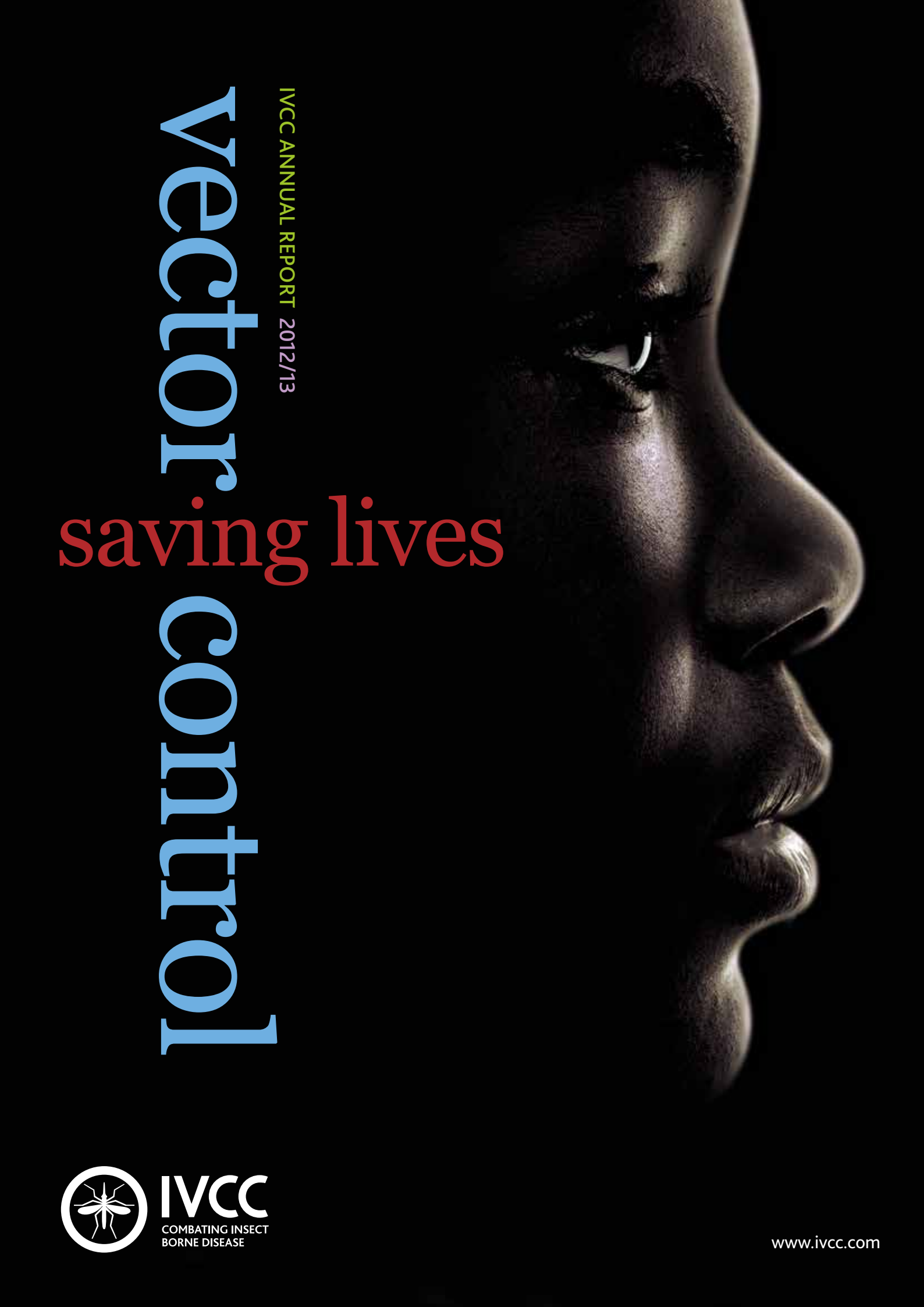
vector control saving lives

IVCC ANNUAL REPORT 2012/13



IVCC
COMBATING INSECT BORNE DISEASE

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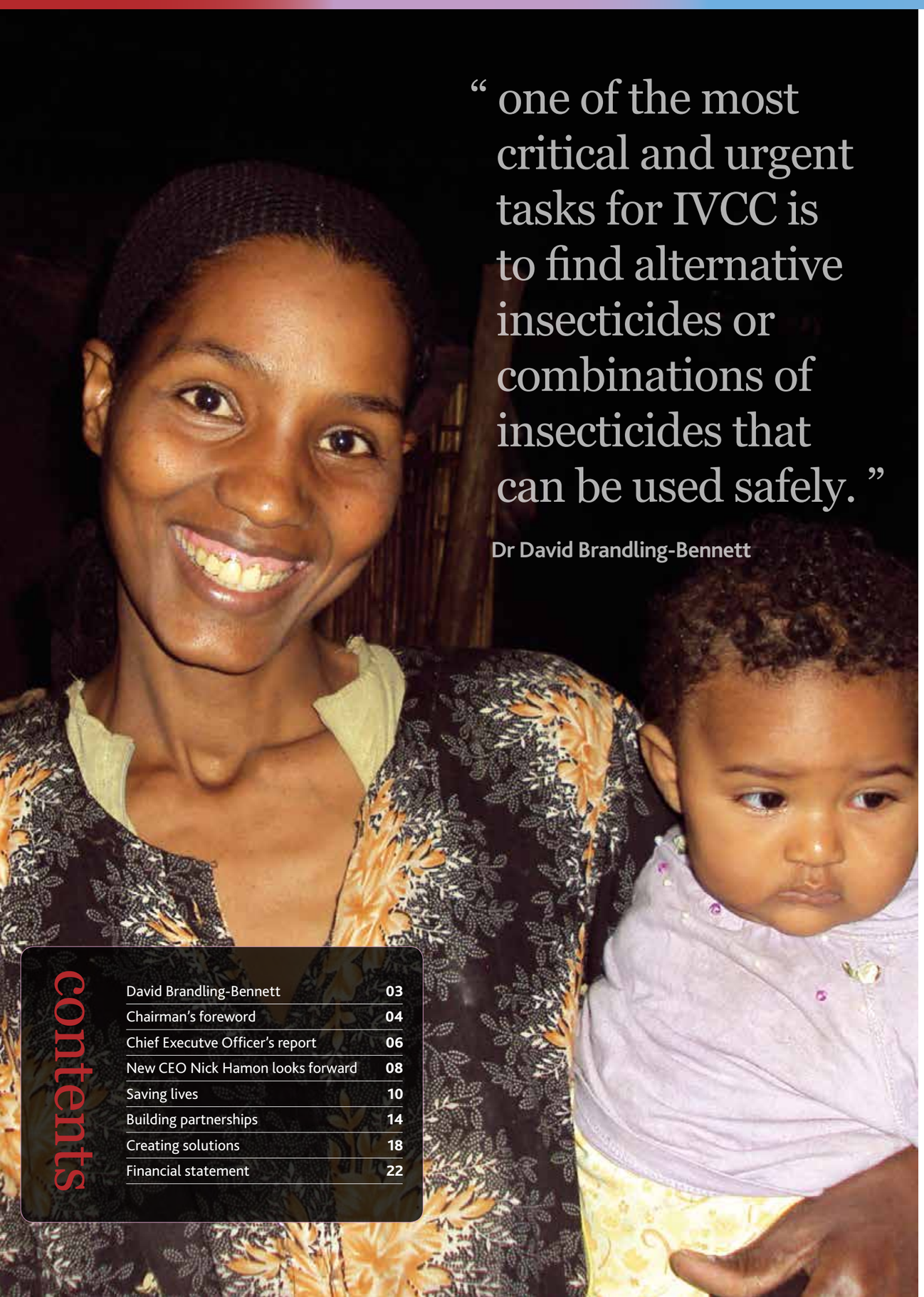

