



PRESIDENT'S MALARIA INITIATIVE



INDOOR RESIDUAL SPRAYING FOR MALARIA CONTROL

Semiannual Report

Indoor Residual Spraying (IRS 2) Task Order One

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Acronyms

AED	Academy for Education Development
AIS	agent de santé itinérant (outreach health officer)
CAME	Coalition Against Malaria in Ethiopia
BCC	behavior change communication
CA-USA	Crown Agents USA, Inc.
CDC	United States Centers for Disease Control and Prevention
CHL	Central Highlands
COP	chief of party
CFR	Code of Federal Regulations
CHP	chief of health post
CNIECS	Centre National d'Information, d'Education et de Communication pour la Santé/ National Center for Information, Education, and Communication
CREC	Entomological Research Center of Cotonou (Centre de Recherche Entomologique de Cotonou)
CSPS	Centre de Santé et Prévention Sociale (Center for Health Prevention)
CSREF	Centre de Santé de Référence/Referral Health Center)
DA	district assembly
DAGRI	Directorate of Agriculture
DC	district coordinator
DDEPN	Regional Directorate for the Environment and Natural Protection (Direction Départementale de l'Environnement et de la Protection de la Nature)
DDS	Regional Directorate for Health (Direction Départemental de la Santé)
DDT	dichloro-diphenyl-trichloroethane
DEEC	Directorate of the Environment and Classified Factories (Direction de l'Environnement et des Etablissement Classés)
DHAB	National Directorate of Hygiene (Direction de l'Hygiène et de l'Assainissement de Base)
DHMT	district health management team
DHPS	Division Hygiène Publique et de Salubrité/Public Hygiene and Sanitation Division
DNACPN	Direction Nationale de l'Assainissement du Contrôle des Pollutions et Nuisances/National Sanitation and Environmental Pollution Control Department
DPS	Direcção Provincial de Saúde/Provincial Department of Health
DPV	Plant Protection Directorate
DTC	Directeur Technique de Centre/Center Technical Director
EIA	Environmental Impact Assessment
EMCAB	Environmental Management Capacity Building
EPA	Environmental Protection Agency (Ghana)
FAO	Food and Agriculture Organization of the United Nations
FY	fiscal year
GC-MS	gas chromatography-mass spectrometry
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria

GHS	Ghana Health Service
GOB	Government of Benin
GOM	government of Mozambique
GR	geographical reconnaissance
HBR	human biting rate
HEW	health extension worker
HH	household
ICP	infirmier chef de post (health post chief nurses)
IEC	information, education, and communication
IQC	indefinite quantity contract
IRS	indoor residual spraying
IRS 2	Indoor Residual Spraying 2
IRSS	Institut de Recherche en Sciences de la Santé
IT	information technology
ITN	insecticide-treated net
KCCR	Kumasi Centre for Collaborative Research into Tropical Medicine
LEVP	Lev Pharmaceuticals, Inc.
LLIN	long-lasting insecticidal net
M&E	monitoring and evaluation
MCD	medecin chef de district (district health manager)
MICOA	Ministry of Environmental Affairs
MOA	Ministry of Agriculture
MOAEP	Ministry of Agriculture and Fisheries (Ministère de l’Agriculture, de l’Elevage et de la Pêche)
MOE	Ministry of Environment
MOENP	Ministry of Environment and Natural Protection
MOH	Ministry of Health
MOP	Malaria Operational Plan
MOU	memorandum of understanding
MRC	Medical Research Council of South Africa
MRTC	Malaria Research and Training Center
NGO	nongovernmental organization
NMCC	National Malaria Control Centre
NMCP	National Malaria Control Program (Programme National de Lutte contre le Paludisme)
NMIMR	Noguchi Memorial Institute for Medical Research
NRO	Nairobi Regional Office
ORHB	Oromia Regional Health Bureau
PDA	personal digital assistant
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
PMI	President’s Malaria Initiative
PNLP	Programme National de lutte contre le Paludisme/National Malaria Control Program
PPE	personal protective equipment
PSI	Population Services International
SDSES	Social Development and Cooperatives Service/ <i>Service de Développement Social et de l’Economie Solidaire</i>
SEA	Supplemental Environmental Assessment
SHAB	Community Hygiene and Sanitation Service (Service de l’Hygiene et de l’Assainissement de Base)

SNH	Service National de l'Hygiene
SOW	scope of work
SPR	spraying performance report
STTA	short-term technical assistance
TOT	training of trainers
TPM	Technical Program Manager
TRAC Plus	Centre for Treatment and Research on AIDS, Malaria, Tuberculosis and Other Epidemics
UCAD	University Cheikh Anta Diop
USAID	United States Assistance for International Development
USG	United States Government
WB	World Bank
WHO	World Health Organization
WHOPEs	WHO Pesticide Evaluation Scheme
ZABS	Zambia Bureau of Standards
ZISSP	Zambia Integrated Systems Strengthening Program

Introduction

RTI International is pleased to submit this semiannual report for the Indoor Residual Spraying (IRS) 2, Task Order One, under Contract No. GHN-I-01-09-000012-00. On September 30, 2009, RTI and its partners, the Medical Research Council, Crown Agents-USA, and the Meridian Group were awarded the IRS 2 Task Order One contract with a ceiling of \$101,603,641. A total obligation of \$58,263,252 was made during this second six-month performance period (April 1, 2010–September 30, 2010), placing the current cumulative obligation at \$79,524,180.34

Funded by the United States President’s Malaria Initiative (PMI), the purpose of the IRS project is to support PMI countries in planning and implementing IRS programs with the overall goal of reducing the burden of malaria in Africa. The specific goal is to support National Malaria Control Programs (NMCPs) to reach a minimum of 85% of the vulnerable population living in selected high-burden malaria regions with a safe and highly effective application of insecticide inside homes. This IRS 2 Task Order One (TO1) has the following five main components:

1. Support NMCPs to implement IRS programs through the provision of operational management, planning, and administrative assistance; competitively procured IRS commodities; field supervision; and short- and long-term technical assistance
2. Build and strengthen the capacity of NMCPs to carry out all aspects of IRS at the central, provincial, and district levels
3. Ensure environmental compliance and the safe use of insecticides
4. Provide cost-effective procurement and logistics systems for IRS
5. Provide ongoing monitoring and evaluation for IRS activities, and ensure quality control measures are in place and implemented.

This semiannual report provides an overview of activities from April 1 through September 30, 2010, in each of the 11 countries funded under IRS 2 TO1: Angola, Benin, Burkina Faso, Ethiopia, Ghana, Madagascar, Mali, Mozambique, Rwanda, Senegal, and Zambia. At the end of this period, obligations for Liberia and Nigeria were awarded and activities for these countries will be reported in the next semi-annual reporting period.

Most country programs have focused activities on preparing for, or launching, their spray campaigns. To prepare for spray operations, RTI country project teams have collaborated with the NMCP/National Malaria Control Center (NMCC), District Health Management Teams (DHMTs), and local assemblies to coordinate expansion into new districts; conduct entomological monitoring and training; and secure office space, warehouses, storerooms, and soak pit sites for the spray operations. Benin, Burkina Faso, Ghana, Mali, and Senegal have successfully completed spray rounds during this period; Angola, Ethiopia, Madagascar, Mozambique, Rwanda, and Zambia will complete spray operations during the next reporting period.

In accordance with IRS standard operating procedure, each country team conducted environmental compliance activities specific to the Malaria Operational Plan and country work plan. We conducted Supplemental Environmental Assessments (SEAs) to determine

additional spray areas in new districts and/or the use of a new insecticide. In April, PMI/Zambia requested that RTI provide technical assistance to begin preliminary studies and meetings towards amending the existing SEA to include an additional 18 new districts and the use of pyrethroids. Other countries that underwent a new SEA were Angola (amendment to include three classes of WHOPEs), Madagascar (amendment to include all regions in country using pyrethroids and carbamates), Mozambique (amendment to include the expansion of IRS activities), Rwanda (amendment to include the expansion of IRS activities), and Senegal (amendment to include additional regions). Currently, Benin is conducting environmental activities to amend the current SEA to include the new northern districts that will be sprayed in the next round scheduled for spring 2011.

Core Activities

A description of the project management structure and key activities taking place under the Core work plan are described below, followed by a summary of key activities and accomplishments during this period.

We received approval to decentralize the organizational management of IRS from RTI's Washington, DC office to our Nairobi Regional office (NRO). As such, during this reporting cycle, two technical program managers (TPMs) relocated to IRS NRO. These Nairobi-based TPM's have been able to engage in more consistent STTA's due to proximity to implementing countries and work closer with the environmental team on any issues pertaining to their countries. Alongside shift of more technical responsibilities to the NRO, the project finalized the recruitment and hiring of the two key personnel positions to complete the senior IRS management team in Nairobi: Finance and Administration Director Alfred Schulz and Deputy Director of Country Programs Carl Henn, who joined the team in July and October, respectively.

RTI's Washington, DC office supports and oversees the project through a senior advisor, TPMs, project administration specialists (PASs), and procurement and financial analyst positions. These staff also liaise with RTI's corporate business units—finance and accounting, procurement, contracts, and human resources—at the Research Triangle Park, NC headquarters. The IRS Washington, DC team completed its operations team by hiring three PAS, one senior procurement manager, and one financial analyst. This facilitated formation of country operation teams that include the TPM, PASs, and the COP t. This formation has instituted better lines of communication amongst the country team specifically resulting in weekly IRS at-large team meetings. The formation of these country teams and improved capacity in procurement and financial management has facilitated better operational support in respect to country financial reporting, consulting and subcontract agreements, on-time procurements, country audits, and managing funding pipelines. Moreover, the lines of communication between country offices, NRO project management, and DC/RTP operations support has improved.

There have been several project support successes during this period that were initially launched in the previous reporting period. First, the master tracker that was created on Microsoft SharePoint has enabled IRS staff in all locations to access the status of procurements, short-term technical assistances, key project deliverables, and environmental activities. This tracker not only has enabled the overall IRS team to have up-to-date

information on project activities, but it also allows staff to play a more integral role in project monitoring by overseeing and taking ownership for their materials. Furthermore, the country operations teams have successfully used new financial reporting tools that were developed to help the field offices monitor, on a monthly basis, where they stand on actual expenses versus the approved budgeted expenses. A summary of all country and core budget expenditures versus budgets is reported to PMI each month. Finally, expenditure data from the 2009 spray round are being analyzed and compared with 2008 data.

Angola

This semiannual report presents the progress in Angola from April to September 2010, and summarizes the Indoor Residual Spraying (IRS) project's current activities and achievements, outstanding issues, and upcoming activities.

Background

In July 2005, the United States Government announced a five-year, \$1.2 billion malaria initiative to rapidly scale up malaria prevention and treatment interventions in 15 high-burden countries in sub-Saharan Africa. The United States President's Malaria Initiative (PMI) began with \$30 million in bilateral funding in fiscal year (FY) 2006 that was increased to \$135 million in FY2007 and \$300 million in FY2008 and FY2009; it is intended to reach \$500 million in FY2010.

In September 2009, RTI International was awarded the Indoor Residual Spraying 2 (IRS 2) Task Order One for the implementation of IRS in sub-Saharan Africa. The purpose of this task order is to support PMI and United States Agency for International Development (USAID) Missions in planning and implementing IRS programs with the overall goal of reducing the burden of malaria in Africa. This task order will enhance PMI's ability to implement IRS programs on the ground through cost-effective commodities procurement and logistics systems and access to technical expertise in order to implement high quality and timely IRS in countries affected by malaria.

The objective of IRS in Angola is to contribute toward reducing malaria morbidity and mortality by 50% by 2010. RTI International (RTI) was identified and contracted by PMI as the implementing partner for IRS1 and IRS2 in Angola, and tasked to provide technical, strategic, managerial, and operational support to the Angola National Malaria Control Program (NMCP) to ensure quality and timely implementation of IRS in the target provinces. RTI was also tasked with carrying out entomological monitoring and training in selected provinces.

The IRS project funded by PMI was initiated in Angola in 2007 in partnership with the Ministry of Health (MOH), and managed by RTI. In 2006 and 2007 a total 110,000 structures (over 85% targeted structures) were sprayed, protecting a total population of more than 613,000 in three southern provinces (Huila, Cunene, and Namibe). In 2008, PMI-supported IRS activities were discontinued in Namibe and Cunene provinces, maintained in Huila and initiated in Huambo province, which has the second highest burden of malaria in the country. In 2009, RTI continued IRS operations in Huambo and Huila; 102,731 structures were sprayed, protecting 485,974 residents, achieving coverage of 95.7%. In 2010, Cunene province was once again added to the two provinces sprayed in 2009, making a total of three provinces for implementing the IRS project. The spray round is planned to start in October and cover approximately 120,000 structures.

Current Activities and Accomplishments

This reporting period was centered on the following activities:

- Spray round planning meetings with national and district counterparts.
- Introduction of the newly hired chief of party (COP), Dr. Nelson Cuamba, and recruitment for various staff positions
- Re-entering the Cunene province and establishing office and operational space
- General logistical preparations, geographical reconnaissance, procurement needs assessment, logistical needs assessment, establishing soak pits, identifying warehouse space

Planning and Assessment

National Level

In June, Autman Tembo, IRS senior environmental inspector, traveled to Angola to support the field team during planning and preparations before the new COP officially onboarded. He collaborated with the logistics manager, PMI representatives and NMCP to meet with the National Malaria Control Program (NMCP) at the national level to discuss the upcoming spray round and re-entering the Cunene province. NMCP drafted a letter for Mr. Tembo to present to the Cunene's province level officials in the NMCP and Department of Public Health (DPS) leadership in the district.

In August, the COP was introduced to one of the PMI Advisors, Dr. Jules Mihigo, and the NMCP Director Dr. Filomeno Fortes in Luanda. Dr. Cuamba also met other NMCP Luanda staff and was briefed on how the program operates, the relationship of RTI with the NMCP program, and opportunities for capacity building collaborations.

The NMCP director, during a second meeting with the COP, offered the following suggestions and guidelines(1) set the IRS launch date to initiate thorough planning ; (2) RTI's assistance to establish sentinel sites for entomological monitoring; 3) RTI's should collaborate with the ongoing larvae control program; 4) RTI should emphasize close collaboration with the NMCP at the district and national levels. These requests will be discussed with PMI to decide on whether item 3 and 4 can be supported by PMI.

The COP also participated in weekly partner meetings; these were forums where PMI, NMCP, and RTI come together and discuss progress and challenges in spray round planning and preparations.

District Level

Cunene. Early meetings with the directors of NMCP and DPS in Cunene province included discussions about key activities and estimated timeline for activities. RTI presented a draft memorandum of understanding (MOU) to the NMCP in Cunene and explained the proposed roles and responsibilities for RTI and the NMCP/DPS. NMCP in Cunene agreed to review the document and suggest changes for finalization. The MOU will be finalized in October.

RTI worked with DPS to conduct a geographical reconnaissance (GR) of the Cunene province to verify the number of structures that will be targeted for spray operations. It was determined that there are approximately 16,000 structures in Cunene, which was lower than

the original estimate from the work plan (20,000). Also during the GR, Mr. Tembo led the RTI team in assessing and identifying operational sites, warehouses, office, and secondary storage facilities in Cunene province. RTI identified possible training sites in Cunene for the training of trainers (TOT) and the training of spray operators' workshops.

In July, RTI's Technical Program Manager, Ms. Lenna Neat, also traveled to Angola for short-term technical assistance (STTA) in planning and preparations for the spray round. She worked closely with the logistics manager to draft the timeline for the pre-spray and implementation period. RTI presented this timeline to PMI for review and comments. PMI approved the proposed dates for all key activities. The spray round launch date was originally scheduled for October 4, but was extended to October 18 due to trainings getting postponed by one week.

During Ms. Neat's STTA, she also met with the district information, education, and communication (IEC) leadership in Cunene province and shared the proposed IEC brochure for household mobilization. The district IEC manager recommended that the brochure be more pictorial. RTI also shared the plan to have IEC distribute an IEC card to each household that would collect information on who sprayed the house, whether a supervisor visited the house, and would track the participation of the household in the IRS campaign for the next four years. The IEC manager agreed that this would be a good addition to the IEC activities.

Huambo. In mid-August, the COP met with the Provincial Director of Health in Huambo Dr. Find to introduce himself and discuss coordination of spray operations with the district staff. The COP stressed the importance of close collaboration throughout all stages of planning and implementation. Dr. Find shared the challenges and lessons learned from previous rounds, including delays in payment of spray operators and some logistics issues. He requested training for the provincial entomologist and expressed his interest in expanding IRS within the province.

The COP shared the draft MOU with the provincial director for his review and signature.

The COP had a brief meeting with the malaria provincial supervisor, Mr. Armando, to discuss IRS planning and collaboration areas.

Huila. In late August, the COP was introduced to the Provincial Directorate of Health (DPS) where he met the head of the DPS in Huila, NMCP Provincial Supervisor, and the Coordinator of the larvae control program. During these meetings, the COP presented the IRS MOU for their review and comments. The MOU is still being reviewed and the COP will continue to follow up for completion.

Procurement and Logistics

Purchase orders for insecticide and equipment was carried out with competitive tenders through RTI procurement partner, Crown Agents-USA. In April 2010, we began the competitive procurement process for the purchase of insecticides for the October IRS campaign. The NMCP and PMI had previously agreed that a pyrethroid insecticide would be used for the 2010 round based on entomological data. Five vendors responded to the solicitation for a pyrethroid class insecticide. ICON[®] 10% CS (Syngenta) was selected to be the product that best fit with the selection criteria, which included registration of

manufacturer; lead times for delivery, cost, effectiveness on mud/thatched surfaces; and duration of efficacy on surfaces.

IRS commodities. Through the logistics and procurement assessment, RTI developed a procurement list for all the key commodities for the 2010 round. Table 1 summarizes the quantities purchased internationally:

Table 1: International Procurement for 2010 Spray Round

Spray pumps	100
Filters	1,000
Manometers	100
Nozzle washers	5,000
Gloves	3,500
Helmet	200
Visors	200
Face masks	10,000
Insecticide (No. of sachets)	88,104

Other items were purchased locally such as boots, coveralls, materials for soak pits, buckets, office supplies, wooden pallets, and other necessary supplies.

We identified and secured warehouse/office space the new province of Cunene. It was determined that water would need to be purchased for spray operations and the logistics for this was worked out in September.

We developed a solicitation for rental vehicles to transport spray operators, advertised it in national newspapers, and received bids from interested applicants. Vendors will be selected based on competitive bids in October. Furthermore, RTI received a USAID waiver permitting us to purchase two vehicles for administrative use the project. RTI conducted a competitive procurement and locally purchased one SUV and one pick-up truck.

Environmental Compliance

During this reporting period, all waste from the 2009 spray round was incinerated.

During his STTA visit, Mr. Autman Tembo, also conducted a pre-spray environmental compliance inspection. The following is an overview of the accomplishments from his trip:

- Worked with the logistics manager, Silvestre Fernando, to set up RTI’s warehouse in Cunene
- In consultation with DPS office, carried out geographical reconnaissance and/or structure count in Cunene. Approximately 16,000 structures were identified in the province
- Assessed and identified operational sites, warehouses, office and secondary storage facilities in Cunene
- Assessed and identified possible training sites in Cunene for the TOT and the Training of Spray Operators
- Conduct introductory meetings with DPS in Cunene to let them know of the upcoming 2010 IRS spray campaign

- Collaborated with DPS Cunene to develop a spray schedule for the spray activities intending to cover up to 20,000 structures in Santa Clara, Namacunde, and Ondjiva on the Angola–Namibia border and establish a preliminary timeline for IRS activities in Cunene
- Conducted a pre-spray environmental compliance assessment
- Debriefed with USAID/Angola Mission, PMI, NMCP, and other appropriate stakeholders during travel.

Soak pits were constructed for Cunene during this reporting period, one in Ondjiva and one in Namacunde. Soak pits in Huila and Huambo were rehabilitated from use in the previous years' spray round.

Information, Education, and Communication

Materials

The COP and Logistics Manager worked closely with the RTI Regional Communication Manager to finalize IEC tools (e.g., IEC household card, IEC brochure, and IEC data recording card) and ensure they were tailored for Angola. A printing vendor was chosen based on competitive bidding and materials were in the process of being printed at the end of this reporting period. The IEC training manual was translated into Portuguese to prepare for the IEC training in October.

Training

Registration of candidates as IEC mobilizers training in Huila and Huambo began at the end of this reporting period. In Cunene, a list of candidates was already available as DPS in Cunene regularly works with networks of volunteers for various health programs in the province.

Spray Operations

Training of Trainers (TOT)

In collaboration with MOH and NMCP, RTI held the training of trainers and subsequent training of spray operators during this reporting period. Mr. Moses Pamhare, IRS expert trainer visited Angola for STTA during the training of trainers. Mr. Pamhare led the six-day TOT along with the COP and DPS authorities. The course started on September 30, 2010. The first three days were allocated to classroom instruction and the last three days for demonstration and practicum of spray techniques. In the classroom lecture portion, discussion and brainstorming training methods were mostly used.

Participants of the TOT were drawn from the three provinces of Cunene, Huila, and Huambo. The participants were chosen by the MOH in consultation with RTI site managers in the provinces. The following criteria were used to select participants in Huila and Huambo:

- Previous experience with IRS campaigns
- Availability during the spray round
- Minimum age of 18 who demonstrated a strong desire to be part of the IRS project.

Since the IRS project did not operate in Cunene in 2009, selection criteria for Cunene included an ability to read and write, age 18 or older, and a strong desire to partake in IRS activities. Twenty two participants attended the training: 7 from Huambo, 10 from Huila, and 4 from Cunene.

All TOT participants were given a pre- and post-training evaluation to assess readiness for leading spray operators in IRS. A full training report is available on request. The TOT trainers were also evaluated by the participants.

Poison Management Training for Physicians

RTI distributed the IRS poison management manual to all the district health offices for disseminating as necessary to hospitals and health care posts around the districts.

Dr. Zepherim, a local malaria staff member from the Global Fund project, led the physician training session for Cunene. The trainings in Huila and Huambo will be held in October.

Other Activities

Entomological Monitoring

The COP worked with NMCP at the central and provincial levels to identify a core team of entomological monitoring technicians that can participate in entomological monitoring in the PMI-targeted provinces. RTI hired an entomology consultant, Mr. Joseph Mwangangi, who will conduct STTA in October and train and supervise the technicians.

Capacity Building of Ministry of Health

Capacity building activities for the Ministry of Health and DPS during this reporting period included the following:

- Various planning meetings between RTI and national and district authorities in order to involve them in all stages of IRS and encourage active participation and leadership in all key preparation activities.
- Training of trainers involved key participants from DPS in the Provinces.

Monitoring and Evaluation

During this reporting period, the IRS project worked with the monitoring and evaluation (M&E) officer from RTI's Nairobi Regional Office to develop the tool and materials that will be used to track M&E indicators in the coming spray round. The following M&E materials were developed for use in the Angola 2010 spray round: spray operator daily record sheet, team leader daily record sheet, IRS household card, IEC daily record sheet, and a supervisor checklist.

Using the aforementioned tools, the following indicators will be tracked in the upcoming spray round:

- Number of structures sprayed/number of structures found (*=IRS coverage*)
- Number of people sleeping in house structures sprayed (*=population protected*)
- Number of children under five years old and pregnant women sleeping in house structures sprayed (*vulnerable groups*)

- Number of people trained in IRS implementation (disaggregated by type of training) (*capacity building*)
- Number of IEC brochures distributed to the target households

In September, candidates for the M&E Manager position were interviewed and Mr. Amorim Salumbongo was selected for the position in late September. He will receive training from RTI's regional M&E officer in early October.

Project Management and Administration

During this reporting period, RTI completed the transition of the main office from Luanda to Huambo. The lease was approved and signed.

RTI met with the new attorney's office in Luanda on three occasions (July, August, and September) during this reporting period to discuss the progress of the RTI registration process. The lawyers are currently reviewing the files that were sent over from the previous attorney and reported that they did not foresee any major issues with completing registration process. RTI continues to follow up with the attorney to push the process along where possible.

STTA

There were three STTA visits during this reporting period, including

- Mr. Autman Tembo in July for STTA in pre-spray environmental compliance
- Ms. Lenna Neat, STTA for Technical Program Management and planning for 2010 IRS round
- Mr. Moses Pamhare, STTA for leading TOT

Staffing

The new Angola COP, Dr. Nelson Cuamba, took his position in Huambo during this reporting period. Various positions were recruited during this period, including finance manager, district staff for Cunene (district coordinator, logistics assistant, finance assistant, and data clerks), M&E officer, and IEC officer. Interviews for finance manager took place during late August and in late September; and Mr. Adolfo Cuamba was hired for this position.

Outstanding Activities

- Rehabilitation of all soak pits
- Selection of Vehicle vendors
- Printing of IEC materials
- Completion of the M&E Database

Upcoming Activities

- Spray operator training
- Spray campaign.
- STTA for entomological monitoring and training of M&E officer
- Mid-spray environmental inspection

Benin

This semiannual report presents progress in RTI's IRS2 Task Order 1 in Benin from April 1 to September 30, 2010, and summarizes the IRS program's current activities and achievements, outstanding issues, and upcoming activities.

Background

Malaria is one of the leading causes of morbidity and mortality in sub-Saharan Africa that adversely affect their social and economic development. The Government of Benin (GOB) and all of its key development partners (World Bank [WB]; United States President's Malaria Initiative [PMI]; World Health Organization [WHO]; and Global Fund to Fight AIDS, Tuberculosis and Malaria [GFATM]) have identified malaria control as a top priority.

In December 2006, the United States Agency for International Development (USAID) identified Benin as one of eight countries to receive funding during the third year of the PMI. Indoor residual spraying (IRS) is one of PMI's major interventions in Benin and is included in the Benin National Strategic Plan for Malaria Control 2006–2010, under axis 3: Vector control. To date, PMI is the only international partner funding IRS activities in Benin.

In 2007, USAID/PMI and the National Malaria Control Program (NMCP), in collaboration with the Entomologic Research Center of Cotonou (CREC), identified different regions in Benin for IRS interventions. In 2008, the in-country PMI team and the NMCP agreed to focus IRS pilot activities in four communes of Ouémé Region: Adjohoun, Akpro-Misséréte, Dangbo, and Sèmè-Kpodji. Ouémé, located within the humid zones of southeast Benin, was chosen for spraying most notably because it has one of the highest incidences of malaria in the country. The project conducts IRS activities before the peak of malaria transmission.

RTI International, under contract with USAID for implementing IRS activities, was tasked to perform the following activities in Benin:

- Provide strategic, technical, management, and operational support for IRS activities in the targeted communes.
- Build capacity in Benin to enable national partners to conduct IRS without the need for external assistance in the future.

RTI works in close collaboration with

- Public partners: mainly the Ministry of Health (MOH) and the NMCP, the Ministry of Agriculture and Fisheries (MOAEP), and the Ministry of Environment and Natural Protection (MOENP) for training, preparation, implementation, and supervision of IRS activities
- Private partners: for procurement of equipment, commodities, fuel, car rental (Crown Agents [CA], Sonacop, Bayer, Hudson, Sotracog, Evazions), and Information, Education, and Communication (IEC) activities (Radio Weke, Radio Alleluia, Radio Gerddes, and Radio la Voix de la Vallée)

In 2008 and 2009, the project conducted two rounds of IRS (R1 and R2), one per year. In 2010, following recommendations from NMCP and CREC, the project conducted two IRS

rounds (R3 and R4) in Ouémé during the same year, to ensure better protection of the population as southern Benin experiences two peaks of malaria transmission, during the long rainfalls (April–July) and the secondary short rainfalls (October–November).

To date, the project has conducted four rounds of IRS in the four communes targeted in southeast Benin. The IRS R4 ended in September 2010 and was the final IRS round in Ouémé. In August 2010, PMI and MOH agreed on relocating IRS activities from Ouémé to Atacora region in northern Benin. The next IRS round (R5) is planned for May–June 2011.

Table 1 below summarizes IRS activities performed and results obtained in Benin to date.

