high spray coverage recorded.
- Data entry verification and data cleaning conducted regularly during IRS data entry was instrumental in identifying any errors and taking immediate remedial action. This also provided an opportunity for comparing insecticide used as per the database and daily logistics records.
- Data collection verification was conducted by all supervisors to validate the accuracy of data collected in the field by interviewing household owners. This provided an opportunity to confirm the correctness of SOP data records on regular basis leading to improved integrity of the IRS campaign.

ANNEXES

ANNEX I: SUMMARY OF 2012 INSECTICIDE SUSCEPTIBILITY TEST RESULTS (24 HOURS POST-EXPOSURE % MORTALITY)

Sites	Organo-chlorine	Carbamates	Organo-phosphates	Pyrethroids	
	DDT 4%	Bendiocarb 0.1%	Fenitrothion 1.0%	Deltamethrin 0.5%	Lamdacyhalothrin 0.75%
Mimuli (Nyagatare)	84	84	100	22.50	19.50
Kivumu (Rutsiro)	100	98.70	100	100	97.20
Rwaza (Musanze)	98.80	100	100	99	97.70
Mubuga (Karongi)	97	98	100	97	89.70
Mareba (Bugesera)	97	100	100	90	85.80

ANNEX 2: MOH LETTER ON INSECTICIDE SELECTION 2013/2014



ANNEX 3: LOCAL PROCUREMENT

Description	Quantity / Number
IRS Transportation	
Rented vehicles used in micro-planning and logistic assessments	6
Rented Vehicles used in IRS implementation	70
IRS Supervision vehicles(Country Office)	3
Rented vehicles that facilitated the Post IRS activities	16
Printed materials	
SOP Forms	5,429
Team Leader Forms	0
IRS Cards	80,601
Brochures	0
IEC Mobilizer Forms	0
IEC Implementer Form	0
Stock Cards	0
Delivery Note Books	0
Request Books	0
Goods Issued Note Books	20
Food Vendors	
Gisagara District	4
Nyagatare District	6
Bugesera District	4

ANNEX 4: SOP TRAINING PROGRAM

TIME	SUBJECT	FACILITOR
DAY I		
08.30am – 09.00am	Session I: Opening Ceremony	Sector Authorities
08.30am - 08.45am	Arrival and Registration	Sector Supervisor
08.45am – 09.00am	Introduction and Opening remarks	Sector Coordinator
09.15am – 09.30am	Objective of the training	Sector Coordinator
09.30am – 10.00am	Introduction to malaria control and indoor residual spraying	Trainer
10.00am – 11.00am	Parts of Compression Pumps handling, progressive rising and Pump maintenance	Trainer
11.30 am - 12.30pm	Introduction to the spraying surface	Trainers
12.30pm – 01.00pm	Safety of population and Environment	Trainers
01.00pm – 02.00pm	LUNCH	
02.00pm – 03.00pm	Personal Protection	Trainers
03.00pm - 04.00pm	Filling of daily collection data forms	
04.15pm - 04.45pm	Filling of Daily collection data forms	
04.45pm - 05.00pm	Filling day evaluation Chart	
DAY 2		
	Session 3: Safety of IRS	
08.00am - 09.00am	Filling of daily collection data forms	Trainers
09.00am – 10.00am	Preparing Structures for IRS, Community mobilization	Trainers
10.00am - 11.00am	Basics in Management of adverse effects	Sector Coordinator
11.00am - 01.00am	Supervision and reporting of all IRS activities (Use of supervision checklists)	Sector Coordinator
1.00pm – 2.00pm	Lunch	
2.00pm – 5.00 pm	Supervision and reporting of all IRS activities (Use of supervision checklists)	
DAY 3 - 5		
	Quality Control	
08.00am – 05.00am	Spraying Walls practices Maintaining 45cm distance from Walls Maintaining 75cm Swath and 5cm overlap Spray rhythm (Speed top – down)	Trainers
Closing		

ANNEX 5: SUMMARY OF M&E SUPERVISION CHECKLISTS COMPLETED BY AIRS STAFF

Type of Form	AIRS Staff	# Expected per week	Week 1		Week 2		Week 3		Week 4	
			# Verified	% Verified						
		Data Collection Forms								
EE for Spray Data	Team Leaders	4,962	4,173	84.1	4,520	91.1	4,535	91.4	2,103	42.4
	Sector Supervisors	4,962	1,249	25.2	1,149	23.2	1,178	23.7	556	11.2
	Sector Coordinators	4,962	410	8.3	445	9.0	435	8.8	172	3.5
	District IEC Assistants	4,962	31	0.6	44	0.9	50	1.0	23	0.5
	District Coordinator	4,962	18	0.4	10	0.2	26	0.5	24	0.5
	M&E Assistants	4,962	147	3.0	170	3.4	172	3.5	110	2.2
	Abt staff	4,962	19	0.4	61	1.2	45	0.9	30	0.6
EE for Mobilizer Data	Cell IEC Supervisors	2,480	277	11.2	372	15.0	296	11.9	120	4.8
	Sector IEC Assistants	2,480	307	12.4	458	18.5	393	15.8	150	6.0
	District IEC Assistants	2,480	18	0.7	44	1.8	60	2.4	17	0.7
	M&E Assistants	2,480	143	5.8	170	6.9	170	6.9	120	4.8
	Abt staff	2,480	12	0.5	24	1.0	28	1.1	30	1.2
		Structures								
DCV Form	Sector Coordinators	29,763	463	1.6	582	2.0	551	1.9	198	0.7
	District IEC Assistants	29,763	18	0.1	40	0.1	51	0.2	14	0.0
	District Coordinators	29,763	19	0.1	18	0.1	31	0.1	12	0.0
	M&E Assistants	29,763	116	0.4	151	0.5	119	0.4	60	0.2
	Abt Staff	29,763	43	0.1	39	0.1	36	0.1	30	0.1
DEV Form	M&E Assistants	29,763	140	0.5	131	0.4	179	0.6	110	0.4
	Abt Staff	29,763	42	0.1	30	0.1	30	0.1	30	0.1

ANNEX 6: STOCK UPDATE

Category	Item	Initial Stock	New Procurement	Used	Equipment Damaged/ Needing Repair)	Usable Stock Remaining
PPE						
	Coveralls	5485	0	2,513	282	5,485
	Boots	1,980	0	1,277	151	1,829
	Helmets	3,072	0	1128	20	30523,072
	Gloves	3575	6192	1923	1829	7938
	Dust masks	20784	51720	25662	0	46842
Spray pumps						
	Spray pumps	1772	0	1016	0	1772
	Repair kits	13	30	4	0	39
	Nozzle gaskets	81	919	769	0	231
	Nozzle tips	113	0	40	0	73
	Strainers	161	839	200	0	800
	Extension Assembly	53	0	7	0	46
	Pressure Gauge	7	89	70	0	26
	Pump Hose	70	0	0	0	70
	Measuring cylinder	25	0	0	0	25
Insecticides						
Pyrethroid	Deltamethrin	16886	104986	121872	0	256870
Empty Sachets						
	Carmabate	0	-	96184	-	-

ANNEX 7: WASTE DISPOSAL CERTIFICATES



**DEPOT PHARMACEUTIQUE ET MATERIEL
MEDICAL KALISIMBI/ INCINERATEUR**
 AVENUE MATHEUS, TEL:502549, FAX:250502548 MOB:0788509072 & 0788307226
 COMPTE BANCAIRE : COGEBANQUE :01390011437-94 INTITULE :GP/INCINERATEUR/DPMMK
 TIN :106808828 B.P 4520 KIGALI
 E-mail :gutetep@gmail.com, kalisimbidepotpharmaceutique@gmail.com

CERTIFICATE OF INCINERATION

This to certify that 496 kg of IRS waste were received from **Abt associates Inc** on March 14th, 2014, and incinerated the same day on March 14th, 2014 by **Depot Pharmaceutique et Materiel Medical Kalisimbi**.