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David Brandling-Bennett

Tipping point

IVCC is moving to meet the resistance challenge

At least three new active ingredients are needed ... to prevent the emergence of resistance to the new insecticides.

The unprecedented progress in the last ten years against malaria is threatened by several factors, and many of these factors also challenge efforts to prevent and control other vector borne diseases. Foremost among these is resistance by vectors to one or more of the four classes of insecticide used in public health. There is widespread concern that in some locations we are approaching a critical tipping point, where our ability to control an important vector with insecticides may be lost and high-level resistance could spread.

The situation with insecticide treated bednets (ITNs) is even more critical, because only one class of insecticides, pyrethroid, is approved for use. The hundreds of millions of nets distributed in the last few years are putting selective pressure on malaria vectors when we have limited alternatives. Therefore, one of the most critical and urgent tasks for IVCC is to find alternative insecticides or combinations of insecticides that can be used safely on bednets or other materials with which people have close contact.

The search for new active ingredients (AIs) is time-consuming and expensive, with the total cost affected by whether a new AI has other uses, particularly in agriculture. At least three new AIs are needed to allow the use of rotations and mixtures to prevent the emergence of resistance to the new insecticides.

The situation with indoor residual spraying (IRS) is perhaps less critical because we have four insecticide classes that can be used, although resistance to these classes is common. Rotation of insecticides used for IRS is recommended; however, alternative insecticides are often considerably more expensive, and increased costs may reduce the number of dwellings that spray programs can reach. Some cost reductions may be achieved by developing longer acting or more effective formulations of insecticides, which IVCC has done.

Developing new formulations and new AIs is not the only approach to sustaining and improving vector control. Other tools and approaches can also be effective against vectors. Efforts are underway to develop new tools (often called new paradigms) that can modify vector behavior with less dependence on human behavior. Such measures could be used by communities to reduce disease transmission in ways that go beyond individual protection.

New paradigms have two potential advantages. One would be as supplements to ITNs or IRS. For example, a spatial repellent used in a sleeping space might provide added protection when people get out of a bednet during the night or fail to use the net properly. Perhaps more importantly, new paradigms could be effective against outdoor biting and resting vectors. New paradigms that can control such vectors are needed to achieve effective control of malaria and other vector borne diseases in many parts of the world.

By applying its knowledge and skills in working with the private sector, IVCC plays an important role in the development of new paradigms. This is a relatively new area of work for IVCC but one which is needed and holds considerable promise. However, that work and the development of new AIs, which is critical, will require considerably more resources than IVCC currently has. The mobilization of more funds from more donors and the greater commitment of industry to public health goals are major challenges and priorities for IVCC.

With the leadership of its new CEO, Nick Hamon, ongoing dedication from the IVCC staff and the Board of Trustees, and the continued support of the Liverpool School of Tropical Medicine, IVCC is positioning itself to meet that challenge. Further support from the international community and the private sector can ensure that we build on the enormous progress made against malaria in the last decade and achieve our ultimate goal of eradicating this scourge altogether.

Dr David Brandling-Bennett,
Senior Advisor for Malaria, Global Health Division
Bill and Melinda Gates Foundation

Chairman's foreword

Transition

A year of critical change for IVCC

In the few short years of its existence IVCC has achieved significant success.

The year has been one of critical transition for IVCC. We appointed Nick Hamon as Chief Executive Officer in succession to Janet Hemingway, the founding force behind IVCC. We are very fortunate that Janet will continue to be closely involved in IVCC, not only as Director of our host institution, The Liverpool School of Tropical Medicine, but directly in some of the work of IVCC. We are equally fortunate to have found Nick Hamon, who brings to the job thirty years of research and commercial development in crop science.

In the few short years of its existence IVCC has achieved significant success. Tools to allow planning and evaluation of vector control campaigns have been developed, and practical insecticide quantification kits have reached the point where they can be commercially manufactured. Both these products will lead to more effective control campaigns and the prevention of waste.

At the same time, working in partnership with our commercial partners, two new long-lasting insecticide formulations are already in use in the field, and there are nine very promising new classes of insecticide from our partners in the IVCC portfolio.

So IVCC is now in a transition phase. The practicality of the original vision, urgently developing products to overcome growing insecticide resistance, has been clearly demonstrated. Now we need to bring the new products to commercial development. This involves a step change in the funding required. To achieve this we need to do two things.

Firstly, we have to work very closely with our commercial partners to bring the new products to the market. To achieve this our partners have to be convinced that it is worth diverting scarce skilled scientists from other projects that may have greater commercial potential. This will be faster and easier if the new products have applications in other fields such as crop protection.

