The Business Case for Indoor Residual Spraying (IRS)

A Private Sector Workshop on Comprehensive Malaria Control

Johannesburg, South Africa - October 2011
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<td>African Leaders Malaria Alliance</td>
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<td>BCC</td>
<td>Behavior Change Communication</td>
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<td>BRICS</td>
<td>Brazil, Russia, India, the People’s Republic of China and South Africa</td>
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<td>CARN</td>
<td>Central Africa Roll Back Malaria Network</td>
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<td>DDT</td>
<td>Dichlorodiphenyltrichloroethane (insecticide)</td>
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<td>EARN</td>
<td>Eastern Africa Roll Back Malaria Network</td>
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<td>Information, Education and Communication</td>
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<td>Indoor Residual Spraying</td>
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<td>LLIN</td>
<td>Long-lasting insecticide-treated net</td>
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The Indoor Residual Spraying (IRS) workstream of the Roll Back Malaria Partnership’s (RBM) Vector Control Working Group (VCWG) has been tasked with broadening and deepening private sector involvement in IRS.

On October 10-11, 2011, RBM in collaboration with GBCHealth and the Corporate Alliance on Malaria in Africa (CAMA), convened a two-day technical workshop on Indoor Residual Spraying (IRS) in Johannesburg, South Africa. The workshop, The Business Case for IRS: A Private Sector Workshop on Comprehensive Malaria Control, brought together more than 80 representatives from 15 countries and 50 organizations within the business, government and non-profit sectors. Key government officials who presented during the workshop included: the Namibian Minister of Health (Dr. Kamwi) and the Permanent Secretaries from Ghana (Dr. Anemana), Zanzibar (Dr. Jiddawi) and Namibia (Dr. Foster). Participants from the private sector included many senior corporate executives and corporate public health managers from the mining, pharmaceutical, energy and food & beverage industries. The workshop also included national malaria program managers and international health experts from the World Health Organization, the Roll Back Malaria (RBM) Partnership, University of Witwatersrand and senior policy makers (for a full list, see appendix).

Executive Summary and Key Recommendations

Key Takeaways:

• IRS is a key component of many national malaria control programs: tremendous progress has been achieved in regards to reduction in malaria cases due to IRS. However, limited human resources and mosquito resistance to insecticides pose a great threat to malaria control efforts.

• Governments can overcome challenges and take ownership of their malaria control programs by increasing domestic funding and introducing a pooled procurement policy. Governments can also seek to establish local manufacturing of certain anti-malarial commodities.

• Well-implemented IRS programs lead to major reductions in mosquito populations and malaria cases, yet these successes are rarely evaluated and documented.

• The private sector seeks to profile and publish program successes with IRS to demonstrate their efficacy and to promote broader stakeholder and community acceptance.

• The success of IRS also rests on the expertise and daily job performance of the spray operators, as these workers enter homes and apply the malaria-preventing insecticide. Extensive, high-quality, pre-intervention spray operator training is therefore critical to ensure successful implementation. This type of training requires ongoing investment and commitment at all levels.

• National leadership and stakeholder engagement at the central, provincial and local levels are essential to malaria control efforts and the success of IRS programs.

1 Pooled procurement, also known as joint purchasing, is a means for countries to save money on malaria commodities by grouping their orders together to create higher volume of demand, resulting in lower unit prices.
Executive Summary and Key Recommendations (cont’d)

Over the two days, the rich workshop discussions and presentations focused on national and regional priorities for IRS and the design and implementation of IRS program interventions. The workshop set the stage for increased corporate action on IRS as part of comprehensive malaria control efforts in Africa over the next five years.

The discussions among the public and private sector players resulted in key recommendations that are being shared with key stakeholders and follow up actions steps led by Roll Back Malaria (RBM’s) Vector Control Working Group and the regional networks (West Africa Roll Back Malaria Network (WARN); Southern Africa Roll Back Malaria Network (SARN); Eastern Africa Roll Back Malaria Network (EARN) and Central Africa Roll Back Malaria Network (CARN). Key stakeholders such as GBCHealth, the UN Special Envoy’s Office on Malaria, U.S. President’s Malaria Initiative (PMI) and the World Bank’s Malaria Booster Program will be consulted.

It was agreed that all stakeholders should identify associated roles and responsibilities, as well as timelines and milestones in reference to the following recommendations:

**Key Recommendations:**

1. The Roll Back Malaria network, (which includes SARN, EARN, WARN and CARN, should conduct a gap analysis and identify key private sector champions to attract more corporate sector involvement for IRS in their respective regions through peer-to-peer outreach.

2. Roll Back Malaria’s sub-regional networks should work with the private sector to identify appropriate representation and priorities (i.e., taxes, incentives and tendering) for regional and national-level strategic discussions on malaria.

3. National governments should develop a strategy to build regional and national entomologic capacity in collaboration with the private sector.

4. The private sector should lend its expertise to strengthen national capacity for vector control and coordinating mechanisms, including the use of regional IRS centers of excellence.

5. SARN’s existing scorecard should be amended to include private sector involvement. Malaria stakeholders should also advocate to the African Leaders Malaria Alliance (ALMA) for private sector inclusion in its scorecard.

6. National ministries should exercise leadership to align regulations and procedures for the registration of malaria control products to reduce bureaucratic barriers.

7. The World Health Organization (WHO) should use Regional Heads of State meetings to advocate for increased domestic funding, including a malaria control support plan from new investors from the BRICS countries.

