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Indoor Residual Spraying (IRS 2) Task Order Four

SENEGAL
END OF SPRAY REPORT 2014

OCTOBER 17, 2014

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SENEGAL
END OF SPRAY REPORT 2014

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ACRONYMS

AIRS	Africa Indoor Residual Spraying
COP	Chief of Party
DC	District Coordinator
DCV	Data Collection Verification
DEC	Data Entry Clerk
DEEC	*Direction de L'environnement et des Etablissements Classés* (Directorate for the Environment and Classified Factories)
DHMT	District Health Management Team
DMO	District Medical Officer
DPM	*Divison de la Prévention Médicale* (Medical Prevention Division)
DPV	*Direction de la Protection des Végétaux* (Directorate for Plant Protection)
DQA	Data Quality Assessment
DREEC	*Direction Régionale de l'Environnement et des Etablissements Classés* (Regional Branch of the Directorate for the Environment and Classified Factories)
EC	Environmental Compliance
ECM	Environmental Compliance Manager
ECO	Environmental Compliance Officer
HPN	Health Post Nurse
IEC	Information, Education, and Communication
IRD	**I**nstitut de Recherche pour le Développement (Research Institute for Development)
IRS	Indoor Residual Spraying
M&E	Monitoring and Evaluation
MOH	Ministry of Health
MSP	Mobile Soak Pit
NMCP	National Malaria Control Program
PMI	President's Malaria Initiative
PPE	Personal Protective Equipment
PSDQA	Post Spray Data Quality Assessment
SC	Steering Committee

SNEIPS	*Service National de l'Education et l'Information pour la Santé* (National Health Education and Information Service)
SNH	Service National de l'Hygiène (National Hygiene Service)
SOP	Spray Operator
SPTS	Spray Performance Tracking Sheet
UCAD	*Université Cheikh Anta Diop de Dakar*
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

In 2014, spray operations were conducted in the four districts of Malem Hoddar, Koungheul, Koumpentoum, and Velingara by the AIRS Senegal project funded by the United States Agency for International Development (USAID) and the President's Malaria Initiative (PMI).

In 2014, as part of the transition process, AIRS Senegal worked with the National Malaria Control Program (NMCP) through an integrated team where AIRS Senegal coached Ministry of Health (MOH) counterparts during the implementation of the IRS campaign in Koumpentoum.

The objective of this transition was to increase the level of responsibility and ownership of indoor residual spraying (IRS) to the local government. For this purpose, NMCP conducted Information, Education, and Communication (IEC) mobilization activities in all four districts with direct funding from PMI and AIRS Senegal's technical assistance. However, due to the NMCP's restructuring process and the resource constraints it posed, AIRS Senegal ultimately implemented IRS in Koumpentoum as in all other districts as originally planned.

AIRS Senegal worked in the four districts in close collaboration with NMCP and was responsible for conducting Monitoring and Evaluation (M&E) and environmental inspections in collaboration with the Directorate for the Environment and Classified Factories (DEEC) and its Regional Branch (DREEC). AIRS Senegal was also responsible for identifying operations sites, procuring insecticide and equipment, managing warehouses, and training more than one thousand seasonal staff to spray homes and follow environmental and health guidelines.

As for supervision of spray operations, AIRS Senegal worked very closely with NMCP and Service National de l'Hygiène/ National Hygiene Services (SNH) in all four districts.

In 2014, 97.4 percent of the targeted structures were sprayed by AIRS Senegal in the four target districts using two classes of insecticide: organophosphate pirimiphos-methyl (Actellic 300 CS) in Koumpentoum and Velingara and carbamate bendiocarb (Ficam®) in Koungheul and Malem Hoddar. AIRS Senegal conducted spraying from May 15 – June 18 in Koumpentoum and Velingara and from July 15 – August 17 in Koungheul and Malem Hoddar.

Table 1 shows the results of the 2014 spray campaign, conducted over the course of 34 operational days from May 15 to August 17 in the four districts.

TABLE 1. SUMMARY OF 2014 IRS CAMPAIGN

Indicator	Results
Number of districts covered by the PMI-supported IRS campaign	Four districts: Koumpentoum, Koungheul, Malem Hoddar, and Velingara
Insecticide used	Carbamates: Malem Hoddar, Koungueul
	Organophosphate: Koumpentoum, Velingara
Number of structures sprayed by spray operators	204,159
Number of structures found by spray operators	209,603
2014 IRS campaign spray coverage	97.4%

Population protected by 2014 IRS campaign	708,999
Number of people trained to deliver IRS with US Government funds[1]	933
Total number of people trained with US Government funds[2]	1,263

For this spray campaign, AIRS Senegal used a total of 25,337 sachets of carbamates and a total of 34,849 bottles of organophosphates with an average of 3.4 structures sprayed per sachet/bottle.

This year's campaign incorporated three different pilots. First, AIRS Senegal implemented an SMS platform to collect and disseminate spray campaign data to PMI and local stakeholders on a daily basis. Second, AIRS Senegal piloted a smartphone application for delivering standardized supervision throughout the campaign thereby improving overall spray campaign quality. Lastly, AIRS Senegal piloted the use of mobile soak pits in four sites. (See Sections 8 and 9 for more information on the pilots.)

[1] Total number of personnel trained in IRS implementation using AIRS Project resources.; this figure includes only spray personnel such as spray operators, team leaders, supervisors, clinicians.
[2] Total number of people trained using AIRS Project resources to implement/support elements of IRS in target districts

RÉSUMÉ ANALYTIQUE

En 2014, les opérations d'aspersion ont été mises en œuvre dans les quatre (4) districts de Malem Hoddar, Koungheul, Koumpentoum et Vélingara par le Projet *AIRS Sénégal* sous financement de l'USAID et de l'Initiative du Président des États-Unis pour la lutte contre le paludisme (PMI).

En 2014, dans le cadre du processus de la dévolution, AIRS Sénégal avait planifié de travailler avec le Progamme National de Lutte contre le Paludisme (PNLP) à travers une équipe intégrée mise en place où AIRS Sénégal allait accompagner le PNLP durant la mise en œuvre des activités AID dans le district de de Koumpentoum

Le but de ce processus de dévolution est d'accroitre le niveau de responsabilité et d'appropriation des AID au niveau des autorités locales. A cet effet, le PNLP a mené des activités de mobilisation IEC dans l'ensemble des 4 districts cibles, avec un financement direct du PMI et l'assistance technique du Projet *AIRS Sénégal*. Cependant à cause de la restructuration du PNLP, AIRS Sénégal a finalement conduit la mise en œuvre des AID à Koumpentoum comme planifiés dans tous les districts.

Le Projet *AIRS Sénégal* en charge de la mise en œuvre des opérations d'aspersion et du Suivi-Evaluation a opéré dans les quatre districts en étroite collaboration avec le PNLP, était responsable de la gestion de la conformité environnementale en collaboration avec les DEEC/DREEC.

En plus de la mise en œuvre de ces volets, le Projet *AIRS Sénégal* était aussi responsable de l'identification des sites opérationnels, de l'achat de l'insecticide et des équipements, la gestion des entrepôts, la formation des milliers de personnels locaux pour le traitement des concessions et le respect des exigences environnementales et sanitaires.

En ce qui concerne la supervision des opérations, AIRS Sénégal a travaillé en étroite collaboration avec le PNLP et le Service National de l'Hygiène (SNH) dans l'ensemble des quatre districts.

En 2014, 97.4 des structures ciblées ont été traitées par le Projet AIRS dans les quatre (4) districts avec deux classes d'insecticide: l'insecticide organophosphoré pirimiphos-methyl (Actellic 300 CS) à Koumpentoum et Vélingara – et le Ficam® un insecticide carbamate à Koungheul et Malem Hoddar. Les opérations d'aspersion ont été mises en œuvre de façon échelonnée dans les quatre districts comme suit: 15 mai – 18 juin (Koumpentoum et Vélingara) et 15 juillet – 17 aout, 2014 (Koungheul et Malem Hoddar) en tenant compte de la rémanence des insecticides dans la lutte contre le vecteur du paludisme.

Le Tableau 1 ci-dessous représente les résultats de la campagne d'aspersion 2014 qui a été mise en œuvre sur une durée globale de 34 jours opérationnels du 15 mai au 17 aout 2014 dans les quatre districts.

TABLEAU 1. RESUME DE LA CAMPAGNE AID 2014

Indicateur	Résultats
Nombre de districts couverts par le projet AID appuyé par le PMI	4 districts: Koumpentoum, Koungheul, Malem Hoddar, et Velingara
Insecticides utilisés	Organophosphorés: Koumpentoum, Vélingara
	Carbamates: Koungueul, Malem hoddar
Nombre de structures traitées par les opérateurs	204.159
Nombre de structures trouvées par les opérateurs	209.603
Couverture de la campagne AID 2014	97,4%
Population protégée par la campagne AID 2014	708.999
Nombre de personnes formées avec le fonds du Gouvernement US pour fournir Les services AID	933
Effectif total des personnes formées avec les fonds du Gouvernement US	1.263

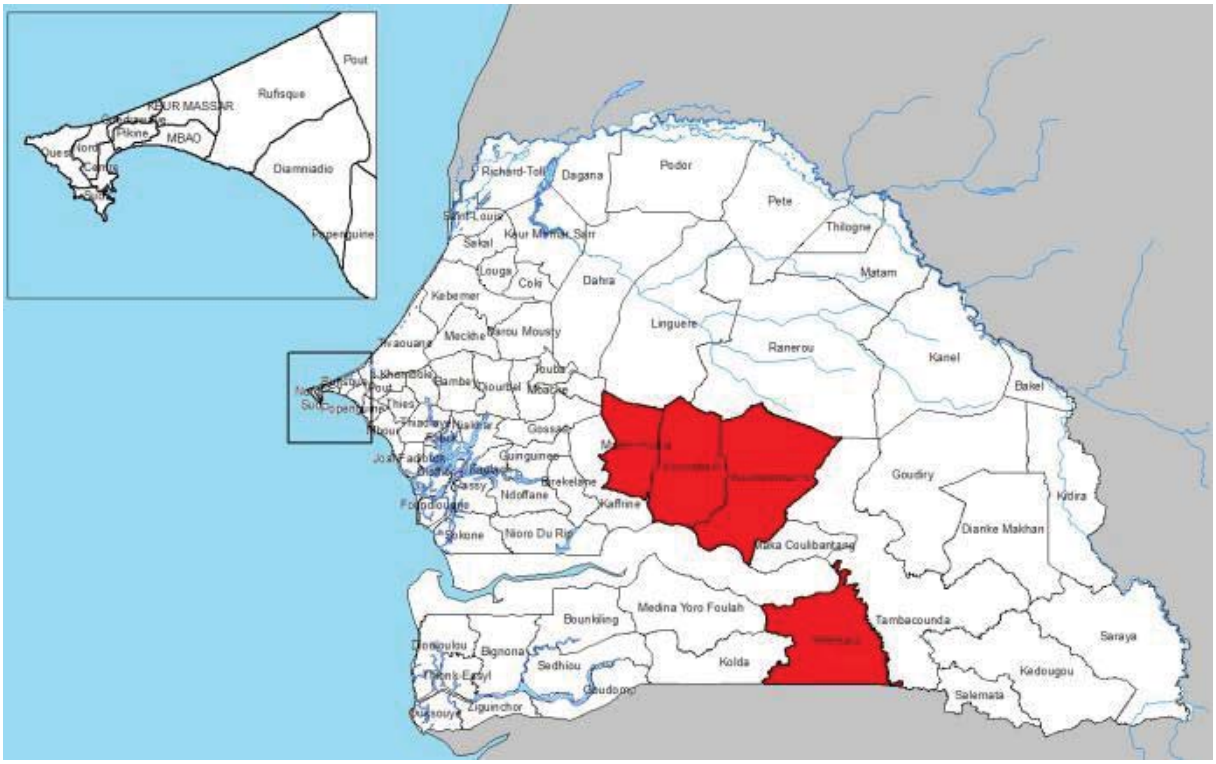
Pour cette campagne 2014, le projet AIRS Sénégal a utilisé un total de 25.337 sachets de carbamates, et un total de 34,849 de flacons d'organophosphorés, avec en moyenne 3,4 structures traitées par un sachet/flacon.

Un fait unique qui a caractérisé la campagne de cette année était initiation de trois activités pilotes. Premièrement, AIRS *Sénégal* a mis en œuvre une plateforme de SMS pour collecter et disséminer les données de la campagne d'aspersion à PMI et aux partenaires locaux de façon quotidienne. Deuxièmement, l'équipe a testé une application de smartphone/téléphone intelligente pour conduire une supervision standardisée tout le long de la campagne améliorant ainsi la qualité de la campagne dans son ensemble. Finalement AIRS *Sénégal* a mené l'étude pilote de l'utilisation des puisards mobiles dans quatre sites (voir section 8 et 9 pour plus d'information sur ces études pilotes)

1. Country Background

In 2014, the NMCP in collaboration with PMI and the Steering Committee decided to continue IRS operations in Koumpentoum, Koungheul, Malem Hoddar, and Velingara, four of the 16 priority districts with high malaria morbidity as shown in Figure 1.

FIGURE 1. MAP OF SENEGAL PMI IRS DISTRICTS



2. Objectives for 2014 IRS Campaign

The main objective for AIRS Senegal in 2014 was to continue working with the Ministry of Health and Social Welfare, NMCP, PMI, and other stakeholders to achieve at least 85 percent spray coverage in the PMI IRS target districts.

In 2014, as part of the transition process to MOH, AIRS Senegal worked with the NMCP as an integrated team throughout the planning and implementation of the IRS campaign in the four districts. NMCP conducted IEC mobilization activities in all four districts with direct funding from PMI/Senegal.

As in previous years, AIRS Senegal was responsible for M&E and environmental compliance (EC) inspections in collaboration with the DEEC and its regional offices (DREEC) covering the four target districts. AIRS Senegal also conducted the distribution and transportation of IRS commodities and personnel. In coordination with NMCP and SNH, AIRS Senegal continued to organize training and supervision of operations in all four districts with SNH playing a key role.

Two insecticides were used for the 2014 IRS campaign: carbamates (Ficam®) for Malem Hoddar and Koungheul and organophosphates (Actellic 300 CS) for Koumpentoum and Velingara districts.

The project was expected to carry out the following activities:

- Support training, capacity-building, and advocacy at the national, regional, and district levels as a means of achieving IRS sustainability. This included building the capacity of the government, counterparts, and partners to lead a high-quality IRS campaign;
- Provide regular M&E support for the IRS program;
- Carry out logistical assessments as needed and arrange all procurement, shipping, delivery, and storage of sprayers, spare parts, insecticides, and personal protective equipment (PPE);
- Ensure safe and correct insecticide application, thus minimizing human and environmental exposure to IRS insecticides in compliance with the Supplemental Environmental Assessment Amendment;
- Support NMCP and other local partners with coordination of IEC, sensitization, and mobilization activities to raise awareness and encourage acceptance of IRS.
- Assist NMCP in smoothly transitioning selected IRS responsibilities to districts, including development of communication plans, recruitment of spray personnel, development of district IRS micro-plans, development of training materials, supervision of IRS activities and EC.
- Test data collection and reporting via SMS for team leaders in four districts, the use of smartphones for IRS supervision in two districts, and the use of mobile soak pits at four operational IRS sites.
- Promote cost efficiency through due diligence and efficiency of operations.
- Spray a target of 212,979 structures in the four districts, protecting target 706,393 residents.

