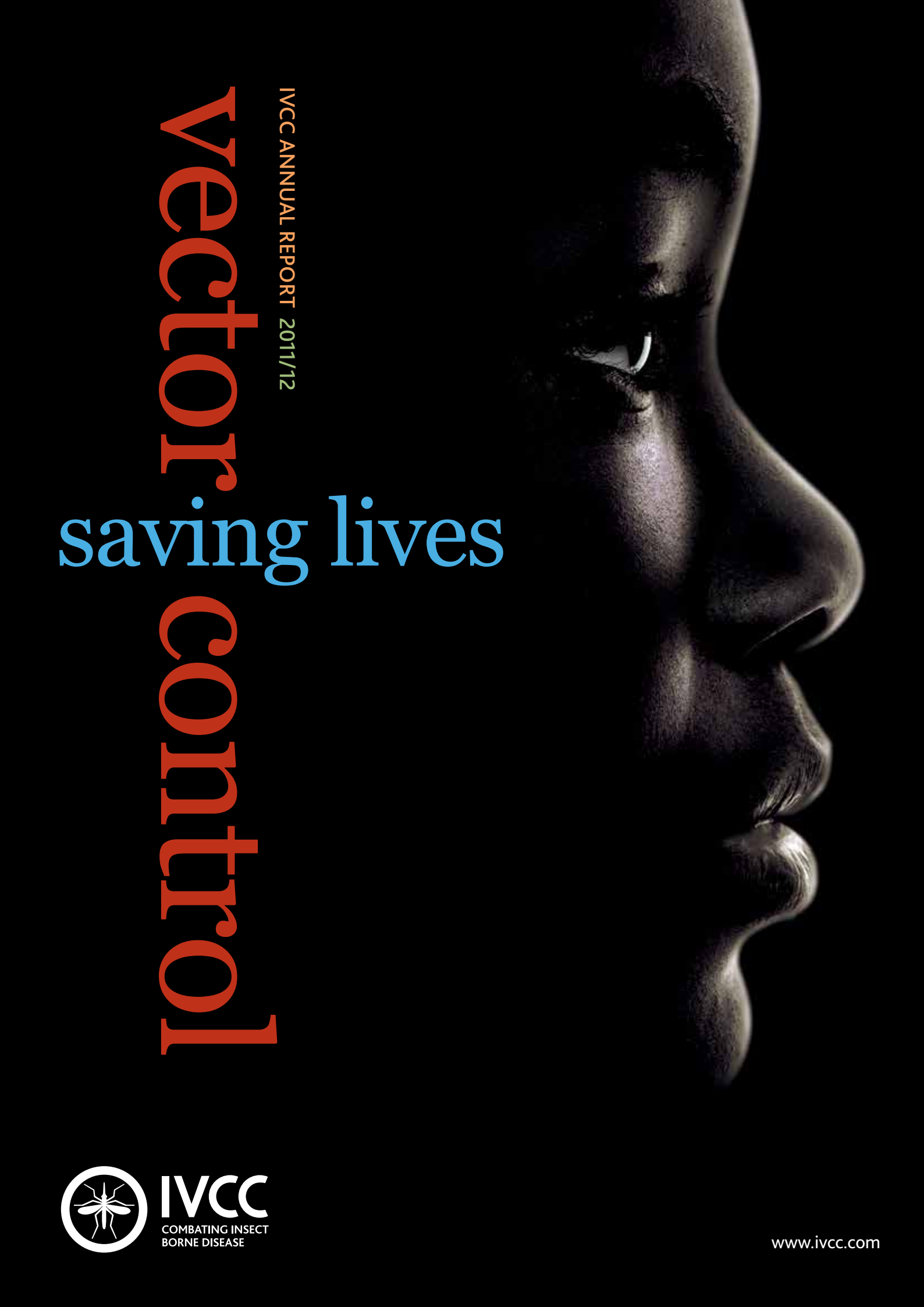
# vector control saving lives

IVCC ANNUAL REPORT 2011/12



IVCC
COMBATING INSECT BORNE DISEASE

www.ivcc.com

“greater investments are urgently required to speed up the research and development process.”

**Professor Janet Hemingway**

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Malaria mortality rates have fallen by more than

**25%**

globally, mainly due to the increased use of insecticide treated bednets and indoor residual spraying



# the challenge

“If we do not act now, more than half of the benefits of vector control could be lost.”

## Robert Newman

In the last decade, there has been remarkable progress in malaria control.

Malaria mortality rates have declined by more than 25% globally, and by more than 33% in sub-Saharan Africa. Conservative estimates suggest that over a million lives have been saved; many millions more have been protected from the harm that malaria brings as well as the economic consequences that devastate communities and countries where malaria is endemic.

Much of this progress has been due to advances in vector control – preventing infection is always better than cure. Increased protection from indoor residual spraying and the distribution of insecticide-treated bednets has been very effective in reducing the transmission of malaria, and has likely had impact on other insect-borne diseases.

Among the challenges facing modern malaria control, the development of resistance to insecticides by *Anopheles* mosquitoes in more than 60 countries worldwide, is one of the most worrisome. If the outstanding effectiveness of current vector control interventions is to be maintained, urgent and coordinated action is required to prevent resistance from spreading. At the same time, there is a pressing need for the development of new vector control tools, especially new insecticides, to meet and ultimately overcome this challenge.

If we do not act now, more than half of the benefits of vector control could be lost – with devastating public health consequences not only in sub-Saharan Africa, but throughout the world. Recent episodes of West Nile Virus in the USA and cases of locally transmitted malaria in Greece are a reminder that vector borne diseases have no boundaries. We must not be complacent.