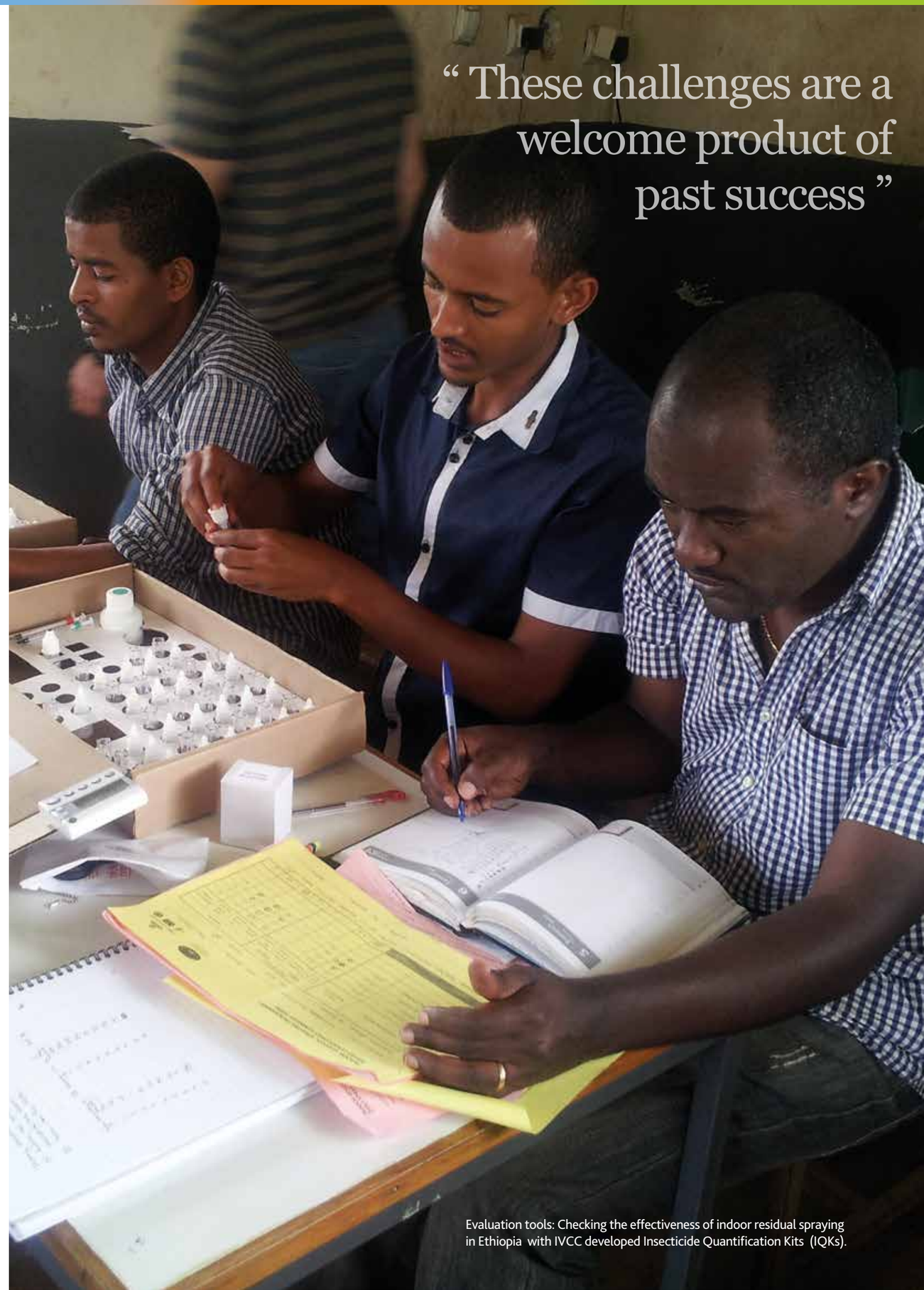
So we need to bring a very commercial mindset to our own work. This is not just a matter of funding, but of working to understand the essential commercial priorities of our partners, without which none of their work would be possible.

Secondly, additional sources of funding will be needed to fill the gap caused by the step change in expenditure needed to develop and test the new products identified. We have been fortunate to receive two major grants totalling $100 million from the Bill and Melinda Gates Foundation. We are now beginning to attract significant funding from development agencies. We will have to demonstrate to all such funders the absolutely essential role of vector control in the campaign to eradicate malaria.

Products of IVCC will be essential tools in this campaign and we can demonstrate that the return for expenditure of funds is much higher for vector control than for drug or vaccine development, even though these are also essential in the fight against insect borne diseases.

At the same time we will need to win financial support from companies who are not partners in the vector control field, but who have commercial operations in disease endemic areas or who, as part of an overall contribution to sustainable development and the health of societies, would be prepared to contribute to the fight against these diseases. At the same time we need to continue the search for new commercial partners and new unconventional applications with potential for vector control.

I feel confident that under the leadership of Nick Hamon and with the continued support of Janet Hemingway, the Liverpool School of Tropical Medicine and all our partners we are well placed to address these new challenges. These challenges are, after all, a welcome product of past success.



Sir Mark Moody Stuart,
Chairman, IVCC

Evaluation tools: Checking the effectiveness of indoor residual spraying in Ethiopia with IVCC developed Insecticide Quantification Kits (IQKs).

Chief Executive Officer's Report

A step change

IVCC has achieved its first objectives

It is almost a decade since Rick Klansner, the head of the Bill and Melinda Gates Foundation's Global Health Team, challenged myself, Barry Beaty and the late Brian Sharp to integrate our vision of the vector control products needed to bring about a step change in malaria and dengue disease prevention.

After much discussion and detailed negotiation, IVCC was established in November 2005, as a grant to the Liverpool School of Tropical Medicine supporting a consortium of five academic institutions. They were challenged with bringing their information systems and diagnostics through the translational product development space into operational use, and engaging the agrochemical industry in a collaborative partnership to bring new insecticides and better formulations to the market for dengue, malaria and other insect-borne disease control.

With only one part-time staff member and a US$50M grant at the outset, few people imagined the transformation that would be achieved in just eight short years.

Few people imagined the transformation that would be achieved in just eight short years.

The information systems for malaria and dengue have been combined into a single platform and is increasingly being used by operational disease control programmes. Next year the system will be expanded to include visceral leishmaniasis control.

The diagnostic systems for insecticide resistance detection and field based insecticide quantification have been developed. The quantification kit is being produced commercially in South Africa and these tools are already being used to assess the effectiveness of insecticide-based control programmes in Africa, Asia and the Pacific.

The agrochemical industry has embraced the IVCC product development partnership model, and has worked with us to develop and launch two new long-lasting indoor residual spray formulations.

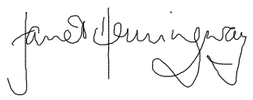
A healthy pipeline of projects is underway with several key industrial partners to produce new public health pesticides. These will be the first new insecticide classes coming into the market in over 30 years.

IVCC has transitioned from a consortium to a separate legal entity, registered as a charity in both the UK and USA. We have achieved the step change from single to multiple donor support, with DFID, USAID and others providing funding alongside the Gates Foundation, who refinanced us in 2010.

In April 2007, with Brian Sharp's death after a long battle with cancer, the world lost one of its leading malaria control experts, and IVCC lost one of its greatest advocates. Barry Beaty retired from the IVCC management group in 2013 to concentrate on his well-earned retirement, which for him meant running a new cutting edge nano-particle pesticide delivery programme.

This also seemed like an opportune time for me to relinquish my role as IVCC CEO. I am delighted that Dr Nick Hamon has been appointed as the new CEO. His career could not have been a better apprenticeship for this role.

With the backing of Nick and the IVCC board I am now settling into a support role, ensuring that donor funding continues to flow and bringing to bear 30 years of practical operation control and insecticide resistance know-how as it is needed. I am certain that, with the team we now have in place and the network of support and commitment from our partners, that the goals of IVCC will be fully achieved and the organisation will fulfil its mission.