3. PREPARATION FOR IRS CAMPAIGN

3.1 IRS CAMPAIGN PLANNING

Following the recommendations made by District Medical Officers (DMOs) during the 2013 evaluation meeting, IRS activities were incorporated into the four district health annual action plans for 2014.

Prior to the work planning exercise, AIRS Senegal conducted a training session on strengthening NMCP capacity in IRS management and implementation. The training session included SNH, DEEC, *Service National de l'Education et l'Information pour la Santé*/National Health Education and Information Service (SNEIPS), and DPM (Medical Prevention Division).

Under the NMCP's leadership, AIRS Senegal, SNH, *Université Cheikh Anta Diop de Dakar* (UCAD), and Steering Committee members participated in the National IRS Planning workshop from April 29-30, 2014. The objectives of the workshop were to share and validate the year's IRS implementation plan and to include IRS activities in the health annual action plans for each PMI-supported district. At this meeting, participants validated the IEC/IRS plan developed by NMCP with AIRS Senegal's technical assistance. Participants included members of the IRS Steering Committee, regional and district health managers, local political authorities, national and regional SNH managers, and SNEIPS. The overall result of this workshop was to build consensus on the IRS activities to be implemented during the 2014 IRS campaign in the focus districts.

Table 2 lists the activities AIRS Senegal led or participated in to plan for and organize the 2014 IRS campaign.

TABLE 2. 2014 IRS PLANNING AND ORGANIZATION

Areas	Activities implemented
AIRS staff orientation	• Chief of Party (COP) Annual Conference and IRS COP retreat, June 2014, Philadelphia, USA
IRS activities planning	• National-level planning, March 2014 • District-level planning (micro-planning), April 2014 in Velingara and Koumpentoum, May 2014 in Koungheul and Malem • Developed spray calendar April 2014 in Velingara and Koumpentoum, May 2014 in Koungheul and Malem
Recruitment of seasonal personnel	• AIRS temporary personnel: finance assistants, logistics assistants, data entry clerks • AIRS site seasonal personnel: site managers, team leaders, spray operators • Auxiliary staff: drivers, storekeepers, repair technicians, washers, water suppliers
Personnel capacity-building	• Review of spray operator training guide • Review of existing training manuals and tools • Training of NMCP staff including SNH, DEEC, SNEIPS • Training of AIRS district staff including, finance assistants, logistics assistants, data entry clerks • Training of new SNH agents in the three regions covering IRS districts (Kaffrine, Kolda, and Tambacounda) • Country-level IRS training of trainers • Physicians' and nurses' training on IRS-related poisoning case management • Training of environmental district coordinators and staff in regions covering IRS districts

Areas	Activities implemented
Environment	• Identification and selection of operational facilities at district and secondary sites • Implementation of mobile soak pit pilot • Pre-inspection and validation for all IRS sites using smartphones • Letter Report development and submission to Home Office for IRS EC • Monitoring secondary IRS site rehabilitation and inspections using smartphones
M&E	• Updating of IRS data collection tools and mobilization data collection tools • Reviewing of IRS database and mobilization database • Recruitment of data clerks for IRS and IEC mobilization data entry • Implementation of SMS for collecting and sending data • Post-Spray Data Quality Audit (PSDQA)
Operations	• Finding secondary sites and camping site • Deployment of Abt district personnel (finance assistants, logistics assistants, data entry clerks) • Micro planning workshops in the four districts • Validation of spray calendars and communication plans • Rehabilitation of IRS sites in compliance with environmental standards • Production of training manuals and data collection tools • Recruitment of seasonal personnel • Seasonal personnel's pre-IRS medical examination • Training of spray operators and auxiliary staff (drivers, storekeepers, repair technicians, washers) • Development of supervision plan for spray operations • Implementation of supervision tools • Coordination and monitoring of spray operations • Implementation of smartphone for supervision • Monitoring of spray performance tracking sheet
Logistics	• Physical inventory of existing equipment • Quantification of insecticide and IRS equipment • Equipment check to determine cleaning and repair needs • Needs assessment for local and international procurement • Transportation needs assessment • Training of logistics assistants and storekeepers • Dispatching and delivery of materials from the central warehouse to districts and secondary sites • Management of contaminated solid wastes
Communication	• Technical assistance to NMCP in reviewing the IEC plan, reviewing and developing IEC materials, IEC material production and distribution, and validating districts IEC plans • Participation in IEC activities supervision • Participation in the various NMCP/IEC committee meetings
Partnership	• Monthly tripartite meeting with NMCP coordinator, PMI malaria advisor, and Abt COP • Initial contact visits with strategic IRS partners: NMCP, SNH, District Health Management Team (DHMT) local authorities, Laboratories of Vector and Parasite Ecology, and Directorate of SOCOCIM Cement Factory, SodiaPlast (bottle recycling firm) • Empowering regional environmental officers for pre-IRS EC inspections • IEC IRS Strategy Committee mainly composed of NMCP, Service National de l'Education et l'Information pour la Santé (SNEIPS) focal persons, and AIRS IEC coordinator • Partnership development with micro-finance institutions
Administration & Finance, procurement	• FY14 Budget preparation • IRS lease agreements—drafting and signing • Recruitment of seasonal personnel • IRS operations participants' agreements—drafting and signing • Vehicle rental announcement and selection • Vehicle lease agreement—drafting and signing

3.2 Logistics Planning and Procurement

3.2.1 Inventory

Based on the 2013 post-spray inventory data and decisions on the 2014 spray target areas, the logistics coordinator quantified the needs for the 2014 season and worked jointly with the procurement coordinator on local purchases of IRS supplies and materials.

During the spray campaign, logistics assistants conducted inventories every 15 days to secure appropriate stock in the districts. The team organized additional dispatches of materials to the secondary sites' storerooms every ten days, or as needed. Besides the stocktaking conducted every 15 days, stock cards and records were completed twice a day by site storekeepers, for more traceability, thus enabling the logistics coordinator to have a daily update of stock in store.

During the 2014 spray campaign, carbamate stock use was subjected to rigorous monitoring in Koungheul and Malem Hoddar. Seventy percent of the sachets in stock were about to expire in February and March 2016 therefore AIRS Senegal developed stock cards for carbamates inventory and stock disposal using the first-expired, first-out (FEFO) rule.

At the end of the spray campaign, all materials and equipment were counted and adequately stored at district level. The decision to store these at the district level was made by AIRS Senegal and district authorities in an effort to save transportation costs. For security purposes all the insecticide was moved to the main warehouse in Kaolack. District coordinators (DCs) were responsible for stock balance and regular reconciliation of the inventory during the offseason.

3.2.2 Servicing of Equipment

For the first phase of the 2014 spray campaign, AIRS Senegal procured new Goizper spray pumps, which are more appropriate for use with organophosphates. AIRS Senegal had to train spray operators and pump repair technicians on the use of this new equipment. To that end, AIRS Senegal called upon the Goizper Regional Director Omar Sanogo to assist with the training of trainers (TOT). Spray operators were also trained in maintenance (preventive and corrective) of Goizper pumps.

During the training of operators using Goizper pumps some difficulties were reported related to the malfunctioning of few pumps. AIRS Senegal called upon Goizper's regional representative who traveled on site and solved the issues. During the first week of spraying few operators were having problems of manipulating and rinsing the pumps, but this issue was steadily solved by SNH supervisors. In addition, the company shipped spare parts to Senegal for use as needed.

Hudson pumps were also subject to preventive maintenance in the four districts, which enabled AIRS Senegal to dismiss all first-generation pumps that were brought back to Kaolack warehouse. The newer and well-functioning pumps were deployed to the IRS sites in Malem Hoddar and Koungheul. In addition, the project serviced and deployed all fire extinguishers and generators to the districts prior to the start of the campaign.

3.2.3 Procurement

To estimate correct quantities of insecticide, IRS equipment, and other supplies required for the 2014 spray season, AIRS Senegal used data that was based on the structures found after the 2013 campaign before data cleaning was conducted. The ratio of sachets used per structure was considered 1:3. Using 2013 IRS structures made it possible to assess the exact number of spray needs for the 2014 campaign in a 30-day period, assuming also that one spray operator sprays an average of 13 structures per day. A list of items procured internationally and locally to meet the needs of the 2014 spray round are included in Annex A.

3.2.4 Dispatching of Commodities

By April 25, 2014, local and international procurements were all available at the central warehouse in Kaolack. AIRS Senegal then developed a dispatching plan based on the distribution list that helped estimate the appropriate quantity of each item for each site. By April 27, 2014, Koumpentoum and Velingara districts had received their IRS materials. Koungheul and Malem Hoddar received theirs on June 21, seventeen (17) days prior to the start of the spray campaign.

During spray operations, AIRS Senegal's technical team members made supervision trips throughout the spray campaign to monitor stock management in the field storerooms. At the end of each trip, supervisors provided recommendations to the logistics assistants and storekeepers and coached them on addressing any shortcomings identified.

3.3 Training

The AIRS Senegal team, jointly with the District Health Management Team (DHMT), SNEIPS and representatives from the NMCP conducted a series of trainings for various spray personnel to prepare for the spray season as shown in Annex B. In total, AIRS Senegal trained 1,263 people, of whom 17.3 percent were female. The trainings and orientation sessions are described below.

Of the total number of people trained, AIRS Senegal hired 1,089 people (21.48 percent of whom are female) for the 2014 Spray Campaign (See Table 6 in Section 5.2). The reason for the large difference between the number of people trained and the number of people hired is that AIRS Senegal works with numerous government supervisors who are trained by AIRS Senegal but not hired by the project.

3.3.1 Capacity Building for NMCP

As part of the IRS transfer of responsibilities to the NMCP, AIRS Senegal held a capacity building workshop March 10-13, 2014 at the NMCP. The workshop focused on all aspects of IRS campaign implementation. Project partners took part in the workshop, namely PMI, LEVP/UCAD, IRD (Research Institute for Development), DEEC, SNEIPS, SNH, and all AIRS Project staff. The following topics were covered during this capacity building workshop:

- Underlying principles of IRS;
- IRS implementation process;
- Environmental aspects;
- IRS supervision;
- M&E;
- Financial and administrative procedures in IRS (USAID); and
- Roles and Responsibilities.

3.3.2 Orientation of AIRS District Temporary Personnel

After recruiting temporary district personnel (e.g. logistics and finance assistants), AIRS Senegal held a two-day workshop in April 2014 to build organizational and operational capacity of newly hired district staff, including logistics and finance assistants, to better execute their assignments at their respective job posts. The workshop topics included:

- Managerial aspects at district level;
- Abt's code of conduct;

- District-level activity timeline;
- EC measures;
- IRS/IEC;
- Logistics organization management;
- Operations' financial procedures;
- Data collection organization;
- Techniques for supervising spray operations; and
- Roles and responsibilities.

For the logistics assistants, AIRS Senegal defined a safety stock for each item to serve as an alert threshold to refill the stock. The size of the safety stock depended on the type of the item, how fast it was consumed, and the site storeroom's accessibility to the district warehouse.

3.3.3 Smartphone Training for SNH Staff

To ensure proper use of smartphones for IRS supervision, Senegalese government staff was trained with support from AIRS Senegal's subcontractor, Dimagi. Twenty-two SNH supervisors were trained in Malem Hoddar and Koungheul on smartphone use on July 4 -5, 2014 by the AIRS Senegal team including Operations, M&E and IT staff. The training covered the following topics:

- Revising supervision checklists;
- Method of smartphone use;
- Supervision reporting; and
- Rules of procedure for smartphone fleet management.

3.3.4 Training Newly Posted SNH Staff in IRS Districts

In 2013, there was a reorganization of SNH staff across the country and new personnel who had not previously worked on IRS were assigned to IRS region/districts. This training took place in Kaolack on April 8–12, 2014 to build the capacity of SNH staff who would train spray operators and supervisors. In total, 14 SNH agents and two NMCP staff were trained on the following topics:

- Overall vector control methods, especially IRS, their indications, and their limits;
- The various steps for IRS implementation at district level;
- Spray techniques and safety issues related to insecticide use; and
- EC safety.

3.3.5 Trainers' Orientation

The AIRS Senegal project conducted a trainers' orientation for all districts on April 29-30, 2014 in the regions covering IRS districts (Kaffrine, Tamba and Kolda). The purpose of the orientation was to share and harmonize methodologies to be used by trainers during their workshops with spray operators and supervision agents. AIRS Senegal designed a trainers' training manual highlighting spray operators' expected skills and the teaching methodology, including the following topics:

- Teaching methodologies and techniques;
- Supervisory data collection tools and questionnaires;

- The use of new Goizper pumps in Tamba and Kolda regions;
- Spray performance tracking tools;
- EC and safety measures; and
- MSP implementation in Tamba and Kolda regions.

3.3.6 Spray Operator Training (SOT)

Depending on the dates of spray operations start-up in the four districts, SOT workshops were held over two sessions. The first session was conducted May 6–10 and the second was held July 7–11, 2014 in Koumpentoum/Velingara and Koungheul/Malem, respectively. Those trained included: 554 sprayers, 35 site managers, 121 team leaders, and 107 substitutes. Among the 817 spray operators (SOPs) trained, 358 were new.

Training covered the following topics:

- Spray techniques and proper management of insecticide;
- Data collection methodology;
- The use and management of new Goizper pumps in Koumpentoum and Velingara;
- Sensitization of beneficiaries on IRS-related safety measures;
- Environmental compliance; and
- Roles and responsibilities.

3.3.7 Washers, Guards and Drivers Training

Sixty-seven washers, 62 guards, and 94 drivers were trained on the roles and responsibilities in IRS, code of conduct, and environmental safety.

3.3.8 Training for Site Managers and Storekeepers

DCs trained site managers and storekeepers on the purpose and use of the Spray Performance Tracking Sheet (SPTS) on May 12 and July 13, 2014.

3.3.9 Orientation of Site managers, Team leaders and Community IEC Supervisors

To improve field coordination, spray leaders (35 site managers, 121 team leaders and community supervisors) were trained on IRS management at the operational level on May 11 and July 12, 2014 in Koumpentoum/Velingara and Koungheul/Malem Hoddar districts, respectively. The sessions, led by AIRS Senegal, covered the following topics:

- Procedures and code of conduct at site level;
- Roles and responsibilities of site managers and team leaders, and relationships with SNH supervisors;
- IRS supervision activities; and
- Use of the error eliminator sheet.

3.3.10 Training of Site Managers and Team leaders on SMS and Smartphone Use

AIRS Senegal also trained site managers, with support from Dimagi, on the use of cell phones to report operational data (number of SOPs, number of sprayed rooms and amount of insecticide used) via SMS on a daily basis. The one-day training sessions were conducted in Koumpentoum/Velingara and Koungheul/Malem Hoddar. Site managers were also trained how to use smartphones to fill out supervisory checklists. The following topics were covered in this workshop:

- Supervision checklists;
- Technical tools for smartphone and mobile phone use; and
- Rules of procedure for smartphone and mobile phone fleet management.

3.3.11 Health Post Nurses' Orientation for Mobilization

The DHMT, under the supervision of NMCP, SNEIPS, and AIRS IEC coordinator, facilitated orientation sessions for 65 health post nurses (HPNs) in four districts. The sessions were held in early May for Velingara and Koumpentoum and early July for Koungheul and Malem Hoddar districts. Among these 65 HPNs, eight were new. The purpose of this orientation was to prepare the IEC mobilizers for mobilization. The topics covered in this orientation included:

- An update on the counseling card, a job aid describing essential IRS messages for the IEC mobilizer;
- Leaflets on IEC containing more information on IRS for the community;
- Messages to be delivered during the mobilization;
- How to fill out data collection forms;
- Supervision of community IEC mobilizers;
- Structure identification and data entry;
- Ensuring mobilization data quality; and
- Training methodology.