8. WHO should develop joint private and public action plans to strengthen pesticide management.
Workshop Overview and Objectives

According to the Roll Back Malaria (RBM) Partnership, half of the world’s population is at risk of malaria, with 91 percent of malaria deaths occurring in Africa. Children under the age of five account for the majority of these deaths. Companies with operations in Africa are also severely impacted, as malaria negatively affects the workforce, operating costs, economic growth and productivity. In fact, a 2006 Global Health Initiative report found that close to 75 percent of companies in sub-Saharan Africa reported that malaria negatively affected their businesses. In endemic regions such as sub-Saharan Africa, the World Health Organization (WHO) recommends the scale-up of IRS as a primary intervention for effective malaria control in order to achieve the 6th Millennium Development Goal (MDG): to halt and reverse malaria incidences by 2015.

GBHealth, the Corporate Alliance on Malaria in Africa (CAMA) and the Roll Back Malaria (RMB) Partnership convened this two-day workshop to increase global private sector understanding, involvement, engagement, support and financing for the scaling-up of IRS for sustained malaria control. This high-caliber workshop was critical in gathering key players and decision-makers from the public and private sectors to collaboratively develop a strategic plan to radically curtail malaria in Africa.

Objectives:
Along with insecticide-treated bed nets, indoor residual spraying of homes (IRS) to kill malaria-transmitting mosquitoes is a prevalent preventive intervention used in malaria control programs. Several examples of successful, privately-funded, community-wide IRS programs have resulted in increased staff productivity, net revenue and an enhanced national and global image for the funding corporation. These companies have also benefited from reduced absenteeism, decreased healthcare spending and higher returns on investment.

The goal of this workshop, therefore, was to promote greater private sector involvement, support and financing for scaled-up IRS efforts for sustained malaria control. Specifically, the event achieved the following objectives:

• **Presented the business case for IRS** as to why IRS programs generate business value for companies (i.e., through reduced absenteeism and improved employee morale).

• **Profiled successful, private-sector initiated IRS programs.** Companies such as AngloGold Ashanti, Konkola Copper Mines and Illovo Sugar Ltd. cited the importance of the private sector’s role in implementing a successful IRS program and shared data on results achieved with IRS.

• **Introduced new private companies to the social and corporate benefits** of conducting or supporting IRS.

• **Shared tools and resources** to assist companies to develop and implement IRS programs.

• **Facilitated networking and knowledge-sharing opportunities** among the private sector and malaria control/IRS specialists.

• **Strengthened partnerships between the private sector and national malaria control programs** to scale up IRS programs.

AGENDA:
The workshop presentations covered the following areas:

• **The State of Malaria: The Problem, Progress to Date and Future Challenges**

• **Leaders’ Panel: National and Regional Priorities for IRS: 2015 and Beyond**

• **Private Sector IRS Programs**

• **Planning, Measuring and Financing IRS**

• **Training for IRS**

• **Safe IRS Application and the Role of the Community**

• **Collaborating with Stakeholders**

• **Country Group Session**

• **Implementing an Effective IRS Program and Lessons Learned**
The State of Malaria: The Problem, Progress to Date and Future Challenges

Dr. Kaka Mudambo, Focal Point for RBM/SARN, provided an overview of malaria and vector control. Dr. Mudambo explained the importance of IRS as a part of an integrated vector control strategy and why partnerships with the private sector have and continue to play a vital role in malaria control. Based on the Global Fund (GF) grant criteria, he outlined the progress in the region as well as the financial gaps. He also highlighted a core value of RBM: the belief that malaria control can only have sustainable success through a broad coalition of partners, including those from international organizations, national control programs, the private sector, academia and civil society.

A successful IRS program is a product of fruitful collaboration between the public and private sectors. Although IRS in sub-Saharan Africa (SSA) has been around for over 40 years, it is only within the past decade that a renewed interest has been ignited by large-scale projects. Combining the efforts of the private sector and the governments of Mozambique, South Africa, Swaziland, Zambia and Zimbabwe, these projects demonstrate the feasibility and positive impact of IRS on fighting malaria. These initiatives have provided blueprints for successful subsequent programs in Ghana and Bioko Island, Equatorial Guinea.

Through the U.S. President’s Malaria Initiative (PMI), IRS coverage has expanded in Africa from two million in 2006 to over 27 million in 2010. Despite this expansion, however, those protected by IRS in 2010 represent only a fraction of the African population at risk. The SSA region continues to face copious challenges to sustainable vector control, such as limited long-term human and financial resources, porous borders and insufficient supply of DDT.

In addition to the aforementioned challenges, successful IRS intervention demands infrastructure, planning, logistics and a skilled workforce. Reduced budgets and increasing insecticide resistance create an urgent need for partnerships and collaborations between the private and public sectors to manage and implement national malaria control programs. In countries with high malaria transmission, a scale-up and sustained support of IRS is critical to realize global 2015 MDG malaria targets.

There is a call to action for governments in malaria-endemic countries to play a significant role in overcoming these challenges by taking ownership of malaria control programs and increasing domestic funding. Furthermore, seeking the local manufacturing of certain antimalarial commodities and pooled procurement are both achievable policies that could lead to cost-savings.

The private sector can also play a role in supporting and sustaining IRS campaigns. By communicating successes and demonstrating positive returns on public health investments, the public sector can showcase the benefits of private sector-led IRS community-wide programs. Lastly, the private sector can leverage its innovative skills to develop creative solutions to combat insecticide resistance and develop the next line of antimalarial commodities.

1 The World Health Organization (WHO) recommends IRS as one of three primary vector control interventions. IRS has been in existence since the 1940s and data documenting its success in sub-Saharan Africa (SSA) dates back to the 1970s.