Table 1. Summary of Benin IRS Activities from 2008 to Date

	Date	Region	Districts	Structures Found	Structures Sprayed	Population Protected	Status
Round 1	2008 (Jul/Aug)	Ouémé (South)	4	151,782	142,813	521,698	Complete
Round 2	2009 (Mar/Apr)	Ouémé (South)	4	157,146	156,223	512,491	Complete
Round 3	2010 (Mar/Apr)	Ouémé (South)	4	168,010	166,910	636,448	Complete
Round 4	2010 (Aug/Sep)	Ouémé (South)	4	200,095	200,036	623,904	IRS operations complete Data cleaning ongoing Post-spray ongoing
Round 5	2011 (May/Jun)	Atacora (North)	9*	To be determined Awaiting GR**	N/A	Target: 500,000	In preparation

* Estimate depending on districts' selection after preliminary IRS studies (entomological and environmental) and logistics/financial assessment (October–November 2010)

** GR = geographical reconnaissance

Current Activities and Accomplishments

This semiannual report covers a period with a large number of activities covering three IRS rounds: the close of R3 (April–May), preparation and implementation of R4 (May–September), and finally, the beginning preparations for R5 (September). To facilitate reading the report, RTI will identify activities reported hereafter by the round to which they relate.

Planning and Assessment

Work Plan

PMI approved the Benin FY10 IRS work plan at the end of March 2010. The work plan covers a period of 18 months, from January 1, 2010, to June 30, 2011, during which three rounds will be conducted: two rounds in 2010 (R3 and R4) in the four targeted communes of Ouémé, and one round (R5) in 2011 in a new region of northern Benin, which was determined in August 2010 as Atacora Department region.

The two rounds of IRS in Ouémé (March–April and August–September of 2010) were correctly planned and detailed in the FY10 work plan. However, most of the activities related to R5 in the North will need to be revised, with further details spelled out, now that Atacora

has been chosen. This area has only one seasonal peak of transmission; thus, a single round of spraying is sufficient to provide year-round protection instead of the two rounds of spraying required for full protection as in Ouémé.

The differences between Ouémé and Atacora regions in surface area and population density require a different approach to conducting IRS operations in 2011, and Atacora activities will require more accurate cost estimates, after the results from the preparatory surveys and the geographical reconnaissance are known. Plans call for conducting these surveys and reconnaissance in September and October 2010.

Furthermore, PMI asked RTI to conduct additional post-IRS activities in Ouémé, including an IEC/behavior change communication (BCC) campaign to inform the community about the MOH's long-term strategy, and to ensure the effective use of insecticide-treated nets (ITNs) after the conclusion of IRS¹ in Ouémé.

IRS Round 4 Planning

Meetings were regularly held during May and June with the PMI country team, the NMCP team at national and regional levels, the Regional Directorate for Health (DDS), and the MOENP at the regional level, regarding the next IRS Round 4 preparation and implementation.

Starting in May 2010 and in collaboration with NMCP, DDS Ouémé, and the medical chiefs of the four communes, RTI staff organized meetings with community leaders in the four communes in Ouémé to inform them of the IRS R4 schedule and to continue to solicit their support. Community leaders included chiefs of targeted villages, traditional leaders, mayors, nurses, and representatives of nongovernmental organizations working in the communes. As R3 had recently ended in April, community mobilization and leaders' support for R4 were very high.

Task Force Committee Meeting

The NMCP convened the IRS Task Force committee meeting on June 25, 2010, at the MOH. The purpose of the meeting was to inform the Task Force committee members about the IRS R3 results (through presentation and distribution of the Benin R3 Spray Performance Report) and the implementation plan of the upcoming R4. The meeting gathered all stakeholders involved in IRS activities in Benin. In addition to NMCP senior staff, participants included representatives from the MOENP, Ministry of Agriculture (MOA), mayors, and medical chiefs of the four communes. After question/response sessions and discussions on the IRS activities, the group validated IRS R3 results and shared IRS R4 activities.

IRS Round 5 Planning

RTI met regularly in July, August, and September with the PMI country team and the NMCP team regarding IRS R5 preparations.

On September 1, 2010, NMCP organized a meeting with key partners (mainly PMI, CREC, GFATM, WHO, MOH, International Relief and Development (IRD), USAID's International

¹ See USAID/Benin, Assistance Agreement (AA) 680-0232: Implementation Letter (IL) No.20 - Relocation of Indoor Residual Spraying from Southern to Northern Benin – August 10, 2010.

Institute for Tropical Agriculture project (IITA), MOENP), most of them members of the IRS Task Force Committee, to present the future of IRS operations in Benin. The meetings focused on the relocation of the IRS activities in Atacora, the district selection process, upcoming surveys related thereto, and the disengagement activities planned for the southern region. Concerning this last point, NMCP has proposed establishment of a technical working group to work on the IEC/BCC campaign in Ouémé in the coming weeks, with RTI assistance.

The group, led by the Deputy Director of the MOH cabinet, made a three-day visit (September 2 to 4, 2010) to Atacora (Natitingou) to meet the regional and local authorities and to present the upcoming IRS operations. The visit was also a good opportunity to gather initial intelligence on Atacora regarding infrastructure, road access, population density, type of structures, climate, and rainy season.

MOH and MOENP regional representatives from Atacora responded positively to the invitation to visit IRS activities “in action” in Ouémé during the last week of R4 operations. This visit helped to advocate and prepare for IRS R5 activities by clarifying many points on IRS activities such as spraying operations, logistics management, IEC actions, population mobilization, monitoring and evaluation (M&E), supervision, insecticide management, and environmental compliance aspects. Further visits and meetings with Atacora authorities will be held in October.

Plans call for conducting several surveys in Atacora in September and October: entomological survey, Supplemental Environmental Assessment (SEA), geographical reconnaissance, and a sociological survey if needed.

Procurement and Logistics

In April 2010, RTI conducted an inventory of IRS equipment and commodities in the main warehouse² where all the items were kept locked in a safe place. RTI counted all items one by one for reconciliation between physical and theoretical inventories (stock cards). The inventory books were then closed at the end of R3. The inventory helped to identify the quantities of personal protective equipment (PPE), pesticide and other goods needed for the IRS R4 in August/September. RTI reopened the stock books in June for R4, and R4 opening stock was equal to R3 closing stock.

After minor maintenance/repair when necessary, all PPE used during the previous IRS rounds (R1 to R3) remained in sufficiently good condition for continued use in R4. Assistant logistics and service technicians rinsed, examined, repaired, and lubricated all pumps in April (end of R3) and again in July (preparation of R4).

Insecticide quantity (56,000 sachets) procured in March 2010 had been ordered to cover R3 and R4. The remaining insecticide stock at the end of R3 operations (29,178 sachets) was expected to be sufficient to conduct IRS R4, with similar objectives and in the same communes. However, for security reasons and to constitute a buffer stock, the project ordered 4,160 insecticide sachets in June, which were delivered on August 25, 2010, at central warehouse. The exact quantity delivered (and recorded on the stock card) was 4,176 sachets, 16 more than ordered.

² For details on remaining stock, see IRS 2 FY2010 Benin Spraying Performance Report Round 3.

During operations, an IRS team member noted that some insecticide barrels (delivered in March) did not have the exact quantities of sachets indicated (320 sachets per barrel), sometimes one or two more or less. Because barrels are filled through an automatic process at the factory level, little mistakes can occur. Insecticide stocks at Ouanho central and district warehouses level were controlled to correct the mistakes when necessary. RTI performed a close inventory the last day of spraying operations.

In June, RTI Procurement ordered additional equipment internationally to complete the existing stock, which was delivered prior to the start of R4 spraying operations:

- Hudson pump spare parts (500 nozzle gasket; 500 O-ring; 50 male-fitting)
- 100 first aid kits
- 50 PVC boots (women's size)
- 300 LED helmet lights

In July, local procurement was done for other commodities necessary for IRS operations (bag, soap, towel, plastic sheeting, brushes, plastic bucket) and for IEC and M&E activities (IEC pamphlets, data forms, IRS card, T-shirts, hats).³

Assessment of logistics needs early in May allowed all procurement to be done on time, reducing stress during IRS operations. No international or local procurement problems were encountered for R4 preparation and implementation.

In July, the RTI team conducted field visits in selected villages of the four communes to update information on the routes to be used during R4 operations and to confirm road access. The team considered rapid assessment good enough as R3 end of operations was near. The target number of structures to be sprayed was considered the same as the number of structures found at the end of R3 (168,010), as the purpose of R4 was to protect twice yearly the same population.

The team hired 40 vehicles, with drivers, for IRS R4 operations (transport of spray operators, coordination, supervision, IEC, and M&E). The team rented the vehicles through a local bidding process done in July, finally selecting two rental companies. All vehicles were inspected and only those in compliance with IRS environmental requirements were chosen.

RTI has reviewed and improved logistics management, following recommendations made during pre-spray and mid-spray inspection visits in R3. Stock cards have been updated, Ficom® tracking card has been improved, and respiratory masks tracking card has been introduced. The team has implemented a new system of expedition/delivery. RTI has trained all logistics assistants of the four district warehouses before and during IRS operations through on-the-job training and constant supervision.

In July, RTI inspected, maintained, and/or repaired central and secondary warehouses (respectively in Ouanho and Adjohoun) when necessary.

A new vehicle (Toyota Land Cruiser hardtop), ordered in 2009, was finally procured and delivered in Benin in July 2010. The team will use this vehicle mainly for field operations.

³ IRS 2 FY2010 Benin Spraying Performance Report Round 4, to be submitted in October 2010, will detail local procurement.

Environmental Compliance

In R3, the RTI logistics officer, the Regional Directorate for the Environment and Natural Protection (DDEPN) representative, and the Directorate of Agriculture (DAGRI) representative jointly conducted IRS environmental monitoring. They found no reports of adverse effects due to insecticide contamination throughout the entire spray operations.

Final reports of the pre-spray and mid-spray inspection visits related to R3, all conducted by Mr. Autman Tembo, the environmental compliance specialist based at RTI Nairobi Regional Office (NRO), were submitted to PMI Benin in May 2010. The team considered all recommendations and implemented them during the R3 operations. The recommendations have also served as a baseline for environmental compliance during the preparatory phase of R4 in July.

All IRS R3 wastes were collected and stored throughout the operations, and then incinerated on June 23, 24, and 25, 2010, at the Central Hospital Department (Centre Départemental Hospitalier) of Ouémé-Plateau in Porto Novo, under the strict supervision of representatives from DDS, DDEPN, DAGRI, and NMCP. Wastes incinerated were as follows:

- 29,227 empty sachets
- 7,298 used respiratory masks
- 1,025 used pairs of gloves
- 184 used spray operator bags

For R4, the pre-spray inspection visit was conducted from July 23 to August 6, 2010, by Mr. Damien Kodjo, local independent environmental specialist, who was recruited through a bidding process. The team followed all recommendations during or immediately after the inspection visit. Final report of the pre-spray inspection was submitted to PMI in September.

Mr. Tembo, environmental compliance specialist, conducted the mid-spray inspection visit for R4 September 15–23. The mid-spray inspection visit report will be finalized in the coming days. During his visit, Mr. Tembo also performed a warehousing evaluation to (1) assess implementing partner's compliance to IRS standardized best practices for warehousing, human safety, transportation, and environmental protection, and (2) identify gaps in adherence to the best management practices and make recommendations for improvement.

Similar to R3, the RTI logistics officer, the representative of DDEPN, and the representative of DAGRI jointly conducted IRS environmental monitoring in R4. Mr. Tembo also participated in field visits in order to continue building capacity through on-the-job trainings and exchange views on IRS environmental best practices in Benin or from other IRS countries.

There were no reports of adverse effects due to insecticide contamination throughout the entire spray operations.

To ensure the optimal level of environmental compliance during spray operations, rigid insecticide control measures were followed (Ficam® tracking), ensuring that sachets of the insecticide could be tracked from the store to the end user and vice versa.

The logistics assistants at all district warehouses daily collected all IRS R4 wastes by level, and safely kept the wastes in closed barrels. The wastes were sent weekly to the central warehouse and stored in closed barrels. Plans call for all wastes to be incinerated in October at the Central Hospital Department of Ouémé-Plateau in Porto Novo, under the strict supervision of representatives from DDS, DDEPN, DAGRI, and NMCP. To date, wastes to be incinerated are as follows:

- 29,833 empty sachets
- More than 6,200 respiratory masks (additional respiratory masks will be used during post-spray activities and then incinerated)
- More than 820 pairs of gloves (additional gloves will be used during post-spray activities and then incinerated)
- 269 operator bags

In October 2010, RTI plans to conduct a SEA in Atacora region in preparation of IRS R5 in 2011, and is preparing the scope of work of this assessment.

Information, Education, and Communication

IEC mobilization and information occurs at different levels. The first and most important is door-to-door mobilization and pamphlet distribution by IEC mobilizers, who are recruited and trained the month before IRS operations, for direct sensitization. Local radios, megaphone users on motorbikes, and traditional “gongonneurs” (bell ringers) are also hired to inform the population of all IRS activities throughout the operations.

During IRS R3 operations, IEC mobilizers, supervised by the chiefs of health post (CHP), passed through the villages announcing the arrival of spraying operators, usually 24 hours before. They continued to remind the population about important actions to take before, during, and after spraying of their houses. A new IEC data collection form, using pictograms, was developed and tested during R3 to help IEC mobilizers, most of whom are low literate, to better collect IEC data and to palliate the lack of IEC data collected in the previous rounds 1 and 2.

From IEC data provided during R3, 94% of households accepted the IRS. The CHP later visited the remaining 6% to discuss the reasons of their refusal. The main reasons explained for refusal were problems of furniture storage, sickness of a family member, fear of insecticide, or doubt regarding insecticide efficiency.

After spray operations, RTI IEC consultants and IEC mobilizers returned to the villages to interview beneficiaries on IRS activities performed in their houses. RTI collected information on the population’s satisfaction, IRS activities’ performance, support and communication received, problems encountered, and their expectations for a future IRS round. The IEC consultant could also check the efficiency of IEC mobilizers during IRS operations.

R3 lessons learned related to IEC activities were as follows:

- The flexibility in scheduling spray operators’ activities by considering local activities and events (e.g., working hours in fluvial regions, market day, village celebrations) provided excellent results in avoiding household absenteeism during spray operations.

- Hiring megaphone users on motorbike and traditional gongonneurs improved IEC activities and facilitated community mobilization, especially in remote areas.
- The CHPs, who were responsible for IEC mobilizer supervision and coordination, encountered problems performing close and good quality supervision and coordination due to their heavy workload and other activities.

RTI took these lessons into consideration for the preparation of IRS R4 in August/September. IEC activities continued to need improvement, especially in data collection and close supervision of IEC mobilizers. In July 2010, the regional communication manager at RTI NRO conducted a three-week mission in Benin to provide technical assistance in streamlining IEC activities through the strengthening of IEC data collection system, improved supervision, and engaging NMCP to oversee the implementation of the IEC component during the 2010 second IRS spray round in Benin.

In close collaboration with NMCP—mainly the IEC team—RTI reviewed the existing IEC strategy to improve quality and efficiency in starting the R4. The team agreed that to improve IEC data collection, close supervision of IEC mobilizers was needed; therefore, in R4 the team introduced the role of a close supervisor into IEC to monitor and supervise IEC mobilizers. This addressed the gap identified during R3 where IEC data could not be collected due to the low literacy level of the IEC mobilizers. The other activity added to IEC strategy was the improved synchronization of mobilization and spray activities during spray operations to increase coverage and reduce mop-up.

RTI revised the contents of the mobilizer training guide and the IEC component presented during the training of trainers (TOT) to reflect the change in the IEC strategy. NMCP performed the review, under the guidance of RTI. Items added to the training content include the definition of roles and responsibilities of all the players in field activities, the IEC data tools, and the IEC materials, which include the IRS household card and the brochure with key IRS messages. The team used the revised training guide during the mobilizer refresher training and the TOT refresher.

In R4, RTI introduced the IRS operations card to Benin. The card replaces the IRS stickers used during mobilization to mark eligible structures. The card is a quality control tool, which helps in supervision and has serialized numbers or unique numbers that can assist in audit trails. The NMCP accepted and approved the IRS operation card for use in the next spray rounds.

NMCP reviewed the existing IRS brochure, and due to the poor quality of illustrations, the NMCP IRS team developed and approved a new brochure with more illustrations and less text. The new brochure has information on all the key stages of IRS, the continuous malaria prevention activities, and information on the insecticide. The IEC mobilizers distributed the brochure during mobilization in July 2010.

In R4, IEC mobilizers carried out door-to-door community mobilization from two weeks before spraying operations through the last day. They continuously reminded the population about important arrangements to take before, during, and after spraying of their houses, providing the new brochure as support. They distributed the new IRS card to households sensitized and accepting the IRS. In accordance with the new strategy, a group leader closely

supervised IEC mobilizers, monitoring and helping them in collecting and reporting IEC data. The synchronization of mobilization and spray operations was successfully implemented.

From August 23 to 27, 2010, NMCP organized the Week of Partners for Malaria Control with the collaboration and participation of all NMCP partners, including RTI.

Spraying Operations

The IRS R3 operations began on March 8, 2010, and ended on April 28, 2010, lasting for 44 days of spraying. On April 15, 2010, Professor Issifou Takpara, Minister of Health in Benin; Mr. James Knight, U.S. Ambassador in Benin; and Mr. Francois Houessou, Prefect of Ouémé-Plateau officially launched IRS operations during a ceremony at Ouanho warehouse.

A total of 265 spray operators, divided into teams of six, were deployed daily in the four communes to conduct spraying operations. An MOH team, supported by representatives from MOENP and MOAEP, supervised the spray operations. The supervision team consisted of NMCP supervisors, hygiene agents from DDS, chief doctors, and a hygiene agent from the National Directorate of Hygiene (DHAB).

RTI conducted the end-of-spray-round workshop on June 25, 2010, jointly with the Task Force IRS committee meeting.

Additional information concerning the IRS R3 operations can be found in the end-of-spray report,⁴ which was submitted in June 2010.

IRS R4 operations took place from August 2, 2010 (opening ceremony) until September 24, 2010 (last day of spray and closing ceremony), encompassing 45 days of spraying.

In July 2010, all trainings concerning IRS R4 operations were organized and conducted by staff members from NMCP (national and regional level), from DDEPN and from DAGRI, with the support of RTI, and occasionally external consultants (environmental consultant, fireman). Trainings conducted were:

- IEC mobilizers TOT (IEC TOT), July 12
- IEC supervisors, July 13
- IEC mobilizers in the four districts, July 13–17
- TOT, July 20–23
- Technical maintenance, July 27–28
- Spray operators, July 27–30
- Intoxication case management, July 29
- Fire security, July 31
- Washers, July 31
- Drivers, July 31

The trainings will be more detailed in the next Spraying Performance Report for R4, in preparation.

⁴ See RTI, IRS 2 FY2010 Benin Spraying Performance Report, prepared for USAID, June 2010.

Table 2. People Trained to Deliver IRS in Round 4

Categories of persons trained	Training																			
	Training of Trainers		Spraying Operation		IEC Trainers		IEC Mobilizers		Medical Treatment of Intoxication Cases (Clinical)		Fire Security		Data Capture		Coveralls Washing		Technical Maintenance		Transport Security	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Spray operators			314	6																
Logistics assistants												6								
Service technician cleaners												3						13	3	
Washers															26					
Hygiene agents	16	13			1															
Drivers																				40
Guards												3								
Warehouse manager												1								
Drivers												4								
IEC mobilizers supervisors					20	2	13													
IEC mobilizers							139	114												
Data clerks														2	2					
Districts coordinators	4				4							2								
Health zone coordinator	2				2															
District chief doctors	3	1			2	1			3	1										
Chief health post					13	13			15	15										
City representative					1															
DDS	3				1				2											
SHAB	1	1							2											
NMCP National		1																		
NMCP Regional	3	3			6				2	3										
DDEPN	1																			
DAGRI	1																			
RTI	3	1			3						1									
TOTAL M/F	37	20	314	6	53	16	152	114	24	19	20	0	2	2	0	26	13	3	40	0
TOTAL/ training	57		320		69		266		43		20		4		26		16		40	

Out of 320 spray operators trained, 265 were successful and were selected for IRS activities. Primarily, the spray operators remained the same as for IRS R3. The spray operators were divided into spray teams, composed of one team leader and five spray operators, and were deployed in the four districts. All spray operators received personal protective equipment (PPE), spray pump, helmet light, bags, and data collection forms. They operated from 7:00 am until 1:00 or 2:00 pm Monday to Saturday for 45 days (8 weeks). They were closely supervised by hygiene agents from DDS. Officials from MOH (NMCP) at national and regional levels, DDEPN, and MOAEP were frequently in the field to ensure supervision and control in different, important IRS aspects (environmental compliance, insecticide management, quality of spraying, data quality control).

The next Benin Spraying Performance Report on R4 will be ready at the beginning of November. The end-of-spray round 4 workshop will be organized in November 2010.

Other Activities

Entomological Monitoring

The CREC was tasked to assess the efficiency of IRS operations in the four targeted communes for Round 3 and Round 4. CREC conducted several monitoring field visits in the four communes during and after the IRS operations (R3 and R4) to control the quality and homogeneity of the spraying by spray operators and to monitor entomological activities for vector sensibility and insecticide durability on different sprayed surfaces.

In August 2010, CREC submitted preliminary report 1 on the activities carried out for IRS R3. Among their outcomes:

“A drastic decrease of human biting rate (HBR) was found after IRS, particularly in Adjohoun, Dangbo and Misséréte where each inhabitant living on the tray areas receives, respectively 0.38, 0.81, and 0.75 An. gambiae bites for 4 nights during April-July. Before implementation of IRS, communities of the same localities and same districts received, respectively 6.53, 8.75, and 2.84 bites which are 9 times higher. In the control area, HBR (11.5) is 18 times higher compared to the rates of districts under IRS. We found also an increase of exophily of An. gambiae and mansonias spp. and a decrease of human biting rates of An. gambiae inside houses in areas under IRS.”⁵

The next CREC report regarding IRS operations in Ouémé-Plateau is due November 30, 2010.

In September 2010, CREC started an entomological study in preparation for implementation of IRS operations in Atacora. The CREC team has already conducted two visits in several districts. The preliminary results of this study are expected by the end of October.

Capacity Building of Ministry of Health

With respect to the IRS sustainability plan, high-level officers of the MOH (NMCP, DHAB, and DDS) were fully involved and were responsible in conducting training of trainers, IEC mobilizers, and spray operators. RTI only provided support for these trainings.

IEC staff of NMCP (at national and regional levels) were also involved in the upgrading of IEC tools, leading all the working sessions and giving the final approval on the new design. They were then responsible to train IRS staff on the correct utilization of the new tools, such as IRS card, data collection form, and IRS brochures. Furthermore, they maintained constant and close supervision of the IEC mobilizers throughout the IRS operations.

Staff from MOH, DDEPN, and DAGRI were fully involved in environmental supervision activities. Moreover, they received on-the-job training from the RTI environmental specialists during the pre-spray and mid-spray inspection visits in both IRS R3 and R4.

⁵ For full report, see Professor Martin Akogbeto, preliminary report 1 of the first round of IRS 2010, CREC, July 31, 2010.

Malaria Control Program Partners' Monthly Meeting

The IRS program team participated in the country Malaria Partners Meeting at the NMCP conference room every first Wednesday of the month. The NMCP coordinator chaired the meetings, which focused on different matters related to malaria control in Benin. Main partners were in good attendance at these meetings and frequently presented updates on IRS activities.

Monitoring and Evaluation

Prior to IRS operations, all trainers and spray operators were trained on how to fill out the data collection forms. Spray operators and team leaders have to complete all the forms on a daily basis during operations. Spray operators are asked to fill out one form for all structures sprayed that are part of one household. Their team leaders directly supervise them, in addition to MOH hygiene agents who accompany the teams in the field.

To ensure the quality of data collection, the project has three levels of supervision in place: (1) team leaders check the spray operators' forms and summarize their team's data on their own data form; (2) MOH hygiene agents perform some checks on team leaders' and operators' forms; and (3) district coordinators check and review all forms. Then, district coordinators summarize the data for daily reporting and send all the forms to data clerks for entry into the database. M&E consultant and Dr. Victor Nounangnon, M&E officer at the DDS, recruited and trained four data clerks (one per district) before operations began. After the clerks enter data on a daily basis, the M&E consultant completes an M&E spreadsheet (Master Tracker) detailing the data collected on the standard PMI indicators. The COP sends the M&E Master Tracker every two days to the M&E specialist at RTI NRO for information and supervision.

Table 3. Structures Sprayed and Coverage in Round 3

District	Structures	Structures Sprayed	% Coverage	Population Protected
Adjohoun	40,526	40,413	99.7	153,615
Akpro-Misséréte	41,790	41,469	99.2	137,645
Dangbo	20,927	20,378	97.4	79,939
Sèmè-Kpodji	65,767	64,650	98.3	265,249
Total	169,010	166,910	98.8	636,448

Complete and additional data on IRS Round 3 were reported in the last Benin Spray Performance Report for R3, submitted to PMI in May 2010.

In IRS R4, the IRS card was introduced and tested as an IEC tool (see IEC section). IEC mobilizers distributed the IRS card to each household sensitized and willing to be sprayed. Only households who showed the IRS card to the spray operators were sprayed. During the operations, mobilizers frequently noted that some households who refused IRS some weeks before finally accepted when seeing operators in action. Those households were then given the IRS card immediately so that they could be sprayed.

Table 4. Structures Sprayed and Coverage in Round 4 – preliminary data

District	Structures	Structures Sprayed	% Coverage	Population Protected
Adjohoun	53,172	53,172	100	159,843
Akpro-Missérété	46,553	46,534	99.9	120,698
Dangbo	25,598	25,563	99.9	82,111
Sèmè-Kpodji	74,772	74,767	99.9	261,252
Total	200,095	200,036	99.9	623,904

During field supervision, team leaders noted that some operators did not fully respect the obligation to report data on their forms directly after having sprayed structures. When asked, the operators explained that it was not easy to fill out the form with gloves dirtied by insecticide. Most of them wrote the data on draft paper, and then filled out the data form later. They were strongly reminded to strictly respect the rules they received during the training.

Data collection continuously remains an important challenge in IRS operations, one that still needs to be addressed. In collaboration with the MOH, RTI Benin team will continue to seek ways to improve the data quality system for the next IRS round in 2011.

Project Management and Administration

The team recruited a new and experienced driver for a permanent position and assigned him to the new Toyota Land Cruiser on September 1, 2010. He will primarily support all activities in the field.

To reinforce the RTI team during IRS operations, they hired an M&E senior consultant to work from July 12 to October 15, 2010. Her role and responsibilities are mainly to ensure the data quality system at all levels.

From September 2 to September 10, 2010, an RTI IRS senior financial analyst came to Benin to provide financial and budgeting support to the Benin country team in preparation of the FY2011 budgets and work plans. Additionally, she had the responsibility of working with the country office finance manager and chief of party to ensure that country offices have the capacity to properly manage field financial reporting.

Partnership and Collaboration

In Benin, RTI is the only partner implementing IRS activities in collaboration with the MOH. When requested by NMCP and WHO, RTI has provided IRS information and data to different international or local consultants working on various important issues related to Benin malaria control, such as the National Strategic Plan, the Roll Back Malaria report, and the WHO report.

During this report period, RTI participated twice in PMI quarterly review meetings at the USAID conference room (May 21 and August 20, 2010). RTI made a presentation regarding the latest achievements in the IRS activities in Benin, focusing on results, challenges, and next activities. These meetings were good opportunities to share with other PMI partners the activities, experiences, and lessons learned from RTI's different projects in malaria control.

Outstanding Activities

Some activities were incomplete at the end of this reporting period and will be finished during the next.

- IRS R4 post-spray activities: All of these activities (inventory, waste disposal) began in September and will continue in October.
- IRS R5 preparation: The activities to prepare the next IRS round in 2011 started at the end of August, after the project received the official implementation letter from the MOH regarding the next round of IRS activities in Benin.
- Exit strategy for Ouémé-Plateau: NMCP and RTI began work on this issue in September.
- Entomological surveillance: CREC will continue entomological surveillance in Ouémé-Plateau after IRS operations to assess their efficiency in the four districts. Report is expected in October.