Professor Janet Hemingway,
Chief Executive Officer, IVCC

" these new public health pesticides will be the first new insecticide classes coming into the market in over 30 years "

Nick Hamon

Looking ahead

IVCC will deliver its mission

IVCC is on track to identify and promote three novel active ingredients into full development within the next 18 months.

Vector control, through the use of insecticide treated bednets (ITNs) and indoor residual spraying (IRS) has and will continue to save millions of lives, improve health and reduce poverty. However, mosquitoes are rapidly developing resistance to all four chemical classes of insecticides and the gains made in the past ten years could be lost if we do not create a new generation of insecticide tools. Vector control tools are needed to partner with drugs and vaccines on the journey towards eradication of malaria and other neglected tropical diseases around the world.

Seven years ago it took the vision of Professor Janet Hemingway and the trust and leadership of the Bill and Melinda Gates Foundation (BMGF) to create IVCC, a small team of committed scientists focused on catalysing innovation in vector control. No new chemistries have been developed in the vector market for more than 30 years because, as Bill Gates said in a 2009 Ted talk, "the market does not drive the scientists, the communicators, the thinkers, the governments to do the right things".

IVCC is on track to identify and promote three novel active ingredients into full development within the next 18 months. Bringing new innovations to market is not a quick process; it could take more than six years to get these new technologies into practical use. We cannot afford to be patient as new tools are needed today.

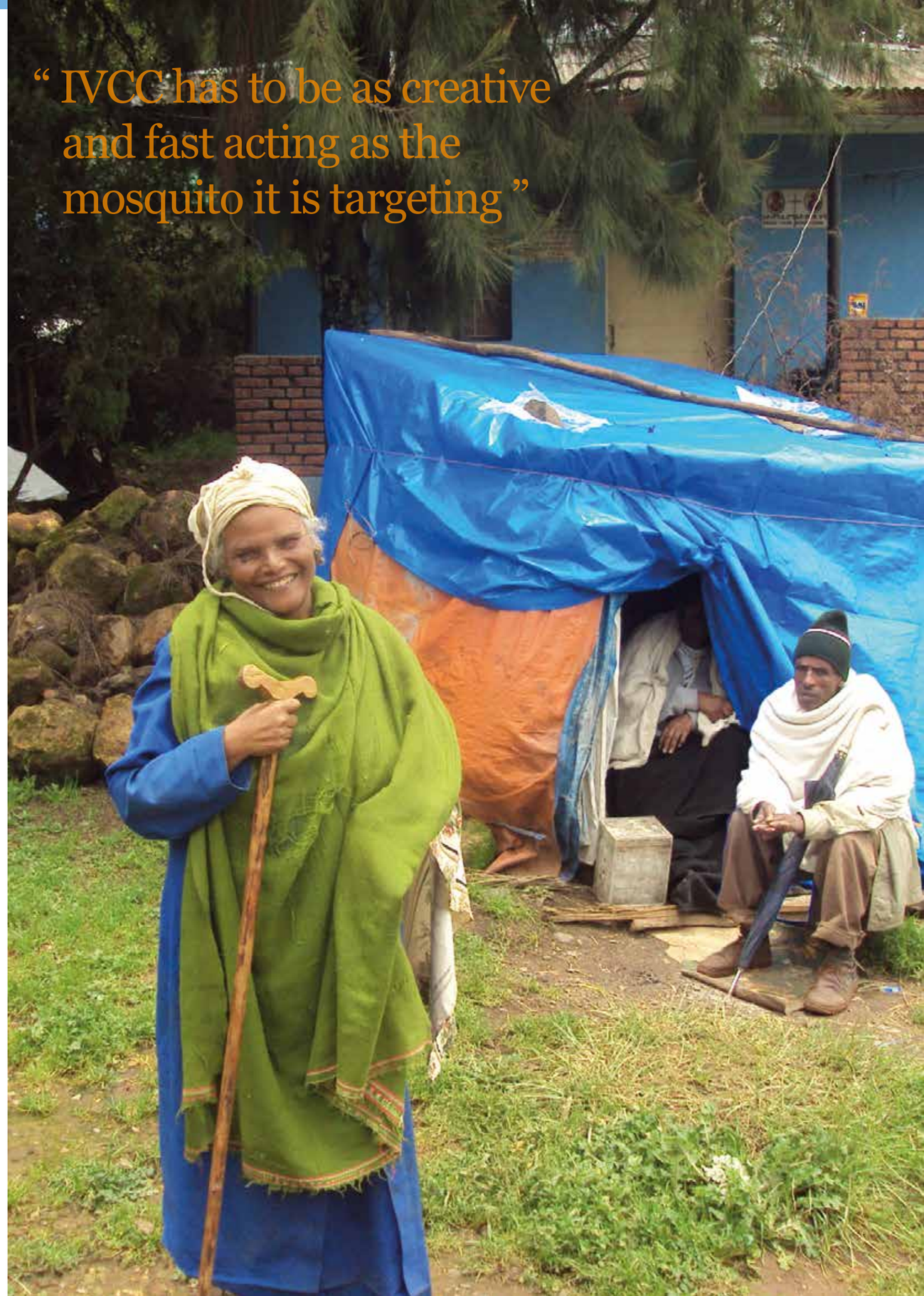
In the interim, IVCC and its partners have launched new long lasting IRS products with improved performance and long residual activity. Next year we will see the availability of resistance-combatting dual active ingredient bednets. Diagnostic kits and data management systems are now available to optimise the decision-making process and optimise the performance of vector control insecticides.

