2013:
Malaria at the crossroads

Report for the All-Party Parliamentary Group on Malaria and Neglected Tropical Diseases (APPMG)

Richard Bacon MP (South Norfolk), Jeremy Lefroy MP (Stafford) and John Mann MP (Bassetlaw) with an Olyset mosquito net at the A-Z Textiles factory in Arusha, Tanzania.
2013: Malaria at the crossroads
Report for the All-Party Parliamentary Group on Malaria and Neglected Tropical Diseases
2012 - 2013

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So much has been achieved in the past decade in the fight against malaria. Yet we are now facing our biggest challenges.

An estimated 660,000 people are still dying every year from the disease, the vast majority children under five years old in sub-Saharan Africa. The tools which have served us so well – long-lasting insecticide-treated mosquito nets (LLIN) for prevention and Artemisinin Combination Therapies (ACTs) for cure – are both coming up against resistance by the ever-versatile and resilient malaria parasite. The money required to control and eventually eradicate malaria from the planet remains far greater than the money available, despite a huge increase in resources since 2001.

In visits to Tanzania, Rwanda and Burundi this year, I have seen first-hand how much the work done in tackling malaria has improved the lives of millions of people. It is not only the estimated 1.1 million deaths which were prevented between 2001 and 2010 – each one a precious son, daughter, mother or father – but also the hundreds of millions of episodes which have not occurred, enabling people to work or go to school when they would have been unable to. Malaria takes 1.3% from the per capita Gross Domestic Product of a country in which it is seriously endemic, adding up to almost half per capita GDP over 25 years. Certainly some of the excellent economic growth seen in many sub-Saharan African countries in recent years can be attributed to better control of malaria and other debilitating or fatal diseases.

In Tanzania, the All Party Parliamentary Group (APPG) had the pleasure of visiting the A-Z Textiles factory near Arusha which has the capacity to produce 30 million mosquito nets every year and employs some 7,000 people. They make a very substantial direct contribution to the Tanzanian economy as well as supplying nets to countries throughout the continent – a fine example of a local business, in partnership with an international company (Sumitomo), joining forces to produce something of vital importance where it is needed.

We also saw the work which is being done to test the RTS,S malaria vaccine candidate developed in partnership by GSK, the PATH Malaria Vaccine Initiative (MVI), and research centres in seven African countries. The two research centres we visited – in Korogwe (Tanga Region) and Bagamoyo (Pwani Region) – were both led by outstanding Tanzanian scientists and their teams who work closely with colleagues in the UK, Belgium, Switzerland, the US, Denmark and elsewhere. It was encouraging to see this international cooperation at work on a vital project with a strong emphasis on training Tanzanians.

But without a renewed effort in the coming 5 years, the progress that has been made may stall. As our report shows, deliveries of mosquito nets have fallen in each of the past 2 years, despite coverage being nowhere near sufficient in the countries where there is the greatest risk of being infected. Since a mosquito net has an effective life of perhaps 3 years, many of those delivered during the rapid increase in deliveries in the years until 2010 already need to be replaced.
The threat of insecticide resistance needs also to be taken seriously. Improved nets with a combination of chemicals to counter resistance are available. But they are more expensive and there is a natural tendency to buy the cheapest product when money is scarce, especially if resistance is not yet a significant problem.

Our report shows how large the funding gap remains, and this is despite very substantial increases in money coming via the Global Fund and directly from the US and UK governments.

There are three major ways in which this gap can be filled – official development assistance (ODA) from governments, donations from private individuals and companies, and domestic health spending by malaria-endemic countries themselves. ODA is unlikely to rise substantially in traditional donor countries while economic growth remains weak – although we must continue to make the case, especially to those countries which have not yet met the UN target of giving 0.7% of Gross National Income as ODA. Private individuals and companies can be encouraged to follow the example of the Gates Foundation and others who have given very substantially over recent years.