2 The WHO has approved 12 insecticides for use in malaria control, including DDT, which has longer residual efficacy than the alternatives (greater than 6 months when sprayed on walls).
National and Regional Priorities for IRS: 2015 and Beyond

Presenters for this session were key government officials, including: Honorable Mohammed Jidawi, Principal Secretary, Zanzibar Ministry of Health; Honorable Sylvester Dona Anemana, Permanent Secretary, Ghana Ministry of Health; and Dr. Norbert Foster, Permanent Secretary, Namibia Ministry of Health. The session was facilitated by Anna Thompson-Quaye, GBCHealth.

The session provided an overview of national and regional plans for malaria control, an outline of the risks and opportunities and the development of partnerships with the private sector.

The officials echoed that IRS compliance is close to 100 percent. IRS is a priority and the core intervention strategy of the national malaria control programs in Tanzania, Ghana and Namibia. It has been successful in reducing the national counts of malaria cases and deaths. Ministries of Health hope to expand their IRS activities in order to cover 95 percent of the population within the next five to ten years. Ministries of Health also plan to sustain IRS progress by strategically using more targeted and reactive spraying in areas with outbreaks.

With plans to increase vector control activities, the private sector can be an instrumental player in expanding IRS activities. AngloGold Ashanti’s partnership with the national malaria control program in Ghana is a great example of a successful partnership. The company’s support of Ghana’s IRS program has been an integral component of Ghana’s sustained expansion of IRS coverage. AngloGold Ashanti developed the integrated malaria control program, which began in the Obuasi mine and the surrounding community in 2006. The model exceeded the initial objective of a 50 percent incidence reduction, reporting up to 75 percent reduction in certain areas. The successful model has since been expanded in other regions of Ghana and replicated in East and West Africa.

A second example of a successful partnership is the Zanzibar Malaria Control Program (ZMCP) in Tanzania. ZMCP has shown exemplary strides in significantly reducing the burden of malaria to one percent of its population. With such low levels of malaria incidences, ZMCP is undergoing plans to transition from malaria control to elimination. This is a noteworthy turnaround for Zanzibar, which in 2004 had no access to effective malaria control technologies and 40 percent of its population of one million had been affected by malaria. Together, the President’s Malaria Initiative (PMI), Research Triangle Institute (RTI) and the Global Fund launched a multi-faceted campaign that contributed to improvements in malaria control. The campaign, which integrated vector control interventions, high IRS coverage, Long-lasting insecticide-treated nets (LLIN) distribution, prompt and effective malaria case management and education led to significant declines in malaria cases.

The third and final example is the case of Namibia, which used public-private partnerships to maintain high levels of IRS coverage and LLIN distribution, both of which have contributed to sizeable decreases in malaria incidence with reported declines of over 80 percent from 2005 to 2009. The success of the program has prompted the Ministry of Health’s decision to make plans towards transitioning to malaria pre-elimination, with the goal of being malaria-free by 2020.

* Namibia is a member of Elimination 8, a group of eight countries committed to eliminating malaria in their land.
Private Sector IRS Programs

Participants gained insights about private sector-led IRS programs and increased their understanding of the business case for IRS, as well as the management of IRS, including internal and external stakeholders.

The presenters were: AngloGold Ashanti’s Vice President of Safety, Brian Chicksen; Konkola Copper Mines’ Director of Community Medicine, Janet Sikasote; and Illovo Sugar Limited’s Group Chief Medical Officer, Dr. Paul Canter. The session provided an overview of the business case for IRS, including the indirect and direct benefits of investing in IRS, how to sell IRS internally, the reputational risks and return on investment and private-public partnerships in reference to IRS.

ANGLOGOLD ASHANTI

When assessing rationales for malaria control efforts, AngloGold Ashanti has chosen moral duty over profit to guide their actions toward meaningful global health impact, having experienced how malaria investments reduce poverty in the communities in which they work. Notable factors for their success in malaria programs include utilizing an integrated vector control strategy, including IRS, larvaciding of breeding areas and LLINS.

Malaria remains a significant threat to AngloGold, which has operations in East and West Africa. Malaria is responsible for illness and absenteeism within the workforce. For AngloGold, implementation of an integrated malaria control program in Obuasi, Ghana, was non-negotiable, as inaction would translate into an inability to operate in such a malaria-endemic region. The key to the program’s success was an effective collaboration with the national malaria control program by seeking full alignment with its priorities.

This vector control program, which has gained full acceptance from members of the Obuasi community, is comprised of three components: IRS of structures (i.e. dwellings and buildings) twice a year; larvaciding of all mosquito breeding areas; and distribution of LLINs to high-risk individuals, such as expectant mothers and children.

AngloGold has experienced ongoing success with its Obuasi malaria control program. Incidence rates of malaria for employees, contractors, dependents and members of the community declined over 80 percent over the period 2005 to 2008. The program’s success has led to its replication in other malaria-endemic regions where AngloGold has operations, including other parts of Ghana, Guinea, Mali and Tanzania.
**ILLOVO SUGAR LIMITED**

Dr. Canter noted that the history of malaria control in South Africa began with the sugar industry in the KwaZulu-Natal province. As Africa’s biggest sugar producer, **Illovo Sugar Limited** quickly came to the realization that the same environment that promoted sugar cane growth was the same environment that promoted mosquito proliferation. With over 36,000 employees, two-thirds of whom are seasonal employees, Illovo produces close to two million tons of sugar annually.

Illovo’s successful strategy for malaria control includes adopting a corporate treatment policy that regulates the use of malaria Rapid Diagnostic Tests (RDTs) in order to test for the presence of malaria parasites and uses bed nets in Illovo’s medical facilities. Illovo’s malaria control program also encourages employees to take prophylaxis and has incorporated larvaciding of targeted water bodies to control mosquito densities. In areas without public hospitals, the company offers medical services to community members.