Upcoming Activities

- IRS Round 4: Spray Performance Report, due 45 days post-R4 end date
- IRS Round 5: geographical reconnaissance in Atacora (October)
- IRS Round 5: Supplemental Environmental Assessment in Atacora (October/November)
- Amendment to FY2010 work plan and budget revision, regarding Atacora IRS R5
- FY2011 work plan and budget preparations, covering July 1, 2011 to December 31, 2011

Burkina Faso

This semiannual report presents the progress in Burkina Faso from April to September 2010, and summarizes the country's Indoor Residual Spraying (IRS 2) Task Order One project's current activities and achievements, outstanding issues, and upcoming activities.

Background

In July 2005, the United States Government (USG) announced a five-year, \$1.2 billion malaria initiative to rapidly scale up malaria prevention and treatment interventions in 15 high-burden countries in sub-Saharan Africa. The United States President's Malaria Initiative (PMI) began with \$30 million in bilateral funding in fiscal year (FY) 2006, which increased to \$135 million in FY 2007 and to \$300 million in FYs 2008 and 2009, and was expected to reach \$500 million in FY 2010.

PMI has set four objectives, with a final goal of reducing malaria-related mortality by 50%. One of the objectives is 85% coverage of indoor residual spraying (IRS) in target communities. Now in its fourth year of funding, PMI is fully implementing IRS activities in 15 countries. In partnership with the National Malaria Control Program (NMCP) and in support of country-level strategic plans, PMI is providing technical, managerial, and commodity support for IRS campaigns in all 15 PMI countries.

In September 2009, RTI International was awarded the IRS 2 Task Order One for the continued implementation of IRS in Sub-Saharan Africa. The purpose of this task order is to support PMI and United States Agency for International Development (USAID) missions or bureaus outside PMI countries to plan and implement IRS programs with the overall goal of reducing the burden of malaria in Africa. Task Order One enhances PMI/USAID's ability to implement IRS programs on the ground through cost-effective procurement and logistics, access to technical expertise, and implementation of IRS in countries affected by malaria.

In October 2009, RTI met with stakeholders to discuss plans for implementation of IRS in Burkina Faso. Given that FY 2010 would be the first year for USAID-supported IRS in Burkina Faso, the stakeholders determined that a pilot IRS program in the district of Diébougou covering about 25,000 households would be most appropriate.

In December 2009, a team of RTI IRS experts traveled to Burkina Faso and worked with the NMCP and the regional and district health teams in Diébougou to plan for the upcoming spray round, scheduled to begin May 12, 2010. The team accomplished the following activities: selection of IRS implementation sites, selection of insecticide, collection of baseline data, geographical reconnaissance and logistics assessment, development of a national Environmental Impact Assessment (EIA) Report to satisfy host government environmental regulations, and a Supplemental Environmental Assessment (SEA) to comply with USAID Code of Federal Regulations (CFR) 216. In addition, the team identified a suitable solid waste disposal facility for IRS solid wastes that will be generated during the operations.

In February 2010, the Chief of Party (COP), Adama Kone, traveled to Burkina Faso to follow up on previous visits and initiate start-up activities. RTI discussed sharing temporary office

space with Jhpiego, an international health organization affiliated with The Johns Hopkins University; collected information for RTI registration in the country; discussed with Programme National de Lutte Contre le Paludisme (PNLP)/Ministry of Health (MOH) and Ministry of Environment the selected pesticide registration in Burkina Faso; and initiated the implementation of the work plan with the PNLN and the selected district health team.

In March, RTI worked on local employees' recruitment and initiated IRS activities with MOH/PNLP and the selected district health teams. The new COP (Dr. Adama Kone) moved to Burkina Faso on March 9, 2010.

Current Activities and Accomplishments

Activities completed during the period from April 1, 2010, to September 30, 2010, include (1) development of a detailed implementation plan with PNLN and the District Health Management Team (DHMT); (2) organization of training of trainers (TOT); (3) identification, recruitment, and training of spray operators and Information, Education, and Communication (IEC) mobilizers; (4) procurement of equipment, materials, and supplies for IRS implementation; (5) environmental assessment; (6) pre-inspection; (7) construction of soak pits for environmental compliance; and (8) implementation of the first IRS campaign and demobilization activities after campaign.

Planning and Assessment

The finance manager (recruited March 15, 2010), and the technical and logistics managers were brought on board by April 12, 2010, which completed the RTI local staff recruitment as planned for this year's activities. RTI conducted field trips to work with the DHMT in planning IRS activities and estimating local costs. Geographical reconnaissance in early 2010 showed that the actual number of households to be sprayed in the target district was 23,927, corresponding to a population of 107,456 people.⁶ The planning activities factored in the number of households in the district of Diébougou. The assumption was an average of two structures per household in Burkina Faso, yielding an estimated 47,458 structures targeted for spraying.

RTI worked with the DHMT in identifying potential trainers at district and regional levels for the spray operators' TOT. All DHMT members were selected as trainers of trainers. Geographically the district consists of five communes. For IRS operations, these communes were divided into seven sites. Two of the three staff members from local centers for health prevention (CSPSs) were identified as potential trainers of spray operators as well as IRS operations supervisors in the seven selected sites. The planning took into consideration mobilization activities.

The regional environmental specialists conducted pre-inspection and mid-spray inspection visits in April and May 2010.

Procurement and Logistics

In April 2010, Bayer delivered 54 barrels of Ficam[®] containing 17,280 sachets of insecticide to RTI through the U.S. embassy. In the same month, 13 packages containing personal

⁶ Data collected from the district administration office.

protective equipment (PPE) and other IRS materials were also delivered to RTI. RTI locally procured additional PPE, boots, coveralls, bags, and gloves.

The project used 17 vehicles, including nine minibuses and eight pickup trucks, for spray operators' transportation and supervision. Health post chief nurses (ICPs) and outreach health agents (AISs) used motorbikes for supervision. Spray operators used their own bikes in hard-to-reach areas.

The warehouse provided by the high commissioner in Diébougou was secured, connected to electricity, and marked with a warning danger sign. RTI hired a temporary storekeeper for the main warehouse in Diébougou. He is an experienced storekeeper working with the district health office. The logistics manager worked with him on the store arrangement, data entry, recordkeeping, and inventory. RTI recruited a security guard to provide extra protection.

Environmental Compliance

Between March 26 and April 12, 2010, the regional environmental specialist conducted a pre-inspection visit in the district of Diébougou. He assisted with putting into place appropriate IRS infrastructures, including adequate warehouses and preparation of washing areas and soak pits to facilitate environmental compliance to meet USAID and government environmental requirements. Seven soak pits and washing areas were prepared. In addition, Gaspard Bikwemu, an IRS regional environmental compliance inspector, assisted with the TOT, covering all aspects of environmental compliance. He met with the regional and district environmental health specialists, and oriented them to facilitate their integration into the district health team for monitoring and supervision during the spray operations.

From May 26 to June 3, 2010, Autman Tembo, an IRS regional environmental compliance inspector, conducted the mid-spray inspection of IRS activities to ascertain their level of compliance with USAID's pesticide procedures specified in Federal Regulation 22 CFR 216 and in the Burkina Faso IRS Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP)/SEA and the IRS guidelines. He participated in the daily monitoring and supervision of field visits, inspection of warehouses, IRS operation techniques and logistics systems, and the distribution of insecticides. He provided corrective actions as needed, which RTI immediately implemented where possible. A detailed list of environmental compliance issues is included in the Burkina Faso 2010 spraying performance report (SPR).

IRS Waste Disposal

In December 2009, the RTI team identified an incinerator at the Central University Hospital in Ouagadougou that met the standards for pesticide waste disposal set forth by the Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO).

The hospital in Diébougou has an incinerator. Its specifications were sent to the regional environmental specialists and met RTI's requirement for the incineration of IRS waste. RTI worked with the DHMT to have the incinerator officially handed over to the health district. A pit was constructed for the disposal of ashes after incineration of IRS waste.

During the spray campaign, disposal wastes, including used sachets, gloves, masks, and other disposable wastes, were collected at sites, packed, and sent to the warehouse in Diébougou.

On September 29, 2010, RTI, in collaboration with the DHMT and the district environmental specialist, proceeded with the incineration of 270 kg of waste, completing the process on October 1.

Information, Education, and Communication (IEC)

From April 7 to April 9, 2010, RTI, in collaboration with the PNLP, organized a workshop to discuss IEC strategy and to develop messages for radio broadcasting and IRS brochures for community mobilization. Workshop participants included two representatives of the Directorate of Public Hygiene and Health Education; five participants from PNLP, including the three staff of the communication unit; a representative of the Hygiene Services from Regional Health Directorate; the IRS coordinator; and the IEC coordinator from the target district of Diébougou. Dorothy Mbuvi, RTI/IRS regional communication coordinator, and Burkina Faso RTI staff were present as well. The malaria program communication unit has extensive experience in developing IEC tools, materials, and messages. RTI's presentation on the IRS project activities engaged participants in a discussion about the adaptation of existing IEC tools and materials into the context of IRS for Burkina Faso.

The three-day workshop achieved the following:

- Identified communication channels.
- Agreed on key communication messages.
- Identified key IEC materials for use in the IRS campaign.

RTI held a meeting with the district representatives and the technical program manager to review IRS data tools including the revised IRS IEC tools. The team agreed to adapt the tools to the Burkina Faso context.

The project printed 25,000 brochures for community mobilization, and distributed 24,910. In addition, the project printed 25,000 household identification cards, distributing 24,879. Limited funding prevented use of any banners or billboards.

RTI and the DHMT worked with UNITAS, a local radio station in Diébougou, to disseminate IRS information and messages through radio spots and "radio talk" on IRS throughout the campaign.

Training of trainers for IEC mobilizers: On April 12–16, 2010, RTI and the DHMT trained 28 chief nurses and health officers in the same TOT session as spray operators. Training topics include the following: definition of malaria, transmission mode, IRS, IRS advantages, processes, phases (before, during, and after campaign), and collection and data entry (with exercises). During the training, criteria for selecting IEC mobilizers were defined, including reading and writing skills and previous experiences in mobilizing the communities. RTI and the DHMT agreed that the villages would select two IEC mobilizers, yielding a total of 322 IEC mobilizers.

From April 19 to April 21, 2010, RTI conducted IEC mobilizer training sessions in the seven sites, training 322 mobilizers. The training included IEC in the IRS context and practical field exercises using data collection tools.

On May 4, 2010, an advocacy and orientation meeting was held at the district level, chaired by the governor of the South West region. In attendance were 98 participants, including

political, administrative, religious, and opinion leaders and civil society authorities from the provinces and districts of the region. The DHMT leader presented malaria preventive measures, including IRS as one of the strategies. He presented all phases of IRS, with emphasis on the mobilization of the population as well as the ownership of the IRS by the local authorities needed to support the program. The governor assured RTI/USAID and the health authorities that his administration would strongly support IRS operations.

Door-to-door mobilization started May 10, 2010, two days before the spraying.

Spray Operations

Selection of spray operators: RTI defined the selection criteria of potential spray operators as follows: spray operators must know how to read and write in order to fill out spraying forms, be available during the entire IRS campaign, be from the local community, be able to pass a medical checkup, and have a good reputation in the community.

Medical checkup: From April 20 through April 24, the district medical team traveled to sites and conducted medical checkups of 154 potential spray operators and 16 washers (female). The medical examination consisted of a physical examination and blood tests for liver and kidney, and pregnancy tests for females. Unfortunately, for cultural reasons, no females applied for the position of seasonal spray operator.

Training of trainers: The TOT took place in Diébougou April 12–16, 2010. Participants included 14 ICPs, 14 AISs, eight members of the DHMT, one local environment officer, and two representatives of the Regional Health Directorate. The trainers included RTI consultant Dr. Ngayo Sy, the regional environmental specialist, and the RTI Burkina Faso team. The sessions were both theoretical and practical. A pre-test was administered before the first session, and a post-test was conducted after sessions to evaluate participants' performance and identify trainers. At the end of the IRS training, eight participants among ICPs and AISs were selected to conduct the training of spray operators.

Training of spray operators: During April 27 through May 1, 2010, the trainers from CSPS conducted training sessions for spray operators at the seven selected sites, supported by DHMT, RTI Burkina Faso technical staff, and an RTI consultant hired to facilitate the training. Training of the 154 spray operators included instruction on spray techniques, data entry, and environmental compliance. After the post-test, the 22 participants with the best scores were selected as team leaders.

Other trainings:

- Training on adverse effects of the insecticide: The deputy district health manager (MCD) worked with the RTI team to conduct a one-day training for the 14 ICPs, 7 hospital staff, and the 7 members of DHMT. The session included the description of the insecticide, its possible effect on the body, itching, systemic reaction, possible short- and long-term effects, and preventive measures to take on-site and at health centers.
- A one-day training on IRS was conducted for eight pump repairmen, 16 washers, 7 storekeepers, and 7 security guards, emphasizing specific areas per personnel category.

IRS implementation: The IRS first-round campaign planned for May 1, 2010, was delayed because of National Immunization Days activities. The spray campaign launched May 12 and ended June 12, 2010. In collaboration with the DHMT at the district level, with oversight from the PNL and the regional health director of the South West region, the IRS project coordinated all spray activities. The RTI COP, the technical manager, and the MCD established a sound communication system in coordinating IRS field activities. One of the DHMT members has been assigned as IRS district coordinator. The COP also sent weekly updates on IRS operations to the RTI regional IRS director who, after review, sent it to USAID/PMI and USAID/Burkina Faso. The MCD supervised the district coordinator, who worked in close collaboration with the RTI technical manager and COP. The district coordinator organized all spray activities at the district level, and site supervisors coordinated activities at the level of the seven sites/communes. During this spray round, environmental health officers were also involved in IRS operations at the site level.

Most of the pesticides and other supplies were delivered to sites only a few days before the operations and as needed during operations. During operations, the team promptly procured local supplies that were insufficient or missing (batteries, towel, gloves, coveralls, and boots) and supplied them to spraying sites.

The team sent data collected at the site level via telephone for distant sites and hand delivered data to Diébougou for the closest sites; the data were then computerized, reviewed by the RTI technical manager and COP, and sent to Nairobi.

ICP carried out supervision at site level with health center motorbikes, with RTI providing fuel and making repairs as needed. In some cases, operators used bikes for hard-to-reach areas.

Spray teams consisted of a spray supervisor who oversaw two to three team leaders. Each team leader was responsible for supervising six spray operators. In total, 154 spray operators were deployed in the district. The spray teams worked closely with IEC mobilizers to ensure that communities had been sensitized at least two days before the planned spray date and that IEC mobilizers were with teams on the spray day. The IEC coordinator at the district level supported spray teams. At the beginning of the operations, a lack of coordination between IEC mobilizers led to mobilized households that were not sprayed on the dates indicated or households that were not informed. The team corrected these situations. A few spray operators had minor injuries due to wearing boots without socks. However, team leaders strongly recommended to all spray operators to use socks for protection.

In the first round, spray operators sprayed an average of nine structures per day and used 13,891 sachets of Ficom[®] (bendiocarb) insecticide. Empty insecticide sachets were collected and stored in spraying sites and district warehouses. Each site had two washers, except Diébougou, which had four washers.

At the end of the operations, the team moved equipment and materials from the secondary stores to the main warehouse in Diébougou. This encompassed barrels and solid wastes, including empty sachets.

RTI conducted a general inventory at the end of operations. The team cleaned pumps and other equipment as needed, and repaired all broken pumps except for three, due to lack of spare parts.

RTI arranged with ICP to secure washing areas and soak pits, which will be renovated as needed for use during future campaigns. All payments were finalized and seasonal workers laid off.

Dissemination of IRS results

RTI conducted the internal evaluation meeting of the IRS round with DHMT in Diébougou on July 13, 2010. The representative of the High Commissioner chaired the meeting. Participants included all local district authorities (mayors, prefects, heads of police, and local representatives of associations and religious groups) and ICPs. The DHMT leader presented the campaign results. All stakeholders appreciated RTI's support of the MOH, and made recommendations for future IRS activities.

The IRS closing meeting at national level, organized in collaboration with PNLP was held on September 1, 2010. The Secretary General of the MOH chaired the event, which was attended by 47 participants, including key representatives of MOH national directorates, regional health directors, USAID representatives, malaria partners, and stakeholders. USAID representative Mark Wentling spoke, and the DHMT team leader presented the first IRS campaign results were presented by the DHMT team leader. RTI responded to participants' questions and comments as needed.

Lessons learned include the participation of local authorities in the mobilization of the community and DHMT's ownership of IRS activities. Challenges include the IRS campaign timing, which coincided with the rainy season, and the availability of the DHMT and CSPS team to conduct IRS campaign activities and health center routine activities.

Other Activities

Entomological Monitoring

In April 2010, RTI worked with PNLP and Institut de Recherche en Sciences de la Santé (IRSS/Centre Muraz on entomology monitoring activities. RTI and IRSS signed a subcontract to support an assessment of the impact of IRS on malaria transmission in Burkina Faso. They selected study and control areas and performed sampling in early May before the spraying. IRSS/Centre Muraz continued its activities during and after the spraying. IRSS/CM submitted the preliminary progress report to RTI in August 2010 for contractual requirements; further studies are ongoing and significant results will be available in October or November 2010.

Capacity Building of Ministry of Health

The TOTs of two regional directorate members and eight members of DHMT have strengthened capacity building of the MOH. RTI support of both local and regional teams during this first IRS campaign has increased the capacity of the DHMT and the regional health team in IRS operations' supervision and monitoring.

Monitoring and Evaluation

The IRS technical program manager is in charge of monitoring and evaluation (M&E). During this period he worked with Dorothy Mbuvi, the regional communication specialist, as

well as with Carolyn Njue, the regional IRS quality assurance and M&E manager, on IRS tools for capturing and reporting data, including the IRS database.

IRS/RTI staff members were mostly in the field during this period. They developed a monitoring supervision plan, and identified three teams to conduct daily monitoring and supervision visits. The teams observed errors in spray techniques and progressive washing of pumps, and corrected them. At the end of each spraying day (5:00 pm), all teams reported findings, and made recommendations, which were sent to the field the next day for application.

Because Burkina Faso was going through its first round of IRS, the COP requested operational assistance from the regional IRS office. During the period of May 12–June 10, 2010, Catherine Ngugi, Regional IRS Operations Officer, provided daily assistance in the implementation of the first IRS campaign in Burkina Faso. On her daily monitoring and supervision field visits, she pursued on-site training of operators, improving their spray techniques, data collection, and spray pump handling and washing.

As results for this first round of the IRS campaign in Burkina Faso, RTI found 34,284 structures, spraying 33,897 (98.9%) and protecting 118,691 persons, including 24,587 children less than five years old and 2,317 pregnant women. The round used 13,891 sachets of insecticide. Tables 1 and 2 summarize structures sprayed, coverage, and total seasonal spray personnel by site.

Table 1. Structures Sprayed and Coverage

Commune	Structures	Structures Sprayed	% Coverage	Population Protected
Diébougou	7,351	7,196	97.9	26,957
Loto	3,908	3,907	100.0	14,349
Dolo	3,607	3,464	96.0	9,521
Bondigui	7,654	7,589	99.2	20,247
Tiankoura	3,981	3,958	99.4	21,447
Iolonioro	3,224	3,224	100.0	13,853
Diassara	4,559	4,559	100.0	12,317
Total	34,284	33,897	98.9	118,691

Table 2. Total Seasonal Spray Personnel

Name of Site District of Diébougou	Estimated No. of Structures	No. of Spray Operators (30 days)	Team Leaders	Super- visors	IEC Mobilizers	Washers	Store- keepers, Guards, Repairmen	Total Spray Personnel
Diébougou	13,398	36	6	2	40	4	4	92
Loto	6,490	18	3	2	34	2	3	62
Dolo	4,352	12	2	2	28	2	3	49
Bondigui	6,634	18	3	2	30	2	3	58
Iolonioro	4,758	12	2	2	66	2	3	87
Tiankoura	8,370	24	4	2	90	2	3	125
Diassara	3,852	12	2	2	34	2	3	55
Total	47,854	132	22	14	322	16	22	528

Project Management and Administration

RTI continued subletting an office room from Jhpiego during April, and moved to a new office in the same building in May 2010.

In April 2010, the COP worked with the IRS technical manager, the regional IRS team, and the RTI home office on a draft memorandum of understanding (MOU) that has been reviewed and submitted to PNLP/MOH. RTI is still waiting for MOH approval and signature.

The COP and home office worked with local legal counsel on RTI registration. Language barriers necessitated translation of official RTI documents.

Partnership and Collaboration

During this reporting period, RTI worked with PNLP on MOU development and particularly with the regional health office and DHMT on IRS implementation. USAID has been supportive and has participated in field visits.

Outstanding Activities

There were no outstanding activities during this reporting period.

Upcoming Activities

- FY 2011 work plan and budget development
- Procurement of IRS materials for 2011 spray activities

Ethiopia

This semiannual report presents the progress in Ethiopia from April 1, 2010, to September 30, 2010, and summarizes the Indoor Residual Spraying project's current activities and achievements, outstanding issues, and upcoming activities.



Adama central warehouse where all PMI supported insecticides, wastes, and PPE are stored on a year round basis for IRS activities, July 2010.

Background

Ethiopia is one of the countries in the third group to receive indoor residual spraying (IRS) funding under the United States President's Malaria Initiative (PMI) since fiscal year (FY) 2008. The IRS project in Ethiopia is led by RTI International with funding from the United States Agency for International Development (USAID), under contract GHN-I-01-06-00002-00 from 2006 to 2011, in collaboration with Crown Agents USA, Oromia Regional Health Bureau (ORHB), the Ethiopian Health and Nutrition Research Institute, Addis Ababa University's Institute of Pathobiology, Academy for Education and Development (AED), the Health Education and Extension Center, the Ministry of Agriculture National Environmental Protection Authority, World Health Organization (WHO), the United Nations Children's Fund, and other implementing partners.

RTI is tasked with providing strategic, technical, environmental compliance, management, and operations support for IRS activities in specific districts of Oromia Region, which is supported by PMI. During FY10, IRS support increased from 23 to 30 selected districts in

five zones (11 districts in East Shoa, 5 districts in Arsi, 5 districts in West Arsi, 3 districts in West Hararge, and 6 districts in Jima). FY2010 IRS operations started in 24 districts on June 14, 2010, and completed on July 27, 2010. The second phase of IRS operations in the six Jima zone districts started on September 1, 2010, and will continue until October 5, 2010.

Current Activities and Accomplishments

During this reporting period, RTI Ethiopia rehabilitated 30 district storage facilities, modified 16 evaporation tanks, and constructed 52 soak pits. Pilot mapping and geocoding in four districts was accomplished for the first time with the use of personal digital assistants (PDAs) providing additional details of target areas including structures and populations targeted. In addition, RTI Ethiopia conducted a training of trainers (TOT) on IRS operations for spray operators and information, education, and communication (IEC) mobilizers, and undertook TOT on spray pump maintenance and use through organizing local experts. The project provided insecticide poison management training to health officers and nurses working in 25 districts. All PMI-supported project districts were supplied with necessary IRS materials and personal protective equipment (PPE) and vehicles to transport IRS operators and materials. IEC mobilization was implemented through media channels and door-to-door sensitization. We conducted IRS operations in 30 districts, which include the six new districts in the Jima zone. Spray activities were conducted in two spray phases: first, 24 districts conducted IRS activities from June 24 to July 27, 2010; and, second, the newly added 6 districts in Jima zone conducted spray activities from September 1 to October 8, 2010. In 2010, a total population of 2,063,930 was protected, and 646,619 structures were sprayed because of the spray campaign. During this year's activities, on average, RTI Ethiopia achieved 98% coverage of unit structures. Details of the spray performance will be provided in the Spray Performance Report (SPR).

Planning and Assessment

Based on plans developed in the microplanning meeting held December 7, 2009, with district health offices and other partners, the FY2010 work plan and detailed budget were prepared, reviewed, finalized, and approved by the mission with input from the home office. This report is based on activities and progress made this year under the FY2010 work plan.

Procurement and Logistics

Local procurement of IRS materials was initiated based on the approved 2010 work plan. Accordingly, all materials required for this spray round were procured and distributed to each district prior to activities starting. Certain PPE and spray pumps with spare kits were internationally procured and shipped, with distribution to respective districts. This year, the project procured approximately 19,508 hand gloves, 48,378 masks, 8,028 nozzle tips, 303 pregnancy tests, 563 spray pump kits, and 1,555 spray pumps. Of these items, 4,800 nozzle tips, 563 spray pump kits, and 1,200 spray pumps were provided to the ORHB in support of non-PMI districts. All districts were provided with rented vehicles to transport IRS workforce, materials, and IEC coordinators. Procurement details, including district breakouts, will be included in the 2010 SPR.

Environmental Compliance

To maintain environmental compliance for IRS operations in Ethiopia, a logistical assessment was done by the RTI/Ethiopia IRS team to identify 53 sites in 30 project districts where IRS operations should take place. In response to recommendations, the project has constructed evaporation tanks in 38 of the sites in the last two years. Sixteen of the evaporation tanks that already existed in project districts were modified to soak pits. In the remaining 24 district evaporation tanks previously used for spraying activities with dichloro-diphenyl-trichloroethane (DDT), DDT contaminated water was not dried, thus the project constructed new soak pits for spray activities. In addition, we constructed 15 new soak pits in the newly added six districts.

Based on the assessment made in newly added districts on storage conditions and on agreements reached with district health offices, the RTI/Ethiopia IRS team made substantial efforts to solve problems related to lack of appropriate storage facilities for insecticides and IRS materials. Accordingly, rehabilitation of seven district storage facilities (six from Jima zone and one from West Arsi zone) was completed, and the facilities are currently in use. Empty sachets, deltamethrin cartons, used hand gloves, respiratory masks, and IRS operation wastes for this round have all been transported to the central storage facility at Adama.



Photo of the collected DDT insecticides and wastes in the central storage facility in Adama town, 2010.

Information, Education, and Communication

RTI has been operating closely with AED/C-Change, a PMI partner working on malaria IEC in Ethiopia, particularly on IRS-focused message development. As a result, RTI has developed IEC messages in the form of leaflets, posters, and radio messages in Afan Oromo. Current production and distribution includes 300,000 brochures, 150,000 fliers, and 6,000

posters (Figure 1 and 2) in all 30 districts, IRS-targeted communities, and schools. Radio spot messages specific to IRS activities were run for 30 days on local (Oromia Radio) and national (Radio Fana) radio services. RTI Ethiopia conducted IEC TOT May 26–28, 2010, for 24 districts and August 18–20 for 6 districts in Jima zone; all 30 districts were each represented by an IEC focal person appointed by the ORHB. Advocacy meetings conducted by RTI with district and kebele (the lowest administrative structure) political figures and community leaders were held for one day in each district; 572 IRS-targeted kebeles were represented by 1,144 people (two people per kebele). Likewise, IEC TOT participants conducted trainings in each district for IEC mobilizers—1,144 IRS mobilizers in total were trained. The trainees are door-to-door mobilizers who provide key IRS messages to householders and inhabitants ahead of and during spray days.



Figure 1: Flyer in local language highlighting the importance of IRS for local communities.



Figure 2: Poster in local language illustrating IRS steps for community members

Spray Operations

In accordance with the approved work plan, RTI and ORHB personnel conducted IRS TOT in Adama town at the Dire International Hotel for 24 districts May 26–28, 2010, and for 6 districts in Jima zone August 18–20, 2010, at the Jima Central Hotel. A total of 259 people from all 30 districts were trained. Table 1 shows the total trained health professionals from each district. The following training topics were included: national strategic plan for malaria prevention, control, and elimination; introduction to IRS principles, justifications, benefits, and challenges; Ethiopian environmental regulations pertaining to use of insecticide; general

safety/questions on deltamethrin and safeguards; human and environmental safety concerns; environmental compliance measures by spray team, storekeepers, and drivers; and data collection and reporting (spray cards).

RTI and ORHB personnel also conducted practical training of spray operations and rinsing procedures at the Adama Malaria Reference Training Center and the Kersa health center, where trainees spent considerable time practicing the spray and triple rinsing procedure. After the district health office recruited spray operators and a number of reserve spray operators, the TOT participants in turn trained the recruited spray operators in their respective districts for six consecutive days. Accordingly, 1,841 spray operators and reserve operators, 95 washers, 75 spray pump technicians, and 30 storekeepers were trained.