Following this training, under the supervision of NMCP, SNEIPS, and AIRS staff, HPNs conducted trainings for 1,377 IEC mobilizers and 143 community supervisors in the four districts.

3.3.12 Training Of Regional Environmental Officers, District coordinators, and New SNH Agents

The training prepared the trainees as facilitators who would be responsible for incorporating EC education into the trainings of supervisors, team leaders, spray operators, and district health and environmental officers. On April 8 – 9, 2014, seven DREEC agents from the regions of Kolda, Tambacounda, and Kaffrine covering IRS districts and the four Districts Coordinators of Koumpentoum, Koungheul, Malem Hoddar, and Velingara were trained on IRS EC management by AIRS Senegal. The same training was delivered April 10, 2014, to seventeen new SNH staff who would be both supervising the IRS campaign and training other seasonal staff.

3.3.13 Health Workers' Training on Insecticide Poisoning Management

All DMOs were trained on IRS-related poisoning management in April 2014. At the district level, 26 HPNs and midwives (15 males and 11 females) newly posted in IRS zones were trained by their respective DMOs in 2014.

4. IEC Activities

IEC was the first IRS component that was totally transferred to the Senegalese government. Throughout the 2014 spray campaign, the NMCP was fully responsible for this component with technical assistance from AIRS Senegal. This section describes the technical assistance that Abt provided to NMCP in the implementation of IEC Activities. AIRS Senegal's IEC objectives for the 2014 spray were to continue supporting NMCP and other local partners with coordination of IEC, sensitization, and mobilization activities to raise awareness and encourage acceptance of IRS.

4.1 Preparations

AIRS Senegal provided NMCP with technical assistance in the following areas:

- Review of national IEC policy and tools;
- Validation of district IEC plans;
- HPNs' orientation for IEC mobilizers' training;
- IEC mobilizers' training by HPNs;
- Supervision of IEC and conduct of the mobilization; and
- Coordination and monitoring of mobilization data collection and reporting to the district health offices and the AIRS office in Dakar.

4.2 IEC Activities

For the 2014 spray campaign, the NMCP maintained the same IEC intervention scheme implemented by AIRS Senegal in 2013. Activity planning and implementation were conducted at the district level. AIRS Senegal provided technical assistance in the validation process for communications plans.

Overall, IEC activities were conducted satisfactorily in the four districts. Districts implemented activities while systematically ensuring proper monitoring, which was done through daily coordination meetings in some districts. This approach made it possible to conduct the spray campaign with minimal difficulty in transmitting IEC messages to the beneficiaries.

In addition, this allowed districts to take action immediately when beneficiaries refused to have their homes sprayed. For example, in Koungheul when the removal of beneficiaries' personal properties was identified as a common reason to refuse spraying, a volunteer group was established to help beneficiaries remove their belongings before the arrival of spray teams.

A strength of the communications campaign this year was the systematic support IEC mobilizers provided to SOPs. In addition to home visits 48 hours before spraying, most districts provided support to SOPs through IEC mobilizers. This strategy helped reduce refusal cases and promptly report those that came up to the district for appropriate action.

However, some problems were reported in Velingara during the first week of spraying when an entire neighborhood in a commune collectively refused IRS. Fortunately, this community ultimately accepted spraying thanks to the negotiations undertaken between various local partners such as neighborhoods delegates, district authorities backed by AIRS Senegal, and local authorities. Homes in this neighborhood were finally sprayed at a later date.

4.3 IEC SUPERVISION

With respect to IEC/mobilization supervision from the central level, it was agreed that any member of the IEC working group could provide assistance to field operations as needed. Because of the lack of availability of NMCP and SNIEPS for IEC supervision, the AIRS Senegal IEC coordinator provided most of the necessary assistance.

The AIRS Senegal IEC coordinator systematically supervised IEC activities in the beginning and at the end of the spray campaign. In the first week of spraying in Velingara and Koumpentoum the IEC coordinator conducted close supervision. As part of his field visits, the IEC coordinator also provided support for IEC mobilizers and spray teams often resolving refusal cases.

The NMCP also conducted supervision in the last week of spraying in Velingara and Koumpentoum. They provided support to those districts towards the end of spray operations, with the deployment of back-up teams in the areas where spraying was still going on. This required readjusting local communications plans. During NMCP's supervision activity, spot checks were conducted to ensure effectiveness of communication and spraying activities and to verify the messages delivered by spray operators and IEC mobilizers.

The last week of spraying in Malem Hoddar and Koungheul was also supervised by the AIRS Senegal IEC coordinator and SNEIPS. Tables 3-5 show some of the IEC campaign results.

TABLE 3. IRS SENSITIZATION RESULTS (HOME VISITS)

Districts	Males	Females	Total
Koumpentoum	25,356	29,553	54 659
Koungheul	23,016	32,790	55,806
Malem Hoddar	14,099	20,889	34,988
Velingara	68,147	75,129	142,833
Total	135,585	167,122	302,707

Source: AIRS Senegal 2014 database

TABLE 4. OTHER IEC ACTIVITIES IMPLEMENTED

Districts	# radio spots	# radio programs	# of roadshows	# of launch days	# of advocacy meetings/days	# of social mobilization	CDD* Meetings
Koumpentoum	115	10	4	01	11	10	01
Koungheul	50	10	05	00	00	00	01
Malem Hoddar**	00	00	0	01	01	00	01
Velingara	675	61	08	01	29	34	0
Total	840	44	21	03	41	35	03

Source: Summary of district presentations at the national evaluation workshop

* CDD - Comité départemental de développement (Departmental Development Committee meeting)

** Malem Hoddar has no local radio station.

TABLE 5. IRS CAMPAIGN COMMUNICATION MATERIALS

Items	No. produced by NMCP
Counseling cards	1,700
Flyers	57,000
Trainer's guide	90
IEC mobilizer's manual	1,700
IRS cards	41,089
T-shirts	3,000
Streamers	100
Posters	3,000

Source: NMCP presentation at the national evaluation workshop

5. IMPLEMENTATION OF IRS ACTIVITIES

5.1 SPRAY CAMPAIGN LAUNCH CEREMONY

On May 17, 2014 there was an official launch ceremony at the national level for the 2014 campaign in the IRS operational site of Bamba Thialene in Koumpentoum. The ceremony was organized by NMCP, AIRS Senegal, and the DHMT, and chaired by the Prefect of Koumpentoum. It was attended by local administrative bodies, village leaders, community leaders, youth associations, community workers/IEC mobilizers, and community members from Bamba and the neighboring villages. The event raised awareness about the needs of this community and provided information on the importance of IRS. The Chief of Party (COP) was interviewed by the Tambacounda local radio and TV stations.

5.2 SPRAY OPERATIONS

The spray campaign began on time on May 15 in Koumpentoum and Velingara, and on July 15 in Koungheul and Malem districts. Spray operations were completed within 35 operational days in Koumpentoum and Velingara, and within 32 operational days in Koungheul and Malem Hoddar.

For the first time in Senegal, organophosphates were used for IRS in Koumpentoum and Velingara with Goizper plastic spray pumps. In order to improve management of spray pumps, spray operators' roles and responsibilities were reviewed. The spray can progressive rinse, previously performed by pump repair technicians, was assigned to spray operators. Pump repair technicians were in charge of supervising the progressive rinse and measuring insecticide leftover after spraying. However, in the districts where carbamates were used with Hudson pumps, progressive rinsing was carried out by repair technicians as done in the past.

It was reported that majority of beneficiaries were happy with the new organophosphate product. Not only did the insecticide protect households from mosquitoes carrying the malaria parasite, but it also helped households with pest control of other insects and small animals like cockroaches and salamanders. However, it was reported on the satisfaction survey that very few refusals in Velingara were related to the smell of the product.

In total, 1,089 seasonal workers, including SOPs, site managers, team leaders, washers, storekeepers, assistant logisticians, accountants, repair technicians, security guards, drivers, and others, were deployed to the 35 sites in PMI districts, as shown in Table 6.

TABLE 6. NUMBER OF PEOPLE HIRED

Position	Male (M)	Female (F)	TOTAL
SOPs	464	90	554
Operational site managers	34	01	35
Team leaders	108	13	121
Data entry clerks	08	04	12
Storekeepers	33	07	40
Finance assistants	02	00	2
Logistics assistants	01	01	2
Repair technicians	43	01	44
Washers	00	67	67

Position	Male (M)	Female (F)	TOTAL
Guards	62	00	62
Drivers	94	00	94
Water fetchers	06	26	32
Office and operations sites cleaners	00	24	24
Total M/F Hire for IRS	**855**	**234**	**1,089**

The 35 sites were distributed as follows: 13 in Velingara, eight in Koumpentoum, nine in Koungheul, and five in Malem Hoddar. At each operational site, AIRS Senegal deployed two to five teams of four to five SOPs. Spray teams worked six days per week with average hours of operation from 7 a.m. to 2 p.m. Before leaving for the spraying sites, all SOPs have breakfast provided by a person selected in collaboration with the local hygiene agent. In addition, SNH agents conducted daily supervision on the quality of food provided. The teams adjusted their hours daily based on weather conditions. Cars were arranged to transport SOPs to and from spray villages. After returning to the operational site, they returned the PPE, unused insecticide and empty bottles/sachets, cleaned themselves, and went home. In some remote operational sites, SOPs camped overnight (i.e. with communities providing lodging and the project covering feeding cost and other supplies).

Prior to the start of spray operations, 817 seasonal workers, including SOPs, team leaders, site managers, washers, and storekeepers, underwent a general medical examination to assess their medical fitness for IRS activities. All female personnel took a pregnancy test at the start of the spay campaign. After 30 days of spraying, none tested positive for pregnancy. At the end of the campaign, spray personnel received an additional medical examination, from which no adverse effects were reported. To minimize health risks and eliminate exposure to the insecticides, all SOPs received complete sets of personal protective equipment that included helmets, face shields, nose and mouth masks, long-sleeved cotton overalls, rubber gloves, pairs of cotton-rich stockings, robust gum boots, and neck covers.

5.2.1 Operations Coordination and Supervision

For adequate coordination of spray operations, there were regular meetings at site and district levels. Coordination and supervision activities are described below.

5.2.1.1 Coordination at Site Level

Coordination at site level was conducted daily and concerned all actors, namely, site managers HPNs, community supervisors, and local SNH supervisors. All issues encountered during IRS implementation were discussed at the site level for an immediate solution. IEC mobilizers were informed of any change in spray calendars for better coordination in the field.

5.2.1.2 Coordination at District Level

Coordination at the district level was conducted under the leadership of the DMO or his representative, and involved all supervision actors (central and regional level SNH and AIRS team) and DHMT. Issues were also discussed during those meetings to come up with solutions and smooth execution of activities on the ground.

5.2.1.3 Operations Supervision

Supervision of the IRS campaign involved identification of potential problems, immediate correction of inadequacies, and problem-solving, leading to improved program performance and helping to ensure a successful campaign overall. The IRS steering committee reviewed and validated the comprehensive IRS supervision checklist and supervision manuals for the use by all supervisors during the 2014 spray

operations as listed in Table 7. In collaboration with the NMCP and other stakeholders, AIRS Senegal developed a supervision plan that is summarized in the following subsections and in Table 8.

TABLE 7. IRS-RELATED MANUALS USED FOR 2014 CAMPAIGN

Manuals	Status
Supervision manual	Reviewed
Training of trainers manual	Reviewed
Spray Operator Pocket Guide	New
Operator booklet	Reviewed
District coordinator guide	Reviewed
Guide for logistics assistant	Reviewed
Storekeeper manual	Reviewed
Manual for pump repair technician	Reviewed
Guide for training on environment	Reviewed
Insecticide shipping guide	Reviewed
Manual on pesticide intoxication case management for physicians	Reviewed
Manual on pesticide intoxication case management for HPN	Reviewed
Guide for IEC mobilizers' trainer	Reviewed
Manual for IEC mobilizers	Reviewed
Manual on data collection	Reviewed

5.2.1.4 Supervision At Site Level

At the site level, each site had an average of three to four spray teams. Every team leader directly supervised the work of four to five spray operators. Site managers were in charge of overseeing team leaders' performance and also observing the work of spray operators and other actors on site, including washers and security guards.

Every site had one local supervisor assigned by SNH. After one week of supervision in a given site, those assigned SNH supervisors would rotate with their colleagues from other operational sites. At the end of the day, there were debriefing meetings with the team leader, site manager, and SNH supervisor to share the findings and lessons learned from the day and to make recommendations for the next day.

SNH supervisors and site managers played a key role in monitoring spray operations, particularly with the introduction of the smartphone for IRS supervision pilot in Koungheul and Malem Hoddar.

5.2.1.5 Supervision at Regional and National level

Representatives from the SNH regional offices and the central level performed supervision visits to assess the progress and any issues with the campaign as well as to observe the performance of local SNH agents.

5.2.1.6 AIRS Senegal supervision

Supervision has always been conducted throughout the period of spray operations. However, in 2014, the approach and frequency of supervision were enhanced. As a result, the working relationship between the AIRS Senegal team, DHMT, and local SNH significantly improved. Specifically, all AIRS Senegal technical staff worked in the field during the length of the campaign, performing close supervision and coaching in all aspects of the operations. They specifically focused on the supervision of

spray techniques, EC, IEC mobilization, stock management, and handling of the insecticide. In addition, SNH officers were widely dispatched to each district to conduct daily supervision in all operational sites. Careful and consistent supervision was a key factor of success during this spray campaign.

While in the field the AIRS Senegal team provided coaching to the SNH officers and DHMT on how to conduct proper supervision using the smartphones as part of the smartphone pilot for supervision. This new method of supervision allowed supervisors to resolve issues more quickly on-site as compared to last year. (For more on the smartphone pilot for supervision please refer to section 5.3)

Supervision also focused on:

- Making sure spray calendars are implemented as planned and monitoring spray operators' daily performances to prevent any voluntary slowdown in operations by spray operators;
- Strengthening working relationships between various actors in the field; and
- Management of refusal cases in close collaboration with local authorities.

Supervision had an important impact on the following:

- Adhering to spray progress timelines in operational sites;
- Spray teams adhering to daily performance targets;
- No complaints from beneficiaries reported to authorities; and
- Refusal cases were managed successfully (households accepted spray during supervision, particularly in Velingara district).

Both last year and this year, the increased ownership of government authorities has been evident. This year the Prefects of Koumpentoum and Koungheul both made visits to spray sites. During the district evaluation meeting, Koumpentoum's Prefect gave out awards for outstanding performance in this campaign.

Table 8 summarizes the spray operations supervision and monitoring schedule.

TABLE 8. SPRAY OPERATIONS SUPERVISION AND MONITORING SCHEDULE

Actors	Frequency	Supervised areas
District SNH staff	Daily visit during the entire period of spraying	Spraying techniques, environmental safety and compliance, spray operators' behavior IEC messages delivered Spray performance Spray organization in the field
SNH (regional and central)	2 visits for central-level and 3 for regional-level SNH	Spraying techniques, environmental safety and compliance, spray operators' behavior, supervision of SNH supervisors, IEC
Abt national and field Office	Daily visit during the entire period of spraying	Spraying techniques, environmental safety and compliance, spray operators' behavior, supervision of SNH supervisors, management of storekeepers, IEC message delivered, spray performance
NMCP	4 visits during the campaign	Field organization, environmental safety and compliance, partner relationships, supervision of SNH supervisors, IEC component
PMI/USAID	3 visits during the campaign	Field organization, partner relationships, supervision, management of storekeepers, availability and status of materials stock, IEC, Spray performance

DHMT	5 visits for IEC mobilization; 11 visits for spray operations	IEC, spray operations and beneficiaries' impressions; IRS operations in joint supervision with Abt staff
Local leaders (prefet, mayors, etc.)	2 visits throughout the campaign	IEC mobilization, oversight of entire IRS operations

5.3 SMARTHPHONE PILOT FOR SUPERVISION

In an effort to improve, standardize, and automate supervision, AIRS Senegal hired Dimagi to help develop a smartphone application for supervision. The following is a brief description of the pilot. During the campaign, the Home Office M&E Specialist visited Senegal to oversee and provide assistance with the implementation of this pilot.