However, it is domestic health spending which is the key. The governments of most endemic countries in sub-Saharan Africa (where most of the malaria disease burden and deaths occur) have signed pledges, such as the Abuja declaration to commit 15% of their national budget to health. Only 9 countries - Ethiopia, Lesotho, Liberia, Madagascar, Malawi, Rwanda, Swaziland, Togo and Zambia - achieved this target in 2011 (WHO figures). The populations of the remaining countries should keep up the pressure on their governments to achieve the Abuja targets. In doing so, they will be more able to maintain the progress they have made in fighting not only malaria but HIV/AIDS, TB, pneumonia and the other diseases which cause such pain and suffering and which continue to hold their economies back from greater growth.

I would like to pay tribute to Mrs Pauline Latham OBE MP and Baroness Hayman for all that they contribute to the work of the Group. I would also like to thank Susan Dykes whose dedication and enthusiasm ensures that the Group runs smoothly.

The excellent news as we go to press:

Rt Hon Justine Greening MP (Putney), Secretary of State at the Department for International Development, UK, has just pledged £1 billion to the Global Fund for the 2014-16 period. This is wonderful news.
Abbreviations

ACT ..............................Artemisinin-based Combination Therapy
AMFm ...........................Affordable Medicines Facility for malaria
APPG ............................All Party Parliamentary Group
APPMG ..........................All Party Parliamentary Group on Malaria and Neglected Tropical Diseases
DFID .............................UK Department for International Development
EDCTP ..........................European and Developing Countries Clinical Trials Partnership
FIND .............................Foundation for Innovative New Diagnostics
GFATM ..........................Global Fund to Fight AIDS, Tuberculosis and Malaria
GMP .............................Global Malaria Programme (at World Health Organization)
GNI ..............................Gross National Income
IHP ..............................International Health Partnership
IPT .................................Intermittent Preventive Treatment
IPTi ...............................Intermittent Preventive Treatment in infants
IPTp ...............................Intermittent Preventive Treatment in pregnancy
IRS .................................Indoor Residual Spraying
ITN ...............................Insecticide Treated mosquito Net
IVCC .............................Innovative Vector Control Consortium
LLIN .............................Long Lasting ITN
MDG ..............................Millennium Development Goal
MMV ..............................Medicines for Malaria Venture
MPAC ............................Malaria Policy Advisory Committee
MVI ...............................PATH Malaria Vaccine Initiative
ODA ..............................Official Development Assistance
PDP ...............................Product Development Partnership
R&D ...............................Research and Development
RBM ...............................Roll Back Malaria Partnership
RDT ...............................Rapid Diagnostic Test
SMC ...............................Seasonal Malaria Chemoprevention
UN .................................United Nations
WHO ..............................World Health Organization
We are much indebted to Professor David Schellenberg, London School of Hygiene and Tropical Medicine who once again has masterminded and authored this report. We are grateful to Dr Tim Wells at MMV, Annemarie Meyer and James Whiting at MNM-UK, Alexandra Fullem at MVI, Alex Hulme at Malaria Consortium and the House of Commons library for their contributions and support in developing this report.

We are grateful to our financial supporters without whose help the APPMG could not function.

Medicines for Malaria Venture

Malaria Consortium

The Sabin Institute Europe

Malaria No More UK

The UK Coalition Against Neglected Tropical Diseases

PATH Malaria Vaccine Initiative

Dr Janet Lefroy & Jeremy Lefroy MP (Stafford) for their financial support on the APPMG visit to Tanzania

We would like to thank all the speakers (listed at the back of this Report) who gave up their time to share their expertise to the Group during the year; and Palbha Jain, Medical Student at Keele, for her paper on malaria.

Once again, we would like to thank MMV for their generosity in funding the printing of the Report.
Malaria can be prevented and treated with the tools that exist today. It is astonishing therefore that we allow this infection to cause so much disease and death in the 21st century. Box 1 shows the appalling daily toll in human misery that malaria still causes. Every death is a needless tragedy, disproportionately affecting young children in Africa (figure 1).