Table 1: IRS TOT Participants

No.	Category of Participants	No. of Participants
1	District head/vice head	30
2	Environmental health officers	30
3	IEC focal persons	30
4	District malaria focal persons	30
5	Team leaders	95
6	Zone malaria coordinators	8
7	District storekeepers	30
8	Malaria coordinators from ORHB	6
	Total	259

IRS operations began on June 14, 2010, in 24 districts and on September 1, 2010, in 6 districts in the Jima zone. The variation in starting dates of IRS operation was due to late decision of a type of insecticides and determination of residual life of deltamethrin as well as expectation of importing bendiocarb from abroad for deltamethrin resistant districts. The 24 districts completed IRS operations on July 27, 2010. IRS operations in the six districts in Jima zone completed spray activities on October 8, 2010. In all PMI-supported communities who participated in the IRS spray activities, there was a heightened interest in shift of insecticides from DDT to deltamethrin and its side effect/benefit of killing cockroaches, bedbugs, fleas and other pests.



Spray operators and team leaders during spray operations in Adama district, East Shoa Zone, July 2010.

Other Activities

Training on Insecticide Poison Management

As per the approved work plan, RTI organized training on insecticide poison management in collaboration with Black Line Hospital and Addis Ababa University School of Community Health. The two-day training occurred June 12–13, 2010, in Addis Ababa at the Desalegn Hotel. Participants from all 30 districts were invited to attend, and 25 participants from 25 districts attended the two-day training where they shared experiences, presented case studies, and received a high level of insecticide poison management knowledge. Some of the districts like Akaki, Adama, Adea, Kersa, and Seka Chokorsa did not send trainees.

TOT on Spray Pump Maintenance and Use

Retired experts on Hudson spray pumps usage organized and conducted TOT on spray pump maintenance and use. Experts from different districts were brought together and given adequate time to prepare for the training. The training was held June 1–6, 2010, at the Malaria Control Reference Training Center for 75 participants from 14 zones of Oromia Region.

Table 2: Spray Pump Maintenance and Use TOT

Region	Planned Participant	No. participated
Bale	6	5
Borena	6	5
Guji	4	4
East Hararghe	8	8
North Shoa	4	4
S/W/Shoa	6	6
West Shoa	6	6
East Wollega	8	8
West Wollega	8	8
Kelem Wollega	5	5
Horo-Guduru	5	5
Ilu-Ababor	8	8
Jima Especial Town	1	1
Finfine Zuria Special zone	2	2
Total	77	75

Entomological Monitoring

In September 2010, RTI engaged a consultant, Dr. Mashsha Balkew, an entomologist from the University of Addis Ababa, to lead the susceptibility testing activities. RTI will hire a new full-time entomologist on October 1, 2010 who will also participate in the susceptibility tests. Most of selected study sites (15 sites) will be in the Oromia regional state where PMI/RTI supports IRS operations but 3 of them were from 3 different regions (1 from SNNPR, 1 from Gambella and 1 from Benshangul Gumuz).

All susceptibility tests will be done on 2–3-day-old female *Anopheles gambiae* s.l mosquitoes, reared from larvae collected from the study sites. Tests will be carried out using the standard WHO susceptibility test protocol.^{7,8} Unfed mosquitoes will be exposed for 1 hour in WHO test kits to papers (supplied by WHO) impregnated with the following insecticides: (1) DDT 4%; (2) deltamethrin 0.05%; (3) malathion 5%; (4) bendiocarb 0.1%; (5) lambda-cyhalothrin (ICON[®]); (6) propoxur; and (7) fenitriton. After exposure, mosquitoes will be kept in insecticide-free holding tubes, supplied with sugar solution ad libitum. Mortality will be assessed 24 hours after exposure. Adult females exposed to insecticide-free, oil impregnated papers will serve as controls. If control mortalities range between 5% and 20%, then the test mortalities will be corrected by applying Abbott's formula.⁹ Currently, the study is underway as soon as the activities are completed, we will prepare and submit separate report.

During this reporting period, RTI/Ethiopia conducted entomological monitoring via wall bioassay tests to determine the residual life of deltamethrin both in granules and powders,

⁷ World Health Organization (WHO) (1981). *Instruction for determining the susceptibility or resistance of adult mosquito to organochlorine, organophosphate and carbamate insecticides establishment of base line.* WHO/VBC/81.805.

⁸ WHO (1998). "Test Procedures for Insecticide Resistance Monitoring in Malaria Vectors." *Bio-Efficacy and Persistence of Insecticides on Treated Surfaces.* WHO/CDS/CPC/MAL/98.12.

⁹ A mathematical technique commonly used to assess mortality in insecticide trials when there is need to correct for a change (decrease) in the background population density. The formula is as follows: % corrected control = $100 \times (\% \text{ test mortality} - \% \text{ control mortality}) / (100 - \% \text{ control mortality})$. Abbott, W.S. (1925). A method of computing the effectiveness of an insecticide. *Journal of Economic Entomology.* **18**:265–267.

bendiocarb, ICON, and pirimiphos-methyl in representative mud wall houses in order to get potential alternative insecticides for future IRS operations.

To date, the current results after six months of IRS operations on K-Othrin 25% and deltamethrin 2.5% indicated 80% and 60% mortality of laboratory reared *An. arabiensis* respectively. The result of pirimiphos-methyl after four months of IRS operations indicated 97% mortality. The results of bendiocarb and ICON[®] are found at second month and needs further monitoring for the rest of 4 months to reach on conclusion and recommendation.

Pilot Mapping and Geocoding

RTI, in coordination with ORHB conducted a pilot mapping and geocoding study in selected PMI-targeted districts, namely Adea, Arsi Negele, Boset, and Merti of Oromia Region from March 23 to April 30, 2010. A census was also conducted with the use of PDAs and structured questionnaires in every household; in each of the studied villages, one out of every ten houses was measured.

The main objectives were to estimate the geographic areas and the number of population who are actually under protection by IRS and to determine each district's average house measurement for areas targeted by IRS. Table 3 summarizes the findings.

Table 3: Summary Report for Pilot Mapping and Geocoding

Variables	Adea	A/Negele	Boset	Merti
Demography:				
Households (HHs)	32,110	62,360	46,847	23,643
Structures enumerated	52,677	77,368	59,670	28,017
Structures per HH	1.64 ± 0.77	1.24 ± 0.53	1.28 ± 0.6	1.19 ± 0.49
Sleeping spaces	60,230	11,3351	79,892	45,069
Sleeping spaces per HH	1.88 ± 0.97	1.82 ± 0.78	1.71 ± 0.90	1.91 ± 0.78
Total houses enumerated	37,780	62,360	46,857	26,215
Houses with incomplete data (%)	4,230 (11.2)	0 (0.0)	10 (0.02)	2,572 (9.8)
Total population	144,918	308,278	201,269	108,814
Children under five years of age (%)	19,013 (13.1)	53,638 (17.4)	33,384 (16.7)	18,329 (16.8)
Pregnant women (%)	2,191 (1.5)	6,583 (2.1)	5,104 (2.5)	1,933 (1.8)
Average population per HH	5.81 ± 2.5	5.6 ± 2.6	5.44 ± 2.3	5.9 ± 2.5
Children under five per HH	0.59 ± 0.7	0.86 ± 0.87	0.72 ± 0.78	0.78 ± 0.82
Average HH measurement in square meters	103.32 ± 50.69	117.28 ± 45.77	97.99 ± 51.07	121.8 ± 52.69
IRS:				
Rooms enumerated	73,645	97,128	67,640	41,390
Rooms with plastered surfaces (%)	71,570 (97.2)	93,279 (96.0)	65,778 (97.3)	40,105 (96.9)
Rooms per HH	2.3 ± 1.27	1.56 ± 0.91	1.45 ± 0.83	1.75 ± 0.92
HHs sprayed <12 months (%)	12,596 (39.2)	23,214 (37.2)	17,854 (38.1)	11,853 (50.1)
Health Extension Worker (HEW) visit:				
HEW ever visit (%)	18,330 (57.1)	20,090 (32.2)	22,423 (47.9)	10,517 (44.5)
Ill people treated at home by HEWs	3,053	9,336	6,708	1,305
Average no. of months prior HH sprayed	7.15 ± 2.5	7.24 ± 2.0	7.12 ± 2.2	5.97 ± 1.8

Monitoring and Evaluation

Standard spray cards are used to collect IRS data daily. Each day following activities, the spray operator card data were provided to the squad chief, who then compiled the data and provided it to the team leader. The team leader compiled the appropriate data and submitted daily spray data reports to the district malaria focal person. The data were then entered into an M&E database and submitted to the RTI/Ethiopia team in Addis Ababa for review.

Table 4 shows progress by each district. Table 5 shows the number of people trained for IRS operation by zone and district.

Table 4: Results of Spray Operations by District

Zone	District	Housing Structures			Population		
		Found	Sprayed	Percent	Protected	Not Protected	Percent
East Shoa	Adama	31,498	29,905	94.9	77,544	2,019	97.5
	Adea	24,125	23,377	96.9	61,639	1,095	98.3
	Adami Tulu	40,270	38,990	96.9	132,307	5,206	96.2
	Akaki	14,354	14,080	98.1	37,078	578	98.5
	Boset	24,141	23,925	99.1	62,569	5,854	91.4
	Bora	17,104	16,770	98.0	47,825	1,275	97.4
	Dugda	18,113	17,792	98.3	62,130	987	98.4
	Fentale	21,606	19,225	89.0	51,886	2,928	94.7
	Gimbichu	2,504	2,490	99.4	5,654	9	99.8
	Lume	18,571	17,082	92.0	38,845	3,017	92.8
Liben Chukala	24,925	24,923	99.9	72,837	13	99.9	
	Subtotal	237,211	228,559	96.4	650,314	22,981	96.5
Arsi	Dodota	21,315	20,955	98.3	54,759	582	98.9
	Mert	18,087	17,729	98.0	58,402	1,066	98.2
	Jeju	14,962	14,824	99.1	43,066	264	99.4
	Sire	10,151	9,621	94.8	26,110	799	97.0
	Ziway Dugda	29,016	28,301	97.5	99,610	2,176	97.9
		Subtotal	93,531	91,430	97.8	281,947	4,887
West Arsi	Arsi Negele	36,619	35,952	98.2	122,167	1,458	98.8
	Shashemene	30,074	28,565	95.0	97,117	3,962	96.1
	Shala	29,655	27,926	94.2	113,527	5,804	95.1
	Siraro	36,885	35,085	95.1	147,476	7,050	90.7
	Wondo	14,470	13,843	95.7	43,138	1,711	96.2
		Subtotal	147,703	141,371	95.7	523,425	19,985
West Hararge	Mieso	25,197	22,503	89.3	103,390	7,170	93.5
	Chiro	32,093	30,887	96.2	115,881	4,345	96.4
	Anchar	12,993	12,554	96.6	49,503	1,493	97.1
		Subtotal	70,283	65,944	93.8	268,774	13,008
	Sokoru	15,600	15,446	99.0	45,346	637	98.6
	Omo-Nada	29,257	28,600	97.8	82,768	1,495	98.2
	Tiro-Afeta	22,299	22,155	99.4	64,883	292	99.5
	Kersa	23,147	22,161	95.7	56,949	2,876	95.2
	Seka-Chokorsa	18,090	17,897	98.9	54,867	636	98.8
	Shebe-Sombo	13,100	13,056	99.7	34,657	84	99.7
		Subtotal	121,493	119,315	98.2	339,470	6,020
Grand Total		670,221	646,619	96.5	2,063,930	66,881	96.6

Table 5: People Trained to Deliver IRS

Zone	District	IEC Mobilizers	Spray Trainers	Spray Operators	Squad Chiefs	District Admin. Teams	Washers and Guards
East Shoa	Adama	86	6	90	18	4	10
	Adea	32	5	65	13	4	8
	Adami Tulu	86	6	100	20	4	10
	Akaki	36	4	40	8	4	6
	Boset	48	4	71	14	4	6
	Bora	36	3	44	8	4	4
	Dugda	40	4	60	12	4	6
	Fentale	54	4	60	12	4	6
	Gimbichu	16	2	8	2	4	2
	Lume	36	4	50	10	4	6
Liben Chukala	36	4	65	13	4	6	

Zone	District	IEC Mobilizers	Spray Trainers	Spray Operators	Squad Chiefs	District Admin. Teams	Washers and Guards
	Subtotal	506	46	653	130	44	70
Arsi	Dodota	26	4	60	12	4	6
	Merti	34	3	40	8	4	4
	Jeju	26	5	28	10	4	8
	Sire	18	4	70	6	4	5
	Zuway Dugda	58	4	100	14	4	6
	Subtotal	668	66	298	180	64	99
West Arsi	Arsi Negele	56	7	75	20	4	11
	Shashemene	44	6	85	15	4	9
	Shala	64	5	100	17	4	8
	Siraro	54	7	45	20	4	11
	Wondo	20	3	80	9	4	4
	Subtotal	238	28	385	81	20	43
West Hararge	Mieso	94	5	80	16	4	10
	Chiro	48	5	80	16	4	12
	Anchar	32	3	40	8	4	6
	Subtotal	174	13	200	40	12	28
Jima	Sokoru	30	3	40	8	4	4
	Omo Nada	24	5	85	17	2	8
	Tiro Afata	24	4	60	12	4	6
	Kersa	32	4	60	12	4	6
	Seka-Chokors	20	4	60	12	4	6
	Shebe-Sombo	16	3	30	6	4	4
	Subtotal	146	23	335	67	22	34
Grand Total		1,144	176	1,841	498	162	274

Project Management and Administration

During this reporting period, the IRS project in Ethiopia hired a senior technical specialist, a finance manager, and three drivers. The drivers joined the team on June 7, 2010; the senior technical specialist joined on June 29; and the finance manager joined on September 1, 2010. The RTI team received technical and administrative support from Mr. Scott Torres, technical program manager; Dr. Gaspard Bikwemu, senior environmental compliance inspector; and Mr. Samson Mesfin, regional finance manager from the RTI Nairobi regional office.

Partnership and Collaboration

As a member of the Coalition Against Malaria in Ethiopia (CAME), the RTI Ethiopia IRS team continues to participate in the regular meetings of the malaria control support team, organized by the Federal Ministry of Health. Regular discussions are held with ORHB officials, project zones, and districts about improving IRS operation in all aspects. During this reporting period, the participants met on the development of new guidelines on malaria vector control and diagnosis and treatment of malaria at different levels of health facilities.

Outstanding Activities

There were no outstanding activities during this reporting period.

Upcoming Activities

- Convening post-IRS evaluation meeting for 30 districts
- Conducting insecticide susceptibility study in 15 selected sites
- Conducting residual efficacy of pirimiphos-methyl 30%, bendiocarb 80%, and ICON[®] 10% on mud wall houses in order to select alternative insecticides for IRS
- Modifying previous evaporation tanks to soak pits
- Conducting situational analysis of insecticide and insecticide waste issue
- Preparing and submitting the spray performance report (SPR)
- Work planning and preparing for FY2011
- Procuring IRS materials for 2011 spray activities

Ghana

This semiannual report presents the progress in Ghana from April to September 2010, and summarizes the Indoor Residual Spraying project's current activities and achievements, outstanding issues, and upcoming activities.

Background

Ghana's IRS has recorded success since beginning in 2007. The country is in its third phase of indoor residual spraying (IRS) since its selection by the United States government to draw funding from a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The project is part of the United States President's Malaria Initiative (PMI) and is being implemented in Ghana by RTI International in partnership with Ghana's Ministry of Health and the sector institutions. PMI and the National Malaria Control Program of Ghana have mutually agreed to support IRS activities in eight districts of the northern region. In 2010, IRS was conducted in eight districts of Saboba, Chereponi, East Mamprusi, Gushegu, Karaga, Savelugu/Nanton, Tolon/Kumbungu, and West Mamprusi; for the ninth district of Bunkpurugu-Yunyoo, PMI is supporting baseline entomological and epidemiologic studies this year, with IRS campaign launching in 2011.

Under a contract with United States Agency for International Development (USAID)/PMI, RTI is the prime contractor for the implementation of the IRS 2 Task Order One in Ghana. RTI is working with its subcontractors and partners, Crown Agents, USA (CA-USA) for procurement and logistical services; and the Noguchi Memorial Institute for Medical Research (NMIMR) for conducting entomology surveillance and building local capacity in entomological monitoring. The NMCP played a critical role in the development of IEC materials and information dissemination at the district level.

RTI's main task is to provide strategic, technical, management, and operations support for IRS activities in the above-mentioned districts. RTI and the NMCP targeted to treat houses with residual insecticide and protect over 800,000 people in eight districts during the third round of IRS.

Current Activities and Accomplishments

Planning and Assessment

In March 2010, the Ghana IRS project held microplanning meetings in all targeted districts with relevant stakeholders—including the regional Ghana Health Service (GHS), district health management team (DHMT), district assemblies (DA)—and operational and logistic assessments were undertaken. In March and April 2010, the RTI team visited the IRS beneficiary districts to assess their preparedness for IRS operations for 2010. Teams visited operational sites to ensure that equipment was in place and ready for use and that insecticides were in districts prior to spray activities. We conducted environmental inspections to ensure that districts were properly prepared for spraying activities, including reviewing preparation of soak pits and the availability of fire extinguishers and first aid kits. The teams worked with

IEC mobilizers to ensure that each village received proper IEC messages about IRS before spraying activities. Weekly field reports and M&E data was prepared at these meetings and subsequently delivered to district MOH officials as a measure to fully engage officials at all levels and to raise awareness of the impact of the program at the district level.

We organized a series of meetings in both Accra and Tamale during the spray campaign (May to July) to review technical and administrative operations for IRS Round 3 spray operations. The meeting served as a platform for the district operations managers and their district level teams to provide regular updates of the IRS progress at the lower district levels. Through lessons learned and sharing experiences at these meetings, we identified problems and were able to properly address and correct them during the spray period. Weekly field reports and M&E data were prepared at these meetings and subsequently delivered to district MOH officials as a measure to fully engage officials at all levels and to raise awareness of the impact of the project at the district level.

The DHMT together with district assemblies as in the previous years were responsible for recruiting the district spray teams comprising spray operators, team leaders, pump mechanics, wash persons, etc. Hence, during the second quarter, Ghana IRS staff advertised available positions to all the DHMTs and DAs for the selection and recruitment of the district core staff. All shortlisted applicants then went through interviews, medical examinations, and IRS training to be a part of the district teams. Interviews were conducted at the regional level to recruit the district operations managers.

A total of 103 temporary staff comprising 50 district core staff, 27 site managers, and 26 supervisors were engaged by the RTI Ghana team for IRS Round 3 operations. A two-day staff orientation meeting was organized for all RTI Ghana staff April 6–7, 2010, at Tamale. Present at the meeting was the PMI/United States Centers for Disease Control and Prevention (CDC) Advisor, who interacted with the RTI Ghana team and recounted the successes achieved by RTI in the previous years and called on the newly recruited staff to put forth their best effort to ensure that RTI achieved the set targets for Round 3 spray operations

Procurement and Logistics

The RTI Ghana IRS logistic officer resigned at the end of January 2010, and we subsequently began recruiting for a replacement; the new logistics officer started on April 1, 2010. The chief of party (COP), Mr. Napoleon Graham, initiated discussions with RTI's procurement team and technical program manager (TPM) on procurement requirements for Round 3 operations. The NMCP issued a letter endorsing pyrethroids as the insecticide class of choice. RTI and its procurement partner, CA-USA, developed an insecticide solicitation specifying insecticide class and other specifications. Through the procurement processes, deltamethrin 25% wettable granule [WG] was selected as the insecticide.

In February 2010, a request for bids for the procurement and supply of print materials, car rental, and computers was placed in the national daily newspapers. Received bids were assessed as per RTI procurement policies. We selected three companies in April 2010 and signed lease/contract agreements for use during IRS operations.

We received the first shipment of pumps and the personal protective equipments (PPEs) in Ghana on April 29–30, 2010, and subsequently distributed it to the IRS operational sites. In total 618 spray pumps, 726 pairs of boots, 1,542 coveralls, 676 hard hats, 7,000 pairs of

gloves, and 731 face shields were procured for program activities. In addition, we received a shipment of 88,104 sachets of deltamethrin on May 1, 2010, and subsequently, delivered to the districts prior to the launch of IRS activities. We have developed strong collaborative relationships with DHMTs and DAs; in fact, both have assisted us to secure offices, warehouses, and stores for the spray operations in all eight districts. We conducted major renovations of five offices and warehouses. All other operational sites were reassessed and refurbishment work undertaken on old soak pits and construction of some entirely new ones. In total, 22 soak pits were renovated and 5 were newly constructed.

All IRS material and tools required for the commencement of the spray round were delivered to Tamale warehouse by May 2, 2010 for onward distribution to the 27 operational sites for the start of spray operations on May 4, 2010. After the distribution, the logistics team visited each IRS operational site from May 25 to June 5, 2010, to conduct asset verification and provide hands-on training to the district logistics assistants on stock management and inventory control.

Environmental Compliance

As stated in the Ghana Supplemental Environmental Assessment (SEA), RTI Ghana conducted a pre-spray environmental compliance inspection in April 2010 to ensure that all facilities such as office space, warehouses, secondary stores, and soak pits were functional and complied with international standards before the start of IRS operations. We paid particular attention to the two newly added districts of Saboba and Chereponi. District and subdistrict stores with faulty door locks were replaced and reinforced. Rooms used to store insecticides were reinforced with double locks and a new system of key custody was introduced to ensure security and reduce the pilfering of insecticide. Only authorized personnel had access to the stores and warehouse. A district level firefighting training was organized and held in April 2010 in 27 operational sites for all district staff, including the security personnel, to teach them how to respond to emergency situations.

RTI Ghana successfully facilitated a pesticide poisoning management training for 62 selected health staff working in the eight IRS districts on April 29–30, 2010 at Tamale. The Ghana Health Service (GHS) coordinated the training and Dr. David Kolbillah, head of the medical team at the Tamale Teaching Hospital (TTH), led the training workshop. During the training, GHS staff who had been involved in the training in previous years shared their past experiences with their colleagues who were participating in the pesticide poisoning management training for the first time. The training focused on operational protocols for managing accidental pesticide exposure in local settings and featured a demonstration of first aid treatment to mitigate adverse effects of exposure with items that were expected to be stocked at the health post.

In fulfillment of the compliance requirements, the logistics officer inspected the entire fleet of buses for the transportation of spray operators at the RTI Tamale office to ascertain their road worthiness, comprehensive insurance coverage, first aid facilities and presence of fire extinguishers, as well as the licenses of the drivers. On May 2, 2010, we convened a one-day training for all the drivers involved in regional and district IRS operations to review defensive driving skills, safe handling and transportation of insecticides, decontamination of

buses, and emergency response measures. The logistics officer, COP, and M&E/environmental officer facilitated the training.

The DHMT conducted the medical examination of all the spray operators. All females engaged for the IRS operations were given a monthly pregnancy test throughout the period of spray operations. To assess the level of fitness of the spray teams for IRS operations, medical examinations were conducted for all temporary staff and all who had been engaged for the spray operations at the district level. All female staff directly involved in the spray activities took a pregnancy test before the district IRS training. The pregnancy test was repeated each month throughout spray operations, any female staff who had a positive result was immediately reassigned to another position to ensure that her pregnancy was not adversely affected by exposure to insecticide.

Dr. Gaspard Bikwemu, senior environmental compliance inspector/RTI Nairobi Regional Office, visited the RTI Ghana regional and district offices June 13–19, 2010, to conduct a mid-spray environmental compliance inspection on IRS activities. Mr. John Pwamang, director of Pesticide of the Ghana Environmental Protection Agency (EPA), accompanied Dr. Bikwemu on the field inspections. The inspection team visited four out of the eight IRS districts—Savelugu Nanton, West Mamprusi, Saboba, and Chereponi—and interacted with the operations team across these operational sites. They also visited the Kumasi Centre for Collaborative Research into Tropical Medicine (KCCR), where RTI had identified an incinerator with the standard requirements for the disposal of IRS solid waste materials. A copy of Dr. Bikwemu’s report on the mid-spray environmental compliance has been submitted to PMI, NMCP, and other partners in June 2010.

Two participants, the RTI M&E officer and EPA Northern Region director, were selected to attend the Environmental Management Capacity Building (EMCAB) training held in Kisumu, Kenya, June 27–July 3, 2010. This was a regional workshop to train environmental compliance experts on conducting supplemental environmental assessments for IRS. These experts are expected to support general IRS inspections and waste disposal thereby promoting sustainability in the area of environmental compliance of IRS in Ghana.

The Ghana IRS team worked closely with the Northern Region office of the EPA to coordinate the disposal of empty sachets according to the IRS standard operating procedures and World Health Organization (WHO) guidelines. The incinerator facility at the KCCR was identified to meet the specifications for the disposal of solid waste. The waste was incinerated August 9–11, 2010. A total of 72,620 empty sachets were incinerated, representing an 82.4% of total insecticide procured for the third round of spraying. The remaining insecticides will be used in the next round of IRS.

Information, Education, and Communication

During January to June 2010, the Ghana IRS project worked with the NMCP Communication Task Team to review IEC materials for the Round 3 operations. The IEC officer and the Tamale team conducted community mobilization and community entry activities in all eight IRS targeted districts. The team interacted with district chief executives, district directors of Health Services, traditional leaders, assemblymen and women, and the general public.

In preparation for Round 3 operations, IEC activities began in April (a month ahead of the spray operations), with the IEC officer and the district operations managers visiting all eight

districts. These IEC visits focused on meeting with opinion leaders such as chiefs, religious leaders, assemblymen and women, unit committee members, and the security agencies. These visits provided useful information and feedback that were factored into the regional and district stakeholder meetings. The opinion leaders expressed their gratitude for the selection of their communities and for the successful implementation of the previous IRS rounds in their communities.

A training of trainers (TOT) session was organized in mid-April 2010 at the regional level for the district IEC assistants, some of whom had been newly recruited. The district IEC assistants together with IEC officers trained a total of 325 IEC implementers at the district and subdistrict levels across all eight districts during April 5–9, 2010. The IEC officer for RTI facilitated all trainings at district and subdistrict levels. The DHMTs and districts authorities contributed tremendously to the smooth startup and implementation of the spray operations.

As part of the preparatory steps for Round 3 operations, RTI Ghana IRS organized a regional IRS stakeholders meeting in Tamale on April 28, 2010. Dignitaries present included the regional coordinating director, who represented the honorable regional minister and presented the keynote address. Others present included the deputy regional director of Health Services who chaired the meeting, regional director of Ghana EPA, Northern Zone manager of NMCP, the PMI/CDC Advisor, NMIMR staff, and the Northern Regional GHS biologist. Other participants included the district coordinating directors, district directors of health services and district operation managers from the eight beneficiary IRS districts. This meeting was a key component to seeking support from the GHS at the district level and was an opportunity to discuss and determine criteria for recruitment of spray personnel and the way forward to mobilize communities and disseminate IEC materials.

Spray Operations

A regional level TOT workshop for all the eight districts was organized in Tamale on April 11–16, 2010. A total of 98 participants successfully completed the TOT training. The participants comprised disease control officers and environmental health officers from all eight IRS districts. Other participants included a ten man contingent from Zoomlion Ghana Limited (a private company that intends to support IRS operations in Ghana), RTI IRS supervisors, site managers, M&E coordinators, and district operation managers. Officials from GHS, NMCP and USAID/CDC were also in attendance. RTI Ghana staff (COP & M&E/environment officer), Regional EPA director, and representatives from the GHS facilitated the workshop.

District level spray operator trainings were organized across all eight districts during April 18–24, 2010. The district level training was facilitated by personnel drawn from the district disease control officers, environmental health officers, and district RTI staff such as the M&E coordinators and district operations managers, site managers and supervisors from the eight IRS districts who had earlier received training from the TOT workshops.

Spray operations started simultaneously across the 27 operational sites in all eight districts on May 4, 2010, targeting hard-to-reach areas first.