To address these issues, the WHO Global Malaria Programme coordinated the development of the Global Plan for Insecticide Resistance Management in malaria vectors (GPIRM). Launched in May 2012, the GPIRM synthesized input from over 130 stakeholders representing all the constituencies of the malaria control community and resulted in an urgent call to action, laying the foundations for integrated insecticide resistance management practices in all malaria-endemic countries.

The GPIRM is based on five major pillars, and lays out clear actions for each pillar spanning the short, medium and long term. These include planning and implementation of insecticide resistance management; ensuring proper, timely entomological and resistance management and effective data management; developing innovative vector control tools; filling the gaps in knowledge on mechanisms of resistance and impact; and ensuring that enabling mechanisms (advocacy, human and financial resources) are in place.

These activities call for action from a wide constituency of actors in malaria control. IVCC has a crucial role to play in the third pillar – developing innovative vector control tools. It has demonstrated the strength of the product development partnership (pdp) model in the way it has brought together stakeholders from diverse backgrounds including endemic countries, academic institutions, agro-chemical organisations, regulators, implementing non-governmental organisations, and development partners.

This ability to engage the right partners from both public and private sectors in a clear and common objective of developing the tools we need to defeat malaria is essential, especially at this crucial moment in the battle. IVCC has already developed an impressive pipeline for reformulations of existing insecticides, and the ongoing search for new active ingredients is promising. But greater investments are urgently required to speed up the research and development process.

Malaria is also being tackled through the development of better diagnostic tests and treatments, and the search for a vaccine. These developments, however, are built on a foundation of universal access to vector control, which will always be central to the control and elimination of malaria.

One of the rewarding elements of being at the heart of the fight against malaria is to see how effective we are when we work together towards common objectives. That is why, knowing the reality of the enormous challenges that face us, I am both hopeful and optimistic that together we can meet the challenge of insecticide resistance, and create a world that is free from the scourge of malaria.

**Robert Newman,**
**Director, WHO Global Malaria Programme**

net gains.

# Chairman's Foreword

## This year saw the largest and most active IVCC Stakeholder Forum take place in Edinburgh, in the impressive facilities of the Dynamic Earth centre.

The Forum attracted a record number of private sector partners: practitioners from around the world; representatives of foundations and funders; members of the scientific advisory committees and board members. The presentations on progress and discussions, both in the main sessions and in the networking periods, were very animated and productive. This is clearly a result of the concrete achievements of IVCC, which vindicate the validity of the model that the founding consortium members and the founding funder, the Bill and Melinda Gates Foundation, had in mind when the original research consortium was set up.

On the Public Health Product side there are exciting developments of several reformulated compounds that overcome forms of mosquito resistance. Current products are now undergoing evaluation by the World Health Organization Pesticide Evaluation Scheme (WHOPES). Not far behind these compounds come several completely new molecules, which offer the prospects of families of new tools in vector control. There is a real possibility that these products can be fast-tracked and used to fight the increasing challenge of resistance. If resistance spreads rapidly, the encouraging progress of the last few years could be negated and reversed.

One extremely important area of work in IVCC is the bringing together of all the parties involved in the process of approval for new products: private sector organisations; research funders; governments who fund programmes; regulatory authorities and the World Health Organization; as well as those responsible for approving use in individual countries. It has become clear that this is an important initiative; having all those concerned together in a single room prevents each player simply seeing the problems that lie elsewhere in the chain of approval. It is encouraging to see how co-operation can speed up the process and help to minimise delays. The important role of IVCC as a neutral communicator was widely acknowledged at the Stakeholder Forum. Although not part of the original plan, this role may well be of great importance in speeding up the process of development and approval.

There is encouraging progress on rolling out the practical software and test kits, which IVCC has developed, allowing insect-borne disease campaigns to be easily monitored. This includes monitoring the effectiveness of insecticide-treated nets being used in campaigns. There are indications that it will be possible to give funders and users a real insight of what the most cost-effective product is, thus moving away from the tendency simply to assume that all products are more or less equivalent in efficacy and that price is therefore the overriding factor.

IVCC continues to expand its reach and develop new areas of collaboration and operation, such as the very important agreement with the Saudi Arabian Ministry of Health. As a Board, it is a pleasure to see such encouraging progress on many fronts.