The direct burden of disease and death is compounded by longer term indirect costs on health, economic and educational development. Such broad effects make malaria a major impediment to economic development, and the improved prevention and treatment of malaria an important driver of economic development. Malaria is a disease of poverty, with mortality rates highest in countries with the lowest Gross National Income (GNI) per capita. Even within countries, the prevalence of parasitaemia in children is highest among poorer populations than those who are less poor.

Considerable progress has been made in the last decade. Malaria has been eliminated from 4 countries since 2007 and strong declines in others show that the battle can be won. Fifty countries are on track to reduce their malaria case incidence by 75% by 2015, in line with the World Health Assembly and Roll Back Malaria targets. If the malaria incidence and mortality rates estimated for 2000 had remained unchanged over the decade, 274 million more cases and 1.1 million more deaths would have occurred between 2001 and 2010.

Encouraging though this progress is, it is essential to maintain and tighten our grip on malaria as any faltering will result in a rapid resurgence of the disease. Furthermore, the 50 countries with the greatest proportionate declines in malaria in recent years account for only 3% of the total estimated malaria cases worldwide. Important gains have been made in countries with the highest disease burden, for instance the majority of cases averted (52%) and lives saved (58%) were in 10 of the most heavily burdened countries. However, there is still a clear need to ramp up malaria prevention and treatment in the 14 countries with the highest burden, currently accounting for 80% of malaria deaths. If we are successful, the potential health and economic gains would be enormous.

“If the malaria incidence and mortality rates estimated for 2000 had remained unchanged over the decade, 274 million more cases and 1.1 million more deaths would have occurred between 2001 and 2010.”
Malaria in the UK

There were 1,378 cases of malaria reported in returned travellers to the UK in 2012, including two deaths. The majority (73%) of cases were caused by the potentially life-threatening *Plasmodium falciparum*, and were acquired in Africa. Malaria is a particular problem among people visiting friends and relatives, where the majority of travellers do not take malaria prophylaxis. Reasons for this include not seeking or being unable to access appropriate medical advice before travel, receiving poor advice, not adhering to advice, or not perceiving themselves to be at risk because the destination was familiar to them.

Although at lower risk of contracting the infection, holiday travellers are at high risk of death from malaria if they contract it, particularly older travellers.

Travel is predicted to grow to nearly 1.6 billion international arrivals by 2020 and travellers will be at increased risk of malaria. Healthcare practitioners involved in advising travellers about preventing malaria should follow the clear and concise guidelines on malaria prevention for UK travellers.

![Figure 1: Malaria burden 2010: deaths by region & age group](image)
The means to prevent and treat malaria

Current tools and strategies

Box 2 lists the approaches recommended by the World Health Organization for the prevention and treatment of malaria. The cornerstone of prevention is the use of Long-Lasting Insecticide-treated mosquito Nets (LLIN, figure 2), although Indoor Residual Spraying (IRS) is useful in situations with a high density of suitable dwellings. Drugs are also recommended for the prevention of malaria in specific risk groups in malaria-endemic settings. Intermittent Preventive Treatment in pregnancy (IPTp) and infancy (IPTi) target women in pregnancy and children under one year of age, respectively. In 2012, WHO recommended Seasonal Malaria Chemoprevention (SMC) for the prevention of malaria in children under 5 years of age living in areas of intensely seasonal malaria transmission in the Sahel. This simple and inexpensive intervention can prevent more than 75% of uncomplicated and severe malaria among children younger than 5 years of age living in intensely seasonal malaria transmission settings and could help prevent 11 million cases of malaria and 50,000 deaths annually, thus reducing the burden of malaria in parts of Africa.