Entomological Evaluations

The scheduled monthly entomological evaluations for monitoring vector behavior, densities, and bioassays were conducted successfully. GHS field supervisors were mobilized and have been engaged on this exercise throughout the reporting period. The Northern Regional biologist and the RTI Ghana entomologist and M&E officer coordinated these monthly activities, and a senior entomologist from NMIMR provided oversight and supervisory functions during the field evaluations and laboratory activities. The RTI Ghana team visited the Navrongo Health Research Centre to discuss collaboration efforts in the management and support of the RTI Ghana insectary at Tamale.

During the first week of May 2010, RTI Ghana discussed the scope of work (SOW) of the 2010 entomological monitoring strategy with the NMIMR team. The COP, RTI Ghana entomologist, and the M&E coordinator represented RTI Ghana and Drs. Maxwell Appawu and Samuel Dadzie represented the NMIMR team. After the discussions, a draft SOW for fiscal year 2010 entomological evaluations was submitted to all parties for consideration. In this SOW two more districts (Saboba and Bunkpurugu-Yunyoo) were added as part of the sentinel districts for the entomological monitoring of IRS activities. However, it was agreed that, for Bunkpurugu-Yunyoo, quarterly baseline entomological data will be gathered for 2010, before the start of spray operations in 2011.

One of the key goals of PMI is to build local capacity to conduct and sustain effective malaria control and integrated vector management activities in Ghana. In this regard, an entomological vector collection training workshop was organized by RTI and Noguchi for GHS staff, DAs, and RTI district staff July 25–August 6, 2010, in Tamale. NMIMR research fellows helped facilitate the training, which was attended by 40 participants. The IRS project continues to support post-IRS entomology surveillance in the selected districts.

Before the start of IRS operations in Saboba, baseline measurements of vector density and behavior were carried out. This activity was preceded by a three-day vector collection training for vector collectors and supervisors. Facilitation at the training was provided by the COP, RTI Ghana entomologist, and the M&E coordinator. Monthly entomological evaluations in the sentinel districts (i.e., Savelugu/Nanton, Tolon/Kumbungu, and Tamale) continued in the first half of 2010.

Dr. Dan Szumlas (CDC entomologist) visited IRS field operations in June 2010 to observe spray activities in Savelugu/Nanton district, and provided technical assistance on entomological evaluations.

Monitoring and Evaluation

In preparation to reach the targeted protected population of about 800,000 in all eight districts, RTI district offices were set up and necessary requirements put in place for effective operations. New operational sites were identified and provided with the necessary resources and facilities such as soak pits areas in readiness for Round 3 spray operations.

To reach the beneficiary protected population, we developed and implemented an effective M&E strategy throughout the period of spray operations. In this strategy, district M&E coordinators tracked the progress of work at the district level, and submitted weekly progress reports to the M&E officer. We also developed a monitoring schedule for the spray

operations in all eight districts and strictly implemented it to provide regular support visits at all field levels of operation. RTI staff from the regional level regularly visited all eight IRS districts on rotating basis from the start of spray operations to monitor spray activities and inspect district operations at all 27 operational sites. The officers involved in the monitoring exercise included the COP, the M&E/environmental officer, logistic officer, finance officer, data manager and the IEC officer. The feedback from these monitoring visits contributed immensely to address challenges encountered during field operations and ensured smooth IRS operations. Spray operations ended in July 2010. Total coverage at the end of spray operations was 97%, which comprised 342,876 sprayed structures out of a total of 352,177 structures targeted and resulted in 849,620 people protected, including 177,943 under five children and 20,014 pregnant women.

As a quality assurance check, RTI Ghana sampled 10 sachets of the insecticide consignment received for Round 3 IRS operations based on the criteria outlined in the IRS standard operating procedure for insecticide quality assurance, and sent them to Nairobi Regional Office for analysis. Preliminary results from these quality checks were released in August 2010 and indicated the potency of the active ingredient for the insecticide.

During May through September, the Director of Pesticides of the EPA Mr. John Pwamang, and RTI Senior Environmental Compliance Inspector Dr. Gaspard Bikwemu undertook a mid-spray environmental compliance visit to Ghana IRS operations June 13–18, 2010. They were accompanied by the M&E coordinator, logistics officer, and COP. At the end of their visit they held debriefing sessions with NMCP, USAID, EPA, and RTI staff. They visited the following sites:

- Incineration facility at KCCR, Kumasi, where the director and the deputy director of KCCR were engaged in discussions about the disposal of the waste generated from IRS Round 3 operations
- RTI main warehouse at Regional Medical Stores, Tamale
- Eight operational sites of Moglaa, Diare, Walewale, Kpasenkpe, Janga, Wapuli, Wenchiki, and Saboba.

At the end of the environmental compliance visit, Dr. Gaspard Bikwemu submitted a report on his findings to PMI and other partners. RTI Ghana has implemented most of his recommendations. In the report, Dr. Bikwemu recommended transferring the opened and/or expired insecticide sachets from 2008 IRS operations to Ghana EPA to be disposed under EPA Ghana Obsolete Pesticide project. We transferred the applicable insecticide sachets on June 25, 2010, under the supervision of Mr. Abu Iddrisu, the Northern Regional EPA director. The recommendation on the key custody system where the handling of keys used for the double locking of the insecticide stores was immediately implemented. Also, we provided shea butter cream to all the spray operators as part of the items in the first aid kits as recommended in the environmental compliance report.

RTI's M&E/environmental officer and Northern Regional EPA director participated in the Environmental Management Capacity Building (EMCAB) training in Kisumu, Kenya, on June 27–July 3, 2010. The objectives of the workshop included helping participants to

- conduct a field environmental evaluation of IRS programs

- describe different environmental compliance components (regulations and procedures) required for the safe handling of pesticides used for IRS
- develop a plan on how to apply environmental best management practices for monitoring and evaluating IRS programs in the field.

A trip report is being developed and will be submitted to PMI, NMCP, and partners upon completion.

Project Management and Administration

The recruitment of staff for temporary district positions was done during January to March 2010. We advertised for available positions in the national dailies; shortlisted candidates were interviewed and selected. Recruited staff were then deployed to various districts to manage IRS operations.

During April to September, the RTI Ghana office recruited logistics officer who assumed duty on April 1, 2010. The IEC officer also resigned his position effective May 31, 2010, and the recruiting for a replacement is actively ongoing; we hope to fill the position in the upcoming months. As a result, the COP took on additional responsibility of handling the IEC portfolio during the spray period. Weekly staff meetings were held during this reporting period to address human resource, technical, and other operational challenges that confronted the Ghana IRS project.

We received the following short-term technical assistance support during this reporting period:

- RTI Senior Human Resources (HR) Officer, Alex Semiloff: Visited the Ghana team in April 2010 to evaluate RTI HR policies and address compensation and benefits concerns.
- TPM, Scott Torres: Visited Ghana in August 2010 to attend the end of spray round review meetings for the Ghana IRS project; generate lessons learned and identify areas for improvement for subsequent IRS operations; and provide other assistance and training to the RTI IRS team, including new reporting guidelines and entomological monitoring.
- Regional Administrator, Zacharia Orem: Visited Ghana in September 2010 to provide training on property management and inventory control to the RTI/Ghana logistics officer and to promote good administrative and procurement practices.

Partnership and Collaboration

During this reporting period, the RTI Ghana team attended several meetings and workshops with country malaria partners, as summarized below.

- A team comprising officials from GHS, NMCP, and USAID/CDC undertook data collection for the rapid impact assessment of IRS on malaria burden in selected districts of the Northern Region April 7–17, 2010.
- The COP and M&E officer met with officials from Zoomlion to discuss opportunities for collaboration in IRS operations including their participation in the TOT work shop.

- As a part of the activities lined up for the commemoration of the World Malaria Day, RTI Ghana office participated in the Giant Net Hanging Ceremony organized by the NMCP in collaboration with its partners. RTI Ghana participated in the World Malaria Day celebration which was launched during the Ghana Health Summit 2010 by the Minister of Health on April 26, 2010, and was able to showcase the success of the IRS operations in the Northern Region supported by PMI. Dignitaries present at the occasion were the deputy minister of health, the Danish ambassador, vice president of AngloGold Ashanti, USAID/Ghana Mission director, chairman and ranking member of the Parliamentary Select Committee on Health, and program manager and staff of the NMCP. The ceremony was chaired by the minister of justice and attorney general.
- The USAID/Ghana Mission Director Ms. Cheryl Anderson paid a one-day working visit to IRS operations on May 6, 2010. She was accompanied by the USAID/PMI advisor, CDC/PMI Advisor and staff from the USAID Public Relations Department, and United States Department of State. Other officials participating in the visit included the vector control manager (NMCP), Northern Zone program officer (NMCP), district director of Health Services (Savelugu/Nanton), and staff of ProMPT (USAID health partner). RTI was represented by our COP, M&E coordinator, IEC officer, and district operation manager.
- The COP participated and made a presentation on IRS operations at the Northern Regional Health Directorate Stakeholders meeting on Malaria Control held in Tamale on May 28, 2010, to improve channels of communication and coordination among partners. Meeting participants included NMCP staff, district directors of Health Services, ProMPT, ADDRO, Nets for Life, and RTI.
- RTI Ghana Office participated in USAID Communication workshop on writing success stories and capturing quality pictures in Accra on May 26, 2010.
- The COP provided update on IRS operations and proposed future directions to PMI FY 2011 Malaria Operational Plan (MOP) writing team at USAID Ghana Mission on June 4, 2010.
- The USAID/Ghana Mission Health Chief Ms. Laurel Fain, CDC/PMI Advisor Dr. Paul Psychas, and Malaria Specialist Mr. Kwame Ankobea visited IRS operations June 21–23, 2010.
- The Ghana IRS team organized post-spray evaluation meetings in July 2010 in each of the eight IRS districts supported by PMI to provide all stakeholders at the district level the opportunity to present their observations of the third round of IRS operations and to suggest recommendations for future operations. A regional post-spray evaluation meeting was held in Tamale on August 17, 2010, to evaluate the IRS operations and also to receive feedback and recommendations for improving future IRS rounds. Participants were drawn from USAID, PMI, CDC, NMCP, NMIMR, WHO, GHS, traditional leaders, the media, representatives of DHMT and district assemblies of beneficiary districts, and RTI staff.

Outstanding Activities

- Completion of the television documentary on IRS operations
- Operations research study on anemia and parasitemia in Bunkpurugu-Yunyoo

Upcoming Activities

- Work planning for 2011 IRS operations
- Schedule a needs assessments with the USAID/Ghana Mission
- Coordinate site visits to IRS target areas and geographical reconnaissance in new district to be added in Round 4 (partnership with GHS)
- Initiate procurement for Round 4
- Refurbish district spraying facilities including soak pits, warehouses, and sanitation facilities
- Meet with PMI/Ghana team, MOH/NMCP, and NMIMR to discuss and plan entomology surveillance for IRS districts

Madagascar

This semiannual report presents the progress in Madagascar from April to September 2010, and summarizes the Indoor Residual Spraying project's current activities and achievements, outstanding issues, and upcoming activities.

Background

In September 2009, RTI International was awarded the indoor residual spraying (IRS) 2 Task Order One for the continued implementation of IRS in sub-Saharan Africa. The purpose of this task order is to support the United States President's Malaria Initiative (PMI) and United States Agency for International Development (USAID) Missions to plan and implement IRS programs with the overall goal of reducing the burden of malaria in Africa. IRS 2 Task Order One will enhance PMI/USAID's ability to implement IRS programs on the ground through cost-effective procurement and logistics, access to technical expertise, and implementation of IRS in countries affected by malaria.

RTI is the prime contractor for the implementation of IRS 2 Task Order One. In Madagascar, RTI is working with its subcontractor and partner, Crown Agents-USA for procurement and logistics services. In addition, RTI will collaborate with local technical institutions aimed at enhancing their capacities to become the local go-to organizations for technical and quality control references.

Fiscal year (FY) 2010 spray operations are expected to take place in six health districts of the Central Highlands (CHL) where IRS was implemented in fiscal year FY2009, plus an additional 10 districts in an expansion area in the northwest and the south between October and December 2010.

Current Activities and Accomplishments

RTI organizes all activities in connection with IRS operations and provides technical support to RTI/IRS Madagascar team, including support for training, monitoring, and quality assurance activities. RTI will support existing IRS community mobilization activities and the development of information, education, and communication (IEC) materials to promote spray activities.

Planning and Assessment

Following the IRS schedule in Madagascar, as described in the FY2010 work plan, the spray campaign will begin in October and end in December 2010. The timeline for spray activities is shown below:

- Phase I: Betsiboka Region (Maevatanana, Tsaratanana, and Kandreo districts), October 11–November 19, 2010
- Phase II: South Region (Betroka, Bekily, Amboasary, Ambovombe, Beloha, Tsihombe, and Ampanihy), November 2–December 4, 2010

- Phase III: CHL and Fringe Region (Anjozorobe, Ankazobe, Betafo/Mandoto, Ambositra, Ambatofinandrahana, and Ambohimahasoia), November 2–December 4, 2010

At the end of this reporting period, we are beginning preparation activities for the Betsiboka and South regions.

The IRS team collaborated with PMI and national nongovernmental organizations (NGOs) to review the geographic reconnaissance and population data for the targeted extension areas (Betsiboka and South), and to verify the numbers of structures and villages within each district. Those national NGOs (Somontsoy, Saf FJKM, and Sunray) will undertake IEC activities in each beneficiary community to garner support for IRS activities.

Procurement and Logistics

RTI IRS Madagascar team conducted an assessment in April 2010 to develop a list of commodities to be procured under the FY2010 work plan. A thorough inventory of personal protective equipment (PPE), insecticide, spray pumps, spare parts and other equipment was conducted in the central and district warehouses; the FY10 IRS work plan budget included those commodities needed for spray operations in the 16 health districts. RTI then undertook a competitive procurement selection process to identify vendors for each of the commodities to be procured.

In March and April 2010, the Roll Back Malaria vector control subcommittee selected a pyrethroid-class insecticide for use in the CHL and a carbamate-class insecticide for the fringes and the extension areas. Subsequently, the Ministry of Health, Family Planning and Social Prevention signed and submitted its letter of authorization for insecticides on May 5, 2010.

Procurement and Commodities

In September 2010, we received shipment of the insecticides (bendiocarb and deltamethrin) in Antananarivo, and subsequently distributed them to the main warehouses and operational sites in Betsiboka and the Southern areas. Distribution to the CHL is scheduled to occur in October. We sent samples of the insecticides to the Nairobi Regional Office for testing and analysis as part of the quality control protocol.

The details for the procurement are shown in the table below.

Description	Number Required
K-Othrine (sachet)	53,376
FICAM VC 320 (sachet)	183,278
HUDSON X-PERT pump	776
Reparation kit	10
Cover gasket	690
Nozzle O-ring gasket for extensible	1,450
Nozzle gasket	5,000
Nozzle tip	1,620
Strainer	4,300
Coveralls	4,493
Raincoat	2,922
Rubber boots	2,000
Rubber gloves	11,220

Description	Number Required
Helmet	1,500
Helmet for motorbike	29
Dust mask	40,000
Socks	8,600

Warehouses

All pesticides and related supplies are stored in warehouses that are in compliance with environmental safety policies. For FY2010, RTI has identified one central warehouse in Ambositra, and has identified a new storage facility in Ambovombe. This strategy facilitates the provision of materials and pesticides for the extension area in southern Madagascar. During each spray round, secondary warehouses are established for quicker access and to store commodities. Warehouses will be staffed with a storekeeper who is responsible for keeping inventory and recording the entry and exit of all commodities as well as maintaining environmental compliance in the warehouses. All storekeepers in the Betsiboka region were trained during the week of September 6–11, 2010, to ensure full understanding of and compliance with environmental safety and logistics standards and procedures when handling insecticides, PPE, and other materials.

Soak Pits

All principal soak pits in Betsiboka were established in every operational site for rinsing and washing of equipment and materials. The secondary soak pits will also be placed at the village level for simple rinsing, but not for full washing of equipment. The exact location will be determined during microplanning meetings. Additional soak pit sites at the village level will be identified during the geographical reconnaissance review.

Transportation

RTI rented 53 vehicles for IRS operations. In addition, RTI procured 47 (29 newly purchased and 18 refurbished) motorcycles for sector and district managers. All drivers were trained on the safe transport of insecticide and road safety.

Environmental Compliance

In addition to the IRS Best Management Practice established by USAID, the Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) signed in 2006 provides the guidelines currently used for all IRS Madagascar activities. This document was updated to include information developed during Supplemental Environmental Assessment (SEA) dictating the use of the whole class of pyrethroids in the PMI-supported districts in the CHL, and approved in October 2009. RTI conducted an additional SEA in April 2010 to provide guidelines for the expansion of the IRS project to the entire country, and to allow for a choice between the two insecticide classes approved by the World Health Organization (pyrethroids and carbamates) to be considered in the annual decision-making process.

During August–September 2010, the Environmental Compliance Manager Mr. Tito Kodiaga conducted the pre-spray inspections in the Betsiboka region (Maevatanana and Tsaratanana districts) and in the southern part of Madagascar (Ambovombe district).

Information, Education, and Communication

For this round of spray operations, RTI identified three national NGO subcontractors to ensure and strengthen the implementation of IEC activities. Somontsoy operates in the South extension area, SAF FJKM in the CHL, and Sunray in the Betsiboka region (Northwest extension area).

Specific objectives of the IRS IEC campaign are to

- Create long-term sustainability of the program by involving and engaging key stakeholders
- Ensure appropriate geographical reconnaissance
- Train community health workers and health care personnel from all surrounding facilities on emergency response to acute pesticide poisoning, and to equip those health facilities with the recommended treatments for pesticide poisoning
- Inform spray campaign beneficiaries about the benefits of IRS in controlling and preventing malaria morbidity and mortality
- Inform beneficiaries about their role before, during, and after spray operations
- Inform stakeholders and beneficiaries about safety issues related to environmental and health effects of using insecticides

We will use IEC materials similar to those used in the previous round and developed in collaboration with the NMCP. All IEC materials are distributed in the Betsiboka region.

Spray Operations

Following the IRS timeline, we are now beginning the pre-campaign activities such as census, staffing recruitment, and training.

In the northern and southern regions, respectively, Sunray and Somontsoy are already beginning the census activities. These NGOs will also ensure maintenance of the geographical database.

Training Temporary Staff in the Region and District Level

All temporary staff have been trained on the spray preparation activities.

Training of Trainers (TOT) in the North Region

All technical temporary staff in the Betsiboka region have been trained on technical application techniques. This TOT was conducted on September 18, 2010.

Other Activities

Entomological Monitoring

For entomological monitoring and surveying, RTI will manage all activities. Based on the areas funded for IRS by PMI, and entomological criteria, RTI IRS staff selected the following sites to conduct entomological monitoring: Brieville (in Tsaratanana), Amboasary, Kiangara, and Anjazafotsy (in Betafo). We completed database collection for the two new sites -

Amboasary and Tsaratanana in the extension areas- before the launch of the 2010 IRS campaign.

RTI will conduct the PMI-required entomological monitoring activities against five key indicators: (1) vector susceptibility; (2) insecticide decay rates; (3) species identification; (4) vector density; and (5) vector behavior. The objective for the first field entomological monitoring is to collect the entomological baseline data before launching spray operations.

Monitoring and Evaluation

RTI IRS Madagascar project established a new software program to facilitate the database record in each district.

Project Management and Administration

In addition to the temporary district staff, we hired two monitoring and evaluation officers and one environmental assistant. We also recruited and hired one district manager, one financial assistant, and one data entry clerk in each intervention district. One regional coordinator and one regional assistant in each region reinforced the district team. Sector managers and regional technical managers provided IRS technical supervision.

As noted in section 3.3, Tito Kodiaga conducted the pre-spray compliance inspection. He included the following observations in his trip report (submitted on September 30, 2010):

- The central storage facilities visited in Ambovombe and all secondary warehouses are generally a house but meet all the necessary conditions. The regional and district teams had already put insecticide pallets in place before insecticide delivery; fire extinguishers, appropriate warning signs, adequate labeling were all present; spill response kits were also present and accounted for in all warehouses.
- All news pumps were tested.

Partnership and Collaboration

For the census activity, we collaborated with PSI in a district where there are both IRS and insecticide-treated net distribution.

Outstanding Activities

Field preparation:

- Geographical reconnaissance
- Warehouse renovation and soak pit construction
- Dispatch and distribution of insecticides, PPE, and other materials
- Training of trainers for the technical staff
- Spray operators' training
- Entomological monitoring and evaluation in the intervention areas

Upcoming Activities

- Spray campaign

- Spray Performance Report
- IRS 2011 preparation (work plan, logistics assessment, etc.)

Mali

This semiannual report presents the progress of activities in Mali from April to September, 2010. It summarizes the indoor residual spraying (IRS) project's current activities and achievements, outstanding issues, and upcoming activities.

Background

In Mali, malaria accounts for an estimated 13% of mortality in children under age five and a maternal mortality ratio of 463 per 1,000 live births.¹⁰ As a result, Mali was one of 15 countries selected to receive support from the United States President's Malaria Initiative (PMI) in 2008. Geographic coverage for the total population in Mali who have access to public health services is estimated at 50% within a 3.11-mile (5-km) and 75% within a 9.32-mile (15-km) radius from health facilities.

Before the introduction of PMI in Mali, no systematic IRS program was operational, and the country did not have experience conducting large-scale IRS programs. The overall objective of the IRS project in Mali is to help the Ministry of Health (MOH) and the National Malaria Control Program (Programme National de Lutte contre le Paludisme [PNLP]) provide IRS and other malaria control interventions to 85% of the targeted population, thereby achieving a 50% reduction in malaria-related mortality by the end of the project in 2010. RTI works under the direction of, and in full collaboration with, the NMCP to implement IRS campaigns as an integral part of the government's malaria control program (Figure 1 and 2).

The project's main activities are to

- Provide the support, management, and operations to implement the objectives of the MOH (through the PNL) to reduce mortality due to malaria in the targeted zones
- Strengthen capacity on all the levels of the government to promote greater sustainability of the national IRS program
- Encourage the appropriation and the cash-in-hand of the program by the country, including community participation.

The IRS team works alongside the MOH/PNLP and other partners (e.g., Ministry of Environment, Malaria Research and Training Center [MRTC]) to strengthen their capacity to plan, conduct, monitor, and assess IRS at all levels. This capacity building training included ground operations; information, education, and communication (IEC); supportive supervision; monitoring; and data collection. Specifically, RTI worked with PNL and the following partners:

- The Public Hygiene and Health Division (Division d'Hygiène Publique et Salubrité), was involved in supervision at the national level
- The MOH's National Center for Information, Education, and Communication (Centre National d'Information d'Education et de Communication pour la Santé [CNIECS]) on served to inform beneficiaries, raise public awareness, and promote behavior change, including environmental management and sanitation

¹⁰ PMI Fact Sheet, April 2009; available at <http://www.pmi.gov>

- The Ministry of Environment (MOE) in Bamako and its counterparts in the two targeted districts (cercles) of Koulikoro and Bla and the African Program on Pesticide Stocks (Programme Africain relatif Aux Stocks de Pesticides Obsolètes) provided pesticide supervision at the national level
- The regional health services (*Direction Régionale de la Santé* [DRS]), were involved in supervision at the regional level
- The referral health centers (*Centre de Santé de Référence*) were also involved in supervision at the regional level
- The Social Development and Cooperatives Service (*Service de Développement Social et de l'Economie Solidaire* [SDSES]) was involved in supervision at the district level
- The community health centers (*Centre de Santé Communautaire* [CSCOM]) and the community health associations (*Association de Santé Communautaire* [ASACO]), were involved in supervision at the local or community levels

Figure 1. IRS Intervention Districts in Mali

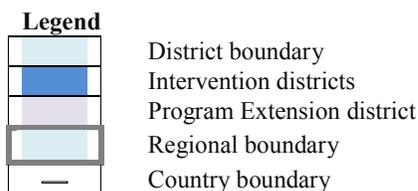
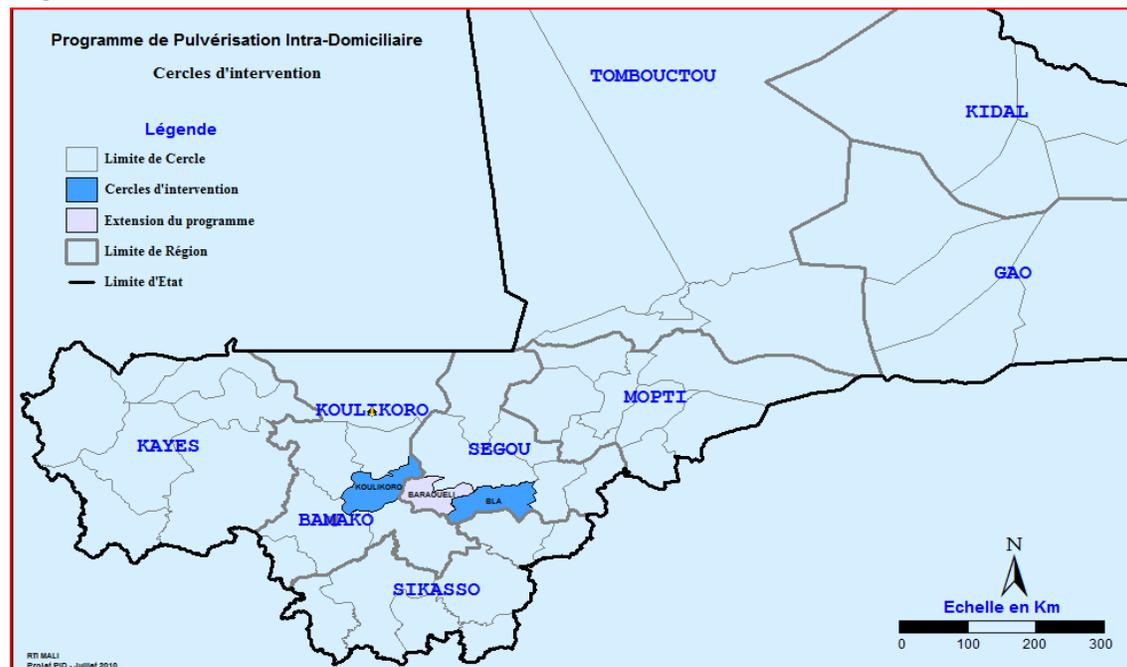
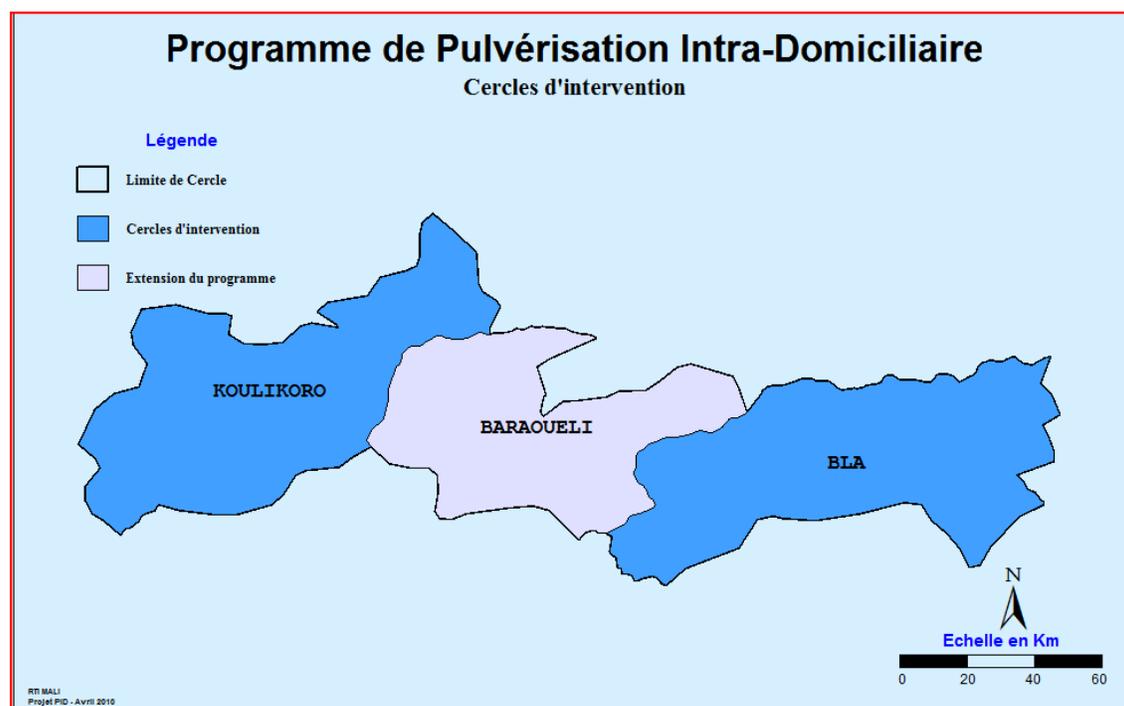


Figure 2. IRS Project Intervention Districts



Koulikoro and Bla are the current IRS target districts. In 2011, IRS will be expanded to a third district, Baraouéli, in the Ségou region. Figure legend: bold line, district boundary; blue shading, current intervention districts; and white shading, expansion district.