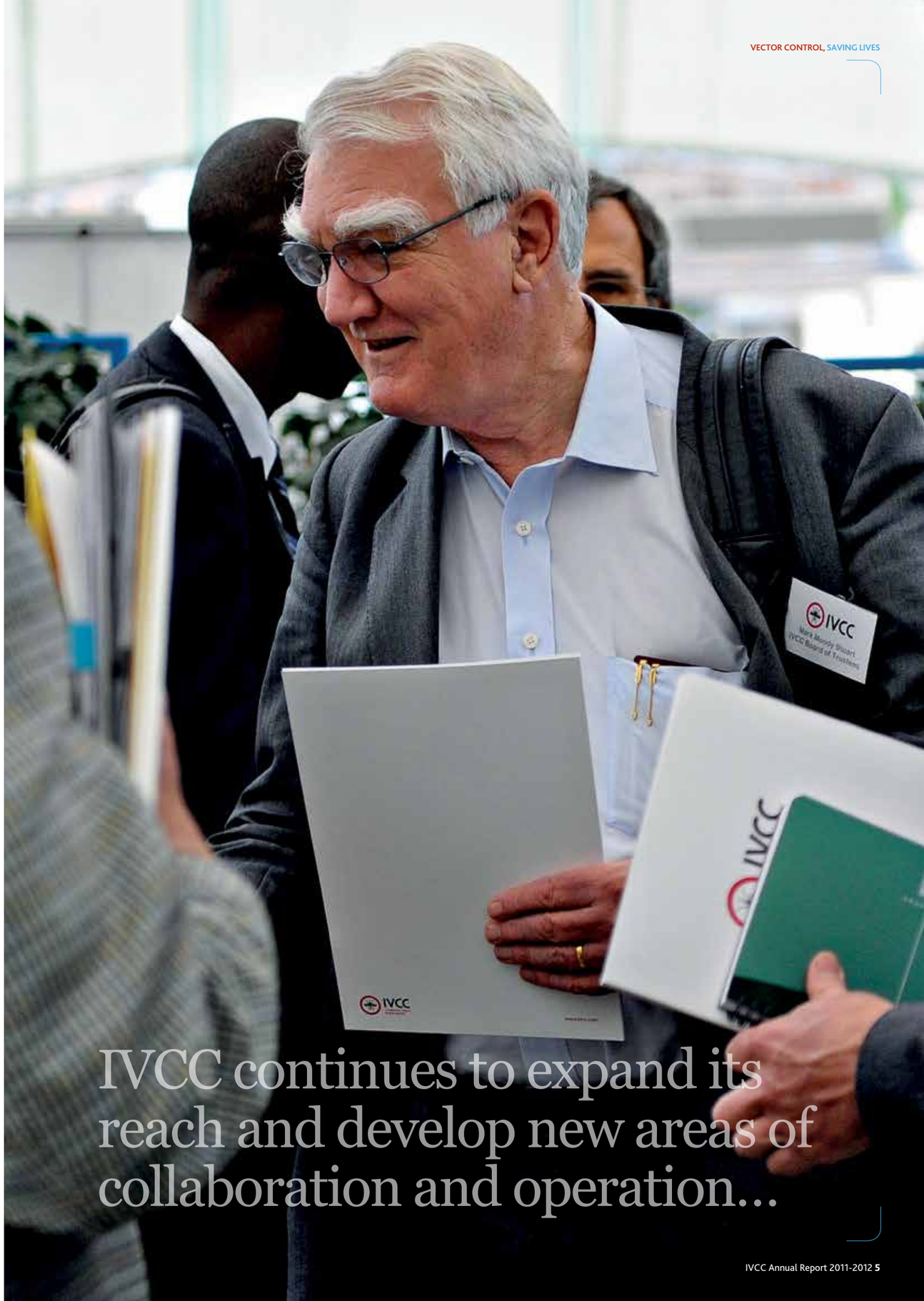
Sir Mark Moody Stuart,
Chairman, IVCC

"Practical software and test kits, which IVCC have developed, are allowing insect-borne disease campaigns to be easily monitored."

Sir Mark Moody Stuart








IVCC continues to expand its reach and develop new areas of collaboration and operation...

# call to action

## Chief Executive Officer's Report

### The need for a Product Development Partnership such as IVCC has never been greater.

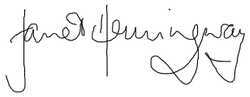
This year the World Health Organization (WHO) recognised the increasing importance of pyrethroid resistance in malaria vectors, with a call to action in the form of the Global Plan for Insecticide Resistance Management. This describes the need to develop immediate plans for reducing the rate at which resistance to current insecticides is developing, to maintain the effectiveness of vector control interventions while we await new insecticides coming onto the market.

The speed at which pyrethroid resistance has been selected in African vectors has taken many by surprise and non-pyrethroid formulations for long-lasting insecticidal nets (LLINs) and indoor residual spraying (IRS) are urgently needed to sustain the gains already made from the recent scale-up of malaria control activities. The IVCC portfolio is starting to address this issue, with a balanced range of collaborative projects designed to bring new insecticide formulations to market in the next two years, and a number of projects aimed at developing new insecticides over the next 7-10 years.

The introduction of new paradigms for mainstream vector control to complement the IRS and LLIN interventions has now become more of a priority for IVCC. We have formed an External Scientific Advisory Committee to help define the target product profiles for new paradigms and ensure that these can be rapidly brought to market. A number of these methods are currently undergoing trials in Cambodia in collaboration with the Ministry of Health and National Malaria Control Programme. These technologies are likely to have relevance to malaria control in Africa where the importance of the outdoor biting and resting *Anopheles arabiensis* mosquito is increasingly being recognised.

IVCC diagnostics and information systems projects, started six years ago, are now being put into operational use. The early adopters of the Insecticide Quantification Kits (IQK) immediately understood their value as an important tool for monitoring the quality of IRS spray activities. Initial large-scale trials of IQK, in both Equatorial Guinea and Zanzibar, immediately resulted in repeat orders of the kits for routine operational use. We are currently completing the development of these kits with funding from the Wellcome Trust, and identifying appropriate recommendation, manufacture and supply routes.

We are grateful for the continued support and commitment of our funders and partners. Together we will be able to ensure that new products for disease vector control are developed in a timely and effective manner. Prevention activities can then be scaled-up and sustained over a substantive period of time to reduce the burden of infectious diseases worldwide.