“Seasonal Malaria Chemoprevention ... could help prevent 11 million cases of malaria and 50,000 deaths annually”

<table>
<thead>
<tr>
<th>Box 2: Malaria control - the tools and strategies:</th>
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<tbody>
<tr>
<td><strong>Long-Lasting Insecticidal Nets</strong></td>
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<tr>
<td>• Reduce all-cause mortality by 23%, severe malaria by 45%, malaria episodes by 50%</td>
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<tr>
<td>• Cost ~$3 each</td>
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<tr>
<td><strong>Indoor Residual Spraying</strong></td>
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<tr>
<td>• Reduces malaria episodes by 14%</td>
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<tr>
<td>• Cost per house sprayed ~ $15</td>
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<tr>
<td><strong>Diagnostic testing</strong></td>
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<tr>
<td>• Rapid Diagnostic Tests (RDTs) over 90% sensitive and specific for P falciparum</td>
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<tr>
<td>• RDTs cost ~$0.51 each</td>
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<tr>
<td><strong>Artemisinin-based Combination Therapies (ACTs)</strong></td>
</tr>
<tr>
<td>• ACTs cure over 95% of malaria episodes in most settings</td>
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<tr>
<td>• Cost ~ $0.40 per course of treatment</td>
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<tr>
<td><strong>Intermittent Preventive Treatment in pregnancy (IPTp) and infants (IPTi)</strong></td>
</tr>
<tr>
<td>• IPTp reduces maternal anaemia by ~39%</td>
</tr>
<tr>
<td>• IPTI can reduce malaria in infants by ~30%</td>
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<tr>
<td>• The drug used for IPTp and IPTI costs ~$0.06 per dose</td>
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<tr>
<td><strong>Seasonal Malaria Chemoprevention (SMC)</strong></td>
</tr>
<tr>
<td>• Can reduce malaria episodes by over 75% in intensely seasonal transmission settings</td>
</tr>
<tr>
<td>• The drugs used for SMC costs ~$0.28 per course</td>
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Note that the figures quoted for costs and effects are indicative as commodity cost vary and delivery costs are not included. Not all tools are applicable everywhere.

The malaria landscape has changed dramatically since the beginning of the millennium. ACTs have been introduced and there has been a marked increase in coverage of insecticide-treated nets, and, in more recent years, increasing access to diagnostics. However, between 2010 and 2011 much more modest increases in access to these interventions were observed. For example, insecticide-treated net (ITN) use in sub-Saharan Africa rose from 3% in 2000 to 53% in 2011, but remained at 53% in 2012 (figure 3). Protection by IRS in Africa rose from under 5% in 2005 to 11% in 2010, but remained at that level in 2011. The percentage of suspected cases receiving a parasitological test rose from 68% in 2005 to 77% in 2011, but the increase in testing between 2010 and 2011 was just 1%. These findings, from the 2012 World Malaria Report, raise concern that the availability of these life-saving commodities may have reached a plateau, in parallel with a levelling out of funding.

Proportion of population sleeping under an ITN derived from relationship with household ownership of at least one ITN analyzed by linear regression in 48 household surveys 2001-2011, \( y = 0.67x - 0.03 \).

Source: ITN coverage model from the Institute for Health Metrics and Evaluation, which takes into account ITNs supplied by manufacturers, ITNs delivered by NMCPs and household survey results (1). Includes Djibouti, Somalia and Sudan which are in the WHO Eastern Mediterranean Region.
The means to prevent and treat malaria

“DFID’s leadership in malaria was recognised by the 2013 National Audit Office’s report on malaria”

Funding

An estimated US$ 5.1 billion is needed every year between 2011 and 2020 to achieve universal access to currently available malaria interventions. This level of investment in malaria control has never been reached. At present, only US$ 2.3 billion is available leaving a gap of US$ 2.8 billion (figure 4). International disbursements for malaria control rose from less than US$ 100 million in 2000 to US$ 1.71 billion in 2010, and were estimated to be US$ 1.66 billion in 2011 and US$ 1.84 billion in 2012 (figure 5). Domestic government funding for malaria programmes also increased between 2005–2011, estimated at US$ 625 million in 2011 (figure 6), suggesting that increased international funding may catalyse endemic country funding for malaria.