5.3.1 EQUIPMENT USED

AIRS Senegal procured 36 Samsung Galaxy pocket phones to distribute to SNH Supervisors, Site Supervisors, steering committee members, and AIRS Senegal staff. The AIRS Senegal team along with Dimagi, the project's implementing partner, downloaded a mobile application containing the supervision forms to each phone and also set up an email address where users would receive the daily reports for the supervisor's teams.

The following supervision forms were included in the smartphone application:

1. Spray operators' mobilization and vehicle inspection;
2. Structure preparation and observations on spraying techniques;
3. Spray operators' return at the end of day; and
4. Storekeepers' performance monitoring.

After installing the forms on the smartphones, the AIRS team and Dimagi continued to test the application to ensure the forms were functioning properly and could be used properly during the spray campaign. They practiced and tested how to submit completed forms, how to edit forms, and the wording of questions. Updates were also carried out throughout the entire implementation process for improvement purposes as needed.

5.3.2 IMPLEMENTATION, STRENGTHS, AND CHALLENGES OF THE PILOT

The four forms were completed on a daily basis by local supervisors. Site managers were in charge of spray operators' morning mobilization and their return to base. Central level supervisors (AIRS staff, SNH supervisor) and regional level SNH also completed sub-forms but did not systematically follow spray teams for a full day.

Every day at 6:00 pm supervisors would receive the supervision data as an email on their smartphone. The AIRS M&E assistant ensured that all data sent by users was uploaded into the database and pushed out in the daily reports.

Throughout the spray campaign, of the 577 forms completed and uploaded into the database, only 2.2 % had shortcomings that were either addressed immediately or shortly thereafter.

Some of the strengths of the smartphone pilot for supervision included:

- Daily use of mobile application by site managers and supervisors;
- Local SNH supervisors and site managers received reports every day and implemented recommendations immediately;
- Supervision was standardized both across the AIRS Senegal project as well as the government

supervisors;

- Reports were processed and shared daily with partners and implementing actors;
- A qualified and committed team (M&E team & IT Manager) was available for application implementation and support;
- Availability of Dimagi consultant's services and readiness for troubleshooting;
- Storekeepers' compliance with requirements of daily phone stock management; and
- Appropriate use of application and timely reporting of data.

Table 9 summarizes challenges and solutions for system implementation.

TABLE 9. CHALLENGES AND SOLUTIONS FOR SYSTEM IMPLEMENTATION

Challenges	Solutions
• Users not very familiar with smartphones	• Conduct systematic close supervision in the first week of spraying.
• Risk of loss of phones	• Leave the management of mobile phones to the storekeeper.
• No power supply in some sites for recharging smartphones batteries	• Provide solar-powered lamps for smartphone power supply in sites where there's no electricity.
• Pre-paid credit management and mobile data option activation	• Pass option with 1 week validity and Internet credit refill from the 6th day. • Enable the mobile data option for connection while sending or receiving reports and disable the mobile data option when Internet connection is not needed to save credit. • Purchase prepaid credit cards every 10 days.

5.4 SPRAY PERFORMANCE TRACKING SHEET

In 2014, AIRS Senegal continued using the Spray Performance Tracking Sheet (SPTS) tool introduced in 2013 and reviewed in 2014 in all four target districts.

This tool allowed daily tracking of SOP performance and the use of insecticide. After analyzing the data, site managers communicated feedback to the team leaders and provided recommendations and corrections as needed. They also shared the performance results with the DHMT and other partners on a daily basis.

Site managers were responsible for recording the performance data. They worked with storekeepers to input information on insecticide use on the SPTS on a daily basis. This information was available to DCs and shared with DMOs. DMOs submitted this data to the IRS focal person at the NMCP central office. In addition, AIRS Senegal synthesized the data and shared it every week with all partners including PMI, the NMCP, the SNH, the District and the Home Office. This tool was highly appreciated by all stakeholders visiting operations during the campaign.

5.5 LOGISTICS AND STOCK MANAGEMENT

The introduction of organophosphates led to a reorganization of the logistics chain. Organophosphates' packages are larger than those of carbamates so the team faced more challenges related to storage capacity. To that end, district warehouses were supplied more frequently because of the space limitation for restocking and stock monitoring.

The new plastic Goizer spray pumps are easily adaptable to this type of liquid pesticide. Because these are plastic pumps, all previously used Hudson maintenance tools were not compatible and therefore withdrawn from the stock during the OP phase of the campaign. Consequently, new parts and materials, such as lubricants for serviceability of spray pumps, were introduced.

As for the insecticide, a warning threshold was established in each district central storage facility based on the total insecticide stock for each site. From there, two pesticide re-stockings were carried out over the course of the campaign to avoid stock-outs.

6. POST-SPRAY ACTIVITIES

6.1 SUMMARY OF POST-SPRAY ACTIVITIES

Post-spray activities included campaign evaluation meetings at the site, district, and national level; demobilization of commodities; site rehabilitation; and solid waste management, which are covered in Section 9. Table 10 provides details on each post-spray activity.

TABLE 10. POST-SPRAY ACTIVITIES

Activities	Responsible Party	Results
Post-IRS medical examination including pregnancy tests	DMO	Completed except in Velingara (DMO and deputy not available)
Site-level IRS evaluation	HPNs, SOPs' site managers, team leaders and SOP, religious and community leaders, elected officials and AIRS	Completed
District-level IRS evaluation	DHMT, HPNs, site coordinators, district high level authorities, religious and community leaders, local elected officials and AIRS	Completed
National-level IRS evaluation	Country-level partners, local elected leaders, UCAD, SNH, SNEIPS, DMOs, AIRS, local media	Completed
IRS site closeouts	AIRS district staff	Completed
Data cleaning and archiving	M&E team	Completed

6.1.1 POST SPRAY EVALUATION MEETINGS

At the post-spray evaluation meetings, participants identified strengths and limitations of the 2014 spray campaign planning and implementation.

6.1.1.1 STRENGTHS

- AIRS Senegal's capacity building of NMCP staff on IRS implementation.
- Close supervision of spray operations at all levels provided by all stakeholders and partners (AIRS Senegal and Home Office, SNH, NMCP, regional and district health offices, DEEC/DREEC, UCAD, USAID/PMI).
- Dispatching and coding of spray operators' materials by site managers and team leaders the day before the start of spray operations prevented delays that are common to first days of spraying.
- Making a DHMT member available to the program as an IRS focal point for better activity monitoring by the district.
- Establishing a voluntary group of young men to help beneficiaries in household preparation before the arrival of spray teams in Koungheul district.
- Reducing the number of road accidents (0 cases in 2014 versus 4 in 2013) and poisoning cases (1 case in 2014 versus 3 in 2013).
- Distributed insecticide and other equipment prior to the IRS start.

- Shared SPTS and daily performance monitoring.
- Coordinated spray calendars with home visit (mobilization) schedules to ensure home visits occurred within 48 hours before spray.
- Involved local governments in IRS implementation activities (micro-planning, supervision) and evaluation workshops for better IRS ownership and future transfer.
- Strengthened commitment from key stakeholders (SNH, districts, NMCP).
- Improved management of refusal cases.
- Improved coordination at all levels for quick strategic decisions and management actions.
- Effectively involved DREEC and DEEC agents in IRS campaign implementation.
- Rented adequate vehicles for marshy areas to replace minibuses.
- Availability of a professional from Goizper pump manufacturer for training of trainers.
- Piloting a few innovations including use of SMS for reporting, supervision using smartphones, and use of mobile soak pits.

6.1.1.2 Limitations

- Capacity of MOH and particularly, DHMT, to implement IRS activities along with the routine activities of the health center.
- Low educational level of seasonal workers. It was noticeable among some spray operators and IEC mobilizers when filling out data collection forms.
- Inadequate management of IRS cards at household level.
- Limited time available for regional health teams' comprehensive involvement in the campaign.

6.2 Demobilization of Commodities

Following completion of spray operations, the project moved the leftover insecticide, equipment, and PPE from the 35 operational sites to the district-level warehouses, and then all leftover insecticide and solid wastes were transferred to the main warehouse in Kaolack. Annex A details the post-spray inventory of the equipment and supplies available in the central warehouse.

7. ENTOMOLOGY

In Senegal, PMI contracted UCAD directly to provide entomological monitoring in the IRS target districts. For the 2014 campaign, UCAD conducted cone bioassays with susceptible strains of *An. gambiae* s.s in four districts (Koumpentoum, Malem Hoddar, Koungheul and Velingara). The purpose of the tests was to assess the quality of the spraying and the efficacy of the insecticide during spraying. From mid-May to mid-June, Actellic (organophosphate) was used in Koumpentoum and Velingara. From mid-July to mid-August, Ficam® (Carbamates) was used in Malem Hoddar and Koungheul. As demonstrated in Tables 11-13, the data collected from July to September indicate good quality of spraying. AIRS Senegal TM/Entomologist worked very closely with UCAD, drafting preliminary results based on UCAD collected data.

TABLE 11. CONE BIOASSAY RESULTS, KOUMPENTOUM

Evolution of the residual effect of the insecticide (organophosphate) on reared strain according to the type of support (July-November 2014)

No. of Months Post-Spray	1 Month	2 Months	3 Months	4 Months	5 Months
Control	3.6% (7/195)	4.9% (2/41)	7.0% (10/142)	13.1% (17/130)	8.0% (7/87)
Test	99% (746/751)	100% (158/158)	98% (535/543) (MC)	96% (473/490) (MC)	80% (251/309) (MC)

MC = mortality corrected by Abott formula

The residual efficacy of the Actellic remained high five months after spraying in Koumpentoum (Table 11).

TABLE 12. CONE BIOASSAY RESULTS, VELINGARA

Evolution of the residual effect of the insecticide (organophosphate) on reared strain according to the type of support (July-December 2014)

No. of Months Post-Spray	1 Month	2 Months	3 Months	4 Months	5 Months	6 Months
Control	6.0% (5/84)	3.7% (9/246)	4.1% (5/121)	13.8% (11/80)	7.9% (7/89)	6.1% (9/148)
Test	81.3% (384/466) (MC)	82.8% (612/739)	97.4% (454/466)	98.8% (297/300) (MC)	66.6% (218/315) (MC)	72.3% (383/518) (MC)

MC = mortality corrected by Abott formula

The residual efficacy of the Actellic remained high for four months after spraying in Velingara and started to decrease in the fifth month (Table 12).

TABLE 13. CONE BIOASSAY RESULTS, KOUNGHEUL

Evolution of the residual effect of the insecticide (carbamates) on reared strain according to the type of support (August-November 2014)

Month		Banco			Ciment			Total *		
		1 month (Aug.)	2 months (Oct.)	3 months (Oct.)	1 month (Aug.)	2 months (Oct.)	3 months (Oct.)	1 month (Aug.)	2 months (Oct.)	3 months (Oct.)
Exposed	Test	395	396	62	304	217	98	699	613	160
	Controls	102	126	-	81	41	44	183	167	44
Nb. of deaths 24 h	Test	395	195	23	304	128	44	699	323	67
	Controls	4	3	-	2	1	0	6	4	0
Mortality 24 h (%)	Test	100%	49,2%	37,1%	100%	59%	44,9%	100%	52,7%	41,9%
	Controls	3,9%	2,4%	-	2,5%	2,4%	0%	3,3	2,4%	0%

*23 rooms tested in August in 5 villages which are in their first month post spray (13 mud, 10 cement), 20 rooms tested in October in four villages which are in their second month post spray (13 mud, 7 cement), 5 rooms tested in October in 1 villages which is in its third month post spray (2 mud, 3 cement).

One month after the spray, the mortality of the exposed mosquitoes was summed for all tested walls. At the end of two months of monitoring, all sprayed walls have lost their residual effectiveness (49.2% of mortality post exposition in mud walls compared to 59% in cement walls) (Table 13)

TABLE 14. CONE BIOASSAY RESULTS, MALEM HODDAR

Evolution of the residual effect of the insecticide (carbamates) on reared strain according to the type of support (August-November 2014)

Month		Banco					Ciment					Total *				
		< 1 month (Aug.)	1 month (Aug./Sept.)	2 month (Sept.)	3 month (Nov.)	4 month (Nov.)	< 1 month (Aug.)	1 month (Aug./Sept.)	2 month (Sept.)	3 month (Nov.)	4 month (Nov.)	< 1 month (Aug.)	1 month (Aug./Sept.)	2 month (Sept.)	3 month (Nov.)	4 month (Nov.)
Exposed	Test	90	405	90	279	193	207	444	69	195	130	297	849	159	474	323
	Controls	41	43	-	-	40	41	170	43	117	43	81	213	43	117	84
Nb of deaths 24 h	Test	90	302	49	67	21	207	370	54	59	11	297	672	103	126	32
	Controls	1	1	-	-	0	1	4	1	4	3	2	5	1	4	1
Mortality 24 h (%)	Test	100%	74,6%	54,4%	24,0%	10,9%	100%	83,3%	78,3 %	30,3 %	8,5%	100%	79,2%	64,8 %	26,6 %	9,9%
	Controls	2,4%	2,3%	-	-	0,0%	2,4%	2,4%	2,3%	3,4%	7,0%	2,5%	2,3%	2,3%	3,4%	1,2%

*10 rooms tested in August in 2 villages which are less than one month of monitoring (3 mud, 7 cement), 25 rooms tested in August and September in 5 villages which are in their first month post spray (12 mud, 13 cement), 5 rooms tested in September in 1 village which is in its second month post spray (3 mud, 2 cement), 15 rooms tested in November for 3 villages which are in their 3rd month post spray (9 mud, 6 cement), 10 rooms tested in November for 2 villages which are in their 4th month post spray (6 mud, 4 cement)

During the monitoring, 1057 specimens were exposed to mud walls compared with 1045 cement walls. One month after treatment, mortalities were 74.6% and 83.3% respectively in mud and cement walls. Cement walls remained effective until two months of the monitoring unlike mud walls for which the duration of the residual performance is less than two months (Table 14).

TABLE 15. *AN. GAMBIAE* S.L AGRESSIVITY RATE

Date	Region	District	H/N		*An. gambiae*		Other Anoph	*Culicinae*	Agressivity rate		
			Indoor	**outdoor**	**Indoor**	**outdoor**			**Indoor**	**outdoor**	**Average**
Aug-14	Kolda	Kolda	30	30	52	43	0	97	**1,73**	**1,43**	**1,58**
July -14	Kolda	Velingara	30	30	2	2	0	116	**0,07**	**0,07**	**0,07**
Aug-14	Kolda	Velingara	30	30	6	14	0	0	**0,20**	**0,47**	**0,33**
July -14	Tamba	Koumpentoum	18	18	0	0	0	11	**0,00**	**0,00**	**0,00**
Sept-14	Tamba	Koumpentoum	18	18	1	4		29	**0,06**	**0,22**	**0,14**
Sept-14	Kaffrine	Malem Hoddar	18	18	4	1	0	127	**0,22**	**0,06**	**0,14**
Sept-14	Kaffrine	Koungheul	18	18	3	0	0	792	**0,17**	**0,00**	**0,08**

In a non-spray district of Kolda, the rate of human bites in the existing vector (*An. gambiae*) was higher in Kolda compared to Velingara district during the same period. In all sprayed districts, the frequency of malaria vectors was very low.