The company maintains a close rapport with the national malaria control program and assists with malaria diagnosis and surveillance, contributing to prompt screening and effective case management. Working closely with the Roll Back Malaria (RMB) Partnership, Illovo implements mosquito control spray programs and distributes LLINs in areas that are most affected by malaria. Consequently, there has been an overall decline of 7,800 cases of malaria among Illovo employees since 2006, with half of the decrease being at its Mozambique site.

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**KONKOLA COPPER MINES (KCM)**

Copper mining requires a fit and productive workforce and is the requirement for employment with Zambia’s **Konkola Copper Mines**. From 1976 to 2000, the national incidence of malaria tripled from 121 to 321 cases per 1,000 persons. KCM felt the impact of malaria in the form of high levels of employee absenteeism, which contributed to lost man-hours and lower productivity. In response, KCM incorporated IRS in conjunction with larval control and LLIN distribution as part of an integrated vector control management strategy. It also introduced an Information, Education and Communication (IEC) policy in order to inform its workforce on the dangers of malaria and to encourage them to seek appropriate treatment that is provided free of charge at the KCM clinics. These efforts proved fruitful: KCM invested $96,700 in its first round of IRS and experienced a significant drop in malaria cases. Through its IEC work, over 1,000 cases were treated.
Key Takeaways:

- There is a business case for IRS. Corporate engagement in malaria control, when coupled with strategic partnerships with the national government and aligned with national priorities for malaria control, can contribute to a sustainable model for comprehensive malaria control.
- Companies operating in malaria-endemic regions need to obtain buy-in from all stakeholders within their organization to make the best investment and to make a difference in their workforce and their communities.
- Stakeholder relationships can determine sustainability. A successful IRS program also requires community buy-in. IRS spray operators should come from the community and ultimately, the homeowner needs to accept the IRS spray operator into his/her home.
- Since IRS programs require that spray operators enter people’s homes, sensitizing and engaging in a dialogue with community members before the spray teams arrive is critically important to get an assessment of the community’s perceptions and concerns regarding malaria and malaria control. Such dialogue can help guide decisions on the appropriate approach for IEC efforts.
- There is a common misconception that IRS is expensive. According to UK-based Merlin Group’s cost analysis,\(^5\) when done correctly with the right insecticide and the right application rate, the average cost to spray one house, which protects about 8 individuals, is approximately USD$0.86 per person. In comparison, the same size household requires at least four ITNs, at a cost of USD$4.21 per net.
- The capital costs of an effective malaria control program are small, even in comparison to employee wages. For example, according to Dr. Canter, Illovo’s total expenses were valued at R7 billion (USD$888 million). Of the expenses, R1.4 billion (USD$177.5 million) was spent on wages, whereas R2 million (USD $254K) was spent on the malaria control program.
- Once positive results are achieved with IRS, there is a need for an evaluation and documentation of successes and lessons learned.
- Working with local partners and the national and international research community to ascertain baselines, prevalence rates and resistance profiles is an important strategy to increase the likelihood of sustained success over time.

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Planning, Measuring, and Financing IRS

This session focused on an overview of how to plan an IRS program, including:

• Development of baseline and needs assessment (logistics, education, operations)
• Development and execution of implementation plan (including IEC component)
• Developing an M&E plan (key indicators required)
• Financing IRS
• Identifying partnerships and co-investment opportunities for IRS

The session provided an overview of how to plan an IRS program, including: developing baseline and needs assessments, developing and executing an implementation plan, developing a Monitoring & Evaluation (M&E) plan financing IRS and identifying partnerships and co-investment opportunities for IRS.

Freeport McMoran’s Vector-borne Disease Control Advisor Michael Bangs moderated the session. The presenters included Rajendra Maharaj, Director of the Medical Research Council’s Malaria Research Unit and John Chimumbwa, Deputy Program Director for RTI International.

Key Takeaways:

• Logistics Management is critical to the success of an IRS operation. There are several dynamics to consider when implementing IRS.
  o Infrastructure assessment
    • Availability of warehouses, operation bases, networks and health facilities
    • Availability of separate changing and washing facilities by gender
    • Waste disposal infrastructure
    • Laundry and drying facilities
  o Supervisor responsibilities
    • Equipment maintenance and protective clothing
    • Accountability
    • Training and supervision
  o Logistical preparation
    • Vehicles, protective garments, washing soap and basins
    • Reporting tools
  o Spray site assessment and preparation
    • Community readiness
    • Boundaries of the site to be sprayed
    • Details of terrain, access roads, pathways, and water sources

• Number of villages, size, structure type, materials and surfaces
  • Average sprayable surface areas per structure
• Monitoring and evaluation (M&E) is an essential part of any malaria control program, providing key data to assess performance and improve management.
  o M&E provides key data to assess performance and improve management. Indicators to guide data collection include
    • Percent population at risk protected by IRS
    • Percentage of targeted households sprayed
    • Number of non-health staff trained in vector control
• Measuring effectiveness requires examining both the outcome and the impact.
• M&E guides program refinement and measures progress.
• M&E is only impactful when documented. Unpublished results do not help to build knowledge that can strengthen malaria control programs.
• IRS is an exact science and therefore, timing is critical in order to have a successful program. When planning an IRS round, staff members must work backwards from the planned spray date and have all the necessary elements organized before commencing spray operations.
This session focused on the importance and management of spray teams. The discussions outlined the required tools and the stringent training requirements.