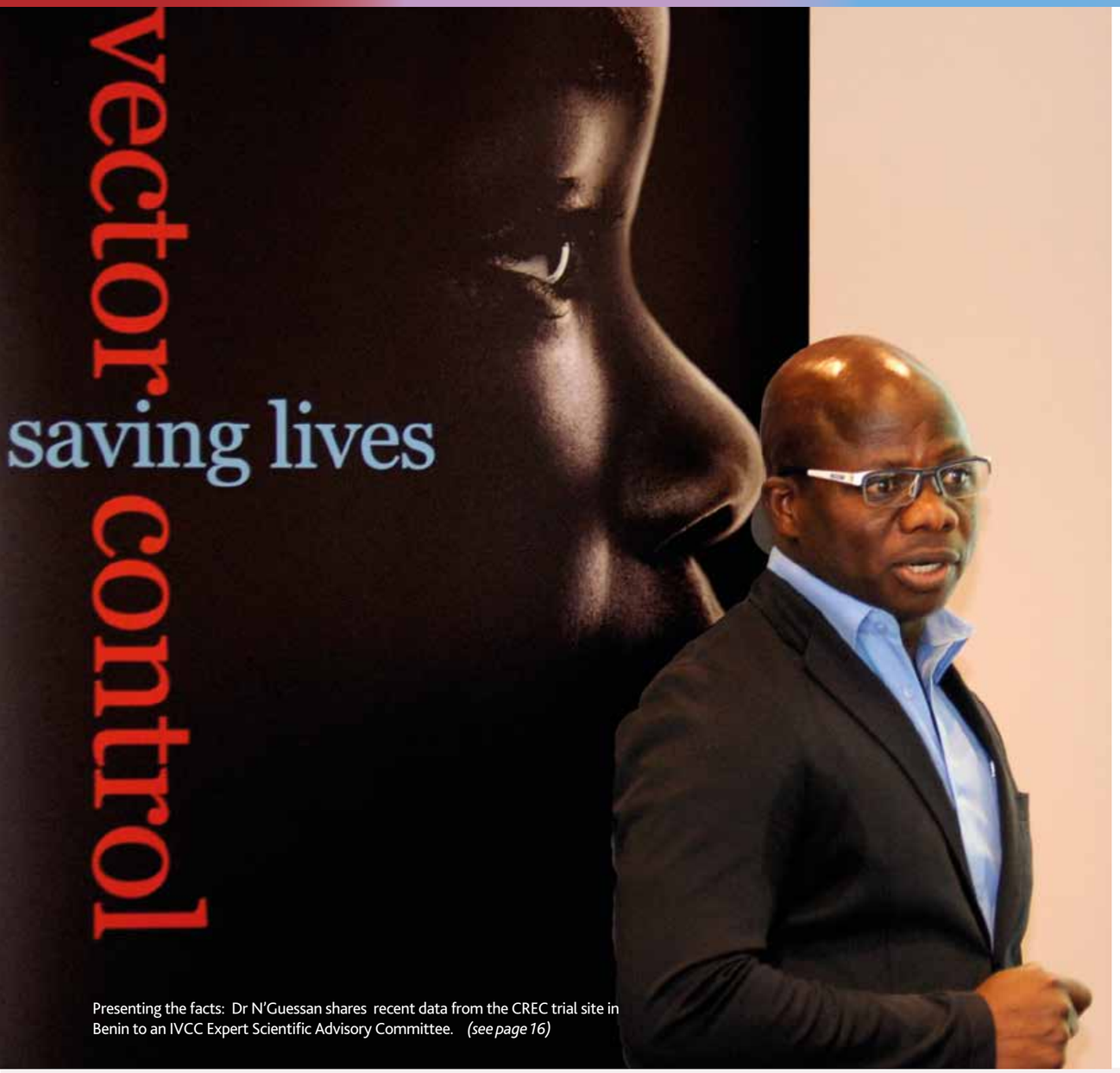
In the short term we will continue to rely on ITNs and IRS to control mosquitoes, but what about the future? We are now seeing a shift from indoor biting mosquitoes to outdoor biting, increasing the risk of transmission during the day. IVCC has to be as creative and fast acting as the mosquito it is targeting—identifying and bringing to market disruptive technologies that can be added to the malaria eradication toolbox.

For me, as the new CEO of IVCC, this role is a once-in-a-lifetime opportunity, focusing knowledge gained from a long and varied career in industry on saving lives through new innovative technologies: You might say that Bayer and its legacy companies I have worked for have spent nearly three decades training me for such a role. I want to thank all our product development partners, especially the BMGF and the agrochemical industry, but also to welcome new partners such as USAID and DfID who also share our vision of a malaria-free world.

IVCC will deliver its mission of bringing new and better vector control technologies to market. This success will not come cheaply, however, and additional funding is needed beyond the guaranteed financial resources we can access today. We are actively looking for funding partners, particularly corporations who share our vision of a healthy and flourishing world, free from diseases such as malaria.

Dr Nick Hamon
Chief Executive Officer, IVCC
from 1 August 2013





Presenting the facts: Dr N'Guessan shares recent data from the CREC trial site in Benin to an IVCC Expert Scientific Advisory Committee. *(see page 16)*

Out of Africa

Working with scientists from countries where malaria is endemic adds an invaluable perspective to IVCC's mission to save lives. This is Dr Raphael N'Guessan's story.

I have seen children die in front of my own eyes. But now when I return home I am happy to see bednets in my village

After Dr Raphael N'Guessan completed his degree in civil engineering he couldn't possibly have imagined himself where he is today; a lecturer in Medical Entomology within the Disease Control Department of the London School of Hygiene & Tropical Medicine based at the Entomological Research Center of Cotonou (CREC) in Benin.

'I had a friend who was a lab technician. it was from him that I learnt all about the mosquito lifecycle and how it carries the malaria parasite. I would follow him as he showed me how to catch and identify them, after a year he asked me if I was interested in becoming an entomologist, I said why not.'

Growing up in his village in Cote d'Ivoire he recalls never seeing any bed nets or spray operators, he also had no idea that malaria was transmitted by mosquitoes. 'Of course I got malaria—everyone did. I have seen children die in front of my own eyes. But now when I return home I am happy to see bednets in my village.'

The largescale distribution of bednets, and the increase in indoor residual spraying has made a major contribution to over a million lives that are estimated to have been saved over the last decade.

Although Dr N'Guessan knows the importance of bednets and the impact they have had on public health he believes that there still needs to be better education on malaria in Africa.

'I remember telling a woman as she sat out on her porch that malaria came from mosquitoes'. he said. 'She laughed at me. I then asked if she used a bednet and she said, "yes, before the mosquitoes would keep me awake all night by biting me. Now I sleep much better".'

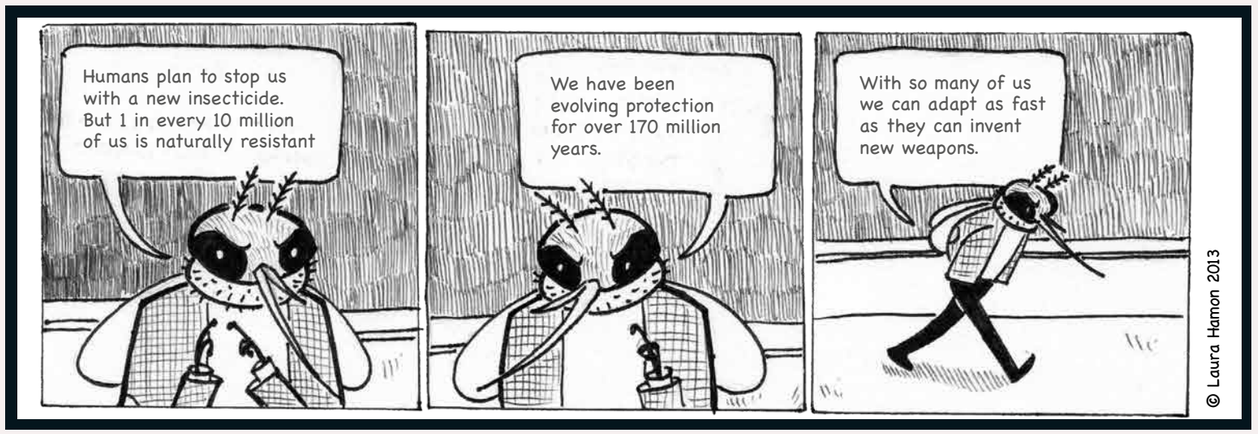
He said that the cultural attitude towards malaria and the lack of education within the communities most affected by the parasite is an important element in dealing with it.