TABLE 16. *AN. GAMBIAE* S.L RESTING DENSITY

Date	**District**	**# of rooms**				***An. gambiae***				**Resting density**					
		Mud		**Cement**		***Mud***		**Cement**		***Mud***		**Cement**		**Average**	
		NS	***S***	***NS***	***S***	***NS***	***S***	***NS***	***S***	***NS***	***S***	***NS***	***S***	***NS***	***S***
August-2014	Kolda	38	-	12	-	20	-	7	-	0,53	-	0,58	-	0,54	-
July-14	Velingara	0	39	0	11	0	2	0	1	_	0,05		0,09		0,06
August-2014	Velingara	0	38	0	11	0	5	0	1	_	0,13	-	0,09	-	0,12
July-14	Koumpentoum	0	37	0	13	0	2	0	1	_	0,05	0,00	0,08	0,00	0,06
Sept-14	Koumpentoum	0	37	0	13	0	13	0	2	_	0,35		0,15		0,30
August-2014	Malem Hoddar	13	22	7	8	3	0	5	1	0,00	0,00	0,00	0,13	0,00	0,03
Sept-14	Koungheul	0	31	0	19	0	1	0	1	_	0,03	0,00	0,05	0,00	0,04

NS= Not Sprayed. S= Sprayed

A lower resting density was registered in all sprayed districts as compared to the non-spray district (Kolda).

8. Monitoring and Evaluation

AIRS Senegal identified lessons learned from the 2013 spray operations and made improvements to the M&E system for the 2014 campaign to:

- Emphasize accuracy of both the data collection and the data entry processes through comprehensive trainings and supervision at all levels.
- Streamline and standardize data information flow to minimize errors and facilitate timely reporting and use of data for effective and better IRS operations.
- Improve data sharing with NMCP in anticipation of NMCP ownership of IRS M&E by sharing spray progress on a daily and weekly basis. Unfortunately the NMCP M&E manager was not available in 2014 for a field visit and comprehensive exposure to IRS monitoring activities.
- Ensure IRS data security and storage for future reference through establishment and enforcement of proper protocols.

8.1 Data Collection

The data collection closely followed the process described in the country work plan. The project employed 12 data entry clerks (DEC) to enter mobilization and spray data from operations in the first half of the campaign (Koumpentoum/Velingara) and eight during the second half (Malem and Koungheul). Those data clerks have been recruited and trained to cover both spray campaigns. AIRS Senegal established four data entry centers with three DECs sitting in Malem Hoddar, four in Koumpentoum, five in Koungheul, and eight in Velingara. Each of the DECs received a laptop that contained the AIRS Senegal Access database. DECs entered Spray Operator Forms into the Access database and transmitted the results to the central office within 24 hours of the receipt of the data. The networking access built into the database, which used the Microsoft Access program, was able to provide automated real-time updates of spray progress reports both locally and at the AIRS Home Office. Once entered, the paper forms were filed and archived at the data entry site.

This year, to reduce the variances between data summary forms and spray operators' (compound) forms, a ratio of totals and details was established in the database. This approach was very helpful to DECs as it enabled them to immediately identify errors on spray forms or in the data entry, and clean the data the same day it was entered.

8.2 Mobile Health Pilots

This year AIRS Senegal implemented two mHealth pilots to improve the information flow and allow the team and steering committee to better supervise the spray campaign. With the help of the subcontractor, Dimagi, AIRS Senegal implemented the SMS data reporting pilot in all four spray districts and implemented the supervisory forms on smartphones in Malem Hoddar and Koungheul as described earlier in this report. AIRS Senegal worked with Dimagi to select the mobile phone operator, the phones to be used for the pilot, indicators for SMS data reporting, as well as to format the reports and guide preparation, training, and supervision.

8.3 SMS Data Reporting

In the past, the information used for spray operations monitoring mainly came from data collected by spray operators and those recorded in supervision forms. It was found that the time for actors and partners to receive and process these forms was relatively long to allow them to take urgent action. In order to improve the spray operations monitoring approach, AIRS Senegal piloted an SMS data reporting system whereby team leaders would send, via SMS, their operational data daily. This pilot was suggested by PMI Senegal after the 2013 spray campaign, and was implemented by AIRS Senegal with the help of Dimagi.

The spray data was sent into a cloud-based database that the M&E team would download and send to the AIRS Senegal staff and Steering Committee on a daily basis. This allowed the operations team and other stakeholders to receive and process the data immediately, and thus take urgent action, if needed.

Each day, team leaders would send a daily SMS with the following data for their teams:

1. Number of spray operators working/day/team
2. Total number of rooms sprayed/day/team
3. Number of sachets or bottles used/day/team

Users of the SMS system found it to be very user-friendly, and those who received the data were happy to have the data at their disposal on a daily basis. AIRS Senegal implemented the SMS pilot for data reporting in the four target spray districts, while the smartphone pilot for supervision was only implemented in Malem Hoddar and Koungheul.

8.3.1 Training

All AIRS Senegal staff was trained for the implementation of mobile applications and their monitoring at the operational level.

For SMS data collection and reporting, DCs, site managers, team leaders, and storekeepers in the four districts were trained. Overall, 121 team leaders were trained for daily SMS data reporting. DCs' roles and responsibilities were to make sure team leaders sent their SMS data. If team leaders did not send in their data by 6:00 pm, DCs would SMS in the team's data. Storekeepers received training on mobile phone fleet management (security and recharging).

Operational level actors who were responsible for supervision, as well as storekeepers, were also trained on the smartphone application use. Thirty-five operational site managers and 16 storekeepers in Koungheul and Malem Hoddar, as well as 22 SNH staff from Kaffrine region for the two districts, were trained on the mobile supervisory form and SMS pilot.

8.4 Data Quality Assurance

8.4.1 Data Collection/In-Field Verification

Data quality assurance activities were instituted for both data collection and data entry verification through newly developed supervisory tools and the standard database audit checks. Our data quality assurance efforts significantly reduced the number of errors found on Daily Spray Operator Forms and in the M&E database, improving the overall quality of the data and IRS results. Table 16 describes which Data Quality Assurance Forms were used throughout the campaign and the corresponding percentage of structures verified.

TABLE 17. SUPERVISORY TOOLS USED

M&E supervisory tools	Structures verified	Percent of errors found
Error Eliminator	Completeness and accuracy of data	1.4%
	Completeness and accuracy of data	2.3%
	Logic Control	1.0%
Data Collection Verification	1,406 compounds	1.5%
Data Entry Verification	3,801 lines	1.0%

8.4.1.1 Error Eliminator

AIRS Senegal supervisors, team leaders, and site managers used the Error Eliminator (EE) daily to detect and correct common errors on Spray Operator Forms before they were transported to the data center. Common errors included arithmetic mistakes and failure to complete all data items on the Data Collection Forms.

8.4.1.2 Data Collection Verification Form

AIRS Senegal senior management, local supervisors, and SNH Supervisors used the Data Collection Verification (DCV) tool to interview households to verify spray coverage data; 1,406 compounds were visited using the DCV form, and 21 different types of errors were identified and corrected. The most frequent types of errors were related to the counting of rooms, particularly compounds with verandas, and the population count (the number of people found during spray operations is different from the number of people found during the verification process). Corrections were done by cross-checking the data recorded on the spray operator forms to the data recorded on the IRS spray cards in the field. Staff performed these verification visits within approximately two days of spraying, and identified errors in enough time to correct mistakes and notify spray operators and team leaders to prevent repeat errors. Errors found from DCV this year (1.5%) are lower as compared to 2013 (3.6%) indicating higher quality of data collection.

8.4.2 Data Entry Verification

8.4.2.1 Data Entry Verification Form

The M&E and database managers and the database supervisors used the Data Entry Verification tool to verify that the data entered into the database matched the data on the Daily Spray Operator Forms. They found far fewer errors this year compared to last year as a result of the in-field supervisory verification tools (i.e., Error Eliminator and DCV tools), and the data cleaning tool that compares spray totals to spray details and was installed on every DEC's computer. This year, 7,552 lines were verified using the Data Entry Verification Form and 92 errors were identified and corrected. The DECs were re-trained when required.

8.4.2.2 Access Database Audit Locks and Data Cleaner

In addition to the database validation rules (e.g., the number of pregnant women in the structure cannot exceed the number of women in the structure), the Database Manager verified all data entered into the database daily. On a daily basis, the Database Manager would also send errors to the DECs and Database Supervisors for immediate cleaning. This practice let AIRS Senegal check and correct for any DECs once all the spray data had been entered.

AIRS Senegal created reports of how these supervisory tools were used and common errors; these reports were shared with the Home Office regularly, which allowed the Home Office to follow up on any problems with data collection or data inconsistencies.

Improved data entry allowed AIRS Senegal to produce Weekly Spray Reports with the most up-to-date data.

8.5 Spray Results

All AIRS Senegal performance indicators are presented in a Monitoring and Evaluation Plan matrix in Annex C. Details of some key IRS indicators, such as number of structures sprayed and people protected, are provided in the following sections of the report.

8.5.1 Spray Data

The total number of structures found by spray operators was **209,603,** and the number of structures sprayed was **204,159**. With that, the overall spray coverage was 97.4%, as shown in Table 17.

The total population protected by IRS in 2014 was **708, 999**, protecting 97.7 percent of the target population. Of these, **129,609** children under the age of five and **17,240** pregnant women were protected.

TABLE 18. IRS COVERAGE: ELIGIBLE STRUCTURES SPRAYED AND POPULATION PROTECTED IN TARGETED AREAS

District	Total # of eligible structures found by SOPs	Total # of eligible structures sprayed	% of total structures sprayed	Population protected	Pregnant women protected	Children under 5 protected	% of population protected	Eligible Rooms	
								Found	Sprayed
Koumpentoum	45,758	44,960	98.3%	151,953	4,032	28,361	98.2%	55,143	54,184
Koungheul	57,532	55,800	97.0%	178,861	4,354	34,438	97.5%	74,461	72,397
Malem Hoddar	31,980	31,282	97.8%	97,847	2,099	17,822	97.5%	40,247	39,483
Velingara	74,333	72,117	97.0%	280,338	6,755	48,988	97.6%	134,546	131,709
Grand Total	**209,603**	**204,159**	**97.4%**	**708,999**	**17,240**	**129,609**	**97.7%**	**304,397**	**297,773**

Despite the 97.0% coverage rate in Velingara, the total number of eligible structures found and sprayed in the district decreased in 2014 from figures reported during the previous year. This was the result of the district's spray operators neglecting to consistently report found yet unsprayed structures on their daily data collection forms, thus disproportionally skewing both the coverage ratio's numerator and denominator. Spray operator training for future spray campaigns in the district will emphasize the primacy of accurate data regardless of implications on coverage rates or continued spraying, however this error was isolated in Velingara as all other districts sprayed at least as many structures in 2014 while still maintaining greater than 97% coverage rates.

8.5.2 Insecticide Consumption

A total of 81,215 insecticide sachets were distributed to the districts, and 60,186 were used to spray 204,159 structures (Table 18). On average, one sachet covered 3.4 structures, and each spray operator sprayed 13 structures per day. The stock balance at the end of the campaign was 7,410 unused sachets of carbamates, and 13,619 unused bottles of organophosphates.

TABLE 19. INSECTICIDE USAGE AND SPRAY OPERATOR PERFORMANCE

District	# of sachets Issued	# of sachets Used	# of structures Sprayed	Average # of structures sprayed per sachet/ bottles	# of rooms Sprayed	Average # of rooms sprayed per sachet/bottles
Koumpentoum	17,232	10,639	44,960	4.2	54,184	5.1
Koungheul	21,021	16,368	55,800	3.4	72,397	4.4
Malem Hoddar	11,726	8,969	31,282	3.5	39,483	4.4
Velingara	31,236	24,210	72,117	3.0	131,709	5.4
Total	**81,215**	**60,186**	**204,159**	**3.4**	**297,773**	**4.9**

Overall, AIRS Senegal sprayed 204,159 structures with the average rate of structures per day sprayed ranging from 11 to 15. The project also reports spray coverage by room because historically the Government of Senegal records and reports IRS results by room. The total number of rooms sprayed was 297,773, with the average number sprayed per day 19.5, as shown in Table 19.

TABLE 20. RATE OF SPRAY PROGRESS

Districts	Structures sprayed	Rooms sprayed	# of days	# of spray operator days	Average # rooms/day	Average # structures/day
Koumpentoum	44,960	54,184	33	2,810	19.3	16.0
Koungheul	55,800	72,397	32	3,668	19.7	15.2
Malem Hoddar	31,282	39,483	30	2,021	19.5	15.5
Velingara	72,117	131,709	35	6,768	19.5	10.7

8.6 POST-SPRAY DATA QUALITY AUDIT (PSDQA)

In order to confirm the accuracy of the data collected during the 2014 spray round, AIRS Senegal conducted an audit exercise to verify the number of eligible and/or sprayed structures within a sample of 501 structures in the health districts of Koumpentoum, Koungheul, Malem Hoddar, and Velingara.

The Objectives of the PSDQA were as follows:

- Validate spray coverage reported by Abt Associates for the 2014 spray round.
- Validate proportion of people protected reported by Abt Associates for the 2014 spray round.
- Identify and incorporate best practices and lessons learned for data collection, entry, and management for the remainder of the AIRS Senegal project.

The AIRS Senegal team just finished collecting the data and is currently analyzing the results. The full PSDQA report will be submitted as a separate document to PMI.

9. Environmental Compliance

Pre-spray Environmental Assessment

9.1.1 Background

Senegal operates under a Supplemental Environmental Assessment Amendment that was written and approved in 2010. It covers the use of three classes of WHO recommended pesticides, pyrethroids, carbamates, and organophosphates for the period of 2010-15, and is valid in certain districts in the regions of Kaffrine, Kaolack, Kolda, Saint Louis, and Tambacounda, including the districts PMI was spraying in this year. In 2014, IRS was conducted in the same four districts as in 2013: Velingara, Koumpentoum, Koungheul, and Malem Hoddar.

In Senegal, all districts have difficulty reaching areas due to road condition and longer distances, particularly in the rainy season. To overcome these difficulties, those areas were identified and sprayed first, before the heavy rains begun. Areas of high population density and those accessible were sprayed later. Koumpentoum and Velingara were sprayed - as planned - in May/June before the heavy rains start. Recommended solutions for the 2014 IRS campaign were the use of camping sites and mobile soak pits in hard-to-reach areas.

9.1.2 Pre-Season Environmental Compliance Assessment (PSECA)

AIRS Senegal and DREEC conducted a PSECA in all four districts to evaluate compliance with current environmental regulations and established standards. The role of the DEEC/DREEC was to ensure prevention and control of nuisance and pollution as part of IRS implementation.

9.1.2.1 Identification Of New Sites

Results of the 2013 post-spray inspection inventory showed that 32 sites could be re-used for 2014 IRS and three new sites would need to be set up for a total of 35 sites. In February 2014, AIRS Senegal conducted site location assessments and produced detailed analyses for construction, rehabilitation, and upgrading of the operational sites.

9.1.2.2 Operational Sites Rehabilitation

Based on PMI Best Management Practices, the project set up 35 soak pits at the operational sites in the four districts, which included 32 rehabilitated sites and the three newly constructed sites. There were two soak pits in the same site in Malem Hoddar, Koungheul, Kounkane, Medina Gounass, Pakour and Velingara. AIRS Senegal put up fencing around the soak pit area and then fitted the fence with locks to keep out non-IRS personnel and animals. Soak pit areas were distributed as follows per district: Koungheul (9), Velingara (13), Koumpentoum (8), and Malem Hoddar (5).