However, the governments of endemic countries in sub-Saharan Africa could do more. Most have signed pledges, such as the Abuja declaration, to commit 15% of their national budget to health, and 20% of governments are now investing at this level. A further 39% invest 10–14% of government funding in health and the remaining 41% less than 10%. The governments of endemic countries need to deliver on their commitments, but it is clear that additional funds will continue to be required from international partners for the foreseeable future. DFID’s leadership in malaria was recognised by the 2013 National Audit Office’s report on malaria and demonstrated by the September 2013 announcement that DFID has committed £1 billion to the GFATM over the next 3 years.

The impression of overall stagnation in recent years masks the complexities within. The Global Fund contributed 40% of the total malaria spend in 2012, lower than its 58% share in 2010, but the reductions in Global Fund disbursements were offset by increased funding from the US President’s Malaria Initiative (PMI) and from the UK’s

Figure 4: Past and projected global funding for malaria control, 2005 to 2015

Global funding for malaria control is projected to level off, short of estimated requirements to cover all populations at risk

Global malaria funding ($ billion)

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<tr>
<td>Funding (donor and host government)</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.6</td>
<td>2.2</td>
<td>2.3</td>
<td>2.3</td>
<td>2.3</td>
<td>2.5</td>
<td>2.7</td>
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<tr>
<td>Estimated global requirements per year 2011–2020 (US$ 5.1 billion)</td>
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<tr>
<td>Estimated $2.8 billion funding gap between global funding (donor and host government) and global funding requirements</td>
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NOTES

1. Funding figures include estimated international donor and domestic government spending. Projections of funds available for malaria control between 2012 and 2015 are from formal commitments made by funding agencies or, if data is unavailable, from pledges, as reported in the World Malaria Report 2012.


3. Values are in nominal terms, rounded to the nearest $100 million.

Source: National Audit Office interpretation of World Malaria Report 2012

* In April 2001, at a meeting of African Union countries in Abuja, Nigeria, Heads of State pledged to increase government funding for health to at least 15% of GNP.
Department for International Development (DFID), which accounted for 31% and 11% respectively of estimated disbursements in 2011–2012.

Increased UK support has helped to sustain investments in malaria prevention and treatment at peak levels. DFID’s framework for results is focusing efforts on the worst affected countries and can be expected to have an important effect on malaria deaths by 2015. However, new funding sources are needed to scale up and sustain efforts to improve the prevention and treatment of malaria, and to protect the investments that have been made in the last decade. In parallel, approaches are needed to make existing funds stretch further by increasing the value for money of malaria commodities and the efficiency of service delivery.

Leadership and co-ordination

Tools and finance are essential but not sufficient elements for success in the global fight against malaria. Leadership and co-ordination of international efforts have not always been available and are all too easy to take for granted.

The renaissance in recent years of the World Health Organization’s (WHO) Global Malaria Programme (GMP) has re-established it as the firm technical leader for global malaria control and elimination. The GMP website (http://www.who.int/malaria/en/) boasts an array of publications for policy makers and programme implementers. Recent publications include new global surveillance manuals for malaria control and elimination, the Global Plan for Insecticide Resistance Management in malaria vectors and practical documents to help countries update and refocus their national malaria strategies. The formation in 2011 of the Malaria Policy Advisory Committee (MPAC) assures a robust, transparent and evidence-based approach to policy formation. It was MPAC that approved Seasonal Malaria Chemoprevention for the prevention of malaria in children in sub-Saharan Africa.

The Roll Back Malaria (RBM) partnership provides a forum for everyone with an interest in malaria to co-ordinate their activities. From support for country programmes, to a global malaria action plan and advocacy, the RBM partnership, with support from DFID, helps to shape and share contributions to the global effort. Working groups bring together policy makers and implementers, advocates, researchers, product developers and donors, helping them to work more efficiently to develop and deploy tools to prevent, treat and monitor malaria.