Current Activities and Accomplishments

The 2010 IRS campaign started on May 16, 2010, and ended on June 30, 2010, in Koulikoro and Bla. This time period was selected for the following reasons:

- To avoid spray activities during the raining season
- To avoid spray activities during a period where temperatures rise up to 113°F (45°C) in the shade
- To ensure an efficient coverage rate during the period of highest malaria transmission.

Planning and Assessment

The experience acquired and lessons learned during the 2008 and 2009 spray campaigns in Mali enabled RTI and its partners to improve operational and implementation planning for the 2010 campaign.

PNLP and RTI coordinated microplanning activities, which were held during January and February 2010, and included participation from various district-level departments. As a result of these meetings, all IRS activities were itemized and planned, and tasks were assigned to relevant officers for completion.

Before microplanning, the RTI team conducted missions to

- Assess the status of the IRS sites (sinks, wash areas, and secondary warehouses), and determine any necessary repairs

- Take stock of the personal protective equipment (PPE) and insecticide to determine the quantities available
- Take inventory of those commodities and consumer items that could be procured locally

This inventory enabled the RTI team to assess the needs in terms of PPE, insecticide, and local consumer items for the 2010 IRS campaign.

Procurement and Logistics

Our logistics activities are organized according the following subcategories: before, during, and after the campaign.

Before the campaign

Bid announcements were published in national newspapers inviting vendors to submit proposals for provision of materials, equipment, and vehicles. RTI then undertook a competitive procurement selection process to identify vendors for each of the commodities to be procured. We selected vendors, signed contracts, and initiated procurement.

All materials, equipment, and vehicles were delivered to the RTI office in Bamako at the end of April 2010, and then transferred to the Koulikoro and Bla districts. Table 1 lists the items and amount of PPE procured.

Table 1. Personal Protective Equipment

Items	Total No. of Units
Pumps	274
Insecticide	2,447
Pregnancy test	257
Helmets	276
Gloves	3,030
PVC Gum Boots	303 (120 in size 9 & 183 in size 11)
Visor supports	286
Visors	820
Respirator masks	29,990
Overalls	595 (357 in size 42 & 238 in size 50)
First aid kits	67
Filters	684
Nozzles (“buses”)	842

Crown Agents procured and delivered the deltamethrin insecticide to the two central warehouses in Koulikoro and Bla.

At the warehouses, storekeepers affixed the codes (already made at the RTI Mali office in Bamako) onto the insecticide cachets. Afterward, the materials, equipment, and insecticide were apportioned by operational sites, transported to intervention health areas, and stored in the secondary warehouses.

During the campaign

The vehicle allocated to each health area ensured daily transportation of the teams of operators and the supplies of insecticides, consumables, and other items as needed on site. Vehicle fuel supply was subject to special monitoring. Half-way through the campaign, the central logistician conducted site visits to inventory and compare the quantity of used insecticides with the empty sachets stored in the secondary warehouses.

After the campaign

At the end of the campaign, the secondary storekeeper of each site, with oversight support from the supervisor, led demobilization. The number of cars allocated to each site was increased this year and facilitated the transfer of materials, equipment, and wastes to the central warehouse. The central warehouse logistician conducted a final inventory of all the materials and equipment and the insecticide used compared with the number of empty sachets.

Environmental Compliance

Because 2010 was the third consecutive year of the IRS project, it was not necessary to conduct an environmental impact assessment, as this was done during the 2008 campaign. Nonetheless, the pre-, mid-, and post-campaign environmental inspections were carried out.

RTI hired a consultant to conduct a pre-campaign inspection in April 2010. Based on the consultant's recommendations, staff repaired the soak pits and renovated the warehouses and washing areas by the end of the inspection visit. Also the medical examinations of the spray operator teams and pregnancy tests for the female staff were conducted.

On May 15–16, 2010, the Environmental Management and Capacity Building (EMCAB) team and the Global Health Bureau environmental officer at USAID/Washington supervised the launch of the IRS campaign in Bla and Koulikoro districts, respectively, and expressed satisfaction with the conduct of the operations.

The previous supervision was directly monitored by the pre-campaign inspection mission conducted May 17–21, 2010, by the RTI environmental consultant from the Nairobi Regional Office. The mission expressed satisfaction with the environmental compliance. However, it stressed the need to intensify supervision to maintain a high level of environmental compliance and to help correct possible errors.

In July, the post-campaign environmental inspection was conducted jointly by our environmental consultant and the IRS focal person at the National Sanitation and Environmental Pollution Control Department (Direction Nationale de l'Assainissement du Contrôle des Pollutions et Nuisances [DNACPN]). This mission helped to initiate mechanisms to decontaminate the materials and secondary warehouses and conduct medical examinations and pregnancy tests for the spray operators.



Koutienso IRS Site: Repaired wash area and soak pit, and barrels for serial rinsing of pumps.



Tombougou (Koulikoro) IRS Site: Secondary warehouse under construction by the community. Even though communities know this construction is their responsibility, in light of previous difficulties the effort required to organize and build them is a good sign of community ownership

Information, Education, and Communication

Because we experienced implementation challenges with IEC component during 2008 and 2009 spray campaigns, particularly with coordination and supervision of IEC mobilizers, we focused our pre-spray planning efforts on retooling our IEC approach. To improve coordination and facilitation of IEC for 2010 spray campaign, we enlisted the Social Development and Cooperatives Service of the two districts to join in the development and implementation of the IEC strategy along with PNLP and CНИЕCS. Moreover, RTI's regional communication coordinator, based in Nairobi, assisted in revamping IEC materials.

In previous spray campaigns, mobilizers affixed stickers to the doors to identify the compounds that had been sprayed by spray operators after the fact. This system was

ineffective because, within a few days, the stickers fell off. In 2010, we introduced the IRS mobilizer card adapted for Mali to use in place of the sticker. The IRS card includes more information than did the sticker: the name of the head of household and his/her identification number; more important, it can be used for four years. During each IRS campaign, the mobilizers give the IRS card to the head of household visited, who in turn shows it to the spray operator; the spray operator passes it to the team leader and finally to the relevant spray supervisor. Hence, an educational pamphlet was designed and translated into the Bambara national language. T-shirts and caps were also prepared for the community mobilization. Data collection forms were developed and updated to facilitate the monitoring of the IEC activities.

During April 4–16, 2010, staff from NMCP, CНИЕCS, and RTI held separate IEC training of trainers (TOT) workshops in Koulikoro and Bla for five days each. Representatives from each of the 17 CSCOMs in Koulikoro and 25 CSCOMs in Bla were trained. Afterward, we selected 772 community workers (down from 1,948 in 2009 campaign) and the DTCs with the support of the SDSSES trained the selected staff.

The IEC activities were concentrated on community mobilization and sensitization. Community mobilization on IRS started three days before the start of the campaign and continued during the first week. It included

- IEC mobilizers visiting homes in their respective villages to inform community members about the imminent start of the IRS operations and to distribute IRS cards to occupants of eligible structures as well as pamphlets to the populations.
- A traditional singing and dancing activity by the health areas, which brought together the municipal, traditional, and religious authorities and the populations around the theme of the IRS, at various points during the IEC campaign, and just prior to the beginning of the spray campaign
- Coordinating an intensive radio campaign with IRS public service announcements.

Mobilizers also sensitized community members during the spray operations. On the eve of scheduled spray operation in a village or a district, the mobilizer informed all residents about the arrival of the spray team; and educated them about the importance and benefits of IRS and on actions to be adopted before, during, and after the IRS. On the day of scheduled spray, the mobilizer accompanied the team of spray operators and continued to conduct sensitization activities. After IRS was completed, the mobilizer returned to homes to reinforce these messages.

Spray Operations

To prepare for IRS operations, we conducted the following human resources and capacity building activities:

- Convening TOT in IRS at the beginning of April
- Recruiting and training local coordination teams
- Identifying and training spray operators in Bla and Koulikoro
- Selecting, at the conclusion of the spray operators' training workshop, 42 supervisors, 70 team leaders, and 42 storekeepers and guiding them on their respective tasks.

The IRS campaign started on May 16, 2010, in Bla and Koulikoro, although there was no official launching ceremony, and lasted for 40 days. In total, 352 operators, 70 team leaders, 42 supervisors, 42 storekeepers, 42 security guards, 53 launderers, and 53 drivers were deployed at 42 sites in the Koulikoro and Bla districts (see Table 3).

The secondary storekeepers were solicited for the demobilization activities. They continued to track and monitor materials and equipment as well as other consumables during the campaign.

Other Activities

Entomological Monitoring

The first entomological follow-up of the 2010 IRS operations was conducted in July, one month after the end of IRS operations in Koulikoro and Bla. The preliminary results showed an average mortality rate of 93%, 98%, and 34%, respectively, in the Koula, Sirakorola, and Karadiè villages in Koulikoro; and 85%, 80%, and 79%, respectively, in the Tia, Niala, and Bagadadji villages. The village of Karadiè was given particular attention, given the low rate of mosquito mortality observed in the sample structures sprayed. To understand the causes of this low rate, the MRTC and RTI undertook the following activities:

- Conducting an analysis of the materials constituting the walls (via chromatography) in Karadiè
- Conducting follow-up interviews with the Karadiè community
- Planning another entomological follow up during the 2011 IRS campaign.

Capacity Building of the Ministry of Health

All stages of implementation of the IRS project, including microplanning activities, training, supervision, and end-of-spray workshops were carried out with the full participation of the partners at DNACPN and the Ministry of Health; i.e., PNLP, CNI ECS, DHPS, DRS, CSREF, and SDSSES.

Monitoring and Evaluation

During the previous campaigns, we had had a “blind” monitoring and evaluation (M&E) system. With this system, once IRS activities were completed in the village, it was impossible to

- Know which structures had not been sprayed.
- Know which operator had sprayed which structures, especially a posteriori.
- Organize the mop-up campaign on the day immediately following IRS of a village.

With the new M&E system, each structure and spray operator had a unique identification number. Therefore, we were able to identify on a daily basis, which operator had sprayed which structure and organizer mop-up campaigns.

The M&E activities are discussed according to subcategories before, during, and after the campaign.

Before the campaign: April 1–May 14, 2010

- Cleaning and entry of geographic reconnaissance data

Concerning capacity building, 40 technicians from the Ministries of Environment and Health received TOT in IRS, not only in Koulikoro and Bla cercles, but in the entire Koulikoro and Ségou Regions, where a total of 352 operators were trained (Table 3). Hence, 45 DTCs previously called CPMs received TOT trainers in IEC/IRS, which made it possible to train 772 mobilizers in IEC. A temporary team in charge of coordination and logistics, drivers and launderers were trained in each targeted district.

The data collected during the campaign showed that while a total of 128,614 structures were estimated and planned for at the beginning of the campaign, 130,842 were found; of these 127,273 were treated, representing a coverage rate of 98% of structures found and 99% of structures planned. Table 4 presents the main indicators of the 2010 campaign.

Table 4. Indicators of the 2010 Campaign

Zone Indicators	Bla	Koulikoro	Total
Structures planned	73,146	55,468	128,614
Structures found	80,475	50,367	130,842
Structures treated	79,048	48,225	127,273
Percentage in relation to the planning	108.1%	86.9%	98.9%
Coverage	98.2%	95.7%	97.2%
Number of persons in structures found	269,833	180,609	450,442
Number of persons in structures treated	266,123	174,692	440,815
Percentage	98.6%	96.7%	97.8%
Number of children under age 5 in structures found	59,845	34,463	94,308
Number of children under age 5 in structures treated	59,046	33,315	92,361
Percent of children under 5 protected	98.6%	96.6%	97.9%
Number of pregnant women in structures found	7503	5660	13,163
Number of pregnant women in structures treated	7406	5470	12,876
Percent of pregnant women protected	98.7%	96.6%	97.8%
Used sachets	28,933	15,752	44,685

Project Management and Administration

Instead of conducting recruitment, IRS used the health system already in place in Mali. The MOH already has in place a system of health workers working with partner organizations and trained in health programs. This system of workers includes the Service d'Hygiène (Hygiene Service) staff from health centers and district health offices, medical doctors, nurses, and community workers. Before the start of the spray campaign in May, training for all personnel involved in IRS was conducted in close collaboration with PNLP. IRS district teams, in close partnership with the MOH and other agencies, provided oversight to achieve RTI's goal of providing day-to-day operational management and support for IRS implementation, including all aspects of monitoring and quality assurance. During the 2010 IRS campaign, we worked with one permanent staff and one temporary staff at the national, district and community levels.

- Seasonal staff at the district level (temporary):
 - 2 district coordinators
 - 2 district logisticians
 - 6 input clerks
 - 6 monitors
 - 4 maintenance workers.

- Supervision Team:
 - National level supervision: MOH and MOE
 - Regional level supervision
 - District level supervision.
- Other persons involved:
 - 2 hygiene agents for the health district covered
 - 2 CSRéf Chief Medical Officers
 - 42 DTCs
 - 2 hygiene agents at the regional level
 - 2 local representatives of the Ministry of Environment.

Partnership and Collaboration

On April 8, 2010 we convened the IRS Steering Committee meeting, which included participation from the following partners: secretary general of the MOH, PNLP, the Ministry of Territorial Administration and Local Communities, the Ministry of Agriculture, the Ministry of Environment, WHO Mali Office, the *Direction de l'hygiène Publique et de la Salubrité*, MRTC, and PMI/USAID. The purpose of the meeting was to present the microplan of 2010 IRS activities. The discussions concerned

- The signing of the memorandum of understanding between the government of Mali and RTI, which was being prepared;
- The need to strengthen capacities and skills transfer in the decentralized and de-concentrated context with a view to ensuring further ownership and sustainability of the program by the government of Mali;
- The development of a National Strategic Plan for IRS.

On April 20, 2010, RTI team and the PNLP team met to analyze the microplan of activities for the IRS campaign and to determine the implementation modalities. At the end of this meeting, each of the activities had a responsible official and an implementation deadline.

The RTI team met with PMI on May 4, 2010, at the USAID mission to provide an update on progress of preparations for the campaign and to discuss measures to be taken in connection with the EMCAB visit.

Outstanding Activities

There are no outstanding activities to report during this reporting period.

Upcoming Activities

- Organize post-campaign follow up activities
- Update the list of compounds in Bla and Koulikoro
- Prepare for 2011 operations, particularly expansion of IRS in new district of Baraouéli
- Develop a national IRS strategic plan

- Prepare FY2011 work plan

Mozambique

This semiannual report presents the progress in Mozambique from April 2010 to September 2010, and summarizes the Indoor Residual Spraying project's current activities and achievements, outstanding issues, and upcoming activities.

Background

In July 2005, the United States' government announced a five-year, \$1.2 billion malaria initiative to rapidly scale up malaria prevention and treatment interventions in 15 high-burden countries in sub-Saharan Africa. The United States President's Malaria Initiative (PMI) began with \$30 million in bilateral funding in fiscal year (FY) 2006 that was increased to \$135 million in FY2007 and \$300 million in FY2008 and 2009; it is intended to reach \$500 million in FY2010.

In September 2009, RTI International was awarded the indoor residual spraying (IRS) 2 Task Order One for the implementation of IRS in sub-Saharan Africa. The purpose of this task order is to support PMI and United States Agency for International Development (USAID) Missions in planning and implementing IRS programs with the overall goal of reducing the burden of malaria in Africa. This task order will enhance PMI's ability to implement IRS programs on the ground through cost-effective commodities procurement and logistics systems and access to technical expertise in order to implement high quality and timely IRS in countries affected by malaria.

USAID identified Mozambique as one of the countries to receive funding under the PMI during the second round of selection in 2006. The National Malaria Control Program (NMCP) is making greater use of several effective malaria interventions, including IRS to reduce the impact of the malaria burden on the Mozambican population. PMI and the NMCP identified six malaria endemic districts in Zambézia province (Milange, Mocuba, Morrumbala, Namacurra, Nicoadala, and Quelimane) for IRS activities. In 2007, PMI began supporting operations in all six of these districts. The Mozambican government had planned to optimize coverage of the target areas in these six districts until 2009, before expanding to include others. In addition to continued support for IRS in six districts in Zambezia, PMI agreed with the Ministry of Health (MOH) to support IRS in two additional districts in Zambezia in 2010, Maganja da Costa and Mopeia, bringing the total to 8 districts under PMI IRS in 2010.

The NMCP has targeted IRS to areas of high population density in Mozambique, such as urban and periurban areas and areas of economic importance. These areas cover an estimated 25–30% of the Mozambican population. There is also interest in expanding spray activities to more rural areas and scaling up coverage to 50% of the country's population by 2013.

Current Activities and Accomplishments

Planning and Assessment

National-Level Planning and Microplanning

The timing of the spray cycle in Mozambique is decided by the MOH/NMCP. While the MOH initially proposed August 23, the launch date was moved several times to August 30, 2010. The implementing teams agreed to influence the delay in the start date in order to match the rain pattern and the effective duration of the insecticide.

District Level Planning and Assessment

RTI facilitated the annual district microplanning meeting in May 2010 where RTI and Provincial Department of Health (DPS) reviewed the previous year's IRS operations and lessons learned to improve the quality of the upcoming round. The meeting served as the foundation for developing a detailed plan for this year's spray campaign. The microplan included: spray schedules, list of spray teams, supply list, insecticide requirements, logistics needs, itinerary and timeline for related IRS activities, spray targets, and start-up activities in the two new districts. During the meeting, RTI reviewed the status of soak pits and latrines and gave orientation to the district health management teams in the two new districts.

An assessment team was formed with staff from DPS and RTI (Manager of NMCP Zambezia, deputy Manager of PNCM Zambezia, Manager of IEC DPS Zambezia and several RTI staffs). They gap analysis developed by the assessment team highlighted outstanding issues in logistics, training, community mobilization and infrastructure, which they proposed to correct through the following activities:

- 10-day training of community mobilizers
- Increased number of pump technicians
- Engagement of data entry clerks
- Use of Access database and revised data tools for a revised monitoring and evaluation (M&E) system

Furthermore, results of the community mobilization and planning meetings indicated that the following issues are critical to the program:

- Involvement of all stakeholders, particularly the community
- Minimization of potential pilferage and misuse of insecticide
- Training of both sprayers and supervisors
- Monitoring the efficacy of the spraying program
- Selection and recruitment of sprayers, focusing on the maturity and integrity
- Strict training of sprayers, supervisors, storehouse workers and drivers

Procurement and Logistics

The government of Mozambique procured lambda cyhalothrin 10%WP, a short (4-6 months) acting pyrethroid, through a local distributor Agrifocus. Personal protective equipment (PPE) and spray pumps were procured and delivered through RTI's international procurement

system, based on the procurement list provided by the district health office and the RTI Logistics Manager.

The warehouse in Quelimane was used as central store for all PPE. DPS decided to move the Quelimane base of operations from the central store in the city to Namuinho, some 12 kilometers away. The move resulted in some overcrowding and options are being reviewed for finding a larger warehouse. One week before the spray round launched, the PPE was distributed to the district warehouses. In the 8 operational districts, secure storage with adequate capacity for IRS insecticides and associated materials was provided. Current infrastructure is adequate to house enough insecticide for the intended activity.

Spray operator transport vehicles were hired through a competitive solicitation process at before the start of the campaign using the criteria that Crown Agents USA had used in 2009. Two supervision vehicles were supplied to each district to better monitor and supervise the implementation of activities. Additional cars were allocated for M&E in Milange and Morrumbala due to a larger population size and wider geographical spread of the two districts.

Environmental Compliance

The below activities related to environmental and safety compliance took place during the current reporting period.

Safety

IRS supervisors, team leaders, spray operators, community mobilizers and RTI staff were trained by RTI, Ministry of Environmental Affairs (MICOA) and Ministry of Agriculture (MINAG) according to World Health Organization (WHO) standards for IRS environmental compliance. Insecticide poisoning training materials were distributed to all health facilities, medical chiefs and health center staff. In the specific districts where PMI is providing support, insecticide storage facility storekeepers were trained by MINAG and FAO (in collaboration with the RTI) on proper stores management.

Occupational exposure to insecticides was minimized through personal protective equipment (according to WHO specs). The IEC campaign will educate households on their roles and responsibilities during the spray campaign to avoid exposure. The IEC campaign will also educate the population to avoid using pesticides that are not registered or certified for agricultural commodities by the MINAG and the MOH.

Under the strategic directives of the government of Mozambique (GOM), an equal number of women and men were sought for recruited. To ensure the safety of the female spray operators, pre-spray pregnancy test, repeated monthly, was carried out for all women of 18–45 years of age (reproductive age group). Anybody who was found pregnant was immediately transferred to roles where there is no direct exposure to the insecticide; e.g. community mobilization.

Environmental Compliance

The DPS, MICOA, and RTI developed a joint work plan for environmental monitoring during the spray campaign. In this way all partners worked together to ensure full compliance

with environmental standards. Furthermore, this presented opportunity for capacity building of the district and national authorities in environmental monitoring.

Short-term technical assistance was provided by Mr. Autman Tembo, RTI Regional Environmental Officer, August 18–September 2, to carry out the pre-spray environmental compliance assessment. Mr. Tembo observed the conversion of evaporation tanks to soak pits and carefully inspected insecticide stock management preparations to ensure that all was in order for the start of the spray round. He also provided support for identification of incineration options in Mozambique.

Monitoring and evaluation for dichloro-diphenyl-trichloroethane (DDT) environmental contamination from previous rounds was carried out in sentinel districts of Mocuba (sample site) and Maganja da Costa (control) in May and August 2010. All samples were sent to RTI contracted laboratories in the United States and Nairobi.

Environmental contamination was kept to a minimum through strict auditing, handling, and washing practices. Each insecticide sachet is strictly accounted for and contaminated waste-water/rinse-water will be re-used in subsequent days of spraying through the “progressive rinse” system which is part of the standard training content.

Samples of insecticides including the expired DDT in Quelimane and the GOM purchased pyrethroid were sent to United States Centers for Disease Control and Prevention (CDC) Atlanta and RTI contracted laboratories in Nairobi for testing.

IEC Development and Implementation

During this reporting period the IEC component was planned with additional emphasis on the door-to-door mobilization activities for 2010. The IEC component was beefed up to include printing and distribution of materials to every home visited by the community mobilizers. The IEC materials were adapted from other IRS country experience in Africa, a process which facilitated its testing and production. RTI worked with the Government program to ensure that PMI indicators could be included to already existing tools being used in all other provinces. RTI discussed the new IRS household card being used in all PMI IRS countries with the NMCP. They accepted the use of the household cards and RTI had enough cards printed to ensure each household would get one. A new IEC indicator was introduced to the IRS program in Mozambique. The indicator records the number of IEC brochures distributed to the households mobilized by IEC.

During this reporting period, RTI assisted in the training of 239 IEC mobilizers to ensure that all IEC agents fully understood how to deliver the IRS messages, the purpose of the new IEC tools, and how to record the IEC data.

Radio messages announcing the spray campaign and key IRS messages were developed and broadcast through local community radios in all 8 districts. The broadcast is on-going.

Spray Operations

In collaboration with MICOA, NMCP, and MINAG, RTI held a training of trainers and subsequent training of spray operators during this reporting period. The table below summarizes the number of personnel trained for the spray campaign.

IEC Mobilizers	239
Pump Technician	32
IRS Supervisors	41
District Health Coordinators	16
Storekeepers	53
Spray Operators	1463
TOTAL	1844

The spray campaign in Mozambique was launched by the government country-wide on August 30 however the spraying in Zambezia started full scale across all 8 districts on September 21. Until the IRS system was in full operation, the early days of the spray campaign was used to:

- test spraying skills as part of continued training
- pilot the new data collection forms
- logistics assessments
- trial run on environmental compliance and cleansing applications
- test the supervisors' checklists
- test the mobilizers' checklists
- establish the M/E computerization system including data flow and electronic submission

Other Activities

Entomological Monitoring

Short-term technical assistance (STTA) for entomological monitoring was requested from RTI Nairobi Regional Office in order to build local capacities and provide strategic directions. Ms. Rodaly Muthoni, RTI IRS Regional Entomologist traveled to Mozambique in August to provide technical assistance in the following areas:

- Perform insecticide resistance tests in a sample of the districts being sprayed and in those targeted for the next season.
- Install window traps for collecting mosquitoes in various districts in Zambezia
- Observe mosquito species identification, behavior, density and distribution in both sprayed and unsprayed structures
- Conduct field orientation training for MOH staff to be involved in the collection of baseline entomological data.
- Provide oversight for NMCP technicians in field evaluations
- Analyze results from evaluations and provide recommendations for entomological monitoring and use of insecticide in Mozambique.
- Review the capacities for vector control and monitoring system in Zambezia province, including human resource, equipment, supplies, infrastructure, strategy, protocols, data entry, analyses, and reporting.

The assessment work was done in the three districts of Maganja da Costa, Mopeia and Pebane (control), to include;

- larval collection and rearing

- insecticide resistance tests
- pyrethrum spray collection
- field orientation for entomology technicians
- assessment of the insectary and entomology laboratory
- Pebane district was used as control for entomological monitoring.

Capacity Building of Ministry of Health

Capacity building activities for the MOH during this reporting period included the following:

- 10-day intensive training of spray operators involving national staff at all levels
- IEC training in the eight districts, introducing the new IRS card that will track household participation in the IRS program for the next 4 years.
- 5-day training of supervisors in order to build the capacity of district authorities in supervision and management of IRS
- Introduction and training on the newly revised M/E system for the benefit of the entire national IRS program
- Revision of the data collection tools and training on PMI core indicators
- RTI facilitated various planning meetings involving all partners and stakeholders during the planning months in order to train government counterparts in the stages of planning and preparations for the IRS program according to WHO standards and IRS best practice.

Insectary Rehabilitation

Supervisory visits were made by CDC and RTI in May 2010 to verify the progress of work in rehabilitation of the Maputo and Pemba insectaries and to make recommendations to bring the work to completion.

Ms. Muthoni also provided review and suggestions for the rehabilitation of the insectaries in Maputo and Cabo Delgado during her STTA in August. Currently, both laboratories and insectaries are being refurbished with materials and equipment according to the list submitted by INS.

Both insectaries are scheduled to be completed by the end of November.

Monitoring and Evaluation

Since the inception of PMI supported IRS in Mozambique, the program has been implemented with the premise that for sustainability purposes, all systems including M&E will be nested within the national health sector systems. The M/E plan for IRS Mozambique was revised in this reporting period to address many of the challenges faced in past rounds, as well as to advance the previously used system to a more efficient and innovative design.

Specific areas highlighted for emphasis in the 2010 work plan year include 1) developing a framework for organization of data flow, 2) improving accuracy and completeness of data recording and reporting, and 3) planning and implementing a solid data management system. In order to respond to the results of the audit, RTI developed a multilevel monitoring and

evaluation plan that will address the shortcomings from the previous M&E plan and will greatly enhance the IRS program as a whole.