TABLE 21. CONSTRUCTION AND REFURBISHMENT OF OPERATIONAL SITES

District	# of operational sites	Refurbished Sites (soak pits, storage facilities, fencing, etc.)
Velingara	13	10 soak pits refurbished 3 new soak pits constructed 2 new mobiles soak pits constructed 13 offices and storage facilities rented
Koumpentoum	8	8 soak pits refurbished 2 new mobiles soak pits constructed 8 offices and storage facilities rented
Koungheul	9	9 soak pits refurbished 4 offices and storage facilities provided by sector authorities (Ribot Escale, Maka Yop, Saly Escale, Ngainth Pathé) 5 offices and storage facilities rented
Malem Hoddar	5	5 soak pits refurbished 1 office and storage facility provided by sector authorities (Dianke Souf) 4 offices and storage facilities rented

9.1.2.3 SMARTPHONE ENVIRONMENTAL COMPLIANCE DATA COLLECTION SYSTEM

AIRS Senegal undertook two environmental inspection trips in the four health districts as follows: Velingara and Koumpentoum (in April) and Malem Hoddar and Koungheul (in July), respectively six and two weeks before the spraying.

AIRS Senegal utilized a smartphone data collection system in 2014 to record site characteristics, capture the GPS location, and take pictures of the site (storeroom exterior and interior, storage and condition of pesticide, if present, and condition of soak pit). The checklist and questions that were loaded onto the smartphone for this assessment were adapted from the checklists recommended in the PMI Best Management Practices Manual.

A work list was generated and then instantly shared with the AIRS Senegal COP, Operations Manager, Technical Manager and the EC Manager. As a result, the 35 sites and four central storage facilities in the target districts passed all requirements in the first pre-campaign evaluation.

9.1.2.4 MOBILE SOAK PITS

In Senegal, all districts have temporarily inaccessible areas, particularly during the rainy season. In areas where operators must travel for more than 30 minutes to reach a spray site, a mobile soak pit is a useful option for eliminating return travel to a central full-scale soak pit for end-of-day cleanup.

A mobile soak pit is a device specially designed to receive liquid wastes containing small amounts of pyrethroids, carbamates, and organophosphates. A mobile soak pit, correctly located and well-constructed, protects the environment from contamination by adsorbing and degrading pesticide from washwaters so that it does not leach into the surrounding soil.

Two mobile soak pits were piloted in each health district of Koumpentoum (Payar and Kouthia Gaidi) and Velingara (Pakour 1 and Pakour 2) in areas that were deemed appropriate according to distances between households, number of spray operators per site, and accessibility. Advantages of mobile soak pits included that progressive rinsing was more easily implemented, the average number of structures spray per operator increased, and the total number of days needed to complete the spray campaign decreased. Disadvantages of mobile soak pits included that the granular activated carbon had to be imported since it was not available locally, conditions of camping were uncomfortable in some villages, and food had to be provided by the AIRS Senegal project. Further details about advantages and disadvantages are listed below.

Limitations of MSP:

- The granular activated carbon was imported because it is not available in Senegal
- Slight increase of the number of vehicles (one additional) made available for camping spray operators
- Condition of camping not comfortable in some villages
- Catering provided by AIRS Senegal

Advantages of MSP:

- Progressive rinsing easily implemented: buckets of clean water and one 100 liter-drum used to collect all waste water generated per day.
- Better performances of spray operators: individually spraying on average up to 23 rooms per day in 2014 in Velingara versus 19 rooms sprayed/day/spray operator in 2013 in Pakour 1 and in Koumpentoum with an average of 21 rooms sprayed/day/spray operator in 2014 versus 18 rooms /day/ spray operator in Kouthia Gaidy.
- Reduction of the number of days in the spray calendar: in Velingara, 23 operational days in 2014 versus 31 days in 2013 in Pakour 2 and 25 operational days in 2014 versus 31 days in 2013 in Pakour 1. This would reduce costs of fuel, vehicle rent, and spray operators' compensation.

A specific training session on MSPs was conducted during the 2014 IRS EC management training organized in Kaolack on April 9 for DCs and DREEC agents, and on April 10, 2014, for newly-posted SNH staff in areas covered by the AIRS Senegal project. Fifteen agents were trained on MSP use on May 13, 2014. Trainees also included eight team leaders (four in Velingara and four in Koumpentoum), four SNH agents supervising pilot sites, and Abt staff (Spray Coordinator, M&E Manager, Velingara DC). In MSP testing areas, spray calendars were revised taking into consideration time gained from not having to transport spray operators to sites. Practical training on MSP use was implemented by team leaders for spray operators prior to the start of spray operations.

9.2 INSECTICIDE

9.2.1 INSECTICIDE QUANTIFICATION

For the 2014 spray campaign, based on recommendations of the Steering Committee, AIRS Senegal used two classes of insecticide, namely organophosphates (Actellic 300 CS) for Koumpentoum and Velingara, and carbamates (Ficam® 125 VC) for Malem Hoddar and Koungheul districts. The two insecticide classes differing in their inherent natures have the same unit load per pump. Data from the 2013 spray campaign showed that, on average, one sachet covered 3.2 structures. The 2014 spray campaign insecticide needs assessment was done using that average. The insecticide needs were estimated at 81,273 insecticide units (including existing 2013 stock and newly procured stock of both carbamates and organophosphates).

TABLE 22. ASSESSMENT OF INSECTICIDE NEEDS

District	Koumpentoum	Velingara	Total	Malem Hoddar	Koungheul	Total
Eligible structures*	45,823	86,360	**102,960**	32,335	57,137	**89,472**
No. of structures per sachet/bottles	3	3	**3**	3	3	**3**
Insecticide sachets/bottles needed	15,274	28,787	**44061**	10,778	19,046	**29,824**
Total need +10% buffer	16,802	31,665	**48,467**	11,856	20,950	**32,806.4**
Stock in place	0	0	**0**	0	0	**23,060**
Insecticide sachets /bottles procured			**48,467 Bottles**			**9,746 Sachets**

* Note: The quantification was based on the "number of structure" data available before the data cleaning was conducted.

9.2.2 INSECTICIDE CLASSES

Organophosphates were used for the first time in Senegal, in two districts (Koumpentoum & Velingara), which began spraying on May 15th, while the other two districts (Malem Hoddar & Koungheul) used remaining supplies of carbamates and began spraying on July 15th. Insecticide selection decisions were made by PMI and NMCP along with the Steering Committee based on entomological and parasitological monitoring data from 2013.

On March 6, 2014, AIRS Senegal received the required official authorization from the Ministry of Environment to use Actellic 300 CS and Ficam® VC wettable powder 125 for the 2014 IRS campaign. Prior to shipment, the insecticides underwent quality assurance and quality control testing by the manufacturers to ensure they were safe for spray in human households. In April 2014, 48,468 pirimiphos-methyl Actellic 300 CS bottles were distributed to the health districts of Koumpentoum and Velingara. Expiry dates for insecticide are May 2016 and June 2016. In July 2014, the environmental inspection of district central insecticide storage facilities showed a total stock of 32,747 Ficam® VC sachets (including 23,030 sachets remaining from 2013) for the two districts of Malem Hoddar and Koungheul. Insecticide boxes were stored according to their expiry date (current Ficam® VC stock has five expiry dates) as follows:

- 70% of the Ficam® VC is from the 2013 stock expiring between April and June 2015; and
- 30% of the Ficam® VC of the 2014 order expiring between November 2015 and March 2016.

TABLE 23. FICAM® VC INVENTORY IN THE HEALTH DISTRICTS OF MALEM HODDAR AND KOUNGHEUL

FICAM® VC	QTY	EXPIRY DATE	OBSERVATIONS
Code A	20,608	April 2015	2013 stock : 22,862 sachets or 70% of total FICAM® VC
Code B	2,262	June 2015	
Code D1	1,560	November 2015	2014 order : 9,840 sachets or 30% of total Ficam® VC
Code D2	4,560	February 2016	
Code D3	3,720	March 2016	

District-level Ficam® VC consumption plans were established following the FEFO method. On a weekly basis throughout the IRS campaign, Logistics Assistants would report to the Logistics Coordinator and the ECO on the Ficam® VC consumption at the district level.

9.2.3 Insecticide Transport

AIRS Senegal received the two separate insecticide procurements for organophosphates and carbamates four weeks before the start of the campaign. The project hired a local transportation company to deliver the packages from Dakar Port to the central warehouse in Kaolack. The AIRS Senegal team trained the vehicle driver and provided him with pesticide transportation-related safety measures (emergency and spill plans, spill kit, first aid kit). The insecticide was transported in one 40-foot truck, and the loading process was supervised by AIRS Senegal staff prior to departure.

After the inventory check at the main warehouse, the project staff coded the insecticide boxes before dispatching them to district storerooms and operational site storerooms where sachets/bottles were subsequently serialized. Insecticide transportation from the central warehouse to the four district storerooms was supervised by AIRS Senegal's Logistics Coordinator. Particular measures were required to secure safe pesticide transport in preparation for the start of the rainy season. Drivers received appropriate training on safety measures for pesticide transport.

For the transportation of organophosphates to Koumpentoum and Velingara, AIRS Senegal rented a 13-meter tarpaulin-covered truck. Given the truck's small capacity, two trips were necessary. The first one was done on April 24, 2014, (21 days prior to campaign start-up) and the second one took place on May 27, 2014, (12 days after the start of the spray campaign); by then storerooms had been cleared and solid wastes removed and shipped to the central warehouse in order to accommodate the second delivery.

For the second phase of the campaign, AIRS Senegal rented a 13-ton covered truck for the delivery of the carbamates insecticide in a single shipment. Delivery of insecticide was 25 days ahead of the start-up of the campaign.

9.3 Availability Of Antidotes

IRS poison management is the responsibility of the Government of Senegal (GOS) through the NMCP in collaboration with health facilities in the concerned health districts. A letter of notification was sent to medical officers in two districts alerting them to the change to organophosphate pesticide, and they received standard PMI guidance for exposure management. Furthermore, a letter was sent on February 14, 2014, to NMCP as a reminder of the GOS responsibility with regards to the availability of drugs in all health facilities in target districts.

Consequently, the pre-IRS inspection noted the availability of atropine or glycopyrolate in each health facility in the districts of Koungheul and Malem Hoddar, and glycopyrolate, pralidoxime or Contrathion®, Diazepam or Lorazepam in each health facility in Velingara and Koumpentoum.

9.4 SEASONAL PERSONNEL PRE-IRS MEDICAL EXAMINATION

In April 2014 for Koumpentoum and Velingara, and in June 2014 for Malem Hoddar and Koungheul, a total of 958 seasonal personnel (including 181 females) were examined as part of the pre-IRS medical check-up. All 181 pregnancy tests proved negative**.** Only one case of physical incapacity (one male) was reported (paralysis of the right arm).

9.5 MID-SPRAY ENVIRONMENTAL COMPLIANCE

9.5.1.1 SAFETY AND ENVIRONMENTAL COMPLIANCE

In collaboration with the DREEC, AIRS Senegal conducted the mid-spray EC inspections during the spray operations in the four IRS districts. To conduct these inspections, we used the EC smartphones as well as paper checklists. Overall, the DREEC conducted six inspection visits.

Major findings found during spray inspections were addressed immediately by the DCs with site managers, technical leaders, and SOPs.

During the 2014 spray round, 82 females (eligible for pregnancy test) out of 93 recruited in Malem Hoddar and Koungheul underwent a 2nd pregnancy test in July 2014, one month after the first test. All 82 tests proved negative. In the districts of Velingara and Koumpentoum, the dates for the second visit corresponded with the Ebola epidemic event and DMOs were not available to perform the tests.

No road accidents were reported**.** However, one intoxication case was reported where a male spray operator had skin irritation as a result of contact with spray drops in Lour Escale (Koungheul District)**,** due to a minor malfunction of his spray tank. He immediately washed himself with clean water and soap. He was administered Atropine and placed on a drip in the health post. He recovered within 24 hours and resumed work. The incident report was submitted to PMI within 48 hours.

9.5.1.2 MOBILE SOAK PITS (MSP) PILOT EXECUTION

Team leaders and spray operators were in charge of MSP installation, use and area restoration in all pilot sites. In addition to their role of maintaining spray cans, repair technicians were in charge of collecting all amounts of returned Actellic insecticide and completing related daily inventory forms. Spray operators were in charge of rinsing spray cans and conserving the remaining insecticide for next spray day. Boots, helmets, face shields and gloves were also cleaned by spray operators in containers with water and soap. After one week of use, there was a lot of mud in the MSPs and carbon bags. As a corrective measure, the gravel and carbon bags were washed.

To prevent silting, MSPs were covered with a cloth. In areas where camping took many days, the MSP hole was cemented. For the MSP maintenance, the carbon layer was changed every ten (10) days and the cloth was cleaned if needed.

Upon inspection two weeks after the start of the spraying, spray operators were able to correctly install, clean and store MSPs. Waste water drainage was done correctly with MSPs.

9.6 POST-SEASON ENVIRONMENTAL ASSESSMENT

The AIRS Senegal team in collaboration with the DREEC staff conducted post-spray inspections in all four PMI IRS districts from September 1st to 9th, 2014 and from September 23rd to 28th.

Using smartphones, data was recorded for each of the 35 IRS sites and all forms were uploaded to the cloud database that is accessible by senior staff and home office personnel. After the IRS campaign, DCs contacted all landlords to know whether or not their premises would be available for the next campaign so that repairs or temporary closings of soak pits could be made based on that. The project successfully prepared all 35 sites for the off-season: 31 soak pits were covered and locked, and four soak pits were

disposed of (the site will not be used for next year's operations). For soak pit disposal, the process consisted on three steps as follows:

- Demolition of soak pit and removal of its content;
- Backfilling and leveling soak pit hole with sand;
- Reusing rubble stones for other soak pit construction.

9.7 IRS Waste Disposal

At the operational site level, solid wastes were packaged separately into boxes, they were numbered and closed. At the end of the campaign, all wastes were shipped to the district warehouse. At the district level, solid wastes were separated by items: 1,283 pairs of gloves and plastic sheets with holes were decontaminated by washing, dried up, and packaged for disposal (gloves in public waste disposal and plastic sheets and Actellic bottles were recycled). 29,700 masks, 25,337 empty sachets and 34,849 empty Actellic bottles were packaged and transferred to the central warehouse in Kaolack.

The 2014 IRS campaign generated contaminated solid wastes of 750 kgs composed of empty sachets and masks. The solid waste was incinerated by SOCOCIM Cement Plant on September 25.This incineration process follows the authorization (# 001775-MEDD/DEEC/DPN) to incinerate issued July 1, 2014, by the Senegalese Ministry of the Environment and Sustainable Development, supervised by DEEC.

TABLE 24. INVENTORY OF CONTAMINATED SOLID WASTES

District	Contaminated items		
	Empty insecticide sachets/bottles	**Masks**	**Gloves**
Velingara	24,210	12,540	467
Koumpentoum	10,639	6,171	279
Koungheul	16,368	7,062	322
Malem Hoddar	8,969	3,927	215
Total	**Sachets : 25,337 Bottles : 34,849**	**29,700**	**1,283**

Traditionally, contaminated plastic solid wastes (gloves, plastic sheets used to cover beneficiaries property) are considered common garbage. After the decontamination, wastes were either disposed in dumpsites or recycled by plastic manufactures. In districts, waste gloves were disposed of in the public waste disposal site. All other solid waste (empty Actellic bottles and plastic sheets with holes) was sent to Sodiaplast for recycling. Sodiaplast reported to AIRS Senegal that the following products were made from the recycled empty bottles: tubs, garbage pails, scrubbing brushes.