Presenters included Anton Gericke, Director of Avima and Ranjith de Alwis, Senior IRS Advisor for Abt Associates. The moderator was Manuel Lluberas, the Executive Director for Public Health for H.D. Hudson.

Key Takeaways:

- The success of IRS rests on the shoulders of the spray operators and their supervisors. Its success is also highly dependent on the quality of the training given to the spray operators.

- Key factors of a successful IRS training program include:
  - Training that covers all aspects of product stewardship
  - Training based on a National Malaria Control Program-Supplier Partnership with shared responsibility, transparency, good planning and communication
  - Provision of training resources (i.e., staff, site, equipment and budget)
  - Ongoing evaluation that is conducted during training and in the field
  - Ongoing training to meet different needs, including train the trainer, drill training and refresher courses

- Product stewardship is an important component of IRS training. Defined as the management of a product throughout its life-cycle, typical product stewardship for IRS involves:
  - Training
    - Insecticide application
    - Handling and storage
    - Recordkeeping
  - Technical support
    - Waste disposal
    - Chemical analysis
    - Calibration kits
    - Check lists
  - Field assessment, monitoring and evaluation
  - Development of IEC materials and campaigns
  - Exposure visits
Safe Application of IRS and Engaging with the Community

This session focused on community mobilization and education. The session also made the business case for resistance management and product stewardship, underlining the rationale for protecting the environment, the community and the spray teams.

Presenters included Anna Thompson-Quaye, Director, GBHealth; François Maartens, Director, Integrated Malaria Control Consulting (IMCC); Maureen Coetzee, Research Professor/Director of the Malaria Entomology, University of the Witwatersrand and Mark Edwardes, Product Development & Regulatory Affairs Manager, Sub Sahara Africa, Bayer. The session was moderated by Jacob W Jacob Williams, Director, Integrated Malaria Vector Project, RTI.

Discussions highlighted:
- The rationale and tools for community education and involvement
- Overview of the procedures for safe application and insecticides
- Safeguarding human and environmental health in IRS and pesticide use
- Product stewardship, quality control, storage and disposal
- Resistance management and development of new insecticides and tools

Key Takeaways:
- Safeguarding human and environmental health in IRS and pesticide use is important.
  - Spray operators are the most exposed group to insecticides in IRS programs.
- The World Health Organization Pesticide Evaluation Scheme (WHOPES) recommends four classes of insecticide for IRS
  - Organochlorines
  - Organophosphates
  - Carbamates
  - Pyrethroids
- Each class of insecticide has its own unique potential to negatively affect human health and cause environmental damage if not handled and applied correctly.

- The following general human health and environmental safeguards are required to ensure safe IRS
  - Spray operator health safeguards
    - Absorption of insecticide can occur through the skin, lungs and mouth during insecticide application.
    - Exposure to insecticides may occur when untrained spray operators handle, mix and apply the residual insecticide.
    - Specific personal protective equipment (PPE) must be used in accordance with WHO guidelines and the specific safety instructions on the insecticide product label.
    - Spray operators require training in the correct use of the following personal protection equipment to safeguard their health
      - Long-sleeved overall: prevents absorption of insecticide
- Peakless jockey cap: protects head, face and neck from spray fall-out
- Face shield/visor: protects face and eyes against spray fall-out
- NIOSH-approved half-mask respirators with disposable filters: protects nose and mouth from airborne particles of spray fall-out
- Chemical-resistant nitrile gloves: protects the hands from spills and absorption of insecticide
- Boots

• Regular supervision, monitoring and evaluation of IRS activities are important to ensure that all safety training aspects are followed.
• IRS standard operating procedures (SOP’s) should be implemented to provide guidelines for spray operators and field supervisors.
• Step-by-step work instruction lists should be developed to provide spray operators and supervisors with clear insecticide application safety guidelines.
• Pre-intervention medical screening of spray operators is required to ensure that healthy individuals are selected as spray operators.
• Cholinesterase medical surveillance of spray operators should take place if Organophosphates and/or Carbamates are used for an extended period.

○ Community health safeguards
• The communication with and sensitization of the communities living in the IRS target area to the idea of spraying is extremely important before spraying commences.
• Homeowners are required to remove all household items, including water, food, cooking utensils and toys from the house.
• All other personal belongings that cannot be removed are covered with sheets to prevent insecticide contamination.
• Homeowners are requested to vacate the house during the spraying process.
• Homeowners are requested to stay out of the sprayed house for at least 40 minutes after spraying to allow the insecticide to dry.

○ Environmental safeguards
• Environmental contamination may occur in the following instances:
  - If the insecticide storage facility and conditions are not adequate
  - If spills occur during the handling or mixing process
  - If the insecticide rinse water or packaging is not disposed correctly

○ Insecticide storeroom safeguards
• Insecticide storerooms should not be located in or near densely populated urban areas or near bodies of water:
  - The storeroom should be a designated unit custom-built for the storage of insecticide.
  - The storeroom should be well secured with controlled access and sound inventory management systems in place to prevent the leakage (theft) of insecticide.
  - Where possible, the handling and mixing of the insecticide should take place in the dedicated mixing area of the storeroom where internal sumps and impermeable floors can contain any spills.