Figure 3.2

Figure 5: International Funding for Malaria Control 2000-2015. Source: World Malaria Report 2012

Figure 6: Domestic funding for malaria control 2005-2011. Source: World Malaria Report 2012

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The threats to controlling malaria

**Box 3: The threats**

- Inadequate financing for malaria prevention and treatment
- Insecticide resistance
- Drug resistance
- Uncertainty of long-term support for product development
- Inadequate delivery mechanisms
- Deficient information systems

**Financing for malaria control** has increased dramatically since the new millennium but still falls far short of the amounts needed to make the most of the tools that already exist today (figure 4). Investment in control now will reap dividends in terms of lives saved and cases avoided, economic development, and a reduced need to develop new anti-malarial measures as malaria is progressively eliminated. A reduction in donor funding for malaria prevention and treatment is the single greatest immediate threat to the malaria situation. The number of ITNs procured in 2012 (66 million) is considerably less than the 92 million provided in 2011 and the 145 million in 2010 (figure 7). As the average lifespan of an ITN is about 3 years, ITN coverage will decrease if they are not replaced in the next few years. There is thus an urgent need to identify new funding sources to maintain and expand coverage levels of interventions so that outbreaks of disease can be avoided and international targets for reducing malaria cases and deaths achieved.

**The development and spread of resistance** is nature’s response to the use of a chemical to kill a biological organism. The latter will be under pressure to develop escape mechanisms which allow its continued survival. At present, malaria control depends on insecticides to kill the mosquito vector and on drugs to kill the malaria parasites in patients. The large-scale use of both insecticides and drugs will continue to drive the development of resistant organisms as long as large numbers of mosquitoes and parasites come into contact with these life-saving commodities.

**Mosquitoes’ resistance to the insecticides** which are used to treat mosquito nets and for IRS has now been documented in 64 countries. Researchers understand a lot about the genetic and biological changes which lead to resistance but so far no novel solutions have been found to counter the problem. This is a worrying development given the central role that insecticides have played in improving malaria prevention in the last decade.

**Parasite resistance to drugs** used to treat malaria was first described for various antimalarial compounds in South-East Asia. Worriedly, resistance to the artemisinins, the key compounds in ACTs recommended for malaria treatment, has now been detected in four countries in South-East Asia (World Malaria Report 2012). Unless containment measures are taken, this resistance could spread to Africa where an inability to treat malaria effectively would cause a massive public health disaster. This draws attention to the importance of efforts, in part supported by DFID, to retard the spread of resistant malaria parasites, and to develop new drugs – including those not based on artemisinin – to continue the fight against malaria.

**“A reduction in donor funding for malaria prevention and treatment is the single greatest immediate threat to the malaria situation.”**

**Figure 7: Major decreases in deliveries of insecticide treated nets (ITNs)**


<table>
<thead>
<tr>
<th>Year</th>
<th>Five countries* with largest cumulative number of ITNs delivered</th>
<th>Other countries</th>
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</thead>
<tbody>
<tr>
<td>2004</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>2005</td>
<td>55</td>
<td>35</td>
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<td>2006</td>
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<td>2010</td>
<td>80</td>
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<tr>
<td>2011</td>
<td>85</td>
<td>65</td>
</tr>
<tr>
<td>2012</td>
<td>90</td>
<td>70</td>
</tr>
</tbody>
</table>

* Democratic Republic of the Congo, Ethiopia, Kenya, Nigeria, United Republic of Tanzania

Source: Alliance for Malaria Prevention. Data for the first three quarters of 2012 have been multiplied by 4/3 to provide an annual estimate.
Investment in research and development of new tools is needed not only in terms of the level of finance but also in the timeframe for the support. Development of new drugs, insecticides, vaccines and diagnostics will be needed to maintain and further improve disease control, to stay ahead of the development and spread of resistance and, eventually, to eliminate malaria. However, product development often takes decades. Maintaining political will and commitment over such long periods is a major challenge and strategies are needed to ensure that long-term funding of research is available to develop the new tools that are needed. Product Development Partnerships (PDPs) can be an efficient means to couple public money and private knowledge to produce products primarily for the poorest countries in the world (Box 4). PDPs can serve as a one-stop function for donors by providing strategy, management and reporting against funds which might not be provided directly to the private sector. In addition, PDPs are also able to catalyse investment of additional donor funds.