Regarding the disposal of MSP, all MSPs were stored at AIRS Senegal's district storage facility. For each layer, gravel was washed separately, sundried and recycled; this gravel will be reused in the construction of new MSPs. The activated carbon has been incinerated by SOCOCIM Industries, along with other wastes.

10.IRS Country Capacity Assessment

As a result of the capacity assessment conducted in 2013, AIRS Senegal conducted training, capacity-building, and advocacy at the national, regional, and district levels as a means of achieving IRS sustainability. The training is described in Section 3.3.1.

AIRS Senegal planned to coach NMCP to increase their responsibilities in IRS implementation during the 2014 campaign. However, due to NMCP's competing priorities and ongoing restructuring process during the spraying campaign, NMCP staff was not available to take on more responsibility of IRS activities as expected. NMCP managed the spray campaign's IEC activities with direct funding from PMI, but beyond these activities NMCP was minimally available for IRS implementation and operations management at the district level.

Besides working with NMCP, AIRS Senegal coached local government environmental agents by co-conducting field inspections and helping with report writing. Draft checklists for the supervision were shared with SNH and NMCP for validation and AIRS Senegal continued to coach SNH supervisors on the use of smartphone. AIRS Senegal worked closely with SNH agents and DMO on data analysis in the field.

In 2014, DMO and DHMT were able to conduct the district micro-planning workshop with HPN and local authorities. During micro-planning, AIRS Senegal coached health posts nurse chiefs of health posts to develop the spray calendar of health post catchment areas. AIRS Senegal also coached district agents in supervision using smartphone technology in order to build capacity in IRS implementing stages at the district level.

Further, AIRS Senegal developed a country capacity action plan with activities that can be implemented in the future. This action plan was submitted and approved by PMI.

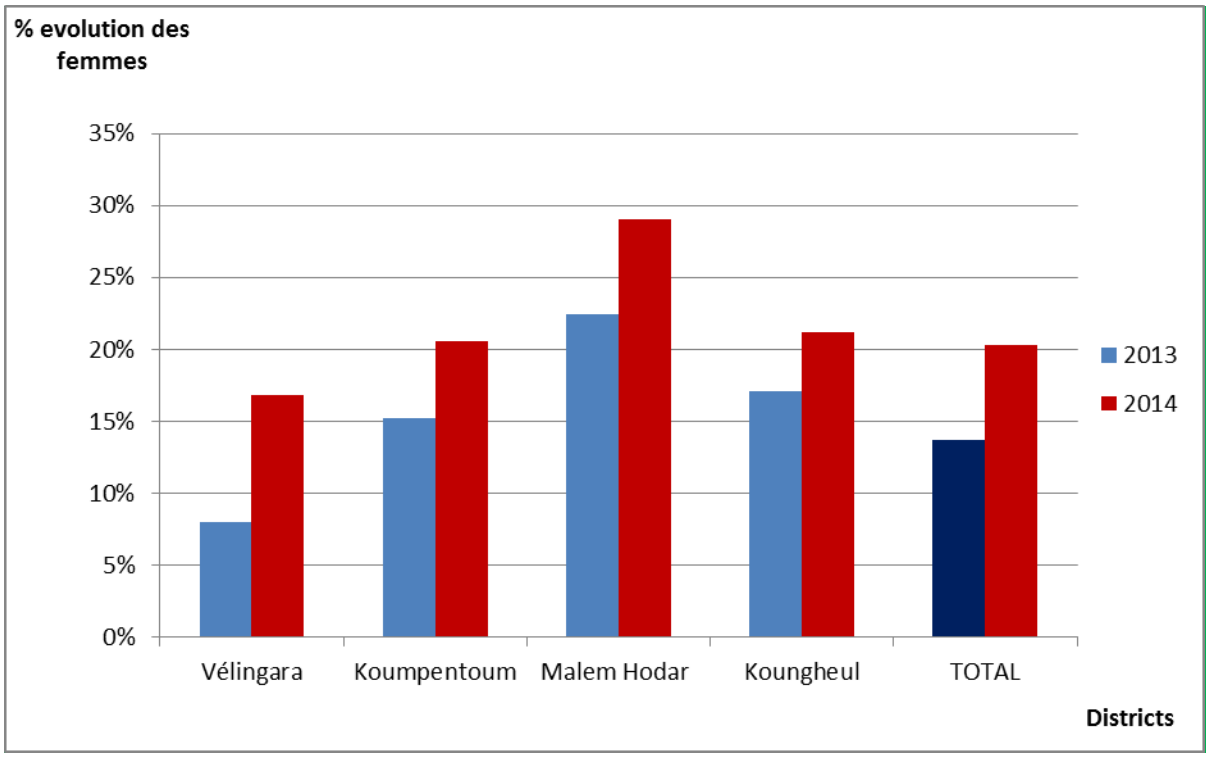
11. GENDER ASSESSMENT

Following the recommendations from Cultural Practice, LLC's Senegal technical assistance on gender issues in 2013, AIRS Senegal made efforts to increase women's representation in all vacancies for the 2014 spray campaign.

Many advocacy activities were conducted locally, such as micro-planning meetings with a focus on encouraging women's applications for all vacancies. As a result of the team's efforts, the percentage of female mobilizers was 34 percent in 2014 compared to 31 percent in 2013.

Figure 2 shows the increase of women recruited for IRS operations (spray operators, pumps repair technician, washers and storekeepers) from 2013 (14 percent) to 2014 (20 percent).

FIGURE 2. DISTRIBUTION OF WOMEN TRAINED IN 2013 AND 2014 IN IRS OPERATIONS



12. LESSONS LEARNED

- Following the needs assessment, quantification of insecticide, and distribution schedule, AIRS Senegal purchased sufficient quantities of equipment and insecticide in a timely manner, and distributed them to all sites two weeks prior to the start of spray operations. Improved inventory management made it possible to avoid stock-outs. The approach to pesticide stock management was enhanced and reinforced during the trainings for the 2014 campaign.
- The presence of AIRS Senegal teams in the field for supervision during the entire campaign – with systematic use of the supervision tools developed by headquarters in the first two districts (Koumpentoum and Velingara) and the use of the smartphone in the two subsequent districts (Koungheul and Malem Hoddar) – spray operations monitoring and on-site problem solving greatly improved SOPs' performance.
- Availability of a DHMT member as an IRS focal point for the campaign allowed better monitoring of spray operations by the district and consequently performance improvement, like in Koumpentoum and Koungheul where debriefing meetings were coordinated by the DHMT.
- Settlement campsites in Fass Thiekene and Ngainth Pathe and MSP pilot sites contributed to reducing travel time for spray teams, which consequently led to increasing performance.
- The use of new Goizper pumps helped increase the roles and responsibilities of spray operators in Koumpentoum and Velingara's progressive rinsing.
- The use of smartphones for collecting and transmitting EC data resulted in much greater EC transparency and allowed the COP, Operations Manager, ECO, ECM, and Technical Coordinators to be much more aware of site conditions than in the past.
- Putting in place the SPTS tool at each site allowed a visual daily monitoring of SOP performance and of pesticide use among the SOPs themselves and their supervisors at all levels. In addition, the tool created healthy competition among spray teams at the same site (Koungheul 1 and 2) and between the sites within the same district.
- Site managers and team leaders were available the day before the start of the campaign to prepare material, coding and packaging for each SOP in order to avoid any start-up delays on the first day.
- In 2014, the use of the Error Eliminator form was required for all supervisors and extended to all data collected at site level.
- Using smartphones for spray supervision allowed teams to immediately address any shortcomings reported by supervisors. Actors on the ground could receive supervision reports at the same time as managers for anticipating shortcomings.
- Sufficient quantity of activated carbon is needed for mobile soak pit implementation.
- The inclusion of local authorities in IRS operations planning, supervision, and end of spraying evaluation contributed to the success of mobilization and IRS acceptance by the population.

13. RECOMMENDATIONS

- Better involve community via local governments (IRS to be included in local government budgets).
- Be more specific with contract terms for vehicle owners in regards to working hours in IRS.
- Incorporate community contributions into the financial planning of district IRS activities.
- Recruit IEC mobilizers and SOPs with a better educational level to improve the quality of data collection.
- Coordinate the distribution and improve management of IRS cards at household level.
- Instruct mobilizers and SOPs to collect feedback from the beneficiaries on IRS messages received to verify the level of comprehension.
- Relocate Koumpentoum site, as well as Koungheul 1&2 away from office premises for better use of space.
- Supplement physical SPTS with electronic SMS.

ANNEX A. AIRS SENEGAL PROCUREMENT AND POST-SPRAY STOCK BALANCE

Items	Qty	Procurement									
		Dispatching				Balance in District Central Warehouses				Balance in Main Warehouse	Total Balance
		Malem Hoddar	Koungheul	Koumpentoum	Velingara	Malem Hoddar	Koungheul	Koumpentoum	Velingara		
LOCAL PROCUREMENT											
Towels	1,008	156	274	236	447	14	00	00	00	00	14
Socks	2,222	280	550	454	876	15	00	00	240	143	398
Soap 500g	1,819	300	540	480	780	18	36	90	00	211	355
Soap 250g	8,970	1,150	2,180	1,840	3,720	144	684	36	686	889	2439
Bleach	106	15	27	24	39	00	00	01	08	10	19
Liquid Detergent	116	15	27	24	39	01	09	04	00	11	24
Powder Soap	3,059	1,580	2,940	2,640	4,220	160	00	560	1,320	109	2149
Teflon	154	20	36	32	52	13	22	16	31	14	83
Grease Pot 1kg	62	10	18	16	26	07	16	15	21	00	59
Adhesive Tape LM	160	20	20	20	20	07	03	07	11	00	28
Laundry Brush	77	17	19	18	37	77	19	18	37	05	156
Flat Wrench	70	12	20	18	28	12	20	18	28	172	250
Universal Pliers	49	11	20	18	24	11	20	18	24	02	75
Gas Tongs	70	12	20	18	28	12	20	18	28	106	184
Plastic Apron	69	36	68	64	92	20	31	30	53	29	163
Toothbrush	567	70	134	108	247	00	00	46	107	66	219
Steel Glue Epoxy	157	20	36	32	52	02	22	00	37	19	80
Plastic Sheet Rolls	57	08	12	11	16	4	7	4	2	25	42
Local Brooms	59	16	22	17	09	16	22	17	09	00	64
Ceiling Fans	32	07	00	08	13	06	09	13	00	07	35
Adhesive Paper	154	20	36	32	52	00	00	00	00	00	00
Measuring Tape	45	05	09	08	13	04	00	08	13	00	25
Markers	325	50	87	90	98	00	00	00	00	00	00
Folders	2,200	250	500	500	500	00	00	00	00	00	00

Procurement											
Items	Qty	Dispatching				Balance in District Central Warehouses				Balance in Main Warehouse	Total Balance
		Malem Hoddar	Koungheul	Koumpentoum	Velingara	Malem Hoddar	Koungheul	Koumpentoum	Velingara		
Inner Folder	1,760	500	500	500	500	00	00	00	00	00	00
Flap Folder	2,843	396	601	644	1,294	00	00	00	00	00	00
Black Pencil	4,654	477	754	768	1,568	35	00	21	144	00	200
Eraser	4,654	477	754	768	1,568	89	30	00	272	00	391
Note Pad	2,843	396	601	643	1,294	03	00	00	55	00	58
Calculator	179	34	58	52	82	85	60	50	82	01	278
Log Book	43	06	12	09	16	00	00	00	00	01	01
Ruler 30 cm	86	10	14	13	18	00	00	00	00	02	02
Clip A4	1,280	161	291	259	464	154	269	247	464	00	1134
Chalk Box (color)	35	05	09	08	13	00	00	00	00	00	00
Chalk Box (white)	35	05	09	08	13	00	00	00	00	00	00
Binder	80	20	20	20	20	12	08	15	16	00	51
Stapler	95	14	22	20	30	14	21	14	31	02	82
Pencil Sharpener	4,383	465	712	752	1,392	87	168	46	72	00	373
Archive Box D4											
Shower Cap	137	18	34	32	46	00	00	00	00	00	00
Scissors	75	10	18	17	25	10	18	17	25	05	75
INTERNATIONAL PROCUREMENT											
Face Shield	837	45	303	246	471	00	00	00	00	00	00
Face Shield Bracket	104	45	276	226	471	155	247	197	411	1,324	2334
Nose Mask w/Filter	27,360	6,260	5,520	8,840	15,360	708	1,720	3,541	6,279	30	12278
Insecticide	81,215	11,726	21,021	17,232	31,236	00	00	00	00	21,029	21,029
Carbamate	32,747	11,726	21,021	00	00	00	00	00	00	7,410	7,410
Organophosphate	48,468	00	00	17,232	31,236	00	00	00	00	13,619	13,619

ANNEX B. PEOPLE TRAINED FOR 2014 CAMPAIGN

Categories of people trained	Training for IRS Implementation										Other Trainings								TOTAL M/F		
	Trainers' Training		Spray Operators' Training		Data Entry		Logistics & Finance Training		Technical Maintenance		IRS related poisoning management		PPE Cleaning		Fire Safety		Transport Safety		M	F	GRAND TOTAL
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			M/F
PNLP/MOH	17	9																	17	9	26
DREEC															5	2			5	2	7
Districts Coordinators	3	1																	3	1	4
Nurses/Midwives											15	11							15	11	26
SNH Supervisor of Spray Operators	60	0																	60	0	60
Spray Operators			464	90															464	90	554
Spray Operators' Substitutes			96	11															96	11	107
Operational Site Managers			34	1															34	1	35
Team Leaders			108	13															108	13	121
Data Entry Clerks					8	4													8	4	12
Storekeepers							33	7											33	7	40
Finance/Logistics Assistants							3	1											3	1	4

Categories of people trained	Training for IRS Implementation										Other Trainings								TOTAL M/F		
	Trainers' Training		Spray Operators' Training		Data Entry		Logistics & Finance Training		Technical Maintenance		IRS related poisoning management		PPE Cleaning		Fire Safety		Transport Safety		M	F	GRAND TOTAL
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			M/F
Repair Technicians									43	1									43	1	44
Washers													0	67					0	67	67
Drivers																	94	0	94	0	94
Guards															62	0			62	0	62
TOTAL M/F	80	10	702	115	8	4	36	8	43	1	15	11	0	67	67	2	94	0	1,045	218	1,263
Total/Training	90		817		12		44		44		26		67		69		94		1,263		

ANNEX C: INDICATOR MATRIX WITH YEAR 3 RESULTS

UPDATED: DECEMBER 2014

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
Component 1: Establish cost-effective supply chain mechanisms, including procurement, distribution, and storage of IRS-related commodities and execute all aspects of logistical plans for IRS-related activities.											
1.1 Procurement											
1.1.1 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	[*Numerator:* Number of international insecticide procurements delivered in country, at port of entry, at least 30 days before the start of spray operations] [*Denominator:* Total number of international insecticide procurements] *Calculation:* [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	*Data source*: Project records – ex: international procurement documents, air way bills, commercial invoices *Reporting frequency*: Each spray season (annual/ semi-annual)	By spray campaign	AIRS	1; 80%	4; 25%	1; 100%	1, 100%	2; 100%	2;100%
1.1.2 Number and percentage of international procurement orders for equipment, including PPE, received at port of entry, 30 days prior to start of spray operations	[Numerator: Number of international procurements for equipment, including PPE, at port of entry, 30 days before start of spray operations] [Denominator: Total number of international procurements for equipment, including PPE.] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	Data source: Project records Reporting frequency: Each spray season (annual/ semi-annual)	By spray campaign	AIRS	1; 85%	1; 100%	1; 100%	1; 100%	1; 100%	1;100%