The objectives for the revised M&E system:

- Establish an efficient data flow system that will carry accurate and timely information from the spray operator level to the central level with minimum opportunities for error;
- Implement the Access based data entry system
- Ensure the availability of the necessary human and material resources;
- Develop a data security and storage system for future reference of IRS data;
- Introduce new data collection and entry tools that will promote efficiency at all levels of the M&E program and enable the program partners to track performance in real-time throughout the spray round.
- Emphasize training and supervision of data recording and data entry for building capacity in IRS M&E and to ensure accuracy of data at all levels

Specific indicators as required by PMI to track progress for each of the thematic areas are as follows:

Core Indicators

- Number of structures sprayed/number of structures found (*=IRS coverage*)
- Number of people sleeping in house structures sprayed (*=population protected*)
- Number of children under five years old and pregnant women sleeping in house structures sprayed (*vulnerable groups*)
- Number of people trained in IRS implementation (disaggregated by type of training) (*capacity building*)

RTI adopted a number of personnel changes and implemented various system inputs at the national and district level to ensure there is enough staff and equipment to fulfill the M&E objectives and allow the system to run properly. An M&E Coordinator was hired to oversee the data quality monitoring and management, supported by a total of 18 data clerks in all 8 operational districts. Carolyne Njue, RTI IRS Regional M&E Officer, visited Mozambique to provide STTA in the new M&E system. Ms. Njue carried out training for the newly hired M&E Coordinator on the new Access database and the data recording tools. Once trained, the M&E coordinator trained all data clerks on the use of the system and emphasized proper data recording to all district coordinators and supervisors.

RTI standardized the spray cards for collecting daily spray data. The first level of data collection is based on the spray operator daily record, where sprayed and unsprayed structures are recorded and a unique household identifier taken from the IRS household card and entered to identify households for mop up exercise. The second level of daily data recording is the spray team leader summary form, a summary of all the structures visited by the spray operators, used as basis for data entry and analysis. (In October, by request of PMI, data entry using the spray operator daily card was implemented)

Project Management and Administration

There were many STTA visits during this reporting period, including:

- Mr. Autman Tembo, Regional Environmental Compliance Officer,
- Mr. Napoleon Graham, RTI IRS chief of party (COP) mentor
- Mr. Sam Mesfin, RTI Regional Finance Manager
- Ms. Carolyne Njue, RTI IRS Regional Monitoring and Evaluation Officer
- Ms. Rodaly Muthoni, RTI IRS Regional Entomologist

Hector Jalipa, the new IRS COP started working on the IRS program in Mozambique in May.

Partnership and Collaboration

The presence of a new COP in RTI Mozambique required a series of introductory meetings with relevant entities in the MOH, NMCP and INS during this reporting period. These meetings were aimed at highlighting the need to build a solid and sustainable IRS program, solidifying partnerships, facilitating open lines of communication, identifying the roles and responsibilities of each stakeholder. A series of meetings with National Institute of Health (INS) were held to discuss the important role it plays in establishing sustainable entomological systems, including management of the insectary and vector monitoring in Zambezia.

Furthermore, a new Director of NMCP was brought on and this offered the opportunity for a new start in collaboration and relationship building.

RTI has place heavy emphasis on building relationships and partnerships with MISAU Zambezia and MICOA. The objective during the planning, preparation, and implementation was to establish a “team” approach taking no regard to who the implementing and governing entities are. RTI has done a lot of work in trying to fuse the programs so that it is seen as one and owned by the community and districts.

Outstanding Activities

- Meetings with NMCP to discuss strategic direction and possible integrated vector management strategy development
- Completion of Maputo and Pemba insectaries
- Comprehensive entomological monitoring plan that involves the PMI supported Entomologist taking the lead in Zambezia entomological monitoring.

Upcoming Activities

- Spray campaign
- Monthly review meetings with DPS Zambezia
- Monthly meetings with NMCP
- End of spray review meeting
- 2011 work plan development

Rwanda

This semiannual report presents the progress in Rwanda from April to September 2010, and summarizes the Indoor Residual Spraying (IRS 2) Task Order One program's current activities and achievements, outstanding issues, and upcoming activities.

Background

The United States Agency for International Development (USAID) has identified Rwanda as one of the countries to receive funding under the United States President's Malaria Initiative (PMI). RTI International is the prime contractor for USAID's Indoor Residual Spraying (IRS) Indefinite Quantity Contract (IQC), under which it supports IRS activities in a number of countries in Africa, including Rwanda. Under the IRS 2 IQC Task Order One, the PMI has requested that RTI continue to provide similar support to the IRS program in Rwanda for fiscal year (FY) 2010.

RTI, a U.S. government contractor for IRS activities, was requested by USAID through the IRS1 (Task Order One) and IRS2 (Task Order One) contract awards, to provide strategic technical, management, and operational support for IRS activities in Rwanda to further the ultimate goal of reducing malaria-associated mortality in the country.

In 2007, the PMI, the Rwanda Ministry of Health (MOH), and the National Malaria Unit under the Centre for Treatment and Research on AIDS, Malaria, Tuberculosis and Other Epidemics (TRAC Plus) identified the three epidemic-prone districts of Nyarugenge, Gasabo, and Kicukiro of Kigali City for indoor residual spraying (IRS) activities. In 2008, PMI and the Malaria Unit agreed to focus spraying activities again in these districts, but also expanded IRS coverage to Kirehe and Nyanza districts. In 2009, two more districts were added: Bugesera and Nyagatare in the Southeast and Eastern provinces of the country. In 2010, the IRS program targeted the same seven districts as in 2009. Table 1 below shows the districts sprayed by IRS program year.

Table 1: Districts Sprayed from 2007 to 2010

Round 1 (August 2007)	Gasabo, Kicukiro, Nyarugenge
Round 2 (August 2008)	Gasabo, Kicukiro, Nyarugenge, Kirehe, Nyanza
Round 3 (March 2009)	Gasabo, Kicukiro, Nyarugenge, Kirehe, Nyanza
Round 4 (September 2009)	Gasabo, Kicukiro, Nyarugenge, Kirehe, Nyanza, Bugesera, Nyagatare
Round 5 (March 2010)	Gasabo, Kicukiro
Round 6 (September 2010)	Gasabo, Kicukiro, Nyarugenge, Kirehe, Nyanza, Bugesera, Nyagatare

Current Activities and Accomplishments

During this reporting period, the Rwanda IRS program focused on planning and preparations for the sixth IRS spray round. The RTI team effectively carried out a logistical assessment of

the seven targeted districts and determined the personnel requirements for the September spray round. Based on the logistics assessment, the team developed a procurement list and carried out procurement, both locally and internationally. The district coordinators and RTI logistics manager ensured that operational sites were established and fully functional for the start of the spray round. Initially planned for August 30, 2010, the launch was postponed to September 7, 2010, due to minor logistical setbacks.

From April to July, the Rwanda IRS program developed a microplan for management and implementation of the sixth round of IRS. The plan was reviewed and finalized with the implementing partners, including the Malaria Unit, PMI, and Population Services International (PSI), as well as local authorities at district level in all districts to be sprayed.

In the area of Information, Education, and Communication (IEC), PMI, RTI, PSI, and Programme National de Lutte contre le Paludisme (PNLP) had numerous discussions during this reporting period to determine who would be responsible for IEC mobilization in the districts. The implementing partners and PNLN reached an agreement, and the discussion results are explained in more detail below.

In August, RTI provided technical support for entomological monitoring for post-spray susceptibility and vector behavior evaluations in the two districts that were sprayed in March. The entomologist worked with Rwanda Malaria Unit staff and the PNLN program manager in performing the field evaluations.

Planning and Assessment Planning

Planning for IRS Round 6 was based on a six-month countdown calendar drafted in March 2010 to guide planning and preparations spray operations, with a heavy emphasis on involving district and local authorities in the planning process. This approach consisted of two levels: the first engaged authorities in each of the seven districts by sharing with them the draft plan and inviting their contributions, under the leadership of the district mayor and district health director. The second level brought together both district and sector authorities to review and discuss the plan in a group setting.

The following recommendations resulted from the discussions with local authorities:

- It is important for the RTI/IRS program to work together with district, sector, and local authorities to effectively implement IRS in the communities.
- RTI needs to ensure that there are no delays to payments to spray operators and IEC implementers as previously experienced in Round 5.
- Weekly meetings at sector and district level involving operations staff and local leaders should be held to improve supervision and provide opportunities for feedback and identification of bottlenecks that need attention.
- In response to communities blaming IRS for increased flea infestation in houses following spraying, RTI has said that IRS in no way promotes flea infestation, although insecticide spraying may provoke fleas to scatter. Improved hygiene in households will assist in ridding fleas from structures.
- District, sector, and local authorities should report acts of impropriety observed in RTI staff to ensure that corrective measures are instituted immediately.

- Sector social affairs officers were deemed the most suitable contact personnel at the sector level, and they should be participants in all planning meetings.
- District and sector staff responsible for health and social affairs should include IRS in their annual work plans with specific targets.
- More efforts are needed to improve sensitization of communities regarding IRS.

These meetings appear to have strengthened the Rwanda IRS program’s relationship with district and local authorities. In some districts, leaders visited training sites in August to acquaint themselves with the ongoing preparations during that period.

Throughout the planning period, the Rwanda program maintained regular weekly updates on preparations for IRS Round 6 with the Rwanda Malaria Unit and PMI. In May 2010, the program made preliminary visits to seven districts to plan for the upcoming spray round. The program team carried out a second round of planning visits in June 2010. Each of these planning trips brought together district and sector leaders to discuss plans for IRS Round 6. During the visits, RTI carried out logistical assessments and discussed any changes in infrastructure or population movements with the district authorities. RTI raised concerns about improving IEC and the involvement of PSI in supporting IEC, especially in the Kigali districts.

Procurement and Logistics

RTI completed the logistics assessment for the sixth IRS round in May 2010, enabling the IRS Rwanda program to identify additional equipment, materials, and supplies required for effective implementation.

A consignment of pyrethroid class (deltamethrin) insecticide (180,114 sachets in May; 10,208 sachets in July) was delivered to Kigali in preparation for the spray round. Other procured materials include the items listed in Table 2 below.

Table 2: Key IRS Commodities Procured Internationally and Locally

Pyrethroid insecticide (deltamethrin)	190,322 sachets
Respiratory masks	83,121
Boots	558 pairs
Hard hats	200
First aid kits	72
Reflective jackets	40
Head gear for hard hats	120
Nitrile gloves	1,308 pairs
Face-shields	1,080
Coveralls	1,304
Spray pumps	272
Spray pump repair kits	7

Open competitive tenders for supplies and services for the spray round were advertised through local media outlets and with international suppliers, depending on the source of the commodities.

The program team procured printed materials, hardware, spray operations transport, and general supplies through open solicitation also, where all vendors were invited to submit a

quotation. RTI awarded winning vendors based on how well they met the selection criteria as listed in the solicitation. Other deciding factors were price and availability.

Environmental Compliance

From July 18 to 30, 2010, Mr. Tito Kodiago, RTI Nairobi environmental officer, conducted the pre-spray environmental compliance inspection to support preparations by the Rwanda team for the 2010 IRS spray round and to assess and improve environmental compliance activities.

Mr. Kodiago's inspection concluded that the Rwanda program should rehabilitate the soak pits used in the 2009 spray operations for use in the 2010 campaign. Minor rehabilitation and maintenance was implemented, including fencing, mowing, and the addition of warning signs.

All seven of the district storage facilities were determined appropriate for use in 2010. Mr. Kodiago found them to be spacious and placed in good locations. All had adequate ventilation and all were highly secure, with double-locked doors and full-time security personnel. The warehouses were fitted with the required fire extinguishers, warning signs, and pallets.

The pre-spray environmental compliance inspection resulted in recommendation of the following activities to ensure full environmental compliance before commencement of the spray operations:

- Soak pits need rehabilitation to bring them up to USAID and World Health Organization soak pit standards. This should include fencing; refilling of the soak pits with new stones, gravel, charcoal, and sawdust; and installing warning signs in all soak pits.
- Warehouses need to be arranged, organized, and cleaned, and have correct warning signage before being turned over to new storekeepers.
- An approved agent should service fire extinguishers in all warehouses before reuse of the extinguishers.
- The program should procure first aid kits and warning signs prior to the start of spray activities.
- Pregnancy tests should be conducted for all female spray operators, storekeepers, and washpersons before spraying.
- Vehicles hired for spray operations should fulfill mandatory requirements for IRS vehicles, including roadworthiness and maintenance of an insurance certificate.
- While the spray pumps recently supplied by Hudson are light in weight, the seals joining the different components of the cans are unusually weak and the base of the cans are convex, not concave as required, in shape. The manufacturer should correct these problems.
- The Kanombe Military Hospital incinerator used in the past for disposal of IRS wastes requires replacement parts for use at the end of spray operations to avoid accumulation of the 2010 waste.

- Disposal of the plastic container included in the insecticide packaging is of paramount importance as these containers must not be used at the household level to store household consumables (i.e., salt, sugar, flour, etc.).

In response to the above findings, the IRS program implemented the following corrective measures:

- The program completed recruitment of district-level storekeepers and logistics assistants before August 20, 2010, to ensure that warehouses were brought up to required standards.
- The logistics officer and logistic assistants cleaned, arranged, organized, and affixed signage to warehouses. RTI provided training to the new teams of storekeepers and logistic assistants to ensure that the facilities they manage remained tidy and organized, with updated stock cards.
- RTI distributed first aid kits and ‘danger warning’ signs to the warehouses and soak pit sites. Each storage facility and soak pit site was posted with danger signs in locations that were visible to all people who approached the area.
- The program completed spray operator training in late August, with an emphasis on mixing insecticide with the nonsoluble sachet to avoid possible cases of insecticide exposure. Logistics assistants and storekeepers have been trained to be cautious with the additional plastic packaging within the insecticide boxes to ensure that the boxes are tracked closely and accounted for to avoid leakage into households within the community.
- The Malaria Unit supported training of clinicians (August 20–25) in the management of side effects from insecticide exposure.
- The program assessed soak pits for readiness, establishing 33 and rehabilitating 34.
- RTI conducted pregnancy tests on all female spray operators prior to the training to ensure that pregnant women are not participating in positions with direct exposure to insecticides.
- RTI immediately replaced the 109 inaccurately sized nozzles procured as part of the 2010 operations with the correct nozzle size, 8002E.

Information, Education, and Communication

Since the second spray round in 2008, PSI has overseen the IEC component for the IRS program. Following poor IEC performance in the March 2010 round, RTI was assigned four districts (Nyanza, Bugesera, Kirehe, and Nyagatare) to manage the IEC door-to-door community mobilization component for the August 2010 round. It was agreed that PSI would continue to oversee IEC activities in the three urban Kigali districts as well as mass media and other community mobilization activities in all seven operations districts.

To prepare for the task, the IRS Rwanda program recruited an IEC coordinator to provide oversight for the door-to-door sensitization in the four districts. RTI Regional IEC Officer Dorothy Mbuvi provided short-term technical assistance (STTA) to the Rwanda team for recruitment of IEC staff at the national and district levels, including four district IEC assistants and one IEC coordinator, and she provided training for all levels of IEC personnel.

Ms. Mbuvi worked closely with the newly recruited IEC coordinator in training community mobilizers and in ensuring proper recording of IEC data.

In preparation for IEC activities for the sixth round, the RTI team introduced a new brochure to the community that is more pictorial, replacing the previous version that had been less effective. In addition, RTI introduced the concept of using an IRS household card to replace household stickers, which was accepted by all partners, including the Malaria Unit, PMI, and PSI. The RTI team developed the new brochure and submitted it together with the IRS household card to the Health Communication Centre for official approval, which was granted. The two tools were used in all seven districts during the sixth round.

The IEC coordinator supervised the training of IEC mobilizers and supervisors. Table 3 shows the numbers of various cadres of IEC personnel who were trained in readiness for the sixth round:

Table 3: Numbers of RTI-trained IEC Supervisors and Mobilizers at District, Sector, Cell, and Village Levels (RTI IEC districts only)

	District	# District IEC Coordinators	# Sector IEC Coordinators	# IEC/Cell Supervisors	# IEC Village Mobilizers
1	Nyagatare	1	9	73	768
2	Bugesera	1	9	43	712
3	Nyanza	1	7	35	612
4	Kirehe	1	12	43	858
	Total	4	37	194	2950

Spray Operations

Spray operations activities for the period of April through September 2010 included the following:

- The IRS Rwanda program initiated recruitment of field seasonal staff through advertisements in local media in late June and conducted interviews in July 2010, enabling completion of recruitment and training of required staff well before the start date for spraying. Using selection criteria provided by the NMCP, local leaders selected the spray operators and IEC implementers. Once recruited, spray operators underwent physical fitness examinations and pregnancy tests (for women) in order to identify those not medically suitable for direct exposure to insecticide.
- Specific training was provided to finance assistants, district IEC assistants, logistics assistants, data clerks, sector coordinators, and sector supervisors.
- The program delivered more intense training on spraying techniques and supervision to sector coordinators, sector supervisors, and spray operators. The IEC training of trainers (TOT) session covered a three-day period, including one day where spray operators were involved to bridge the gap between IEC and Operations during the spray round. Spray operators underwent a five-day training that included a two-day theory training and three-day intensive practical spraying exercise. Trainers extended the theory segment from one to two days to adequately cover the concepts of the new IRS household cards and sprayer forms being introduced for the first time during the sixth round. Overall, a total of 2,179 spray operations personnel were trained across

all districts, including 54 sector coordinators, 127 sector supervisors, and 1,998 spray operators. Table 4 below shows the breakdown of trainees by district.

- In recent spray rounds, questions have been raised on the quality of spraying in the structures. As a result, all trainings focused on improving spray quality, including increased spraying practice. Understanding of and practice in the technique used to deposit insecticide on the walls is essential to ensure spraying quality, which depends upon having the right quantity and spread of the insecticide on the walls in the optimum dose. Out of the five-day training, spray operators spent four days practicing on the walls and ceilings. Participants expressed a better understanding of the importance of spray quality.

Table 4: Numbers of Spray Personnel Trained as Coordinators, Supervisors, and Spray Operators at Sector and Village Levels

District	Sector Coordinators	Sector Supervisors	Spray Operators	Total Trained
Gasabo	12	24	367	403
Kicukiro	5	10	173	188
Nyarugenge	4	7	124	135
Kirehe	8	26	332	366
Nyanza	7	18	328	353
Bugesera	9	18	292	319
Nyagatare	9	24	382	415
Total	54	127	1998	2179

Other Activities

Entomological Monitoring

Enock Mpanga, RTI entomology consultant, carried out STTA for entomological monitoring in Rwanda from August 17 through September 12, 2010. Mr. Mpanga leads the entomology team from the Malaria Unit to assess the residual efficacy of deltamethrin in the structures sprayed in March 2010. During this visit, the insectary was functional and provided sufficient samples of the *Anopheles gambiae* KISUMU strain, the standard pyrethroid-susceptible strain recommended for such tests. The team performed the assessment to evaluate the residual efficacy of deltamethrin six months after spraying. Preliminary results showed that in those houses previously showing 100% mortality one month after spraying, efficacy had dropped to between 92% and 96%.

During the reporting period, the insectary was further equipped with mosquito-rearing equipment, which has upgraded its performance to optimum levels. Currently, the insectary is performing well and is well stocked with the *Anopheles gambiae* KISUMU strain that is susceptible to pyrethroids. Other species and strains will be reared as required.

Capacity Building of Ministry of Health

RTI supported three staff from the Malaria Unit, TRAC Plus Rwanda to attend a two-week entomology training course in Tanzania. The purpose of the international course in mosquito biology, control, and ecology was to equip the trainees with field and laboratory skills for entomological studies investigating the biology, control, and ecology of mosquito disease vectors.

Furthermore, RTI performed capacity building throughout the IRS planning process as RTI worked collaboratively with the national partners at all levels on planning and preparing for the spray round.

Monitoring and Evaluation

RTI recruited a new monitoring and evaluation (M&E) specialist, Mr. Jules Nahimana, in July 2010 to provide M&E support to the RTI/IRS Kigali team. Ms. Carolyn Njue, IRS regional M&E manager, made an STTA trip to Kigali to train the newly hired M&E officer and to assist the IRS program in the planning of M&E activities for the spray round. The following accomplishments occurred during her visit:

- Adopted protocols for the revised M&E strategy for Rwanda, which were implemented by the IRS country program.
- Harmonized data collection tools to appropriately report on PMI indicators. These included the daily sprayer form, daily team leader form, IEC mobilizer form, IEC supervisor form, checklists for supervisors, and supervision form for social affairs.
- Set up the revised Microsoft Access-based IRS data capture and reporting system.
- Facilitated training of the M&E team on the newly introduced database.
- Facilitated trainings of district coordinators, sector coordinators, sector supervisors, and special teams on IRS data collection tools.

The program recruited data clerks during the period, and provided training in data entry and data management for the M&E officer. Once functional, the database was able to provide real-time output for the purpose of tracking progress of IRS operations on a daily basis.

Program Management and Administration

Human Resources Requirements

During the reporting period, RTI recruited permanent and seasonal staff through advertisements in the local media. When the program transitioned from IRS 1 to IRS 2, RTI Rwanda re-advertised all full-time staff positions. The program invited previously hired staff to reapply for their desired positions as well as other candidates from the general public. The final selected staff for the August 2010 spray round was a mix of previously hired staff and new recruits including the newly hired chief of party (COP), Dr. Stephen Magesa; logistics officer, Ms. Jane Karaiba; M&E specialist, Mr. Jules Nahimana; IEC coordinator, Mr. Vincent Tuzinde; and operations manager, Mr. John Ruziga.

The program also conducted interviews for seasonal district operational positions, including district coordinators (7), district IEC assistants (4), logistics assistants (7), finance assistants (7), data clerks (7), storekeepers (7), sector coordinators (54), IEC supervisors (33), and sector supervisors (99).

Short-term Technical Assistance

STTA visits during the reporting period included the following:

- Mr. Sam Mesfin, financial controller, trained and oriented our finance team on use of QuickBooks for financial reporting. He also supported the team in drafting a roadmap

for expedited payment of seasonal workers during the next spray round. During his visit, he supported the COP with recruitment of logistics and finance personnel.

- The former COP, Dr. Adama Kone, visited from IRS-Burkina Faso to assist with orientation of the new COP.
- Mr. Job Ojuok, regional human resources manager, provided support in managing the transition from IRS1 to IRS 2 in terms of staff recruitment and terminations.
- Mr. Ken Mugo, information technology (IT) specialist, furnished IT support, including IT orientation for new, recently recruited staff.

Partnership and Collaboration

RTI/IRS Rwanda conducted regular advisory meetings with the Malaria Unit, PSI, and other local authorities for a joint planning of the upcoming spraying campaign; the IRS Rwanda team is expecting a significant improvement compared to the previous spray round. This collaboration has resulted in a substantial increase in ownership of the program by the local leadership from district, sector, and cell levels. Local authorities have been actively involved in the program at various levels, with local leadership visiting spray operator training sites during preparation to acquaint themselves with program activities, attending weekly meetings to provide feedback on progress and to accompany supervisory teams in the field during spray operations.

Outstanding Activities

- Repair of the Kanombe Military Hospital incinerator (by RTI or other entity)
- Discussions on implementing the March 2011 round based on funds remaining after September 2010 round

Upcoming Activities

- Completion of the sixth round of IRS, which began on September 7, 2010. Scheduled over 36 working days, the operation should end on October 18, 2010, during the next reporting period.
- IRS 2010 Program Planning Week to be held in Nairobi, Kenya.
- Seventh round of IRS scheduled for March 2010. Planning for this mini-spray round to cover only a few districts (depending on availability of funds) will begin immediately after the conclusion of the sixth spray round.

Senegal

This semiannual report presents the progress in Senegal from April to September, 2010, and summarizes the Indoor Residual Spraying (IRS 2) Task Order One project's current activities and achievements, outstanding issues, and upcoming activities.

Background

The United States Agency for International Development (USAID) identified Senegal as one of the countries for funding under the United States President's Malaria Initiative (PMI).

In 2007, the PMI and the Senegal National Malaria Control Program (NMCP) identified three districts (Nioro, Velingara, and Richard-Toll) as the target districts for the indoor residual spraying (IRS) activities that began that same year. In 2010, the program was expanded into three new districts (Malem Hodar, Koumpentoum, and Guinguineo), covering six districts in total. Thus far, pyrethroids have been the selected insecticides for IRS in Senegal, lambda-cyhalothrin for 2007–2009 and deltamethrin for 2010. Table 1 shows the districts sprayed, coverage achieved, and insecticide selected for each round of the Senegal IRS program.

Table 1: Districts Sprayed per Round, Coverage Rate, and Insecticide Used

Round	Districts	Coverage	Insecticide
Round 1 (2007)	Nioro, Richard-Toll, and Velingara	97.5%	ICON® WP
Round 2 (2008)	Richard-Toll	87.2%	ICON® WP
Round 3 (2008)	Nioro, Richard-Toll, and Velingara	94.7%	ICON 10CS
Round 4 (2009)	Richard-Toll	87.7%	ICON 10CS
Round 5 (2009)	Nioro, Richard-Toll, and Velingara	95.5%	ICON 10CS
Round 6 (2010)	Guinguineo, Koumpentoum, Malem Hodar, Nioro, Richard-Toll, and Velingara	97.9%	K-Othrine® / ICON 10CS / ICON® WP

Current Activities and Accomplishments

This period focused on the preparation and implementation of spraying activities that were conducted from May 10 to July 23, 2010, in all six health districts.

The program sprayed 254,559 structures, protecting 959,727 people, including 220,034 children under five years of age and 25,414 pregnant women. A total of 88,195 sachets of insecticide were used to cover the entire 2010 IRS round, including 68,571 K-Othrine® sachets, 5,301 ICON® WP sachets, and 14,323 ICON 10CS sachets.

Planning and Assessment

2010 Spray Season Planning

During this period, the program held many meetings as part of the preparation for the 2010 IRS operations. Discussions regarding the 2011 spray round and the selection of insecticide also took place during this reporting period.

On April 2, 2010, the chief of party (COP), Mr. Amadou Gueye; Dr. Robert Perry of Centers for Disease Control and Prevention (CDC)/PMI; and Dr. Abdoulaye Diop of Programme National de Lutte contre le Paludisme (PNLP, National Malaria Control Program) held a

planning meeting to discuss the IRS data collection. All participants in this meeting agreed on the direct entry of data from spray operator forms into a Microsoft Access database at district level. Mop-up data is recorded in separate forms used only for mop-up operations.

The COP took part in the 2010 IRS microplanning meeting in Richard-Toll on April 8, 2010, where the upcoming spray round was discussed and the timeline of activities was reviewed. A partners' committee was established to discuss insecticide selection for the 2010 IRS operations. The committee, comprised of Dr. Matar Camara of USAID/PMI, Dr. Robert Perry of CDC/PMI, Dr. Konate of University Cheikh Anta Diop (UCAD), Dr. Abdoulaye Diop of PNLN, and RTI COP Amadou Gueye, met on April 21. During the meeting, the committee noted the NMCP's concerns about using the same insecticide for IRS that is used for long-lasting insecticidal nets (LLINs) (and re-impregnation). However, due to the difficulties in changing the insecticide selection and carrying out procurement at such a late stage and the lack of other counter-indications for the use of deltamethrin, the committee agreed on the use of this insecticide in the 2010 IRS round.

2011 Spray Season Planning

Toward the end of the reporting period, the IRS partners (informal committee) met at the RTI office on August 20 to discuss the 2011 IRS objectives. In attendance were the PMI/USAID team (Dr. Camara and Dr. Perry), PNLN (Dr. Diop), UCAD/LEVP (Pr. Ousmane Faye and Dr. Konate), Service National de l'Hygiene (SNH) (Major Mamoudou Wade) and RTI (Amadou Gueye, COP). Discussions were structured around the 2011 IRS objectives, the insecticide selection, and the post-spray survey being planned by Medical Research Council of South Africa (MRC). During the meeting it was confirmed that at least six districts would be targeted for IRS in 2011. At the time, participants discussed the option of stopping IRS in Richard-Toll and Guinguineo in the next spray round. However, they decided that other malaria prevention activities such as increasing the number of nets would be planned for these districts. Since Guinguineo has low malaria prevalence compared with other districts, it was said that this district would be replaced by another with a higher malaria prevalence rate.

The participants concluded that in 2011 the Senegal IRS program will use either an organophosphate or a carbamate. Because the third set of susceptibility evaluations was occurring at the time of the meeting, the group determined that a decision about the selected class of insecticide will be made in mid-September. The informal committee will meet the fourth week of September to make a final decision on which insecticide to use.