Sincerely;





**GAHINI HOSPITAL BIOMEDICAL
WASTE
INCINERATOR**

TO WHOM IT MAY CONCERN DATE 24/03/2014

Ref: 003/G.H.B.I /2014

RE: CERTIFICATE OF IRS WASTES INCINERATOR

Client: Abt Associates, Po Box 5200 Kigali – Rwanda

This is to certify that 650Kgs of IRS wastes for Abt Associates was collected on 14/03/2014 from Nyugatare and have been completely incinerated and destructed.

Kind regards.

Dr. MUVUNYI Alphonse
Gahini Hospital Director





Kibilizi DH

CERTIFICATE OF ACKNOWLEDGMENT

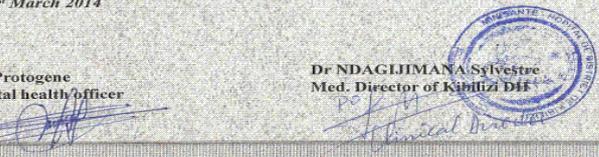
Kibilizi District Hospital is conforming that we have incinerated infectious waste from **ABT** associate produced during IRS activities in Gisagara District.

The quantity was 486.2kg incinerated in 2 rounds:
 1st round of 460.4kg on 7th March 2014
 2nd round of 25.8 kg on 13th March 2014

Done at Kibilizi on 21st March 2014

UWIZEYE Protogene
Environmental health officer
Kibilizi DH

Dr NDAGIJIMANA Sylvestre
Med. Director of Kibilizi DH



ANNEX 8: PYRETHRUM SPRAY CATCH RESULTS

Month	District	Sector	UN FED	FED	HALF GRAVID	GRAVID	Total	Density (An. gambiae s.l./house)
March 2013	Gisagara	Muganza	44	32	28	11	115	19.17
		Mamba	2	1	2	0	5	0.83
	Nyagatare	Mimuli	221	73	76	15	385	64.17
		Rukomo	1	4	0	0	5	0.83
	Bugesera	Mareba	37	34	6	6	83	13.83
	Musenyi	5	5	3	3	16	2.67	
April 2013	Gisagara	Mimuli	205	148	23	29	405	67.5
		Rukomo	112	76	14	7	209	34.83
	Nyagatare	Muganza	34	41	3	5	83	13.83
		Mamba	1	2	0	0	3	0.5
	Bugesera	Mareba	80	42	11	7	140	23.33
	Musenyi	20	10	13	9	52	8.67	
May 2013	Gisagara	Muganza	42	34	15	0	91	15.17
		Mamba	6	3	2	0	11	1.83
	Nyagatare	Mimuli	97	60	18	18	193	32.17
		Rukomo	51	32	7	5	95	15.83
	Bugesera	Mareba	4	3	0	0	7	1.17
	Musenyi	6	2	0	0	8	1.33	
June 2013	Gisagara	Muganza	22	19	4	9	54	9
		Mamba	0	0	0	0	0	0
	Nyagatare	Mareba	5	5	0	1	11	1.83
		Musenyi	8	1	0	0	9	1.5
	Bugesera	Mimuli	25	18	6	5	54	9
Rukomo		3	4	1	0	8	1.33	
July 2013	Gisagara	Muganza	17	29	6	9	61	10.17
		Mamba	0	0	0	0	0	0
	Nyagatare	Mimuli	6	4	1	0	11	1.83
		Rukomo	0	0	0	0	0	0
	Bugesera	Mareba	19	12	2	3	36	6
Musenyi		0	0	0	0	0	0	
August 2013	Gisagara	Muganza	30	16	5	1	52	8.67
		Mamba	4	5	2	0	11	1.83
	Nyagatare	Mimuli	33	15	5	8	61	10.17
		Rukomo	0	1	0	0	1	0.17
	Bugesera	Mareba	30	14	9	4	57	9.5
	Musenyi	12	5	2	3	22	3.67	
September 2013	Gisagara	Muganza	49	32	8	23	112	18.67
		Mamba	8	8	0	1	17	2.83

	Nyagatare	Mimuli	78	38	15	16	147	24.5	
		Rukomo	34	26	6	9	75	12.5	
	Bugesera	Mareba	13	14	4	4	35	5.83	
		Musenyi	4	8	2	0	14	2.33	
	October 2013	Gisagara	Muganza	17	15	7	1	40	2.67
			Gishubi	13	7	10	6	36	2.4
Bugesera		Nyarugenge	31	11	26	22	90	6	
		Musenyi	7	5	6	6	24	1.6	
Nyagatare		Rukomo	8	1	0	0	9	0.6	
		Nyagatare	2	0	1	0	3	0.2	
November 2013	Gisagara	Muganza	97	22	19	20	158	10.53	
		Gishubi	52	11	14	5	82	5.47	
	Bugesera	Nyarugenge	1	0	1	1	3	0.2	
		Musenyi	6	2	0	0	8	0.53	
	Nyagatare	Nyagatare	0	0	0	0	0	0	
		Rukomo	5	2	0	0	7	0.47	
December 2013	Gisagara	Muganza	22	21	16	18	77	5.13	
		Gishubi	23	16	22	16	77	5.13	
	Bugesera	Nyarugenge	13	14	6	4	37	2.47	
		Musenyi	0	1	0	0	1	0.07	
	Nyagatare	Nyagatare	0	1	0	0	1	0.07	
		Rukomo	0	0	0	0	0	0	
January 2014	Gisagara	Muganza	46	135	37	5	223	14.87	
		Gishubi	17	9	18	11	55	3.67	
	Bugesera	Nyarugenge	17	29	11	8	65	4.33	
		Musenyi	0	0	0	0	0	0	
	Nyagatare	Nyagatare	4	4	2	3	13	0.87	
		Rukomo	5	5	3	0	13	0.87	
February 2014	Gisagara	Muganza	5	0	0	0	5	0.33	
		Gishubi	4	0	0	0	4	0.27	
	Bugesera	Nyarugenge	3	0	0	0	3	0.2	
		Musenyi	1	1	0	0	2	0.13	
	Nyagatare	Nyagatare	2	0	0	0	2	0.13	
		Rukomo	2	6	0	1	9	0.6	

ANNEX 9: HUMAN BITING RATES (BITES/PERSON/NIGHT)

Month	Gisagara		Nyagatare		Bugesera	
	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
Sep-13	38.17	55.33	44.67	35.92	12.00	14.58
Oct-13	12.08	9.67	14.17	7.33	1.58	0.83
Nov-13	11.08	18.92	15.17	26.67	0.25	1.25
Dec-13	5.17	4.92	12.58	13.08	0.33	0.67
Jan-14	2.50	3.25	4.50	5.00	5.92	3.08
Feb-14	4.25	9.50	27.42	25.50	13.08	10.00