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
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	[Numerator: Number of local PPE procurements delivered 14 days before the start of spray operations] [Denominator: Total number of local PPE procurements] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	Data source: Project records – ex: delivery notes, goods receiving notes, inventory control cards Reporting frequency: Each spray season (annual/ semi-annual)	By spray campaign	AIRS	1; 80%	1; 100%	1; 100%	1; 100%	1; 100%	1;100%
1.1.4 Successfully completed spray operations without an insecticide stock-out	Milestone: (Achieved/Not achieved)	Y1, Y2, Y3	Data source: Project records – ex: inventory control cards Reporting frequency: Each spray season (annual/ semi-annual)	By spray campaign	AIRS	Achieved	Not achieved	Achieved	Achieved	Achieved	Achieved
1.2 In-country Logistics, Warehousing, and Training											
1.2.1 Number and percentage of logistics, warehouse managers, and storekeepers trained in IRS supply chain management	[Numerator: Total number of logistics and warehouse managers trained in IRS supply chain management using AIRS Project resources] [Denominator: Total number of AIRS logistics and warehouse managers] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	Data source: Routine training records Reporting frequency: Semi-annually	By spray campaign By gender	PMI	N.A.; 100%	51 M: 43 F: 8	38 M: 32 F: 6	43; 100% M: 37 F: 6	42; M: 36 F: 6	42[3] M:34 F:8

[3] **40** storekeepers ; **2** logistics manager

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
1.2.2 Number and percentage of base stores where physical inventories are verified by 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] x 100 (See PIRS for details on sample size for operational audits.)	Y2, Y3	Data source: Project records – ex: inventory control cards Reporting frequency: Each spray season (annual/ semi-annual)	By spray campaign	AIRS	7; 85%	7; 100%	7; 85%	5; 100%	5; 100%	5;100%
1.2.3 Submit up-to-date inventory records to AIRS home office 30 days after the end of each spray campaign	Milestone: (Completed/Not completed)	Y2, Y3	Data source: Project records – ex: warehouse inventory control cards Reporting frequency: Each spray season (annual/ semi-annual)	By spray campaign	AIRS	N.A.	N.A.	Completed	Not completed[4]	Completed	Completed
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: (Co mpleted/Not completed)	Y1, Y2, Y3	Data source: Project records Reporting frequency: Annually		AIRS	Completed	Completed	Completed	Completed	Completed	Completed
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 time5	Milestone: (Completed/Not completed)	Y1, Y2, Y3	Data source: Project records – submitted SEAs/ letter reports Reporting frequency: Each spray campaign	By spray campaign	AIRS	Completed	Completed	Completed	Completed	Completed	Completed

[4] Submitted 52 days after the end of spray.

[5] In Year 1, SEAs were due 30 days before the start of spraying and letter reports were to be submitted 14 days before the start 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 progress on 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 Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
2.2.2 Number and percentage of soak pits and warehouses/storerooms inspected and certified by an environmental officer/AIRS Environmental Compliance Officer (ECO) prior to spraying	[Numerator: Number of soak pits and/or storehouses inspected and certified by AIRS ECO] [Denominator: Total number of project soak pits and/or storehouses] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	Data source: Project records – Reports submitted by environmental officers Reporting frequency: Each spray season	By spray campaign By soak pits and warehouses/ storerooms	AIRS	83 100% inspected and approved before spraying	83 100%	35 soak pits, 33 watehouse 6; 100%	35 soak pits, 33 warehouses 100%	35 soak pits, 33 warehouses 100%	35 soak pits, 33 storehouses 100%
2.2.3 Number of government environmental and health officers trained in IRS EC	Total number of government environmental and health officers trained in IRS EC using AIRS Project resources	Y1, Y2, Y3	Data source: Project training reports Reporting frequency: Semi-annually	By spray campaign By gender	AIRS	N.A.	82 M: 79 F: 3	54 M: 48 F: 6	57[7] M: 32 F: 25	54[8] M: 30 F: 24	33[9] M:20 F: 13
2.2.4 Number of spray personnel trained in EC and personal safety standards in IRS implementation	Total number of spray personnel who attend a training in EC and personal safety standards in IRS implementation using AIRS Project resources, includes all staff who received EC training - spray operators, team leaders, washpersons, storekeepers, etc..	Y1, Y2, Y3	Data source: Project records – Training reports Reporting frequency: Each spray season	By spray campaign By gender	AIRS	1,609	1,210 M: 1,043 F: 167	1,105 M: 928 F: 177	1,121[10] M: 973 F: 148	1161[11] M:1008 F: 153	1124[12] M:934 F:190

[6] 1 central warehouse, 4 districts central stores, 35 secondary stores in sites, 35 soak pits.
[7] 4 DREEC, 5 DMO, 48 nurses.
[8] 11 DREEC/DEEC; 5 DMOs; 38 nurses
[9] 7DREEC;26Nurses
[10] 551 spray operators; 103 substitute operators; 35 operational site managers; 119 team leaders; 33 storekeepers + storekeepers warehouse; 6 storekeeper assistants; 56 repair technicians; 66 washers; 92 drivers; 60 guards.
[11] 831 (spray operators, site managers, team leaders, substitute), 40 storekeepers; 67 repair technicians, 67 washers, 94 drivers, 62 guards
[12] 554spray operators; 107substitute operators; 35operational site managers; 121team leaders; 40 storekeepers + storekeepers warehouse;44 repair technicians; 67washers; 94drivers; 62 guards.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
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	Data source: Project records – Training reports Reporting frequency: Each spray season	By spray campaign By gender	AIRS	59	120 M: 89 F: 31	43 M: 32 F: 11	53 M: 30 F: 23	43[13] M:25 F: 18	26[14] M:15 F:11
2.2.6 Number of adverse reactions to pesticide exposure documented	Total number of incidents of pesticide exposure reported that resulted in a referral for medical care	Y1, Y2, Y3	Data source: Incident report forms that are required for each incidence of pesticide exposure Reporting frequency: Each spray season	By spray campaign By residential/occupational exposure	AIRS	0	10	0	3 M: 1 F: 2	0	1 M:1 F:0
2.2.7. Number of vehicular accidents reported	Total number of vehicular accidents reported	Y1, Y2, Y3	Data source: Vehicular incident report forms that are required for each accident Reporting frequency: Each spray season	By spray campaign	AIRS	0	2	0	4	0	0
2.3 Support Entomological Monitoring Activities and Insecticide Resistance Strategies[15]											
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	Data source: Entomological reports Reporting frequency: Annually	By spray campaign	AIRS	N.A.	N.A.	N.A.	N.A	N.A.	N.A
2.3.2 Number and percentage of entomological monitoring sentinel sites measuring all five primary PMI entomological indicators	[Numerator: Number of entomological monitoring sites measuring all five primary PMI entomological indicators] [Denominator: Number of entomological monitoring sentinel sites]	Y1, Y2, Y3	Data source: Entomological reports Reporting frequency: Annually	By spray campaign	AIRS	N.A.	N.A.	N.A.	N.A	N.A	N.A

[13] 5 DMO; 38 Nurses
[14] 26Nurses
[15] PMI supports directly UCAD for IRS entomological monitoring. Entomological activities are not supported by Abt in Senegal.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
	Calculation: [Numerator ÷ Denominator] x 100										
2.3.3 Number and percentage of entomological monitoring sites measuring at least one secondary PMI indicator	[Numerator: Number of entomological monitoring sites measuring at least one secondary PMI indicator] [Denominator: Number of entomological monitoring sites] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	Data source: Entomological reports Reporting frequency: Annually	By spray campaign	AIRS	N.A.	N.A.	N.A.	N.A	N.A	
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	[Numerator: 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.] [Denominator: Number of insecticide resistance testing sites] Calculation: [Numerator ÷ Denominator] x 100	Y1, Y2, Y3	Data source: Entomological reports Reporting frequency: Annually	By spray Campaign By type of Insecticide	AIRS	N.A.	N.A.	N.A.	N.A	N.A	N.A
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	Data source: Entomological reports Reporting frequency: Per spray campaign	By spray campaign	PMI	N.A.	N.A.	N.A.	N.A	N.A	N.A
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	Data source: Entomological reports Reporting frequency: Per spray campaign	By spray campaign	PMI	N.A.	N.A.	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 Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
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	Data source: Entomological reports Reporting frequency: Per spray campaign	By spray campaign By type of Insecticide	PMI	N.A.	N.A.	N.A.	N.A	N.A	N.A
2.4 Conduct Communications Activities and Community Mobilization[16]											
2.4.1 Number of radio spots and talk shows aired	Total number of radio spots and talk shows aired in target spray districts to stress the safety and benefits of IRS, and to ensure successful spray coverage, timely vacating of premises and adherence to IRS safety precautions by community members	Y1, Y2, Y3	Data source: Project records ex: payment receipts Reporting frequency: Semi-annually	By spray campaign	AIRS	N.A.	N.A.	368[17]	661: 617 spots 44 talk shows	N.A.	N.A
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	Data source: Project records Reporting frequency: Semi-annually	By spray campaign By type of printed material and message(s)	AIRS	N.A.	20,274[18]	65,236[19]	97,874[20]	N.A	N.A
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 via community-based, door-to-door mobilization	Y1, Y2, Y3	Data source: Mobilization Data Collection Forms Reporting frequency: Daily per mobilization conducted	By spray campaign By gender	AIRS	N.A.	417,971 M: 162,050 F: 255,921	366,646 M: 175,990 F: 190,656	302,707 M: 135,585 F: 167,122	N.A	N.A
2.5 Spray Targeted Structures According to Technical Specifications											
2.5.1 Number of structures targeted for spraying	Total number of structures found in targeted spray districts by spray operators	Y1, Y2, Y3	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By spray campaign	PMI	295,000	312,938	204,585	212,979	213,000	209,603

[16] In Y3, the NMCP will be responsible for Mobilization; AIRS Senegal will not be responsible for these outcomes
[17] 320 spots & press releases, and 48 radio programs.
[18] 5,250 posters, 12,650 flyers (French & Wolof), 2,160 IEC mobilizer manuals, and 214 trainers' guides.
[19] 1,646 counselling cards, 50,000 posters, 13,500 compound cards, and 90 trainers' guides.
[20] 1,852 counselling cards, 51,528 flyers, 81 trainers' guides, 1,852 IEC mobilizers manuals, and 42,561 IRS cards.

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
2.5.2 Number of structures sprayed with IRS	Total number of structures sprayed in targeted districts	Y1, Y2, Y3	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By spray campaign	PMI	250,750	306,916	173,897	207,116	181,082	204,159
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	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By spray campaign	PMI	85%	98%	85%	97.2%	85%	97.4%
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	Data source: Daily Spray Operator Forms Reporting frequency: Daily per spray campaign	By spray campaign By number of pregnant women By number of children <5 years old	PMI	1,000,000	1,095,093[21]	667,000	690,029[22]	706,393	708,999 129 609 children under 5 17 240 pregnant women
Component 3: Provide ongoing monitoring and evaluation and quality control measures.											
3.1 Submit Monitoring and Evaluation Plan (MEP) to PMI Senegal	Milestone: (Completed/Not completed)	Y1, Y2, Y3	Data source: Project records Reporting frequency: Semi-annual		AIRS	Completed	Completed	Completed	Completed	Completed	Completed
3.2 Submit a post-spray data quality audit (PSDQA) report to the AIRS M&E specialist in the home office within	Milestone: (Completed/Not completed)	Y1, Y2, Y3	Data source: Spray operations reports Reporting frequency: Per spray campaign	By spray campaign	AIRS	Completed	Completed	N.A.	N.A.	Completed	Completed

[21] Number of pregnant women: 26,263; number of children less than 5 years old: 220,463.
[22] Number of pregnant women: 15,592; number of children less than 5 years old: 126,888

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
60-180 days of completion of spray operations											
3.3 Submit a country-specific Eligible Structure Definition Document to local PMI advisors and NMCP	Milestone: (Completed/Not completed)	Y1	Data source: Project records Reporting frequency: Semi-annually		AIRS	Completed	Completed	N.A.	N.A.	N.A.	NA
3.4 Supply chain review conducted by RTT	Milestone: (Completed/Not completed)	Y1, Y2	Data source: RTT supply chain review reports Reporting frequency: Semi-annually	By spray campaign	AIRS	Completed	Completed	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	Data source: Project records – Activity reports Reporting frequency: Semi-annually	By guideline/checklist/tool	AIRS	16 10 guidelines 6 checklists	16 10 guidelines 6 checklists	17 11 guidelines 6 checklists	21 8 checklists 13 guidelines	21 8 checklists 13 guidelines	21 8 checklists 13 guidelines
4.2 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.	N.A	N.A	1	3 presentations 1 video To be completed

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
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 includes only spray personnel such as spray operators, team leaders, supervisors, clinicians; it excludes data clerks, IEC mobilizers, drivers, washers, porters, pump technicians, security guards, etc.	Y1, Y2, Y3	Data source: Project records – Training reports Reporting frequency: Semi-annually	By spray campaign By gender Percentage of women trained	PMI	1,505	1,221 M: 1,103 F: 118 10%	917 M: 825 F: 92 10%	933 M: 830 F: 103 11%	944[23] M: 842 F: 102 10.8%	933[24] M:797 F:136 14.6%
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	3,515	1,657 M: 1,439 F: 218 13.2%	2,799 M: 2,379 F: 420 15%	3,973 M: 2,752 F: 1,221 30.7%	1,331 M: 931 F:400 30%	1263 M: 1045 F:218 17.4%
5.1.3 Number of personnel trained as IRS implementation trainers	Total number of personnel trained in Training of Trainers 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	95	90 M: 88 F: 2 2%	59	77 M:74 F: 3 4%	70[25] M:70 F: 0 0%	60[26] M:60 F:0 0%

[23] 831 (operators, team leaders, site managers, substitutes), 70 SNH, 38 Nurses, 5 DMO
[24] 26 PNLP,4 district coordinators; 26nurses; 60SNH; 554 spray operators; 107substitutes operators; 35 site managers; 121team leaders
[25] 70 SNH
[26] 60SNH

Performance Indicator	Indicator Definition	Project Year(s) Reporting	Data Source(s) and Reporting Frequency	Disaggregate	PMI/AIRS Indicator	Annual Targets and Results					
						Year 1		Year 2		Year 3	
						Target	Results	Target	Results	Target	Results
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.	82 M: 79 F: 3 3.6% SNH, DREEC	31 M: 29 F: 2 6% SNH, DREEC, IEC supervisors	121[27] M: 96 F: 25 20.6%	123[28] M: 97 F: 26 20.9%	93[29] M:80 F:13 13.9%
5.1.5 AIRS conducted a capacity assessment.	AIRS Senegal 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	Completed	In process	Completed	Completed	N/A	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 National Malaria Control Program, and other local partners and institutions	Y1, Y2, Y3	Data source: Project records – MOUs Reporting frequency: Semi-annually	By spray campaign	AIRS	1 MOU Draft	1 MOU Draft	2	1	1	None

[27] 4 DREEC, 5 DMOs, 48 Nurses, 64 SNH
[28] 10 DEEC/DREEC; 5DMO, 38 Nurses, 70 SNH
[29] 7DREEC; 26 Nurses, 60SNH