One of the greatest assets IVCC has in Vector Control are the people it works with that have grown up in malaria endemic countries and witnessed first-hand the devastating effect this disease has on their communities. Dr N'Guessan is one of many African medical entomologists and malaria control program managers working towards pushing back malaria through effective Vector Control.

The CREC trial site where Dr N'Guessan works is one of several in Africa that IVCC use to test new products being developed. He shares a deep concern for insecticide resistance, particularly towards Pyrethroids, the only insecticide approved for use in bednets.

Insecticide treated bednets don't simply stop the discomfort of being bitten, they stop children being sick. 'I'm so glad to see the children happy and going to school, working for their families, all because of a bednet,' he said.

Professor Mozzie



Find out why Professor Mozzie's worried — watch the 'Why 3AI's' video at www.IVCC.com

Saving lives

Saving lives, improving health and increasing prosperity are inextricably linked where malaria is concerned.

'If you look at the countries with the highest malaria burden and you look at the places where people are living on less than one and a quarter dollars per day, those countries are related. Malaria is both a contributor to keeping countries in poverty and poor countries are less able to fight malaria,' says Dr Robert Newman, Director of the WHO Global Malaria Programme and an IVCC Trustee.

Worldwide, malaria causes the death of 660,000 people a year, 90% of whom are children under 5. Over 200 million people get sick and are unable to work or go to school. The WHO estimates that countries where malaria is endemic lose $12 billion every year due to the effects of the disease.

'It has huge impacts on economies, on workforces, on productivity, and so malaria is one of those diseases that acts across all of society because its such a major cause of death and disability and it has impacts in all sectors, says Dr Kumanan Rasanathan of UNICEF.

This has an economic impact across the globe, not only in countries directly affected. 'The importance of malaria in the global development agenda has already been proven over the last 15-20 years. It has enormous economic impacts,' says UNDP's Douglas Webb.

The global community has engaged in a massive assault against malaria in the last ten years, which has been highly successful in reducing deaths and sickness. Substantial international funding enabled a major increase in effective drug treatments, diagnostic testing, and vector control interventions.

Research and development for new drugs, diagnostic tests, vaccines and vector control tools is at an all-time high. 'A very encouraging fact is that this last decade of malaria activism and action has yielded spectacular results, ' says Sir Richard Feachem, Director of the Global Health Group, UCSF Global Health Sciences.

It is an exemplar of what can be done when resources are combined in a common objective. 'Malaria has already emerged as a great example of what can be done in a short period of time through the world coming together,' says Martin Edlund, CEO of Malaria No More.

IVCC makes its unique contribution to this global campaign by bringing together the resources needed to tackle the specific challenges of vector control. Malaria, after all, is a vector borne disease.

There is no room for complacency. As Dr Newman warns, 'while there is such encouraging progress we have a huge fight still ahead of us. The issue for malaria is that it is a vector-borne disease and so the progress that you've achieved can be undone so quickly. We're at this juncture where we either keep accelerating forward or we risk being swept backwards.'

IVCC

IVCC took part in the Roll Back Malaria advocacy meeting in June on 'Positioning Malaria in the Global Development Agenda: 2015 and beyond', from which the speakers are quoted.

Whatever the conditions
of people's lives,
wherever they live,
however they live,
we all share the same dreams

Melinda Gates

building partnerships

Listening and learning

IVCC's stakeholder event in 2013 took place at MIM in Durban, when key individuals and organisations from all over the world gathered to share information and strategies for fighting

One of IVCC's key objectives for stakeholder events is to engage with people working in country control programmes. The MIM Pan-African Malaria Conference 2013 in Durban provided a perfect opportunity to make contact and learn from people in the front line of malaria vector control.

The IVCC stand provided a visual summary of key achievements since the launch of IVCC in 2005 and a time frame for delivery of new vector control tools.

There were many visitors to the stand. Most were seeking information about the progress of IVCC's collaboration with industry partners to develop the three new active ingredients that will form the basis of a new generation of public health insecticides. A frequent question was, 'how long before you can deliver?', indicative of growing concerns about insecticide resistance.

Information about IVCC's portfolio and details about insecticide resistance were presented to delegates in an IVCC symposium on new tools for the management of insecticide resistance.

Professor Hilary Ranson from LSTM started the IVCC symposium with an overview of insecticide resistance in vector control. Dr Charles Wondji looked at the mechanisms of insecticide resistance and Professor Diabate Abdoulaye considered current strategies and future challenges for malaria vector control in Africa. An industry perspective was provided by Frederic Baur, who outlined the development of new products for insecticide resistance management.

During an evening reception later in the week, the new IVCC CEO, Dr Nick Hamon, outlined the IVCC mission and objectives for the next few years. Tribute was paid to the founders of IVCC and thanks recorded to the committed industry partners and funders who make the work of IVCC possible.

IVCC also took part in a demonstration of the new Insecticide Quantification Kits (IQKs), which are designed to help spray programmes monitor the effectiveness of indoor residual spraying.

building partnerships

Preserving the impact

IVCC's product development is kept on track by a team of independent experts who provide guidance to industrial partners, and independent scientific evaluation of progress

IVCC's three Expert Scientific Advisory Committees (ESACs) have been a key element in its successful development of innovative vector control products over the past eight years. Each ESAC brings together scientists from across the globe to ensure our industrial partners are provided with guidance from conception to roll out.

It begins with the production of a detailed description of the vector control product that is required. This description, called a Target Product Profile (TPP), lists all the essential and desirable characteristics of a product. For insecticides this will include public health attributes, ecological impact, fitness for purpose and costs.

ESACs advise IVCC on new project submissions, project design, project continuance, termination and extension. However, their work doesn't end there; ESACs provide a review of all current projects and product data to ensure IVCC reaches development milestones and products deliver on their promises.

IVCC's three ESACs oversee development of products for Public Health, Information Systems and New Paradigms. IVCC organises two ESAC meetings a year, typically lasting for two days, but the background work of evaluating product development and supporting IVCC's partners takes much longer.

As well as attending the main meetings, members contribute to sub groups when needed. They may also attend individual project meetings as members of the project steering committee, if their skills are relevant.