ANNEX 10: HOURLY INDOOR AND OUTDOOR BITING

		18h-19h		19h-20h		20h-21h		21h-22h		22h-23h		23h-00h		00h-01h		01h-02h		02h-03h		03h-04h		04h-05h		05h-06h	
		in	out																						
Bugesera	Sep 13	10	9	8	7	13	13	21	21	12	12	14	13	13	14	15	15	13	14	16	16	15	16	12	11
	Oct 13	1	0	0	0	1	1	4	2	3	2	2	1	1	0	1	1	3	1	2	0	2	1	0	0
	Nov 13	0	0	1	0	0	2	2	3	1	2	1	0	0	2	0	1	1	1	1	0	0	0	0	0
	Dec 13	0	0	0	0	0	0	1	0	1	1	0	0	2	2	0	0	0	1	1	1	0	2	1	0
	Jan 14	1	0	1	0	0	0	1	1	1	3	2	4	8	10	6	9	10	13	4	7	4	8	6	9
	Feb 14	1	2	2	1	1	0	6	7	7	8	5	7	13	16	19	21	16	18	21	26	20	22	18	20
Gisagara	Sep 13	23	29	33	39	30	36	34	40	38	42	40	44	56	63	68	87	50	56	62	73	47	54	36	42
	Oct 13	3	2	6	6	12	12	10	9	9	9	5	4	9	8	27	27	22	21	20	19	7	6	4	4
	Nov 13	3	5	0	1	11	18	6	13	9	15	13	18	29	37	20	25	18	25	12	18	15	22	10	17
	Dec 13	0	0	3	2	3	1	2	1	4	3	6	5	6	5	5	3	11	8	11	9	12	10	3	2
	Jan 14	0	0	3	2	2	2	1	2	3	4	5	6	5	6	4	4	9	10	10	10	11	11	5	6
	Feb 14	3	5	2	3	3	7	5	9	3	6	4	9	5	9	9	16	8	17	4	7	4	8	7	12
Nyagatare	Sep 13	53	49	46	42	48	45	70	66	99	96	113	106	199	35	18	15	21	19	24	23	22	20	37	35
	Oct 13	5	3	6	2	17	8	8	3	16	8	15	7	26	13	33	18	34	18	4	3	6	2	4	3
	Nov 13	7	14	2	2	3	7	3	5	5	8	5	10	14	28	22	44	13	31	14	28	11	21	8	15
	Dec 13	1	31	6	6	15	16	15	16	16	17	13	13	23	23	7	7	13	14	9	10	4	4	2	2
	Jan 14	3	4	1	1	3	4	4	5	7	7	9	10	9	10	7	9	5	4	4	4	1	2	0	1
	Feb 14	5	4	10	9	21	21	21	20	31	31	40	40	31	31	34	33	30	30	2	60	47	46	19	19

ANNEX I I: PARITY RATES (PERCENTAGE)⁷

SITE	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14
Muganza (Gisagara)	23.5 (149)	21.4 (70)	26.6 (79)	35.1 (57)	40.7 (27)	33.9 (56)
Gishubi (Gisagara)	15.6 (90)	35.9(39)	12.9 (31)	60 (20)	52.4 (21)	32.8 (58)
Nyagatare (Nyagatare)	28.5 (130)	35.9 (50)	25.8 (50)	28.1 (55)	26.3 (38)	29.2 (72)
Rukomo (Nyagatare)	25.2 (127)	28.8 (66)	30.1 (83)	38.4 (86)	27.1 (76)	28.7 (115)
Nyarugenge (Bugesera)	27.7 (83) ₋	27.3 (18)	1 (1)	12.5 (8)	22.2 (54)	33.3 (6)
Musenyi (Bugesera)	19.4 (72)	18.2 (11)	41.2 (17)	25 (4)	0 (1)	27.7 (112)

⁷ The values in brackets represent the total number of *An. gambiae s.l.* dissected

ANNEX 12: SUMMARY OF MID-SPRAY ENVIRONMENTAL INSPECTIONS- STORAGE FACILITY AND SOAK PITS

Operation Site	Date Inspection Performed	Are the store keepers, SOs and wash persons wearing appropriate PPE?	Do spray teams have clean PPE at the start of each work day?	Are overalls washed daily, and dried over the soak pit?	During transport, are all spray operator comfortably seated with pumps well placed between their legs in the transport vehicle?	Are spray operators fed before start of spray? (before wearing of PPE)	Is the store well arranged? (height of arranged items, allowing for free movement, proper stacking of items, allowing for ventilation)	Are warning signs correctly displayed? (danger sign, insecticide safety notice)	Is there firefighting equipment (not expired)?	Are the surroundings of the store and soak pit clear of IRS solid wastes (empty sachets, masks, gloves)?	Are contents of drums 1, 3, 5 and 7 emptied into spray pumps before spray operators depart for field?
Musenyi	2/5/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ngeruka		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shyara	2/18/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nyarugenge	2/17/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ruhuha	2/13/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mareba	2/13/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mamba	2/17/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Operation Site	Date Inspection Performed	Are the store keepers, SOs and wash persons wearing appropriate PPE?	Do spray teams have clean PPE at the start of each work day?	Are overalls washed daily, and dried over the soak pit?	During transport, are all spray operator comfortably seated with pumps well placed between their legs in the transport vehicle?	Are spray operators fed before start of spray? (before wearing of PPE)	Is the store well arranged? (height of arranged items, allowing for free movement, proper stacking of items, allowing for ventilation)	Are warning signs correctly displayed? (danger sign, insecticide safety notice)	Is there firefighting equipment (not expired)?	Are the surroundings of the store and soak pit clear of IRS solid wastes (empty sachets, masks, gloves)?	Are contents of drums 1, 3, 5 and 7 emptied into spray pumps before spray operators depart for field?
Gikonko	2/18/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mukindo	2/20/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muganza	2/19/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mugombwa	2/20/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gishubi	2/19/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Karama	2/12/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mukama	2/12/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mimuli	2/13/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gatunda	1/20/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Operation Site	Date Inspection Performed	Are the store keepers, SOs and wash persons wearing appropriate PPE?	Do spray teams have clean PPE at the start of each work day?	Are overalls washed daily, and dried over the soak pit?	During transport, are all spray operator comfortably seated with pumps well placed between their legs in the transport vehicle?	Are spray operators fed before start of spray? (before wearing of PPE)	Is the store well arranged? (height of arranged items, allowing for free movement, proper stacking of items, allowing for ventilation)	Are warning signs correctly displayed? (danger sign, insecticide safety notice)	Is there firefighting equipment (not expired)?	Are the surroundings of the store and soak pit clear of IRS solid wastes (empty sachets, masks, gloves)?	Are contents of drums 1, 3, 5 and 7 emptied into spray pumps before spray operators depart for field?
Nyagatare	1/12/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Katabagemu	2/13/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tabagwe	2/2/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rukomo	2/26/14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

ANNEX 13. SUMMARY OF MID-SPRAY ENVIRONMENTAL INSPECTIONS- HOUSEHOLD PREPARATION BEFORE IRS

Operation Site	Have all personal belongings, animals, and sick persons been removed from the house?	Have all immovable items been moved to center of the house and properly covered with polythene sheet?	Are the residents instructed on what to do during and after spraying?
Musenyi	Yes	Yes	Yes
Ngeruka	Yes	Yes	Yes
Shyara	Yes	Yes	Yes
Nyarugenge	Yes	Yes	Yes
Ruhuha	Yes	Yes	Yes
Mareba	Yes	Yes	Yes
Mamba	Yes	Yes	Yes
Gikonko	Yes	Yes	Yes
Mukindo	Yes	Yes	Yes
Muganza	Yes	Yes	Yes
Mugombwa	Yes	Yes	Yes
Gishubi	Yes	Yes	Yes
Karama	Yes	Yes	Yes
Mukama	Yes	Yes	Yes
Mimuri	Yes	Yes	Yes
Gatunda	Yes	Yes	Yes
Nyagatare	Yes	Yes	Yes
Katabagemu	Yes	Yes	Yes
Tabagwe	Yes	Yes	Yes
Rukomo	Yes	Yes	Yes