○ Insecticide rinse water management
• Contaminated insecticide rinse water, produced on a daily basis during spray season, has a high potential for environmental contamination if not properly managed.
• Rinse water comes in the form of leftover insecticide in the compression sprayers when the application equipment is washed.
• The progressive rinse method is used to manage and control insecticide wastewater
  - Leftover insecticide from the day’s operations and rinse water is poured into the empty drums
  - The contaminated rinse water is then used to fill up the sprayers for the next day’s spraying
• The progressive rinse method recycles the daily-contaminated rinse water, a progress that virtually eliminates environmental contamination.

  o **Used insecticide packaging and containers management**
    • Disposal recommendations are specified on the manufacturer’s material safety data sheets (MSDS). Nonetheless, the following general recommendations should be implemented to prevent environmental contamination.
    • All used insecticide sachets should be returned to the insecticide storeroom on a daily basis and stored safely.
      - Insecticide containers should be decontaminated by rinsing the containers with water or household detergents several times
      - Decontaminated containers should be permanently marked “not for storage of food or water” or destroyed
    - In most cases (unless specified on MSDS), the used insecticide sachets can safely be incinerated along with other packaging materials (i.e., plastic or paper)

  • **A summary of health and environmental safeguards include**
    o Extensive pre-intervention spray operator training is required to ensure that IRS is conducted safely and effectively.
    o Operational IRS supervision is required to ensure that the spray operators apply the relevant health and environmental safeguards.
    o Regular monitoring and evaluation are required to ensure that international best practices and standards are followed.
    o The potential health risks of malaria infection far outweigh the potential health risks of the insecticides used in IRS programs.

  • **Resistance management and development of new insecticides and tools** are needed as mosquitoes are becoming increasingly resistant to insecticides.
    o All three classes of malaria-carrying mosquitoes in Africa (Anopheles funestus, Anopheles gambiae and Anopheles arabiensis) have shown resistance to insecticides.
    o There are three recommendations that malaria control managers can adopt to manage resistance
      • Rotational spraying: where different classes of insecticides are sprayed from one season to the next
      • Mosaic spraying: where different classes of insecticide are sprayed in different houses
      • Mixtures: where different classes of insecticide are mixed in the pumps and applied to households
    o One rule of thumb is that if insecticide-treated bed nets are included in the strategy to control malaria, a different insecticide should be used for IRS than what is used for the nets.
    o Additional interventions to minimize resistance also include: Integrated Vector Management, larviciding, environmental management, screening of building windows/outside openings and new product development.
    o The best guideline for resistance management is to take steps to counter resistance before the signs of resistance emerge.
VII Collaborating with Stakeholders

This session focused on the public and private sectors’ mutual benefit from IRS collaboration to improve malaria control. Discussions focused on the critical success factors for developing and strengthening partnerships with the public sector and on deepening business-to-business partnerships.

Presenters included Keziah Malm, Deputy, Ghana National Malaria Program; Chadwick Sikaala, Principal IRS Officer, Zambia National Malaria Control Program; Kaka Mudambo, Focal Point, Roll Back Malaria/Southern Africa Roll Back Malaria Network; Rose Peter, Head of Public Health, Arysta/Syngenta and Steve Knowles, Director, Malaria Control Program, AngloGold.

The session was moderated by Richard Tren, Executive Director, Africa Fighting Malaria.

Key Takeaways:

- Stakeholders play an important role in determining the success of malaria control interventions.
- Critical success factors highlighted included:
  - Identifying all the stakeholders at the onset, understanding their interests and concerns and managing them accordingly. These stakeholders include government officials, the private sector and community members.
  - The success of any malaria control program ultimately hinges on community members and their willingness to open the door to allow the spray operator into their homes.
  - The recommended steps for an effective collaboration with stakeholders are:
    - To increase cooperation, develop a calendar of events that can be distributed to all stakeholders so that they are aware of what is happening and when IRS rounds will occur.
    - Plan to involve all stakeholders at the beginning of the IRS campaign in order to ensure all parties agree on the campaign.
    - Form a committee that establishes the guidelines before the program commences and that can make incremental changes over time.
    - Work with community mobilizers, health education workers and health professionals to advocate for malaria control. Advocacy messages should include:
      - Decreased absenteeism from work
      - Increased employment in the community because people are able to work
    - Show private-sector shareholders a return on investment by sharing program data and results.
Implementing an Effective IRS Program: Lessons Learned and Key Recommendations

This session focused on operational challenges and solutions, best practices and lessons learned from implementing IRS programs and the net return on investments.

Presenters included Michael Bang, Vector-borne Disease Control Advisor, Freeport McMoRan Copper & Gold; Devanand Moonasar, Director National Malaria Programme, Department of Health in South Africa; and John Chimumbwa, Deputy Program Director, RTI International. The session was moderated by Steve Knowles, AngloGold Ashanti.

With over one million deaths each year, malaria continues to be a serious health and economic menace and efforts to moderate the impact are proving to be successful in some parts of sub-Saharan Africa. However, resurgences of infections and the increase of drug and insecticide resistance prompt a greater need for innovative strategies and collective action.

Malaria has long been deemed the cause and consequence of poverty. A 2006 World Economic Forum report stated that malaria was indirectly responsible for a country’s economy. As a major causal factor for employee absenteeism and lost manpower, workers with malaria are a threat to business productivity. It is therefore in the company’s best interest to push for public health investments, particularly in IRS, beyond their workforce and into the communities in which they operate. Moreover, as sub-Saharan Africa strives to achieve a stable infrastructure, more companies will gain interest in operating in the region. It will be to these new corporations’ advantage to understand the benefits of implementing IRS for malaria control in the community. Committing funds to IRS in the communities in which the businesses work will benefit their workers, customers and corporate reputation.