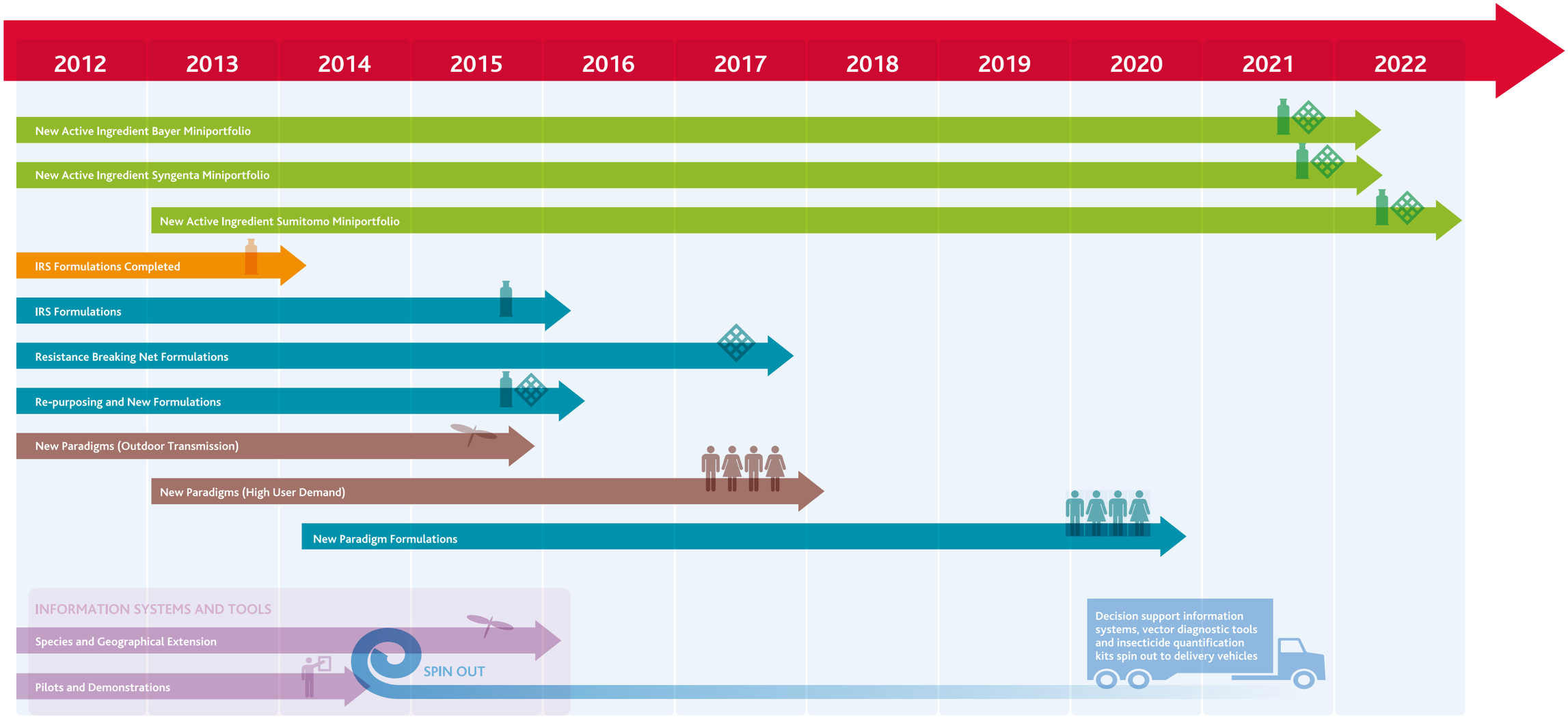
Professor Janet Hemingway,
Chief Executive Officer, IVCC