The Public Health ESAC were responsible for drawing up the TPP for IVCC's active ingredient project—a cornerstone of IVCC's mission. This TPP covered a wide range of requirements, from toxicity for humans and insects to end user requirements tailored for health products in developing countries.

Some of IVCC's industry partners have expressed appreciation of this product development method, which has been crucial to applying their considerable skills towards developing new insecticides targeted at public health.

ESAC members are chosen for their professional skills and knowledge, developed over a lifetime of product development. Given the central role of ESACs in making IVCC's product development a success over the past few years, the search is always on to find additional members that can widen the experience, diversity and skills of the group.

Stairway to success: members of the IVCC Public Health ESAC (right) take a break from the fomal business of evaluating a project (below)

creating solutions.

Improving spray programme performance

IVCC products are making an impact, with two new long lasting insecticide formulations available to vector control programs

Indoor residual spraying (IRS) with public health insecticides has proved itself over several decades as an effective malaria control technology. The WHO credits it to a large part with the elimination of malaria from Europe, the former USSR, and countries in Asia and the Caribbean.

In recent years, together with insecticide treated bednets, IRS has played a major role in the progress made in malaria endemic countries in reducing the number of people dying and falling sick with malaria by reducing disease transmission.

The cost of insecticides used for spraying is only a small proportion of the overall cost of an IRS programme. Operational and labour costs are the biggest cost elements, so providing control programmes with an insecticide that can be sprayed less frequently while maintaining its efficacy greatly reduces the overall cost burden.

In 2007, IVCC engaged Bayer CropScience to develop a new long lasting formulation. In 2012 they released a polymer–enhanced long lasting indoor residual spray. In laboratory trials K-Othrine Polyzone has shown a residual life of 12 months on concrete and wood surfaces, and nine months on mud surfaces. WHO has recognised this unique formulation as having a longer residual lifespan than any other pyrethroid insecticide formulation.

The development of the new formulation represents an important milestone in IVCC's partnership with Bayer. 'It illustrates the progress that has been made on the original objectives to deliver effective and affordable vector control solutions,' said Nick Hamon, IVCC CEO from August 2013.

K-Othrine Polyzone is now commercially available for IRS and is currently being successfully used in Kruger National Park, South Africa. Malahlapanga, a remote spring in the park, has proven a valuable site for research on the behaviour of Anopheles arabiensis mosquitoes, the most important malaria vector in southern Africa, due to the large perennial population of this type within the area.

Synthetic pyrethroids have been the insecticide of choice for over 20 years due to their low cost, effectiveness and residual life. Their popularity however, has also led to the high level of resistance rates.

Finding an new long lasting formulation that retained many of the desirable qualities of pyrethroid has been a major objective for IVCC and its partners, and Sygenta's new non-pyrethroid formulation, Actellic CS, could not have come at a more pivotal time.

Prompted by IVCC, Syngenta explored a range of novel formulation options leading to the successful development of Actellic 300 CS, which employs micro encapsulation technology.

Unlike previous non-pyrethroid formulations that were only effective for two to three months, IVCC sponsored trials have shown that Actellic CS has demonstrated residual activity of nine to twelve months across key household surfaces including challenging surfaces like mud and cement.

Over one million households have already been protected with Actellic 300 CS, according to current estimates, and early monitoring and evaluation data indicate that there has been a significant impact.

In Mozambique, Machava Sugar Estates reported a 58% drop in the number of active cases following spraying with Actellic CS. In a Burkina Faso mine the number of malaria cases over the rainy season dropped to 58 in 2013 from 158 in 2012 following the use of Actellic CS.

The availability of these two new long lasting formulations has widened the options of spray programme managers in the battle against malaria.

creating solutions.

On target for new insecticides

The search for new active ingredients suitable for public health insecticides is delivering promising results

The cornerstone to IVCC's mission is the development of three new active ingredients, each with a novel mode of action, in effect, a different way of killing mosquitoes. These will form the basis of a new generation of insecticides suitable for public health purposes.

The main objective of developing new active ingredients is to target the malaria transmitting mosquitoes, but they will also have wider application in controlling insects that transmit other diseases.

Insecticide treated bednets and indoor residual spraying have proven to be effective methods of malaria vector control. But they depend on only four classes of insecticide for IRS and just one, the pyrethroids, for bednets. Insecticide resistance threatens the effectiveness of all four classes and resistance to pyrethroids has been detected in over 64 countries.

There has been no new public health insecticide for around 30 years and new insecticides are desperately needed. Without them insecticide resistance cannot be challenged.

Working together with its partners in industry and academia and bringing together expertise and resources from across the board, IVCC is on target to deliver the new insecticides that are crucial to challenging insecticide resistance. IVCC's active ingredient (AI) portfolio is on track and showing very promising results.

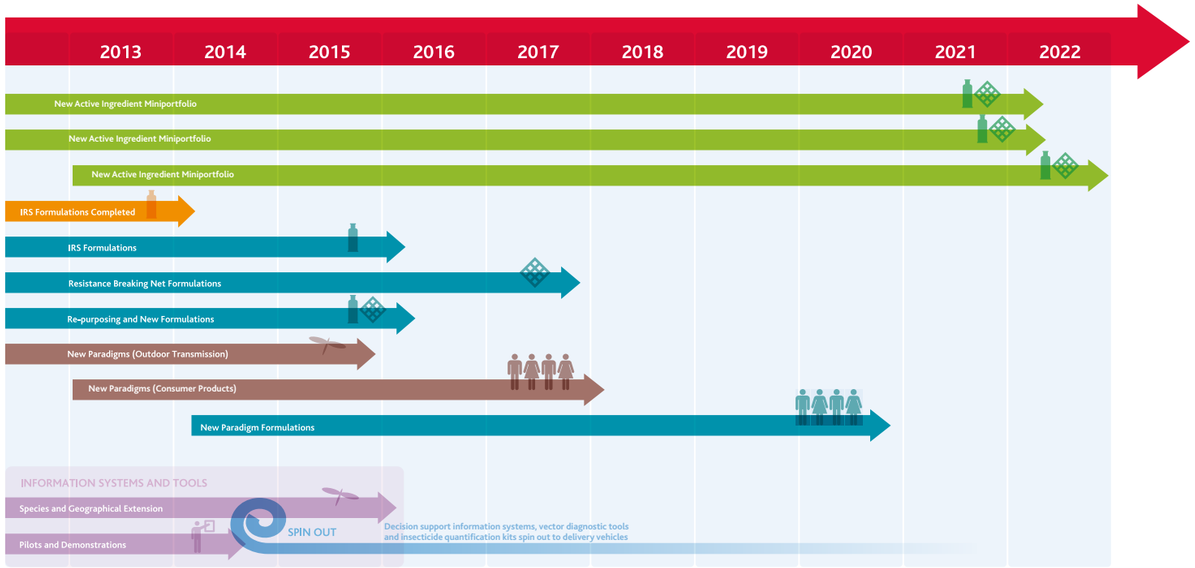
From libraries comprising of around 4 million chemical compounds, hundreds of thousands of chemical classes have been screened using IVCC Target Product Profiles to ensure suitability for purpose.