ANNEX 14. SUMMARY OF MID-SPRAY ENVIRONMENTAL INSPECTIONS- OBSERVATION OF SPRAY OPERATORS IN THE FIELD

Operation Site	Are SOs in full PPE? (helmet, overalls, boots, gloves, mask)	Is mixing of the insecticide witnessed by any household resident?	Are SOs spraying only the recommended surfaces?	Do SOs correctly record household details?	Is any SOs observed eating/drinking/smoking while at work?	Do SOs correctly follow the spraying techniques (standing 45cm from the wall, using vertical swaths, 5cm swath overlap, frequently shaking the can and constant observation of the pressure gauge)
Musenyi	Yes	Yes	yes	Yes	No	
Ngeruka	Yes	Yes	Yes	Yes	No	Yes
Shyara	Yes	Yes	Yes	Yes	No	Yes
Nyarugenge	Yes	Yes	Yes	Yes	No	Yes
Ruhuha	Yes	Yes	Yes	Yes	No	Yes
Mareba	Yes	Yes	Yes	Yes	No	Yes
Mamba	Yes	Yes	Yes	Yes	No	Yes
Gikonko	Yes	Yes	Yes	Yes	No	Yes
Mukindo	Yes	Yes	Yes	Yes	No	Yes
Muganza	Yes	Yes	Yes	Yes	No	Yes
Mugombwa	Yes	Yes	Yes	Yes	No	Yes
Gishubi	Yes	Yes	Yes	Yes	No	Yes
Karama	Yes	Yes	Yes	Yes	No	Yes
Mukama	Yes	Yes	Yes	Yes	No	Yes
Mimuri	Yes	Yes	Yes	Yes	No	Yes
Gatunda	Yes	Yes	Yes	Yes	No	Yes
Nyagatare	Yes	Yes	Yes	Yes	No	Yes
Katabagemu	Yes	Yes	Yes	Yes	No	Yes
Tabagwe	Yes	Yes	Yes	Yes	No	Yes
Rukomo	Yes	Yes	Yes	Yes	No	Yes

ANNEX 15. SUMMARY OF MID-SPRAY ENVIRONMENTAL INSPECTIONS- OBSERVATIONS OF SPRAY OPERATORS AT OPERATION SITES AFTER COMPLETING SPRAYING

Operation Site	At the end of the shift, are both full and empty sachets returned, counted and recorded in inventory?	Empty sachets and used masks are stored in separate designated and labeled containers in the store room?	Are 7 barrels placed and arranged on an impermeable ground or polythene sheet (for permeable grounds) along the wash bay?	Do barrels #2, 4, and 6 contain enough water for triple rinsing?	Do SOs correctly conduct triple rinsing whiles wearing PPE?	Are all IRS PPE and haversacks handed over to the store keeper at the end of the day's work?	Are washed pumps orderly arranged in the store?	Are SOs provided with soap to wash and bathe?	Do spray teams bathe after the day's work?	Is the insecticide usage rate and average no. of houses sprayed per SO within acceptable limits?(At least 2.5 – 3 and 10 houses/SO/day)
Musenyi	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ngeruka	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shyara	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nayarugenge	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ruhuha	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mareba	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mamba	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gikonko	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mukindo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Muganza	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mugombwa	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gishubi	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Karama	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Mukama	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Operation Site	At the end of the shift, are both full and empty sachets returned, counted and recorded in inventory?	Empty sachets and used masks are stored in separate designated and labeled containers in the store room?	Are 7 barrels placed and arranged on an impermeable ground or polythene sheet (for permeable grounds) along the wash bay?	Do barrels #2, 4, and 6 contain enough water for triple rinsing?	Do SOs correctly conduct triple rinsing while wearing PPE?	Are all IRS PPE and haversacks handed over to the store keeper at the end of the day's work?	Are washed pumps orderly arranged in the store?	Are SOs provided with soap to wash and bathe?	Do spray teams bathe after the day's work?	Is the insecticide usage rate and average no. of houses sprayed per SO within acceptable limits?(At least 2.5 – 3 and 10 houses/SO/day)
Gatunda	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nyagatare	Yes	Yes	Yes	Yes	Yes	yes	Yes	Yes	Yes	Yes
Katabagemu	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tabagwe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rukomo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

ANNEX 16: SUMMARY OF POST-SPRAY ENVIRONMENTAL INSPECTIONS- INSPECTION OF STORE AFTER COLLECTION OF LOGISTICS TO THE DISTRICT STORES

Operation Site	Date Inspection Conducted	Are all the IRS items, insecticides and wastes taken back to the district store?	Does the addition of used insecticides and unused insecticides equal the beginning inventory?	Is the store cleaned before being handed over to the owners?	Is the soak pit covered and the gate closed and locked?	Are the soak pit and its surroundings left clean?	Was the working relationship between the IRS team and owners of the store good?
Musenyi	13/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Ngeruka	13/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Shyara	13/3/14	Yes	Yes	Yes	yes	Yes	Yes
Nyarugenge	13/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Ruhuha	13/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Mareba	13/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Mamba	18/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Gikonko	17/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Mukindo	17/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Muganza	17/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Mugombwa	17/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Gishubi	18/3/14	Yes	Yes	Yes	Yes	Yes	Yes
Karama	18/3/14/23/13	Yes	Yes	Yes	Yes	Yes	Yes
Mukama	18/3/14/23/13	Yes	Yes	Yes	Yes	Yes	Yes
Gatunda	18/3/14/23/13	Yes	Yes	Yes	Yes	Yes	Yes
Nyagatare	19/3/14/22/13	Yes	Yes	Yes	Yes	Yes	Yes
Katabagemu	19/3/14/24/13	Yes	Yes	Yes	Yes	Yes	Yes
Tabagwe	18/3//14	Yes	Yes	Yes	Yes	Yes	Yes
Rukomo	18/3/14	Yes	Yes	Yes	Yes	Yes	Yes

ANNEX 17. SUCCESS STORY

Progress against Malaria in Rwanda: The Role of Government Counterparts

Approximately one in five outpatients tested positive for malaria in Gisagara District, Rwanda from January to August 2013. The President’s Malaria Initiative-funded Africa Indoor Residual Spraying project (AIRS) is protecting people from malaria in Gisagara and two other districts in Rwanda through indoor residual spraying (IRS). In 2013, the Abt Associates-led AIRS project sprayed nearly 225,000 structures protecting more than 975,000 people from malaria in Rwanda including approximately 16,000 pregnant women and 147,000 children under 5.