World Health Organization and the Roll Back Malaria Partnership have called for a scale up of IRS intervention. The private sector can respond by supporting national programs to build in-country vector control capacity and increase IRS coverage. The Business Case for IRS: A Private Sector Workshop successfully established the value of IRS for malaria control. Emphasizing the critical importance of strategic partnerships for sustainable malaria control programs, both private sector and government officials echoed that the laudable progress achieved by private sector-led IRS programs on a grand scale proved to be cost-effective. This workshop provided a unique platform for leaders within the governmental, public and private sectors to convene and collaboratively develop key recommendations and outline the necessary action points to which all stakeholders must commit in order to make meaningful impacts on malaria control and to achieve pre-set targets.

Key Takeaways:

• It makes business sense for those living and working in sub-Saharan Africa to control malaria. Key lessons and anecdotes of past experiences shared in this workshop offer evidence that IRS works as an effective malaria intervention. However, IRS is capital and labor intensive, requiring a long-term commitment from all stakeholders.

• Malaria intervention implementers can undermine their own successes in several ways
  o Continuing corporate “bad habits,” such as attempts to save time or effort by going forward with implementation alone. Failure to engage with host governments or the other stakeholders discussed above are likely to find that their programs falter or fail in the long run.
  o Failure to bring in specialists (i.e. M&E, entomologists) from the onset will prevent the program from establishing sound baselines. Without robust M&E systems, it is impossible to understand the impact of the intervention.
  o Lack of adequate planning for long-term commitment and investments to ensure sustainability.

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The Business Case for IRS:

A PRIVATE SECTOR WORKSHOP ON COMPREHENSIVE MALARIA CONTROL

RADISSON BLU HOTEL SANDTON
Johannesburg, South Africa
October 10-11, 2011

**DAY 1**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>08:00 - 08:30 am</td>
<td>Registration and Coffee</td>
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<tr>
<td>08:30 - 09:15 am</td>
<td>Welcome &amp; Opening Remarks</td>
</tr>
<tr>
<td>09:15 - 09:35 am</td>
<td>Objectives and Outcomes of Workshop</td>
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<tr>
<td>09:35 - 10:35 am</td>
<td>The State of Malaria: The Problem, Progress to Date and Future Challenges</td>
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<tr>
<td>10:35 - 11:00 am</td>
<td>Leaders Panel: National &amp; Regional Priorities for IRS: 2015 and Beyond</td>
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<tr>
<td>11:00 am - 12:00 pm</td>
<td>Tea Break</td>
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<tr>
<td>12:00 - 12:15 pm</td>
<td>Private Sector IRS Programs</td>
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<tr>
<td>12:15 - 13:15 pm</td>
<td>Summary &amp; Way Forward</td>
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<td>13:15 - 13:30 pm</td>
<td>Lunch</td>
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<td>13:30 - 15:30 pm</td>
<td>Closure of Part 1</td>
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**DAY 2**

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<th>Time</th>
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<tr>
<td>08:00 - 08:30 am</td>
<td>Registration and Coffee</td>
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<tr>
<td>08:30 - 09:00 am</td>
<td>Summary of Day 1 and Overview of Day 2</td>
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<tr>
<td>09:00 - 10:30 am</td>
<td>Safe Application of IRS and Engaging with the Community</td>
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<tr>
<td>10:30 - 11:00 am</td>
<td>Tea Break</td>
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<td>11:00 am - 12:00 pm</td>
<td>Collaborating with Stakeholders</td>
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<td>12:00 - 14:00 pm</td>
<td>Lunch &amp; Country Group Sessions</td>
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<td>14:00 - 14:45 pm</td>
<td>Working Groups: Reporting Back</td>
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<tr>
<td>14:45 - 15:45 pm</td>
<td>Implementing an Effective IRS Program &amp; Lessons Learned</td>
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The RBM Partnership is founded on the understanding that malaria control requires a broad coalition of partners, from the national programs, the private and commercial sector; civil society, academia, donors and international organizations in order to succeed. This is true for the Southern African Regional Network, SARN (www.rbm.who.int/mechanisms/sarn.html) and for the broad spectrum of public and private partners within the Vector Control Working Group, VCWG (www.rbm.who.int/mechanisms/vcwg.html). The purpose of SARN and the VCWG is to provide fora to bring partners together to share best practices, align strategies and to rapidly scale up and sustain malaria vector control interventions, particularly in this case for vector control, including Insecticide Treated Nets and Indoor Residual Spraying including laviciding.

VCWG is structured along eight “work streams” each drawing partners from across the public and private sectors to focus on specific technical and programmatic issues, including insecticide resistance, LLIN distribution and monitoring systems, Larval Source Management, Integrated Vector Management, Evidence, monitoring and evaluation for vector control and IRS. The VCWG supports IRS as a key, integrated component within the larger context of vector control and a comprehensive national malaria control program that includes both diagnostic and curative services as well as preventive services.

IRS in particular highlights the fruitful collaboration between the public and private sectors. Over the last decade it was the push from the Mozambique/Swaziland/South Africa, Zambia and Zimbabwe governments with the support of a number of private-sector IRS initiatives that sparked a renewed interest for IRS across the African continent and provided a foundation for a number of the national programs such as those in Ghana and Equatorial Guinea to build upon. Just within the programs supported by the US ‘President’s Malaria Initiative’ the number of persons protected from IRS has grown from 2 million in 2006 to more than 27 million in 2010. Now in 2011, after this rapid expansion, IRS and malaria vector control are entering a new phase. The emerging challenges of tightened budgets and insecticide resistance demand greater collaboration between the public and private sectors and between national programs. The private sector has much to offer in articulating “the business case for malaria control” and the economic benefit to communities and nations with well-run, cost-efficient programs. The private sector collaboration also offers opportunities for better managing insecticide resistance and innovation, development and deployment of the next generation vector control strategies and products.