Nine novel chemical classes have shown significant activity against adult mosquitoes and are ready to be moved into the candidate selection in the coming year. The next task is to choose three of these new active ingredients to take to full development, which will take about seven years.

Resistance develops more quickly when only one insecticide is used. By developing three new insecticides with different modes of action and using them in rotation or mixtures, malaria control programmes will have greater opportunities to ensure that the mosquito population has little chance of developing resistance.

The high level of commitment and support that IVCC has received from its industry partners has been invaluable. Without their hard work, the AI portfolio would not be where it is today, poised to enter the final development stages.

Product development roadmap



Active ingredients and new formulations portfolio

What we've achieved

2005

IVCC is launched with support from the Bill and Melinda Gates Foundation to develop new vector control tools.

Partnerships formed with industry to evaluate over four million potential insecticide compounds.

2007

Academic institutions engaged to explore vector control insecticide resistance options.

African trial sites and new insectaries established to provide industry standard testing of new vector control products.

2010

Diagnostic system for insecticide resistance detection developed and in operation with disease control programmes in Africa.

2013

Two new long-lasting indoor residual spray formulations launched, to expand the range of vector control tools for challenging insecticide resistance.

Launch of insecticide quantification kits to monitor spray programme implementation.

What's next

2014

Nine classes of novel active ingredients identified and ready for final development.

2015

Ongoing exploration of new vector control paradigms to deal with outdoor biting insects.

New bednets incorporating two insecticides to counter growing insecticide resistance.

2017

Crop protection insecticide repurposed as a new long-lasting indoor spray formulation.

New paradigm for outdoor vector control identified.

2020

Three new insecticides with novel modes of action approved for public health use form the basis for a new generation of insecticides that will counter future insecticide resistance and underpin a global malaria eradication programme.

finances

Finance Report 2012/3

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 by an independent external organization whose remit is to provide independent and objective assurance to add value 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.

Following last year's significant investment in upgrading the financial reporting system, a major investment to improve and expand the capabilities of the research database reporting tool was implemented. Progress and information on research grants and contracts can now be tracked in real time from application to award in one centralized online repository. Electronic authorization is possible at all stages of the life-cycle of the grant, speeding up the administrative process whilst allowing a complete audit trail.

Financial performance

2012/13 saw a further significant increase in program activity, with total spending reaching £8.3 million, up from £6.1 million in 2011/12 and £4.3 million in 2010/11.

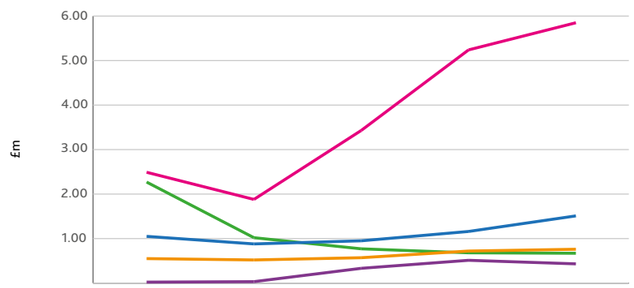
A total of £6.4 million was spent directly on charitable project activities with a further £0.7 million paid out on related project supporting activities. Core administration support costs of £1.2 million were also incurred. This represents 14% of total costs, a fall of 2% compared to last year.

Following 3 new appointments there was a concerted effort by staff within IVCC on fundraising, advocacy, and new paradigms portfolio management during the year specifically funded by our core Gates Foundation grant.

The scaling up of research activity during the year on new active ingredient projects saw an increase in product development costs rising from £3.4 million to £5.3 million as originally forecast last year.

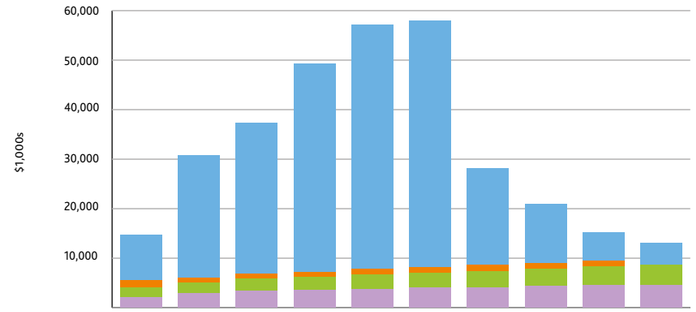
Costs for new Tools and Technologies moved onto alternative sources of funding other than BMGF, namely: ABT Associates, WHO, Marathon Oil and The Saudi Ministry of Health.

Expenditure by research area



	2009/10	2010/11	2011/12	2012/13	2013/14 (Forecast)
Public Health Products	2.49	1.88	3.43	5.24	5.85
New Paradigms	0.00	0.01	0.31	0.49	0.41
Information Systems & Tools	2.27	1.02	0.77	0.68	0.67
Project Related Costs	0.55	0.52	0.57	0.72	0.76
Management & Advocacy	1.05	0.88	0.95	1.16	1.51

Funding requirements 2013-2022



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Active Ingredients	9,130	24,725	30,400	41,963	49,321	49,690	19,426	11,898	5,593	4,310
Formulation	1,510	999	995	1,000	1,050	1,100	1,150	1,200	1,250	0
New Paradigms	1,987	2,121	2,442	2,663	2,884	3,105	3,326	3,547	3,768	3,989
M & A	2,174	3,021	3,532	3,703	3,874	4,045	4,216	4387	4,558	4,729

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, market conditions and increasingly competitive funding environment, 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 peaking in 2017/18 at $57.9 million before dropping off by 2022/23 at $13 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 already being used in the field and now require only relatively small amounts of ongoing investments.

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.

Immense progress has been made on the second of these points with funding of $29 million secured for the next 5 years from DFID and USAID, alongside continued funding and support from the Gates Foundation, however, a significant shortfall still exists. Continued efforts are underway to tackle this shortfall with the creation of a fundraising position and a scaling up of communications and advocacy activities within IVCC's core team to promote the 3 key themes running through IVCC: Savings Lives, Building Partnerships and Creating Solutions.

Funding mix

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 from 81% of the total budget, to 29%. Funding from DFID will increase from 3% to 45% and new funding from USAID will account for 18% of the total.

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 £46k (£36K: 2011/12) and this will be used to fund future project activity.

The Annual Report was written, edited and designed by John Helm, Charlotte Hemingway and Jed Stone. Printed by LT Print Group, Wirral.

Behind the statistics and graphs lies a great and needless tragedy: malaria still takes the life of an African child every minute.

Dr Margaret Chan
Director General, WHO

IVCC
COMBATING INSECT BORNE DISEASE