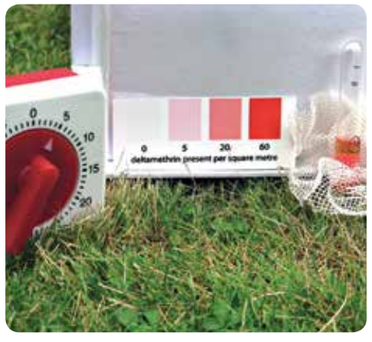


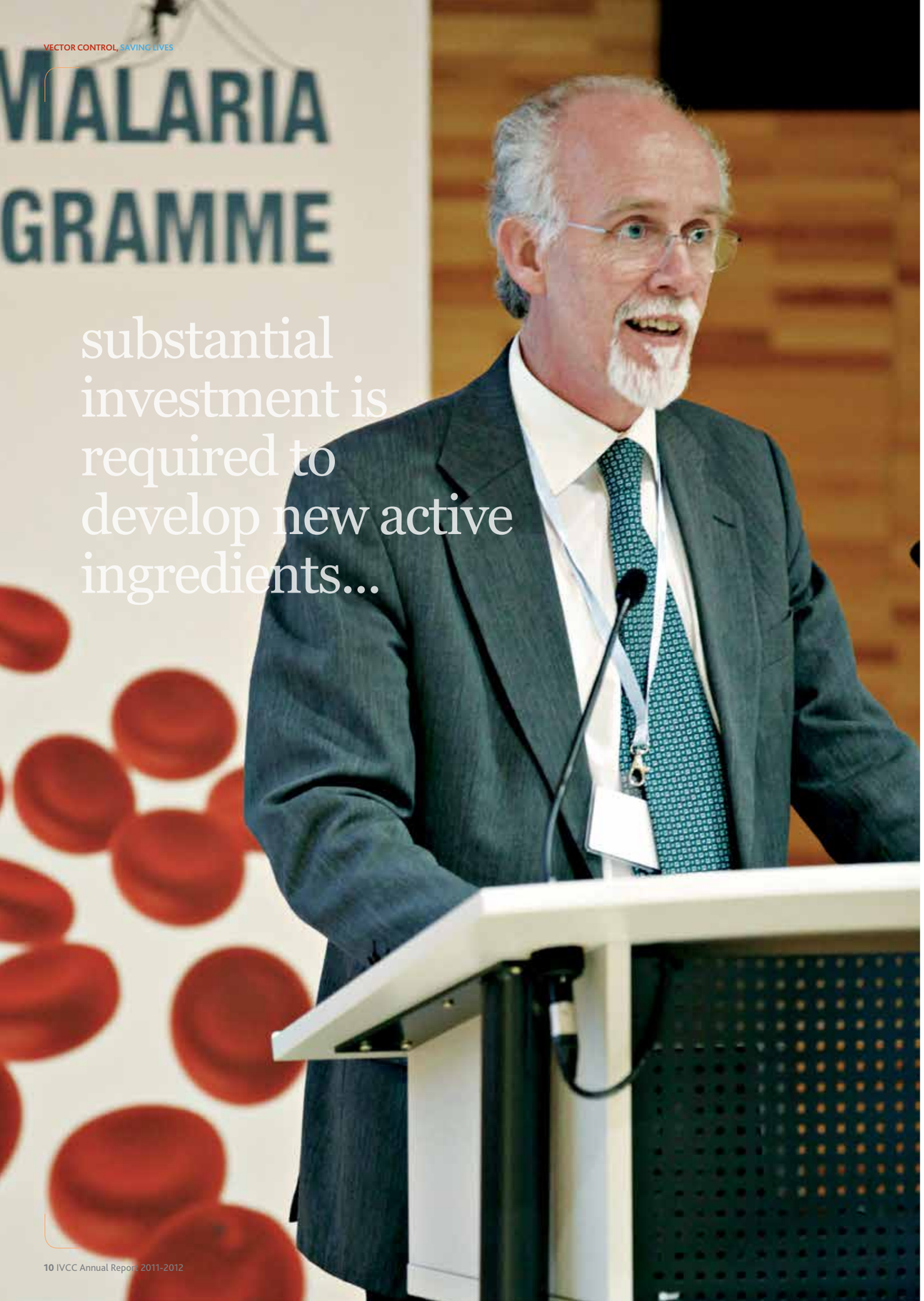


VECTOR CONTROL, SAVING LIVES

# Product Development Roadmap






substantial investment is required to develop new active ingredients...





# the way forward

## The next stages

### Chief Operating Officer Tom McLean reflects on a year of advances and future challenges.

**Q What has been the most exciting development in the vector control projects?**

A One of the most exciting developments over the last year has been the launch of the WHO Global Plan for Insecticide Resistance Management in Malaria (GPIRM). Many stakeholders in the vector control arena contributed to GPIRM, including many IVCC partners, and GPIRM has now established the global context for the crucial work IVCC is doing. It acknowledges that substantial investment is required to develop new active ingredients and, within its broad programme of action, one of the key components emphasises the need to develop new, innovative vector control tools – the heart of IVCC's mission. It is a huge move forward for us to see this progress in creating the global environment for what we are doing.

**Q How is the global recession impacting your work?**

A Recession affects all of our funders and that makes their life challenging and, as a consequence, ours too. Raising money to underpin the vital research and development that we are catalysts for is a key part of what we do, and in these more difficult times it is a challenge. As funding works on very long time scales, our funders have put in place five-year programmes, so we do not see short terms spikes and troughs. Nevertheless, the longer-term horizon in what we can ask for from our funders is more difficult now than it was 6-7 years ago, and, at the same time, the urgency of our task becomes more apparent.

"Raising money to underpin the vital research and development that we are catalysts for is a key part of what we do."

Tom McLean, Chief Operating Officer

**Q What has been challenging within product development?**

A Having all the technical aspects of the product development up and running with our partners, we realised there is a significant number of issues in the process of development that require collaboration between many stakeholders constituencies. These are issues such as the registration process, the method for managing intellectual property created, and recognising the value of vector control products as they arrive in the market place.

All of those points are not within the control of any one stakeholder and so one of the big challenges of last year has been bringing together those stakeholders that influence decisions on how to manage the issues.

**Q Will there be any close partnerships with any new companies in the next year?**

A We are always on the lookout for new partners in manufacturing and distribution. And actively seeking partners for our information systems and tools, who can take the work that we have done in creating technology platforms for insecticide diagnostics, and placing those within the market place where they can be of maximum benefit.

**Q Looking into the future, what are your next plans and projects?**

A The crucial plan for information systems and tools is focused around delivery. It is about getting them from the product development stage into physically operating in the market place. And for the work based on insecticides, the next stages are really about consolidating the product development portfolios, and delivering all the plans that have been put in place, then building the infrastructure around the technical work to deliver the whole of the programme.

VECTOR CONTROL, SAVING LIVES

# Current Product Portfolio



# the results

## Delivering new products

### IVCC's product development pipeline is delivering results, with its first new non-pyrethroid insecticide formulation becoming commercially available in 2012.

The new formulation not only increases the residual performance of the insecticide, something spray programme managers were keen to see, but also provides an effective tool for controlling pyrethroid resistant mosquitoes in the field.

Syngenta's Actellic CS is a longer-lasting formulation that comes out of an IVCC programme to examine the status of all the existing WHOPES recommended insecticides for IRS use and apply modern formulation expertise to increase residual life. The new formulation makes the insecticide more effective on more challenging surfaces, such as traditional muds used in house building in rural African communities, and reduces IRS programme costs by increasing the required interval between applications. A major challenge was the development of a stable formulation that also delivered long lasting activity.

Syngenta's existing insecticide formulation for IRS use, Actellic EC, already had WHOPES approval but was only effective for two to three months, depending upon the type of surface and environmental conditions. Prompted by IVCC, Syngenta explored a range of novel formulation options leading to the successful development of Actellic CS, which employs micro encapsulation technology. IVCC organised and supported the collaborative network of laboratory testing sites to demonstrate the efficacy of the product against pyrethroid resistant mosquitoes.