On August 25, 2010, the PNLN coordinator requested the IRS partners to include all of the PNLN authorities in the decision on whether to stop IRS in Richard-Toll and Guinguineo. Thus, another IRS partners' meeting on the 2011 IRS objectives was scheduled for September at PNLN offices.

IRS partners met on August 27, 2010, in the RTI meeting room to prepare for the September meeting at PNLN. The attendees included the PMI/USAID team (Dr. Camara and Dr. Perry), UCAD/LEVP (Pr. Faye and Dr. Konate), SNH (Major Wade), and the RTI COP. The partners agreed on the following points:

- Data collected (entomological, parasitological, epidemiological) in Richard-Toll are enough to prove the option to cease IRS in this district.

- More data capture is needed in Guinguineo. If the participants from the September meeting insist on maintaining Guinguineo as an IRS district, the decision to stop IRS in this district could be postponed just for one year.
- Setting up a universal net coverage in Richard-Toll is important, especially if IRS is discontinued.
- It would be important to set up a team skilled in swift malaria diagnostics and malaria treatment interventions for the Richard-Toll district.
- A stock of insecticide should be kept available in case of the need for swift intervention.
- IEC for community sensitization will be needed to stop IRS in the district.

Dr. Faye was in charge of preparing a draft protocol for ending spray operations in Richard-Toll, and the COP was tasked to prepare the logistics and financial needs assessment draft for any possible future IRS operations in this district after stopping current activity. The draft was presented during the September meeting.

Procurement and Logistics

RTI rented storage facilities in the six IRS districts for storing the procured commodities for the campaign. The bulk of the procurement items (equipment and training materials) were delivered to the IRS program's central warehouse prior to their dispatch to the various sites at district level. Insecticide for use in this spray campaign was delivered to Dakar on April 23, 2010.

Environmental Compliance

In early April, the district RTI teams, in the company of their community assistants, conducted site visits to carry out a geographical reconnaissance and finalize lease agreements for operational site space. The teams rehabilitated operational sites sprayed in the previous year, and established new sites. Rehabilitation work included cleaning and maintenance of warehouses and bathing areas for spray operators, and setting up soak pit areas according to IRS environmental standards. The RTI environmental officer and her district assistants supervised the work and ensured that all sites were prepared according to environmental compliance specifications. For the sites not connected to water and electricity supply (in Malem Hodar and Koumpentoum), alternative solutions were provided such as generators and contracting local community water supply system.

In early April 2010, the program initiated insecticide vendor selection at class level. In May the NMCP approved the use of the K-Othrine^R WG 250 (deltamethrin), a pyrethroid-based insecticide that was chosen by bid after a competitive evaluation of quotations from various vendors.

Prior to the start of IRS in mid-May, the program undertook a number of environmental compliance inspections to ensure that all spray activities adhered to national and international guidelines. Inspections were undertaken in early May by a committee comprised of representatives from the Ministry of Environment (MOE), Plant Protection Directorate (DPV), local hygiene service agents, local DPV agents, the fire department, and RTI. The Nairobi regional environmental compliance officer conducted another pre-spray inspection.

He reported that the Senegal IRS program complied with environmental requirements specified in the Supplemental Environmental Assessment for Senegal.

All seasonal personnel selected to conduct IRS activities were subject to a general medical examination to assess their fitness. At the end of the spray round, another medical examination was conducted, with no major medical problems relating to IRS among any of the spray operators. Use of personal protective equipment (PPE) during the spray round minimized spray operators' occupational exposure to the insecticide.

With the aim of reducing or minimizing the potential IRS-related social and environmental impacts of IRS, the Directorate of the Environment and Classified Factories (DEEC) and its provincial branches actively participated in conducting the environmental monitoring/evaluation campaign for 2010. The directorate and the regional offices also played a key role in supervision of IRS activity during 2010. The DEEC staff participated in the training of trainers (TOT), the training of spray operators, and IRS supervision.

At the completion of spray activities in each district, the team filled in and closed soak pit areas. All empty insecticide sachets were collected and stored at the respective warehouses prior to their transport to the disposal site. Incineration of wastes took place throughout September.

Information, Education, and Communication

The nongovernmental organization (NGO) consortium led by ChildFund, in collaboration with RTI and other IRS partners, managed and conducted the IEC component.

Prior to the start of spraying activities, coordination meetings took place between the district management teams, RTI, and the ChildFund-led local NGO consortium to assess progress in IEC activities. Local administration authorities chaired the meetings, which were attended by district health officers, the RTI team, IRS partners as well as local religious leaders such as imams and priests.

RTI teams conducted courtesy calls and visits to local authorities before the spray round began. The purpose of the courtesy calls and visits to administrative, religious, and political authorities was to explain the purpose of the IRS program in their territory. This was also an opportunity to brief leaders on the program's existence in Senegal since 2007 and to seek their involvement in program implementation. Since the three new districts for 2010 had not experienced IRS previously, the RTI team's message was structured around the IRS program, the objectives and results, the reason for choosing targeted districts, and the considerable reduction of malaria seen from 2007 to 2009 due to IRS in the districts of Velingara, Nioro, and Richard-Toll. Local authorities welcomed this initiative by the RTI team and reasserted their willingness to support the IRS program implementation in the areas under their responsibility.

RTI also held community meetings targeting leaders at village and neighborhood levels. During these meetings, RTI informed participants (including administrative officers, village headmen, neighborhood leaders, notables, religious leaders, and community-based organization leaders) of IRS's positive health impact, as well as the community's role in the campaign.

During the spray campaign, IEC implementers preceded spray operators in the field to enhance sensitization and ensure that households were prepared for spraying.

Spray Operations

Prior to the start of spraying activities in each district, coordination meetings took place between the district management team, RTI, and the IEC component agency to assess progress of pre-spray activities.

In each district, the IRS implementation calendars were drafted and finalized in collaboration with health post nurses and District Health Management Teams (DHMTs). Health post nurses played a critical role in carrying out the pre-spray physical fitness testing for the spray personnel.

During the pre-IRS medical examinations, health care rooms were set up for spray operator registration, measurements, and photos.

RTI field teams also met with the health post head nurse at each site to prepare the spray operator training venue and to finalize caterer selection.

At the district level, the heads of hygiene service were involved in assigning hygiene staff supervisors to the IRS program for the 2010 operations.

The launch ceremony was discussed between RTI and the respective DHMTs, local administrative officials, and the IEC implementing agency for preparations and organization of the ceremony. Senegal's 2010 spray round officially launched on May 12, 2010, in Koumpentoum, one of the three newly selected IRS districts. The NMCP coordinator standing in for the minister of health and medical prevention hosted the ceremony, which was chaired by the prefect of Koumpentoum and the USAID director. Attendees included Washington PMI representatives, district administrative staff, health care workers, customary authorities, and local constituencies.

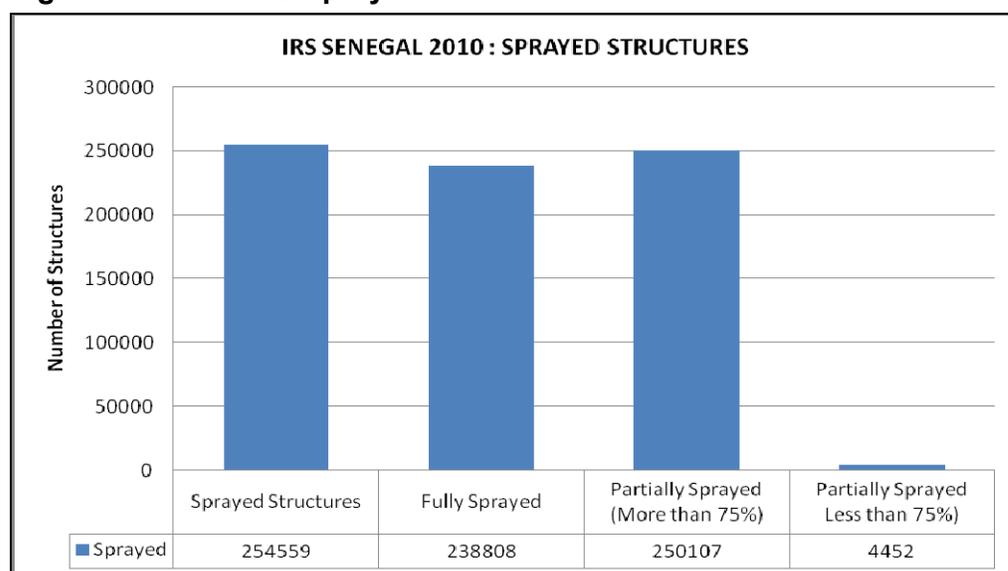
The three main speakers at the launch ceremony were the mayor of Koumpentoum, the USAID Senegal director, and the NMCP coordinator.

Spray activities commenced on May 10 in Koumpentoum and Velingara, May 12 in Malem Hodar, May 18 in Guinguineo, May 24 in Nioro, and June 9 in Richard-Toll.

IRS Results

Program implementation was successful, yielding a high coverage rate of 97.9% of the eligible structures sprayed. The number of eligible structures found was 259,957, with 254,559 being sprayed. In addition, the application rate of the insecticide was within the manufacturer's recommended range: one sachet per 4.5 rooms.

Figure 1. Structures Sprayed in 2010



The number of pregnant women protected was 25,414 and the number of children under five years of age protected by IRS was 220,034.

The total population protected is 959,727, with at least 85% of targeted structures being sprayed in 2,245 villages. It is worth noting that the coverage was less than 85% in 53 small villages that have an average of 37 structures per village.

Training of Trainers

The 2010 spray round training of trainers was held in three sessions from March 4 to 19, 2010. Session 1 involved refresher training for former trainers who had already taken part in previous IRS training. Sessions 2 and 3 were tailored for newcomers mainly from the new regions hosting the districts that will benefit from IRS in 2010. The majority of trainees for all the sessions came from SNH, while others were from the DEEC. The training facilitators came from UCAD (Pr. Faye), PNL (Dr. Diop), SNH (Major Wade), DPV (Mr. Ousmane Boye), and RTI (COP and environmental officer).

The newly recruited IRS field office staff also took part in the training workshop. RTI district field staff attended training sessions that were specifically developed for the roles and responsibilities of RTI staff. Topics covered coordination of IRS activities, time charts, progression plans, supervision of spray personnel, and finance procedures.

Training of Spray Operators

Spray team training took place in Velingara and Koumpentoum May 3–7, in Malem Hodar May 4–8, in Guinguineo May 10–14, in Nioro May 18–22, and in Richard-Toll June 3–7, 2010. The objective of the spray operator training was to produce a critical mass of skilled spray operators and team leaders for carrying out the IRS campaign in the six target districts. All training sessions were conducted according to established WHO and MOH guidelines while also drawing on experiences and lessons learned from previous rounds. RTI staff and

trainers previously trained during the TOT facilitated the training sessions. Trainers were from the MOH, SNH, the MOE, and the MOA.

Also trained during these sessions were storekeepers, washers, guards, pump technicians, and drivers. Trainers adapted the modules of spray operator training were adapted to these categories of seasonal personnel.

People Trained to Deliver IRS

Altogether, 161 temporary operational field staff and 3,117 temporary spray operation and auxiliary personnel were employed during this spray round, as shown in tables below.

Table 2: Spray Operations Personnel and Auxiliary Staff

Title	Total Staff	Title	Total Staff
Spray staff	788	Pump technicians	72
Storekeepers	42	Security guards	74
Washers	74	Water suppliers	18
IEC mobilizers	2,049		
Total			3,117

Other Activities

Entomological Monitoring

The 2010 IRS entomological monitoring activities started in early July and implementation continues at the field level.

Capacity Building of Ministry of Health

RTI continually aims to build the capacity of the NMCP in technical and managerial functions of IRS by engaging them in planning, training, and personnel supervision at the central, regional and district levels.

The following activities were implemented during the period of April–September 2010:

- Conducting training for master trainers to prepare them to provide IRS technical training to spray personnel and supportive supervision for IRS operations (TOT)
- Training spray operators
- Training physicians and nurses on poisoning management
- Training drivers, washers, and other auxiliary staff
- Facilitating the IRS partners meeting to share ideas and thoughts and build capacity of the national partners

Physician Training

The TOT for IRS-related poison management was the last event held (May 3–4) in Dakar prior to the start of spraying activities. Seven district health officers from Richard-Toll, Nioro, Kaffrine, Velingara, Koumpentoum, and Guinguineo were trained in the management of intoxication cases in IRS. Experts from the poison control center conducted the training. The trainees then gave this training in their respective districts to health post nurses to ensure proper management of cases of insecticide poisoning.

Monitoring and Evaluation

With a view to simplifying the data collection system, Senegal IRS partners (RTI, PNL, UCAD, and PMI/CDC) decided on direct data entry from spray operator forms into a Microsoft Access database.

Dr. Robert Perry, PMI advisor, delivered a training session to the district data clerks on the use of Access software. The COP, PNL IRS leadership, and PMI representatives also took part in this training. At the end of the session, participants received training awards following the closing ceremony.

On April 29, Dr. Perry conducted a training session on data entry for the IRS data clerks at the Dakar RTI office. He trained the data clerks in all aspects of the use of Access and the monitoring and evaluation (M&E) system designed for IRS. Topics included how to start the program, open the data entry screens, enter the data from the paper forms, validate the data, back up the data, and transmit data to RTI/Dakar (central level). The data coordinator at the central level was in charge of transferring the IRS data from the six districts in the master tracker. He coordinated the import, organization, and management of the centralized IRS database. The data coordinator also prepared summary reports including the weekly tracker, and liaised with other partners on IRS data collection.

The COP also furnished training to the data clerks on the entire M&E system from data recording in the field to data entry at the district and national levels.

A PMI/USAID/CDC team composed of Julie Wallace (PMI/Washington), Ellen Dotson (PMI/CDC), and Dr. Matar Camara (PMI/Dakar) performed field supervision in Koumpentoum (May 11) and Malem Hodar (May 13). During these field inspections, they assessed compliance with safety rules, storeroom inventory, and timeliness of spraying activities. At the end of their visit, they provided a few recommendations about the clarification of sprayable areas to spray teams, the improvement of the stock management, and the leveling of the soak pit area.

In Malem Hodar, the PMI team and the COP took part in the May 12 IRS debriefing meeting. RTI, World Vision, and the DHMT organized this meeting to assess the daily issues. During the meeting, they addressed points such as the progress of both IEC and technical components, and the level of community and local authorities' involvement.

Dr. Perry (PMI/Dakar), accompanied by the COP, travelled to the various IRS districts to set up the database management software. Dr. Perry also conducted field supervision in each district.

Dr. Camara, PMI/USAID, conducted a supervision in all six IRS districts, where he discussed spray round progress with the district RTI teams. Dr. Camara also visited the IRS sites where he supervised spray operators at work in the company of the RTI district coordinator.

In each district, the hygiene service agent, DEEC officers, and RTI staff also provided additional supervision.

Project Management and Administration

RTI Senegal Staff

The core RTI staff is composed of the following:

- Chief of party, responsible for oversight of IRS operations and client and stakeholder relations in the field
- Finance officer
- Logistics officer
- Environmental compliance officer
- Program assistant

The newly recruited finance manager (Mr. Babacar Mbaye) began work on August 9, 2010. He underwent training with the NRO-based acting finance manager (Mr. Alfred Maina).

District Temporary Staff

Besides the field office staff based in Dakar, RTI has recruited IRS district operations temporary staff in six of its intervention districts. These personnel are recruited for a number of months that coincide with the IRS activities in the health districts.

Table 3: Temporary District Operational Field Staff

Title	Total Staff	Title	Total Staff
District coordinators	6	Environmental assistants	6
Finance assistants	6	Data clerks	12
Logistics assistants	6	Drivers	125
Total			161

Short-term Technical Assistance

Mr. Autman Tembo, RTI senior environmental compliance officer from the Nairobi Regional office, visited Senegal April 12–19, 2010. In collaboration with the RTI logistics manager, he took part in assessing the IRS operational sites before the spray round. They visited all IRS sites in the health districts of Velingara and Nioro. During their mission, they recommended some improvements, such as reinforcing security in ICON[®] storage areas and repairing roofs of storerooms prior to the rainy season. During Mr. Tembo's visit, soak pit areas and bathing areas were installed; water and electricity was confirmed, and premises were cleaned and disinfected.

Mr. Alfred Maina from the NRO accounting section was in Senegal for three months to support the IRS team after the departure of the finance manager.

To support IRS preparations, Carolyne Njue, M&E officer from NRO, visited Senegal to ensure that the M&E system was in place and functioning well for the start of spray operations. She conducted field visits in the health districts of Nioro and Guinguineo.

Gaspard Bikwemu, NRO senior environmental compliance inspector, was in Senegal to conduct the 2010 mid-spray inspection. He visited the districts of Richard-Toll, Malem Hodar, and Nioro in the company of Mme. Aita Sarr Seck from the DEEC. They also visited incineration facilities in the hospitals of Louga, Diourbel, and Touba from July 8 to 14, 2010.

Partnership and Collaboration

The CDC/Atlanta and USAID/Washington teams took part in the PMI's 2011 Malaria Operational Plan (MOP) planning meeting on May 4, 2010, in Dakar. The RTI/IRS COP made a brief presentation for the PMI team on the progress achieved to date in the activities identified in the 2010 MOP (October 2009–March 2010).

During this meeting, the presentations mainly dealt with the following:

- Major malaria intervention areas
- Key results
- Specific challenges and opportunities
- Perspectives / next steps
- Activities that PMI should consider in preparation for the next plan

On May 5, 2010, the PMI team, the NMCP, RTI, and all IRS partners met primarily to discuss the implementation of the Malaria Committee.

Dr. Perry (PMI), the RTI COP, and the data coordinator met on July 14 to prepare the process of checking and validating the entire IRS data.

The RTI environmental officer participated in the forum chaired by PNLN on the achievements and new challenges for vector control in Senegal on July 28. She also visited with the PROPLAST plant's women's network for the recycling of the 2010 IRS empty K-Othrine[®] containers.

During this period, the COP went to the Diourbel hospital and met with administrative officials to discuss and agree upon the 2010 IRS waste incineration process. He also conducted a contact visit with the PROPLAST plant's women's network for the recycling of the 2010 IRS empty K-Othrine[®] containers.

On August 5, 2010, the RTI environmental officer took part in the PNLN workshop on the WHOPES standardization procedures. During this meeting she made a presentation on the safety measures for ecologically rational pesticide management during IRS.

Outstanding Activities

- End of spray report submission

Upcoming Activities

- Drafting of 2011 work plan
- 2010 IRS round evaluation meeting

Zambia

This semiannual report presents the Indoor Residual Spraying (IRS) program's progress in Zambia from April 1 to September 30, 2010, and highlights the program's achievements in this review period. The report also highlights the IRS activities undertaken, outstanding issues, and upcoming activities. During this reporting period, the project focused on pre-spray environmental monitoring, and the acquisition and customs clearance of IRS commodities for the support of 2010 spray operations.

Preparations for the 2010 spray campaign have faced two major challenges; (1) uncertainty over district-level spray operations funding by the Zambian Ministry of Health (MOH), and (2) issues in the shipping and delivery of needed spray campaign commodities such as personal protective equipment (PPE). In response to these challenges, USAID is providing additional financial assistance to the Zambian MOH for the payment of district-level spray operators, and RTI addressed shipping problems and delivered all PPE to the Zambia Integrated Systems Strengthening Program (ZISSP) project for distribution.

Fiscal year (FY) 2010 IRS officially began on September 21, 2010. Full-scale spraying operations are anticipated to begin on October 5, 2010.

Background

Under the United States President's Malaria Initiative (PMI) and with funding from the United States Agency for International Development (USAID) under contract GHN-I-01-09-00012-00, RTI International leads the IRS project in Zambia, in partnership with the Zambia MOH and the National Malaria Control Centre (NMCC). Since its launch in 2003, IRS activities in Zambia have grown from the initial 15 districts to 53 districts in 2010, representing 75% coverage of districts across Zambia. The 2010 IRS campaign will target 1,223,977 structures.

Current Activities and Accomplishments

RTI International has undertaken the following activities in Zambia during this reporting period:

1. The procurement of insecticides, personal protective equipment, spray pumps, and other IRS-related commodities for use in 53 districts
2. The updating and amendment of Supplemental Environmental Assessment (SEA) for both new and old IRS spray districts
3. IRS pre-spray environmental compliance inspections
4. Environmental monitoring of dichloro-diphenyl-trichloroethane (DDT), sample collection of crops and soil
5. The collection and repatriation of DDT waste to South Africa for proper disposal.

In an effort to build local capacity, RTI has worked in close partnership with the Zambia Bureau of Standards (ZABS) to conduct DDT soil and crop sample analysis. RTI has built the capacity of ZABS to conduct DDT analysis and assisted in the development of sampling

protocols. RTI also works with the Environmental Council of Zambia to establish best practices for DDT waste repatriation and environmental compliance inspections.

IRS Senior Environmental Specialist Dr. Gaspard Bikwemu completed a pre-spray environmental compliance inspection in 24 districts. Jacob Chishiba, a Zambian environmental consultant, is currently completing the environmental pre-spray inspection of the remaining districts at the time of this writing. As part of the pre-spray inspection, they have identified and quantified expired and soon-to-expire insecticides. Soon-to-expire stocks have been labeled for “first usage” during the fall 2010 spray campaign. Major findings from both environmental specialists highlight a significant need for the establishment/upgrading of soak pits and proper storage facilities in a number of IRS districts.

Planning and Assessment

In April 2010, NMCC-assembled teams conducted a 53-district needs assessment, funded by ZISSP. Participating in the assessment were representatives from the NMCC and the IRS Zambia program and key ZISSP team members. The formal assessment by the NMCC teams reported that districts who had previously implemented IRS activities have no major constraints that would affect a successful 2010 spray campaign. The assessment also reports that districts new to IRS spray activities needed a heightened level of assistance in the establishment of soak pits, storage centers, and bathing/toilet facilities for spray operators. The IRS2 project is facilitating the construction of soak pits in Chadiza and Katete districts. We are currently awaiting additional districts to invoice the IRS project for repayment of construction materials used to build new soak pits.

The program undertook “mop-up” activities to prioritize the usage of soon-to-expire DDT stocks located in Luanshya, Mazabuka, Kazungula, Ndola, Mufulira, Chingola, and Solwezi. In April 2010, soon-to-expire DDT stocks were dispersed in the aforementioned districts as part of a supplemental spray round to increase IRS coverage and use the remaining insecticide on hand.

Procurement and Logistics

For the 2010 IRS campaign, RTI International procured 192,000 sachets of alpha-cypermethrin (Fendona) and 13,440 sachets of DDT. Remaining insecticide stocks from the IRS 2009 campaign have been prioritized for use in the initial stages of spraying in 2010, followed by newly ordered insecticide stocks with a longer shelf life. The program has distributed all insecticide stocks to the appropriate IRS districts in readiness for this year’s IRS spray round.



IRS country program manager inspecting insecticides at medical stores

Environmental Compliance

1. In April 2010, IRS regional SEA director Tito Kodiaga conducted a Supplemental Environmental Assessment, recommending the inclusion of 53 districts for the FY2010 IRS campaign. This report, submitted in May 2010 to PMI in Zambia, highlighted major environmental needs and challenges across all 53 districts taking part in 2010 spray operations.
2. In May 2010, environmental chemist Melville Richards traveled to Zambia to assist with post-spray monitoring sample collection intended to complement the results of the baseline environmental monitoring conducted in late 2009 and to evaluate changes in DDT concentrations as a result of previous spray campaigns. In addition, Mr. Richards conducted in-depth trainings for in-country environmental teams regarding best practice sampling protocols. The team collected 217 soil and crop samples from six districts where DDT was used during the 2009 spray campaign. One challenge for the sampling team was that many communities had sold or consumed the majority of crops that would have been affected by the previous spray round. The environmental compliance team has taken note of a recommendation to conduct soil and crop sampling earlier in the spring. During August 2010, the monitoring team collected an additional 100 crop samples, which are currently awaiting analysis.
3. In August 2010, regional senior environmental officer Dr. Gaspard Bikwemu conducted a pre-spray environmental compliance inspection in 24 PMI-supported districts scheduled to take part in the 2010 IRS campaign.



Dr. Bikwemu conducting pre-spray environmental compliance inspections

4. In September 2010, environmental consultant Jacob Chishiba conducted pre-spray inspections in 14 additional PMI-supported districts scheduled to take part in the 2010 IRS campaign. With the successful completion of Mr. Chishiba's consultancy, 41 districts received a full pre-spray environmental inspection; the remaining districts will be inspected during the next reporting period. Major findings documented by the environmental teams were that districts new to IRS campaign inclusion in 2010 lacked proper soak pits and storage facilities for insecticide and general IRS supplies. In addition, some districts possess expired and soon-to-expire insecticides that need to be considered for usage or disposal. IRS project staff are in the process of quantifying expired and soon-to-expire stocks. A pre-spray environmental report will be ready by October 15, 2010.
5. All DDT waste associated with the IRS 2009 campaign was repatriated to South Africa-based ThermoPower Process Technology LTD in two different consignments. The first consignment was transported to South Africa in July, and all remaining DDT was transported and incinerated in August 2010.



DDT waste being loaded in a truck for repatriation at Lusaka City Council Yard

Spray Operations

- Spray operator trainings have concluded in all 53 districts participating in the IRS 2010 campaign. A total of 2,210 spray operators and 339 spray supervisors participated in a series of trainings and mobilization activities.
- FY2010 IRS spray activities officially launched on September 21, 2010, and are moving forward. Full-scale spraying operations are anticipated to begin on October 5, 2010. The 2010 IRS campaign will target 1,223,977 structures.



Spray Operators being trained and preparing for the IRS 2010 campaign

Other Activities

Capacity Building

- In July 2010, RTI environmental chemistry manager Dr. William Studabaker trained four members of ZABS in DDT analysis. Those participating in this hands-on training included the ZABS chief laboratory analyst, ZABS senior laboratory analyst, ZABS laboratory manager and the ZABS laboratory assistant. Dr. Studabaker continues to provide technical support in the analysis of soil and crop DDT testing, and he has been instrumental in the final installation of the gas chromatography-mass spectrometry (GC-MS) equipment at ZABS.
- From June 28 to July 2, 2010, IRS Zambia program manager Adrian Kamahuza traveled to Nairobi, Kenya to participate in a workshop focused on environmental compliance capacity building. Accompanying Mr. Kamahuza were Jacob Chishiba, a Zambian environmental expert, and Peter Petulo from the Environmental Council of Zambia. This workshop was designed to give key stakeholders best practice information and training intended to build capacity of both public and private sector environmental monitoring efforts.

Project Management and Administration

The IRS Zambia project office has moved to a new office location at Plot Number 248A/34, Great East Road, Rhodes Park, Lusaka, Zambia.

Partnership and Collaboration

Dr. William Studabaker, RTI environmental chemistry manager, continues to work with ZABS to build Zambia's laboratory capacity. Dr. Studabaker will return to Zambia in October 2010 to complete a mid-spray inspection for the 2010 IRS spray campaign as well as provide additional laboratory setup guidance and hands-on DDT sample analysis training to ZABS personnel.

Outstanding Activities

- Evaporation tank roofing construction is ongoing and needs to be completed in Ndola, Kitwe, Kalulushi, Luanshya, and Mazabuka districts.
- Post-spray washing stations for the spray operators need to be completed in Chililabombwe and Mufulira districts.
- The IRS project is currently constructing soak pits in Gwembe and Choma districts.

Upcoming Activities

- Attend environmental compliance workshop. Three staff members of the Zambian MOH have been identified to participate in an environmental compliance workshop in Mozambique in October 2010. Participants will include the Zambian NMCC chief officer for IRS and two Zambian MOH regional IRS supervisors. The workshop will give key NMCC and MOH personnel best practice information and training that will build the overall capacity of environmental compliance in Zambia while also creating a stable of professionals qualified to conduct future environmental compliance inspections in support of Zambia IRS programs.
- Implement the IRS 2010 campaign October–December 2010.
- Conduct mid- and post-spray environmental compliance inspections.
- Submit end of spray round report.
- Prepare IRS 2011 Work Plan and budget.