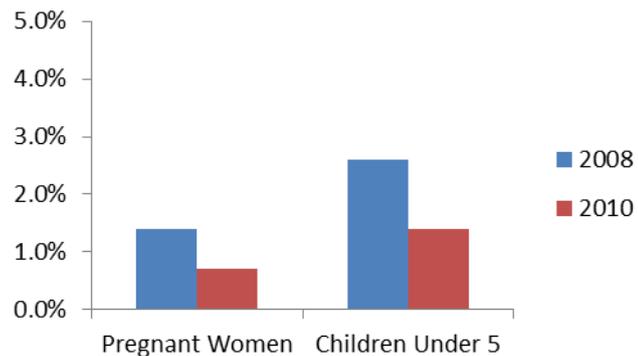
IRS is part of an ambitious malaria prevention and control program in Gisagara where district leaders hope to reach zero malaria deaths by 2017. In addition to protecting nearly one million people from malaria per year with IRS, the district is destroying mosquito breeding sites, distributing long-lasting insecticidal nets, and providing diagnosis and early treatment at community health facilities. As a result of these efforts, malaria prevalence has decreased by half among Rwanda’s most vulnerable populations of women and children under 5 from 2008 to 2010.



Gisagara District Mayor presenting a certificate of appreciation to Abt Associates AIRS Rwanda project



Percentage of Children Under 5 and Pregnant Women with Malaria



Source: Demographic and Health Survey, 2010

As a testimony to Gisagara District’s commitment to preventing malaria, the Kansi Sector hosted an event celebrating the launch of the September 2013 IRS campaign, presided over by the District Mayor, Karekezi Leandre. Public health leaders, including officials from the Ministry of Health, implementing partners, and community members attended. In his

speech, the Mayor urged the population to ensure that their families are protected against malaria by embracing all malaria control strategies including IRS.

“Since the launch of IRS in the district in 2011, absenteeism due to malaria at work on farms and in educational establishments has decreased tremendously and this has contributed immensely to the economic development of the district,” said District Mayor Leandre. He added that the cost of healthcare provision has also reduced because the population is protected against malaria.

The Mayor praised the partnership between Gisagara District, the Ministry of Health and the AIRS project. He commended the AIRS project for training more than 400 community health workers and nearly 1,000 village leaders to support IRS. These capacity building efforts were recognized as a way to make IRS more sustainable. As a gesture of appreciation, the Mayor awarded certificates to the Ministry of Health and Abt Associates for their great support and commitment to malaria control.

Rwanda was among nine countries recognized for their contribution to the fight against malaria by the African Leaders Malaria Alliance Forum in January 2013, receiving the Malaria Excellence Award in the categories of Policy, Impact and Implementation. “This is a great honor and encouragement for the country and everyone’s contribution and cooperation is needed for the success of malaria control efforts in the country,” said Emmanuel Hakizimana, Director of Vector Control at MOPDD.

ANNEX 18: MONITORING AND EVALUATION PLAN MATRIX – FEBRUARY 2014 CAMPAIGN RESULTS

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
Component 1: Establish cost-effective supply chain mechanisms including logistical procurement, distribution and storage of IRS-related commodities and execute all aspects of logistical plans for IRS-related activities.											
I.1 Procurement											
I.1.1 Number and percentage of international insecticide procurement orders delivered in country, at port of entry, at least 30 days prior to the start of spray operations	<p>[<i>Numerator</i>: Number of international insecticide procurement orders delivered in country, at port of entry, at least 30 days prior to the start of spray operations]</p> <p>[<i>Denominator</i>: Total number of international insecticide procurement orders]</p> <p><i>Calculation</i>: [Numerator ÷ Denominator] × 100</p>	Y1, Y2, Y3	<p><i>Data source</i>: Logistics and Procurement Inventory Reports</p> <p><i>Reporting frequency</i>: Each spray season</p>	By Spray Campaign	AIRS	N.A.; 80%	I; 100%	Round 1 ⁸ : I; 100%	Round 1: N.A. ⁹	Round 1: I; 100%	Round 1: I; 100%
I.1.2 Number and percentage of international procurement orders for equipment, including PPE, received at port of entry, 30 days prior to start of spray	<p>[<i>Numerator</i>: Number of international procurements for equipment, including PPE, received at port of entry, 30 days prior to start of spray operations]</p> <p>[<i>Denominator</i>: Total number of international procurements for</p>	Y1, Y2, Y3	<p><i>Data source</i>: Logistics and Procurement Inventory Reports</p> <p><i>Reporting frequency</i>: Each spray season</p>	By Spray Campaign	AIRS	N.A.; 85%	I; 100%	Round 1: I; 100%	Round 1: I; 100%	Round 1: I; 100%	Round 1: I; 100%

⁸ Round 1 occurs in February; round 2 in August/September.

⁹ No international insecticide was procured for Round 1 in Year 2.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
operations.	equipment, including PPE.] <i>Calculation:</i> [Numerator ÷ Denominator] x 100										
1.1.3 Number and percentage of local PPE procurement orders that are delivered to the main warehouse, 14 days before the start of spray operations	[<i>Numerator:</i> Number of local PPE procurement orders delivered to the main warehouse 14 days before the start of spray operations] [<i>Denominator:</i> Total number of local PPE procurement orders] <i>Calculation:</i> [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	<i>Data source:</i> Logistics and Procurement Inventory Reports <i>Reporting frequency:</i> Each spray season	By Spray Campaign	AIRS	N.A.; 80%	1; 100%	Round 1: 1; 100% Round 2: NA	Round 1: 1; 100% Round 2: NA	Round 1: N.A.	Round 1: N.A.
1.1.4 Successfully Complete spray operations without an insecticide stock-out	Milestone: (Acheived/Not achieved)	Y1, Y2, Y3	<i>Data source:</i> Logistics Inventory Report <i>Reporting frequency:</i> Each spray season	By Spray Campaign	AIRS	Acheived	Acheived	Round 1: Acheived Round 2: Acheived	Round 1: Acheived Round 2: Acheived	Round 1: Acheived	Round 1: Acheived
1.2 In-country Logistics, Warehousing, and Training											
1.2.1 Number and percentage of logistics and warehouse managers trained in IRS supply chain	[<i>Numerator:</i> Total number of logistics and warehouse managers trained in IRS supply chain management using AIRS Project resources.]	Y1, Y2, Y3	<i>Data source:</i> Routine training records <i>Reporting</i>	By Spray Campaign By Gender	AIRS	8; 100% 3 males, 5 females	8; 100% 3 males, 5 females	Round 1: 8; 100% 3 males, 5 females	Round 1: 7; 100% 3 males, 4 females	Round 1: ¹⁰ 29; 100% 16 males; 13 females	Round 1: 29; 100% 16 males; 13 females

¹⁰ Warehouse managers were introduced at sector stores, and contributed to the increase of trainees in IRS supply chain management for this spray round.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
management	[Denominator: Total number of AIRS logistics and warehouse managers.] Calculation: [Numerator ÷ Denominator] × 100		frequency: Each spray season					Round 2: 8; 100% 3 males, 5 females	Round 2: 8; 100% 7 males, 1 female		
1.2.2 Number and percentage of base stores where physical inventories are verified with up-to-date stock records	[Numerator: Number of base stores where physical inventories are verified by up-to-date stock records] [Denominator: Total number of base stores audited.] Calculation: [Numerator ÷ Denominator] × 100 (See PIRS for details on sample size for operational audits)	Y2, Y3	Data source: Logistics and Environmental compliance reports Reporting frequency: Each spray season	By Spray Campaign	AIRS	N.A.	N.A.	Round 1: 4; 100% Round 2: 4; 100%	Round 1: 4; 100% Round 2: 4; 100%	Round 1: 4; 100%	Round 1: 4; 100%
1.2.3 Submit up-to-date inventory records to AIRS Home Office 30 days after the end of each spray campaign	Milestone: (Complete/Not Complete)	Y2, Y3	Data source: Post-Spray Logistics Inventory Report Reporting frequency: Each spray season	By Spray Campaign	AIRS	N.A.	N.A.	Round 1: Complete Round 2: Complete	Round 1: Complete Round 2: Complete	Round 1: Complete	Round 1: Complete