Laboratory testing at Syngenta's Stein facility, at the Kilimanjaro Christian Medical Centre, Tanzania, and the Entomological Research Centre of Cotonou, Benin led to field trials of a number of candidate formulations in experimental huts at sites in Tanzania and Benin where residual life of six months or more was demonstrated, even on surfaces such as cement and mud. Further work by Syngenta in Cote D'Ivoire provided additional support to the project.

Welcoming the commercial release of the new formulation, IVCC Chief Operating Officer Tom McLean acknowledged the partnership approach that delivered the product on time. 'The successful development of this new formulation demonstrates the strength of IVCC's product development partnership model, which brings together stakeholders from diverse backgrounds,' he said. 'We anticipate similar results both in new formulations and new active ingredients from our other development partnerships. The current pipeline for new product development is healthy, and in time will provide the urgently needed tools to stop insecticide resistance spreading, with potentially devastating public health consequences.'





# developing the next generation of vector control products...

partnerships

# Sumitomo Chemicals

## Resistance Management LLIN

Sumitomo introduced 'Olyset Net' over 10 years ago. This was the first World Health Organization recommended long-lasting insecticidal net (or LLIN) and it remains a highly effective weapon in the fight against malaria.

We recognised that, for some markets, improvements could be made in the speed of action and efficacy against both susceptible and resistant mosquitoes. This, coupled with reports of increased levels of resistance to pyrethroids and concerns that this may in some cases result in operational failure, has led to the development of an LLIN containing a combination of active ingredients designed to work against pyrethroid-resistant malaria-transmitting insects.

Sumitomo's partnership with IVCC has been very helpful in providing guidance in the complexity of evaluating such a novel type of bed net, and particularly in generating extensive lab and field data in many settings and against resistant as well as susceptible strains of mosquito.

John Lucas, Global Business Development Manager at Sumitomo said, 'It's great to be working alongside IVCC in this important venture. We have been really impressed not only by the quality of the work but also by the level of commitment and enthusiasm from the various field co-operators we have been fortunate enough to be partnered with. There is no doubt that this positive approach will help accelerate the development of this innovative product, which we anticipate will be available within a few years'.

## New Active Ingredient Screening Project

Last year Sumitomo, working in partnership with IVCC, initiated a search within its chemical libraries for novel insecticide chemistry that may have potential in the future for controlling resistant insect disease vectors. Samples selected from Sumitomo's chemical compound library have already been screened and 20% of these compounds have shown a promising activity against adult mosquitoes. Some of these have shown a level of biological activity – up to 90% of the reference standard as a contact insecticide.

> "Sumitomo scientists are excited about working together with IVCC to fight against malaria."
>
> Noriyasu Sakamoto, Chemistry Group Manager

Diverse structural portfolios of these selected compounds will help provide a guide to novel potential entities suitable for development and commercialisation.

Noriyasu Sakamoto, Chemistry Group Manager at Sumitomo responsible for this screening activity said, 'Sumitomo scientists are excited about working together with IVCC to fight against malaria. We believe that Sumitomo's long history of public health insecticide discovery will contribute to achieving this important mission.'

IVCC Chief Executive Officer, Professor Janet Hemingway said, 'We are delighted to have Sumitomo Chemical as a partner; they are a major innovator in both basic chemistry and in bed net technology with demonstrated long-term commitment to this market.'





# Building partnerships

## This year saw the IVCC Stakeholder Day move from strength to strength, bringing together private and public sector partners from around the world.

Asked to comment on the event afterwards, many stakeholders rated it as an essential part of their calendar – one commentator describing it as 'the most important meeting for the 'who is who' in vector control'.

Most stakeholders stressed the importance of the meeting for making new contacts, and gaining valuable information about recent progress in vector control.

IVCC takes seriously its role as a catalyst – bringing together the actors engaged in vector control – and is considering how to expand the stakeholder days in different contexts to make them even more inclusive, and better networking opportunities. One objective is to make more contact with people working in country control programmes.

IQK™
cost-effective,
easy to use...





the right tools

# IQK™ Quality Assurance

## A critical step on the road to eliminating Malaria is to limit infection rates by controlling mosquito populations in affected areas.

Indoor Residual Spraying (IRS) is a major control measure in the fight against malaria, and has been a significant factor in the reduction of deaths from vector-borne diseases over the past decade. The success of an IRS programme, however, depends heavily upon spray quality, and, until now it has proved challenging to assure the quality of IRS programmes.

To solve this problem IVCC has worked with leading research teams in Europe, to develop innovative new quality control technologies. Insecticide Quantification Kits (IQK™) are chemical or enzyme-based, biochemical assays that cover the insecticide classes most commonly used in IRS campaigns and can be used at or near the spray site to assess the level of insecticide present on the sprayed surface.

The IQK tests involve a simple sampling step followed by a vial or strip test with a sensor unit and a 'traffic light' type indicator. This allows immediate visual assessment of the amount of insecticide in the sample.

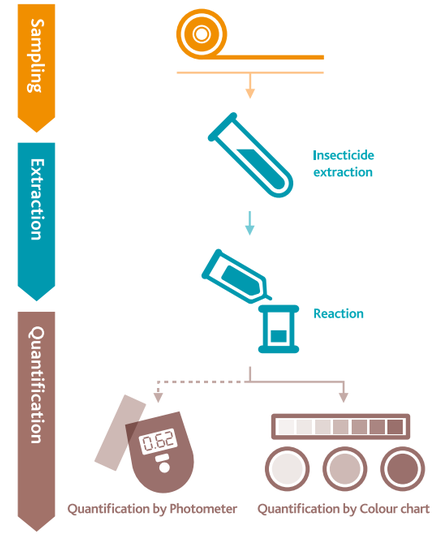
Until the IQKs were developed, the only means available to spray programme managers for testing the effectiveness of spraying were tests using live mosquitoes or high performance liquid chromatography. Both of these methods have proved impractical or unsatisfactory.