SARN, helping to host this workshop, has an especially important role to play, providing a forum to facilitate country-to-country exchange, enabling programs and companies with deep and long-standing IRS expertise to provide support, encouragement and advice to other companies and national programs in earlier phases of program development. RBM is a partnership organization; it is us helping each other to achieve our common vision for the health and welfare of our companies and our communities.
OUR VISION
A global business community that is fully contributing its assets, skills, influence and reach to make a healthier world for employees, their families and their communities.

OUR MISSION
To leverage the power and resources of the business community for positive impact on global health challenges.

OUR APPROACH
- Convene and connect businesses, governments, multilaterals and civil society
- Drive the creation of high-impact partnerships and collective actions
- Provide recognition and visibility to members
- Champion best practices in business engagement on health
- Represent business in key global health settings
- Provide advisory services and guidance

PRIVATE SECTOR DELEGATION TO THE GLOBAL FUND
As the Focal Point for the Private Sector Delegation (PSD) to the Global Fund, GBCHealth works with dozens of committed businesses willing to contribute to the Fund’s agenda, working with private sector representatives to steer priorities and policies, while also ensuring Global Fund initiatives actively engage the business sector.

CORPORATE ALLIANCE ON MALARIA IN AFRICA (CAMA)
GBCHealth serves as the Secretariat for CAMA, and work with the group to help reduce the incidence of malaria by promoting the private sector cooperation on malaria control projects in sub-Saharan Africa.

www.gbchealth.org
HOSTS GBCHEALTH AND ROLL BACK MALARIA
THANK PARTICIPANTS OF THE BUSINESS CASE FOR IRS:
A PRIVATE SECTOR WORKSHOP ON COMPREHENSIVE
MALARIA CONTROL FOR THEIR INVALUABLE CONTRIBUTIONS

Seraphine Adibaku
Ministry of health, Uganda

Sylvester Dona Anemana
Ghana Ministry of Health

Ambrose Anguka
Bayer

Boniface Baah
Newmont Ghana Gold

Michael Bangs
Freeport McMoran Copper & Gold

Joy Beckett
De Beers

Basil Brook
South Africa National Institute of Communicable Diseases

Paul Canter
Illovo Sugar

Brian Chrisksen
AngloGold Ashanti Limited

John Chimumbwa
RTI International

Ross Clark
Bayer

Maureen Coetzee
South Africa National Institute of Communicable Diseases

Ranjith De Alwis
Abt Associates

Eugene De Wet
Bayer

Quinton T. Dlamini
National Public Service Union (NAPSAWU)

Valentine Doula-Mouteng
Pan African Business Coalition (PABC)

Shirley Downey
Rotary International

Peter Engelbrecht
Arysta Life Science

David Faber
Coopers Environmental Service

Bill Farrell
WEFCO Marketing International

Andrew Fasedemi
Arshan Health

Paulo Ferro
Riversdale Mozambique Limited

Paulo Ferro Junior
Rio Tinto Coal Mozambique

Nobert Foster
Ministry of Health Namibia

Anton Gericke
International SOS

Jenni Gillies
Agrimat/Avima

Jolene Girdharie
Arysta Life Science

John Govere
World Health Organization (WHO)

Arvind Gupta
Arshan Health

Nicolas Jamme
Arysta Life Science

Mohamed Jiddawi
Ministry of Health - Zanzibar

Sylvester Jobic
Bayer

Dastan Kalokola
Nganyirwa

Barbara Kennedy
RTI International

Bakari Khatab
Ministry of Health - Zanzibar

Dave Knight
Individuals - Newsletter

Jay Knott
Abt Associates

Steve Knowles
AngloGold Ashanti Limited

Lizette Koekemoer
South Africa National Institute of Communicable Diseases

Brian Leamy
GBC Health

Helen Li
Abt Associates, Inc

Manuel F. Lluberas
H. D. Hudson Manufacturing Company

Francois Maartens
Teck SA

Jerome Mafeni
RTI International

Rajendra Maharaj
Medical Research Council

Keziah Malim
Ghana Health Services

John Maseko
International SOS

Lisa Matt
Abt Associates

Adjo Mlodwo
Bayer

Eunice Misiani
National Department of Health, South Africa

Devanand Patrick Moonasar
Department of Health, South Africa

Chris Mosala
BHP Billiton

Nomusa Moyo
GBC Health

Buddy Msibi
Multi Trade Originals

High Comm. Radhia Msuya
Namibia

Peter Muthee
Tags

Kaka Mudumbo
Roll Back Malaria Southern Africa

Pius Nakoma
USAID Malawi

Marika Nanasi
Suntitoma Corporation

Burnie Nawn
JBN Consulting

Maud Ofori-Nyaney
Newmont Mining Corporation

Rosanna Nyendwa
CHAMP Zambia

Sylvester Parker
Deputy High Commissioner - Ghana

Anna Pascall
High Commission

Rose Peter
First Quantum International

Allan Pope
Arysta LifeScience SAS

Daryl Pope
Agrimat/Avima

Rebone Ramalepe
International SOS

Ildebrando Santos
GBC Health

Michael Schreiber
VALE Mozambique

Chadwick Haadezu Sikaala
GBC Health

Janet Sikasote
National Malaria Control Program, Zambia

Yedwa Simelane
Kanka Copper Mines plc

Elijah Sinyinza
AngloGold Ashanti Limited

Anna Thompson-Quaye
Zambia Integrated Systems

John Travis
Vale

Richard Tren
Westergaard Frandsen

Cristiane Tsuboi
Individuals - Newsletter

Nicholas Tyolo
GBC Health

Jasson Urbach
RTI International

Whitney White
BHP Billiton
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