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 IRS country work plan developed and submitted on time	Milestone: (Complete/Not Complete)	Y1, Y2, Y3	Data source: Project records Reporting frequency: Annually		AIRS	Complete	Complete	Round 1: Complete Round 2: Complete	Round 1: Complete Round 2: Complete	Round 1: Complete	Round 1: Complete
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Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
2.2 Support of Safety and Health Best Practices and Compliance with USAID and Host Country Environmental Regulations											
2.2.1 SEA/letter report submitted on time ¹¹	Milestone: (Complete/Not Complete)	Y1, Y2, Y3	<i>Data source:</i> Project records – submitted SEAs/ letter reports <i>Reporting frequency:</i> Each spray campaign	By Spray Campaign	AIRS	Complete	Complete	Round 1: Complete Round 2: Complete	Round 1: Complete Round 2: Complete	Round 1: Complete	Round 1: Complete
2.2.2 Number and percentage of soak pits and storerooms inspected and approved prior to spraying	[Numerator: Number and percentage of soak pits and warehouses/storerooms inspected and certified by an environmental officer/AIRS Environmental Compliance Officer prior to each spray campaign supported by the AIRS Project] [Denominator: Total number of project soak pits and/or storerooms] Calculation: $[Numerator \div Denominator] \times 100$	Y1, Y2, Y3	<i>Data source:</i> Pre, Mid and Post Inspection Reports submitted by environmental officers <i>Reporting frequency:</i> Each spray season	By Spray Campaign By Soak Pit By Warehouse/ Storeroom	AIRS	N.A.; 100%	84; 100%	Round 1: 46; 100% Round 2: 78; 100% 39 soak pits, 39 storerooms	Round 1: 46; 100% 23 soak pits, 23 storerooms Round 2: 78; 100% 39 soak pits, 39 storerooms	Round 1: 41; 100% 21 soak pits, 20 storerooms	Round 1: 41; 100% 21 soak pits, 20 storerooms
2.2.3 Number of government environmental and health officers trained in IRS environmental	Total number of government environmental and health officers trained in IRS environmental	Y1, Y2, Y3	<i>Data source:</i> Training reports from	By Spray Campaign	AIRS	3	0	Round 1: 3; 3 males	Round 1: 3 2 males;	Round 1: 7 5 males; 2 females	Round 1: 4 3 males; 1 female

¹¹ In Year 1, SEAs were due 30 days prior to the commencement of spraying and letter reports were to be submitted 14 days prior to the commencement of spraying. In Year 2 and Year 3, due dates agreed upon with Washington-PMI will be noted in each country-specific Monitoring and Evaluation Plan to assess indicator 2.2.1.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
health officers trained in IRS environmental compliance	compliance using AIRS Project resources		Environmental Compliance Officer <i>Reporting frequency:</i> Semi-annually	By Gender				Round 2: 9; 100% 6 males, 3 females	1 female Round 2: 8; 88.9%, 5 males, 3 females		
2.2.4 Number of spray personnel trained in environmental compliance and personal safety standards in IRS implementation	Total number of spray personnel who attend a training in environmental compliance and personal safety standards in IRS implementation using AIRS Project resources, includes all staff who received environmental compliance training - spray operators, team leaders, washpersons, storekeepers, etc.	Y1, Y2, Y3	<i>Data source:</i> Project records – Training reports <i>Reporting frequency:</i> Each spray season	By Spray Campaign By Gender	AIRS	N.A.	2,305; 1,227 males, 1,078 females	Round 1: 1,659; 834 males, 825 females Round 2: 1,867; 939 males, 928 females	Round 1: 1,854; 946 males, 908 females Round 2: 1,888; 853 males; 1,035 females	Round 1: 3,852; 2,808 males, 1,044 females	Round 1: 3,376; 2,463 males, 913 females
2.2.5 Number of health workers receiving insecticide poisoning case management training	Total number of clinical personnel trained in insecticide poisoning case management using AIRS Project resources	Y2, Y3	<i>Data source:</i> Project records – Training reports <i>Reporting frequency:</i> Each spray season	By Spray Campaign By Gender	AIRS	N.A.	98; 60 males, 38 females	Round 1: 52; 32 males, 20 females Round 2: 99; 67 males, 32 females	Round 1: 70; 49 males, 21 females Round 2: 99; 67 males, 32 females	Round 1: 57; 32 males, 25 females	Round 1: 57; 32 males, 25 females
2.2.6 Number of adverse reactions to pesticide exposure	Total number of incidents of pesticide exposure reported that resulted in a referral for medical care	Y1, Y2, Y3	<i>Data source:</i> Incident report forms that are	By Spray Campaign	AIRS	0	24	Round 1: 0 Round 2: 0	Round 1: 18 Round 2: 14	Round 1: 0	Round 1: 5

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
documented			required for each incidence of pesticide exposure <i>Reporting frequency:</i> Each spray season	By residential/occupational exposure							
2.2.7. Number of vehicular accidents reported	Total number of vehicular accidents reported	Y1, Y2, Y3	<i>Data source:</i> Vehicular incident report forms that are required for each accident <i>Reporting frequency:</i> Each spray season	By Spray Campaign	AIRS	0	0	Round 1: 0 Round 2: 0	Round 1: 1 Round 2: 0	Round 1: 0	Round 1: 1
2.3 Support Entomological Monitoring Activities and Insecticide Resistance Strategies											
2.3.1 Number of sentinel sites supported by the AIRS project	Total number of entomological sentinel sites supported by the AIRS project	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Annually	By Spray Campaign	AIRS	6	6 (partial support)	Round 1: 6 (partial support) Round 2: 6 (partial support)	Round 1: 6 Round 2: 6 (partial support)	Round 1: 6 (partial support)	Round 1: 6 (partial support)
2.3.2 Number and percentage of entomological monitoring sentinel sites measuring all five primary PMI entomological indicators	<i>[Numerator:</i> Number of entomological monitoring sites measuring all five primary PMI entomological indicators] <i>[Denominator:</i> Number of entomological monitoring sentinel	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Annually	By Spray Campaign	AIRS	6; 100%	6; 100%	Round 1: 6; 100% Round 2: 6; 100%	Round 1: 6; 100% Round 2: 6; 100%	Round 1: 6; 100%	Round 1: 6; 100%