By contrast the IQKs are cost-effective, easy to use and have a unique ability to provide a rapid assessment of spray team performance so that any problems can be rectified promptly, whether by re-spraying, retraining or improved supervision. The IQK technologies have passed the "proof of concept" stage, having been proved effective both in the laboratory and also in field trials carried out as part of IRS programmes.

In Bioko Island, Equatorial Guinea, IQK field trials in 2012 demonstrated that over 4000 samples from wooden and cement sprayed surfaces matched closely with those obtained by high performance liquid chromatography in subsequent validation experiments. The application of the IQK kit in Bioko has, for the first time, allowed programme managers to see exactly how their spray teams are performing and take immediate remedial action when issues with spraying are spotted.

Similarly, in Tanzania and on the South Pacific island of Vanuatu, pilot studies of the different kit types have demonstrated that the IQK can be easily used in the field to visually determine spray quality, with information rapidly fed straight back into spray operations. Use of the IQK in Tanzania and Vanuatu provided valuable information for the quality assurance of the spraying programmes, and prompted appropriate action for improving the intervention.

IQK pilot trials have demonstrated the value of including on-the-spot testing of insecticides in IRS operations. Following the success of these field trials IVCC is now engaging with manufacturing and distribution partners to ensure that IRS spray campaign managers worldwide have ready access to these effective and convenient tools no later than the end of 2013.




| Product | Purpose | Status |
|---|---|---|
| CQK | Assess residual Carabamates level | Concept proven in the field and already supplied for repeat use by selected campaigns. Moving into production prototype stage as partner(s) are engaged |
| OPQK | Assess residual Organophosphate level | Potential development of CQK test. Proof of Principle established in the lab. Next step will be field trials |
| DQK | Assess residual DDT level | Concept proven in the field and already supplied for repeat use by selected campaigns. Further research in hand to assess potential enhancements |

monitoring

# The Malaria Decision Support System

## Monitoring and evaluation of malaria interventions and their impact are essential for understanding the progress, challenges and success of disease control.

Many control programmes, however, have fragmented or poor quality tools that are unable to efficiently evaluate those programmes. An effective system is essential for measuring the performance of a control programme, with continuous surveillance capturing real time data, issues and programmatic decisions that can be made in a timely fashion.

The Malaria Decision Support System (MDSS) project was established with the goal of developing a range of advanced tools that would assist in the operational running, monitoring and evaluation of a malaria control/elimination programme. Development of a software platform that could be configured for any environment was completed in 2011, in partnership with the Dengue Decision Support System. The final software tools operate in both resource-poor and resource-rich environments and can be tailored to operate as a single database to an integrated system, combining data from several resources, producing maps, reports and alerts for disease outbreaks.

The software, called the Disease Data Management System (DDMS), is now facing the challenge of being implemented in three very different and unique situations, demonstrating its versatility.

In Zambia following the detection of high levels of insecticide resistance, the DDMS entomology module is being used as part of insecticide resistance monitoring. This complements the recently published Global Insecticide Resistance Management Plan by the World Health Organization, which emphasises the essential role of accurate recording and reporting of entomological indicators in disease control programmes.

A Spanish version of the software has been developed for the Bioko Island Malaria Control Programme off the African coast of Equatorial Guinea. This highly successful programme has developed and implemented several excellent tools for monitoring, evaluation and surveillance that has resulted in significantly reduced levels of disease. The DDMS will be used to allow the integration of the data from individual systems, and has also been configured to allow remote access by partners, allowing up-to-date investigations of data sets from any location.

The Kingdom of Saudi Arabia is one of 32 countries with a goal of malaria elimination aimed at reducing malaria incidences to well below 1 in 100,000 people. To achieve this they need adequate information systems, and the DDMS, which is currently being Arabised for their malaria elimination programme, will enable them to cover all aspects of the programme from interventions to tracking of individual cases and disease outbreak alerts.

By combining the Dengue and Malaria decision support system projects a unique platform has been successfully developed and is now in the process of being implemented in several diverse settings. While the current implementations are for malaria programmes, the combination of the diseases has resulted in a platform that will suit most vector -borne disease control programmes.

For more information download the screencast at www.ivcc.com/downloadables/index.htm





effective tools for monitoring and evaluation...

the books

# Finance Report 2011/12

## Financial Audit and Governance

IVCC is a not for profit company limited by guarantee with charitable status in both the UK and the US. The annual statutory accounts of IVCC are audited by Grant Thornton UK LLP and are produced using the Statement of Recommended Practice: Accounting for Charities (SORP) issued in March 2005. This ensures compliance under both the Companies Act 2006 and amended Charities Act 2006.

IVCC benefits from shared accounting and audit arrangements with its host institution the Liverpool School of Tropical Medicine (LSTM). A finance and investment committee made up of senior employees and trustees external to the organization give governance oversight on all financial operations of IVCC and meet 4 times a year. A specialist taxation service is provided externally. The team has extensive knowledge of all major funders within the sector and the expertise to comply with all external funder audit requirements.

All internal audit work is carried out by an independent external organization whose remit is to provide independent and objective assurance to add valve and improve the organisation's operations. This is carried out through the evaluation and improvement to risk management, governance and control processes. An audit committee exists to oversee all recommendations made.

This year saw a significant investment in upgrading the financial reporting system to accommodate the increasing complexity in donor reporting needs. An equally significant investment is under way to expand the capabilities of the research database reporting tool. This will be fully rolled out in early 2013.