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
	sites] <i>Calculation:</i> [Numerator ÷ Denominator] x 100										
2.3.3 Number and percentage of entomological monitoring sites measuring at least one secondary PMI indicator	<i>[Numerator:</i> Number of entomological monitoring sites measuring at least one secondary PMI indicator] <i>[Denominator:</i> Number of entomological monitoring sites] <i>Calculation:</i> [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Annually	By Spray Campaign	AIRS	6; 100%	6; 100%	Round 1: 6; 100% Round 2: 6; 100%	Round 1: 6;100% Round 2: 6; 100%	Round 1: 6; 100%	Round 1: 6; 100%
2.3.4 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	<i>[Numerator:</i> Number of insecticide resistance testing sites that tested at least one insecticide from each of the four classes of insecticides recommended for malaria vector control.] <i>[Denominator:</i> Number of insecticide resistance testing sites] <i>Calculation:</i> [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Annually	By Spray Campaign By Type of Insecticide	AIRS	12; 100%	12; 100% All four classes of insecticide are being tested at each of the 12 sites	Round 1: 12; 100% All four classes of insecticide to be tested at each of the 12 sites Round 2: 12; 100% All four classes of insecticide to be tested at each of	Round 1: All four classes of insecticide have been tested at each of the 12 sites Round 2: 5; 41.7% All four classes of insecticide were tested at 5 sites.	Round 1: N.A.	Round 1: N.A.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
								the 12 sites			
2.3.5 Number of wall bioassays conducted within 2 weeks of spraying to evaluate the quality of IRS	Total number of wall bioassay studies conducted in established sentinel sites to evaluate quality of IRS spraying activities	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Per spray campaign	By Spray Campaign	PMI	1 (36 houses)	1 (36 houses)	Round 1: 1 (36 houses) Round 2: 1 (36 houses)	Round 1: 48 houses Round 2: 1 (36 houses)	Round 1: 1 (36 houses)	Round 1: 1 (36 houses)
2.3.6 Number of wall bioassays conducted after the completion of spraying at monthly intervals to evaluate insecticide decay	Total number of wall bioassay studies conducted at monthly intervals in established sentinel sites to evaluate the rate of insecticide decay on sprayed surfaces	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Per spray campaign	By Spray Campaign	PMI	5 (36 houses)	5 (36 houses)	Round 1: 5 (36 houses) Round 2: 5 (36 houses)	Round 1: 36 houses Round 2: 5 (36 houses)	Round 1: 5 (36 houses)	Round 1: 2 (36 houses)
2.3.7 Number of vector susceptibility tests for different insecticides conducted in selected sentinel sites	Total number of vector susceptibility tests conducted to gauge the effectiveness of individual insecticides proposed for use in spray operations	Y1, Y2, Y3	<i>Data source:</i> Entomological reports <i>Reporting frequency:</i> Per spray campaign	By Spray Campaign By Type of Insecticide	PMI	4 replicates per 6 insecticides ¹²	4 replicates per 6 insecticides ¹³	Round 1: 4 replicates per 6 insecticides Round 2: 4 replicates per 6 insecticides	Round 1: 4 replicates per 6 insecticides Round 2: 4 replicates per 6 insecticides	Round 1: 4 replicates per 6 insecticides	Round 1: Ongoing

¹² DDT, Fenitrothion, Bendiocarb, Deltamethrin, Lambdacyhalothrin, Etofenprox

¹³ DDT, Fenitrothion, Bendiocarb, Deltamethrin, Lambdacyhalothrin, Etofenprox

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
2.4 Conduct Communications Activities and Community Mobilization											
2.4.1 Number of radio spots and talk shows aired ¹⁴	Total number of radio spots and talk shows aired in target spray districts to stress the safety and benefits of IRS, ensure successful spray coverage, timely vacating of premises and adherence to IRS safety precautions by community members	Y1, Y2, Y3	<i>Data source:</i> Project records <i>Reporting frequency:</i> Semi-annually	By Spray Campaign	AIRS	N.A.	134	Round 1: 134 Round 2: 134	Round 1: 42 Round 2: 150	Round 1: 96	Round 1: 96
2.4.2 Number of IRS print materials disseminated	Total number of IRS educational materials developed, printed and distributed to community members in target spray districts using AIRS Project resources	Y1, Y2, Y3	<i>Data source:</i> Project records <i>Reporting frequency:</i> Semi-annually	By Spray Campaign By Type of printed material and message(s)	AIRS	270,000	227,767	Round 1: 139,167 Round 2: 241,408	Round 1: 117,518 brochures Round 2: 219,810	Round 1: 136,413	Round 1: 83,811
2.4.3 Number of people reached with IRS messages via door-to-door mobilization	Total number of adults reached with IRS message during pre-spray community, door-to-door mobilization	Y1, Y2, Y3	<i>Data source:</i> Mobilization Data Collection Forms <i>Reporting frequency:</i> Daily per mobilization conducted	By Spray Campaign By Gender	AIRS	N.A.	1,063,869; 508,345 males, 555,524 females	Round 1: 554,098; 264,763 males, 289,335 females Round 2: 511,463; 230,123 males; 281,340 females	Round 1: 496,315; 237,533 males, 258,782 females Round 2: 511,463; 230,123 males; 281,340 females	Round 1: 279,485; 125,649 males, 153,836 females	Round 1: 261,896; 116,777 males, 145,119 females

¹⁴ The February spray round follows shortly after the fall campaign. Thus, fewer radio spots are necessary as communities are still privy to IRS sensitization messages.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
2.5 Spray Targeted Structures According to Technical Specifications											
2.5.1 Number of structures targeted for spraying ¹⁵	Total number of structures found in targeted spray districts by Spray Operators	Y1, Y2, Y3	<i>Data source:</i> Daily Spray Operator Forms <i>Reporting frequency:</i> Daily per spray campaign	By Spray Campaign	PMI	240,000	242,589	Round 1: 125,000 Round 2: 219,462	Round 1: 121,697 Round 2: 229,039	Round 1: 124,012	Round 1: 125,629
2.5.2 Number of structures sprayed with IRS ¹⁶	Total number of structures sprayed in targeted districts	Y1, Y2, Y3	<i>Data source:</i> Daily Spray Operator Forms <i>Reporting frequency:</i> Daily per spray campaign	By Spray Campaign	PMI	204,000	236,610	Round 1: 106,250 Round 2: 186,543	Round 1: 121,154 Round 2: 224,708	Round 1: 105,410	Round 1: 123,919
2.5.3 Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)	[Numerator: Total number of structures sprayed in targeted districts] [Denominator: Total number of structures in targeted areas found by spray operators] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	<i>Data source:</i> Daily Spray Operator Forms <i>Reporting frequency:</i> Daily per spray campaign	By Spray Campaign	PMI	85%	97.5%	Round 1: 85% Round 2: 85%	Round 1: 99.6% Round 2: 98.1%	Round 1: 85%	Round 1: 98.6%

¹⁵ The annual target is from the applicable work plan; the annual result is the number of structures found by spray operators during the campaign.

¹⁶ The annual target is based on 85% spray coverage of indicator 2.5.1.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
2.5.4 Number of people residing in structures sprayed (Number of people protected by IRS)	Total number of people residing in structures sprayed (Actual numbers are collected during spray operations; population estimates are not used.)	Y1, Y2, Y3	<i>Data source:</i> Daily Spray Operator Forms <i>Reporting frequency:</i> Daily per spray campaign	By Spray Campaign By Number of pregnant women By Number of children <5 years old	PMI	N.A.	1,025,181; 17,157, pregnant women; 160,399, children <5 years	Round 1: 533,948; 8,936 pregnant women; 83,541 children <5 years Round 2: 1,025,181; 17,157 pregnant women; 160,399 children <5 years	Round 1: 522,315; 8,935 pregnant women; 81,433 children <5 years Round 2: 957,027; 16,023 pregnant women; 147,531 children <5 years	Round 1: 507,653;	Round 1: 512,789; 8,547 pregnant women, 75,753 children <5 years

Component 3: Provide ongoing monitoring and evaluation and quality control measures