## Financial Performance

2011/12 saw a significant increase in programme activity, with total spending reaching £6.1million up from £4.3 million in 2010/11.

A total of £4.5 million was spent directly on charitable project activities with a further £0.6 million paid out on related project supporting activities. Core administration support costs of £1.0 million were also incurred. This represents 16% of total costs and will fall to 12% during 2012/13.

Several activities that are currently undertaken by senior staff within IVCC such as fund raising, advocacy, and new paradigms portfolio management are planned to grow in importance and scope within the next year. This has caused IVCC to create specific roles funded by our core Gates Foundation grant to deliver those objectives and the majority of these positions were filled during the year.

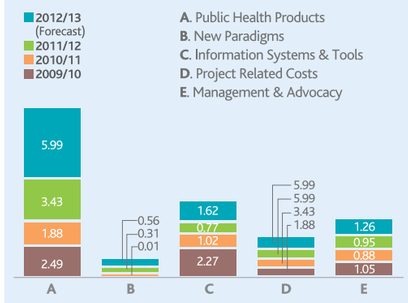
A scaling up of research activity for 2012/13 has begun as the new active ingredient projects gain momentum and this will see an increase in product development costs.

Costs for new Tools and Technologies will move onto funding from other donors as the final tranche of the initial BMGF award is spent.

## Interest

IVCC continues to use a conservative investment strategy using a combination of money market deposits and secure US government and corporate bonds, in line with current unsettled market conditions. Consequently, returns are low on both the sterling and dollar funds held. The total interest received during the year was £36k and this will be used to fund future project activity.

**Expenditure by Research Area (£m)**

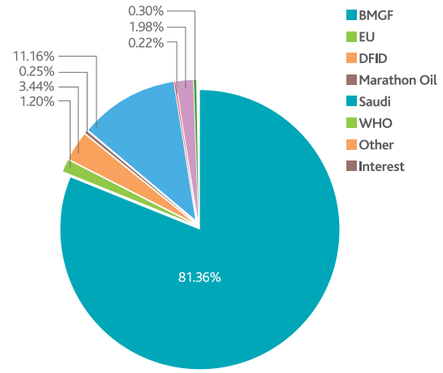





## Funding Mix

IVCC's current work is entirely reliant on grant funding. Over the past few years IVCC has been working hard to attract new sources of funding and reduce its reliance on any one donor. As a result of these efforts, next year will see BMGF's funding reduce to 81% of the total budget, down from 84% this year and 96% the year before and the number of funders expand to 8.

**2012/13 Budget by Funder**




## Funding Requirements 2012-2022

Forecasting various long term funding and income scenarios enables IVCC to manage its product portfolio more effectively. It also provides a base analysis for fundraising activities aimed at financing the portfolio in line with the latest projections.

Given the continuing uncertainty in the financial environment and market conditions, it is clear that the portfolio and new potential fundraising opportunities have to be managed even more dynamically than in the past.

The total funding required to enable IVCC to meet all of its current objectives up to 2022 is dominated by the new active ingredients portfolio. Year on year funding steadily rises from 2012, peaking in 2017 at $50.55 million before dropping off by 2022 at $12.97 million.

Substantial investments from the first five years of IVCC have created products such as insecticide combination nets, resistance monitoring tools and insecticide diagnostics that are ready for field implementation and only small investments are now needed for field demonstration of these products.

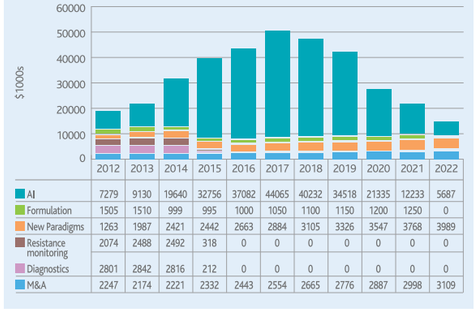
Until now the funding of active ingredient development has been structured to focus on ensuring that the early stages of AI screening and optimization are well funded in order to fill the pipeline with enough suitable candidates to cope with the anticipated failure rates and to maximize the opportunity to find a candidate with substantial agricultural application that will attract high levels of industry partner funding. The strategy has been particularly successful and the technical performance of the pipeline suggests that 3 new active ingredients are indeed achievable if suitable funding is forthcoming.

However, by the pre-trials development stages the funding rate falls short of that demanded by the cost model and funding needs to be secured to take promising lead candidates to the next phase. Routes to coping with this funding rate include:

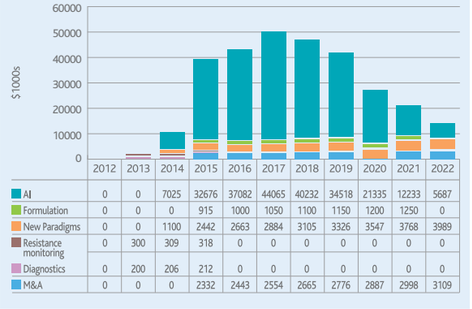
1. Increased co-funding from the partner companies (especially if any agrochemical applications emerge).
2. Alternative donor funding.
3. High risk strategy of reducing the number of candidates in the pipeline and risk non delivery.

Efforts to tackle this shortfall are under way with the creation of an advocacy and a fundraising position within IVCC's core team.

**Total IVCC Funding Requirement**




**Analysis of Gap by Product**



"If nothing is done and insecticide resistance eventually leads to wide-spread failure of pyrethroids, the public health consequences would be devastating: much of the progress achieved in reducing the burden of malaria would be lost."

**Professor Janet Hemingway,**
**Chief Executive, IVCC**

IVCC
COMBATING INSECT BORNE DISEASE

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