3.1 Submit Monitoring and Evaluation Plan (MEP) to PMI-Rwanda	<i>Milestone:</i> (Complete/Not Complete)	Y1, Y2, Y3	<i>Data source:</i> Project records <i>Reporting frequency:</i> Semi-annual		AIRS	Complete	Complete	Round 1: Complete Round 2: Complete	Round 1: Complete Round 2: Complete	Round 1: Complete	Round 1: Complete
3.2 Submit a post-spray data quality audit report to the M&E Specialist in the AIRS Home Office within 60-180 days of completion of spray operations	<i>Milestone:</i> (Complete/Not Complete)	Y1, Y2, Y3	<i>Data source:</i> PSDQA Summary Report <i>Reporting frequency:</i> Per spray campaign	By Spray Campaign	AIRS	N.A.	N.A.	Round 1: N.A. Round 2: Complete	Round 1: N.A. Round 2: Complete	Round 1: Complete	Round 1: Ongoing
3.3 Submit a country-specific Eligible	<i>Milestone:</i> (Complete/Not Complete)	Y1	<i>Data source:</i> Project records		AIRS	Complete	Complete	N.A.	N.A.	N.A.	N.A.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
Structure Definition Document to local PMI and NMCP			<i>Reporting frequency: Semi-annually</i>								
3.4 Supply chain review conducted by RTT	Milestone: (Complete/Not Complete)	Y1, Y2	<i>Data source: RTT supply chain review reports</i> <i>Reporting frequency: Semi-annually</i>	By Spray Campaign	AIRS	Complete	Complete	N.A.	N.A.	N.A.	N.A.

Component 4:

Contribute to Global IRS Policy-Setting and Country-Level Policy Development of Evidence-Based IRS; Disseminate Experiences and Best Practices

4.1 Number of guidelines/checklists/tools related to IRS operations developed or refined with project support	Total number of implementation guidelines, process checklists and program tools related to IRS operations developed or refined using the technical and/or financial resources of the AIRS Project	Y1, Y2, Y3	<i>Data source: Project records – Activity reports</i> <i>Reporting frequency: Semi-annually</i>	By Guideline/checklist/tool	AIRS	8	8	Both spray rounds: 27 Type: 20 supervisory checklists, 7 training manuals	Both spray rounds: 27; 20 supervisory checklists, 7 training manuals (IEC, M&E, operations, database, environment, finance, logistics)	N.A. ¹⁷	N.A.
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¹⁷ We used the same guidelines/checklists/tools developed in September 2013.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
4.2 Number of articles/best practices documents published	Total number of articles or other best-practice documents that have been published in relevant journals or through PMI/USAID communications vehicles	Y2, Y3	Data source: EOSR Reporting frequency: Semi-annually	By Spray Campaign By IRS Technical Area	AIRS	N.A.	N.A.	Round 1: N.A. Round 2: 1 (Mobile environmental compliance collection)	Round 1: N.A. Round 2: 1 (Mobile environmental compliance collection)	N.A.	N.A.
4.3 Number of best practice presentations given at national/ regional/international workshops and conferences	Total number of project-related oral and poster presentations delivered in national, regional and/or international meetings related to IRS.	Y2, Y3	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By IRS Technical Area	AIRS	N.A.	1 Technical area: IRS mobilization /implementation	Both spray rounds: 1 Technical area: IRS mobilization /implementation	Both spray rounds: 1 ¹⁸ Technical area: IRS mobilization /implementation	N.A.	N.A.

Component 5 (Cross-cutting): Capacity Building, Knowledge Transfer, Gender Inclusion

5.1 Capacity Building (Gender Inclusion)											
5.1.1 Number of people trained in IRS implementation	Total number of personnel trained in IRS implementation using AIRS Project resources. This figure only spray personnel (i.e. spray operators, team leaders, supervisors, clinicians.)	Y1, Y2, Y3	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of Women	PMI	N.A.	1,986; 998 males, 988 females 49.7% women	Round 1: 1,659; 834 males, 825 females 49.7% women	Round 1: 1,605; 762 males, 843 females 52.5% women trained	Round 1: 1,180; 525 males, 655 females; 55.5% women trained	Round 1: 1,180; 525 males, 655 females; 55.5% women trained

¹⁸ Presented at the National IRS Evaluation Meeting.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
				Trained			Round 2: 1,847; 877 males, 970 females, 52.5% of women	Round 2: 1,875; 890 males, 985 females, 52.5% of women trained			
5.1.2 Number of people trained to deliver or support IRS in target districts	Total number of people trained using AIRS Project resources to implement/support elements of IRS in target districts. This figure includes all cadre that serve a role in IRS.	Y1, Y2, Y3	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender By Role (e.g., spray operator, storekeeper) Percentage of women trained	AIRS	N.A.	6,065; 4,509 males, 1556 females 25.6% women	Round 1: 3,700; 2,751 males, 949 females 25.6% women Round 2: 6,065; 4,509 males, 1,556 females 25.6% women	Round 1: 3,793; 2,624 males, 1,169 females; 30.8% women trained Round 2: 5,765; 4,196 males, 1,569 females, 27.2 of women trained	Round 1: 3,401; 2,476 males, 925 females; 27.2% women	Round 1: 3,398; 2,474 males; 924 females; 27.2% women trained
5.1.3 Number of personnel trained as IRS implementation trainers	Total number of personnel trained in Training of Trainers (TOT) for IRS delivery	Y1, Y2, Y3	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of women trained	AIRS	178	178; 77 males, 101 females 56.7% women	Round 1: 120; 52 males, 68 females 56.7% women Round 2: 166; 72 males, 94 females	Round 1: 118; 60 males, 58 females 49.1% women trained Round 2: 171; 85 males, 86 females,	Round 1: 81; 41 males, 40 females, 49.4% women	Round 1: 81; 41 males, 40 females, 49.4% women trained

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
								56.6% women	50.3% of women trained		
5.1.4 Number of government environmental and/or health officials trained in IRS oversight	Total number of national and sub-national/district government environmental and/or health officials who are trained in oversight of IRS implementation using AIRS Project resources	Y1, Y2, Y3	Data source: Project records – Training reports Reporting frequency: Semi-annually	By Spray Campaign By Gender Percentage of Women Trained Type of government official (e.g. environmental /health)	AIRS	N.A.	3; 3 males 0% women Type: Environmental health officers	Round 1: 3; 3 males 0% women Type: Environmental health officers Round 2: 9; 100% 6 males, 3 females Type: Environmental health officers	Round 1: 3; 2 males; 1 female 33.3% women Type: Environmental health officers Round 2: 8; 88.9%, 5 males, 3 females, 37.5 % of women trained Type: Environmental health officers	Round 1: 7 5 males 2 females, 28.6 % women trained Type: Environmental health officers	Round 1: 4 3 males; 1 female; 25.0% women trained Type: Environmental health officers

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/ AIRS Indicator	Annual Targets and Actuals					
						Year 1		Year 2		Year 3	
						Targets	Results	Targets	Results	Targets	Results
5.1.5 AIRS conducted a capacity assessment	AIRS Rwanda program conducted an assessment of IRS capacity among national and sub-national/district government health officials	Y1, Y2	Data source: Project records – Capacity assessment reports Reporting frequency: Semi-annually		AIRS	Complete	In process	Complete	Complete	N.A. ¹⁹	N.A.
5.1.6 Number of capacity-building MOUs signed by AIRS, NMCP and partners/ institutions	Total number of Memoranda of Understanding (MOU) on provision of local capacity building finalized and signed between AIRS, the Malaria and Other Parasitic Diseases Division (MOPPD), and other local partners and institutions	Y1, Y2, Y3	Data source: Project records – MOUs Reporting frequency: Semi-annually	By Spray Campaign	AIRS	I	I	N.A.	N.A.	N.A.	N.A.

¹⁹ This has been completed during September 2013 spray round.