Insecticides and drugs have been central to the successes in malaria control over the last decade. Used in huge quantities, massive pressure has been placed on the organisms to develop resistance. This phenomenon could threaten to reverse the gains that have been made to date if alternative chemicals and strategies to delay the spread of resistance are not forthcoming. It is essential to monitor insecticide and drug resistance, to work out how best to contain it or at least retard its spread, and to mobilise resources to fund these strategies. It is essential for the future of malaria prevention and treatment that investments are made in research and development of the new chemical entities that will inevitably be required. As the global malaria situation improves, the rate at which resistance develops can be expected to decline and, correspondingly, the investment needed to develop further new drugs. Conversely, failure to develop new drugs and insecticides risks losing the gains made to date and accelerating the development of resistance.

“PDPs can serve as a one-stop function for donors by providing strategy, management and reporting against funds”

Box 4: DFID’s support to PDPs

In August 2013, the Department for International Development (DFID) announced it is investing £138 million over the next 5 years into 9 public-private partnerships (PDPs). The investment will support the development of innovative new tools to combat some of the world’s most debilitating and deadly diseases, including malaria. Many pharmaceutical companies have been reluctant to research and develop new products because of the small financial returns from these treatments. PDPs bring together experts in the field, while also sharing the costs and risks across partners, to develop new drugs, vaccines, insecticides, diagnostic tools and microbicides to prevent, diagnose or treat the diseases. Examples of treatments resulting from PDPs previously supported by DFID include:

- a sweet-tasting, paediatric antimalarial drug which has so far seen 171 million treatments delivered in more than 30 countries
- an anti-malarial injection recommended by WHO as the first-line treatment for severe malaria of which 6 million vials have been distributed.

Four of the 9 PDPs supported by DFID work on aspects of malaria control:

- Medicines for Malaria Venture (MMV): new drugs for malaria, with a focus on treating malaria in pregnancy and the relapsing form of malaria.
- Innovative Vector Control Consortium (IVCC): new insecticides to control insects that carry malaria and some of the neglected tropical diseases.
- Foundation for Innovative New Diagnostics (FIND): new diagnostic tests for TB, malaria and sleeping sickness.
- New Products for Diarrhoea and Malaria (PATH): developing new drugs, diagnostics and vaccines for diarrhoeal disease and diagnostics for malaria.
Resistance to neither insecticides or artemisinins has yet led to operational failure of malaria control programmes, and current tools remain remarkably effective in most settings. However, it will only be a matter of time before programme failure and a public health disaster if efforts to counter the threat of resistance – by developing strategies to retard the spread of resistance and to develop new insecticides and drugs – are not intensified and sustained.

Delivering the tools – more could be achieved today if the tools currently available were delivered more efficiently. This would help to unlock their full potential and maximise malaria control. There may be opportunities to apply commercial sector solutions to public health problems, especially supply chains. The APPMG was updated on an investment made by USAID to establish a revolving capital fund that procures pools of FDA-approval generic drugs based on consolidated forecasting. The data-driven process results in regional stocks held close to the country of use with frequent local distribution able to meet changing in-country needs. Such developments are welcome, but improved supply systems are needed within malaria-endemic countries to ensure that the millions of people in need can access preventive therapies, diagnostic testing and quality-assured treatment for malaria and other diseases. These are often unavailable where people seek care, despite the availability of supplies in central stores in-country and complex supply chain systems (figure 8).

More work is needed on sub-national supply chains before the target of universal access – to interventions for malaria and other diseases – can be realised.

Adequate health information systems are another important but neglected part of the picture. They are needed to track progress with disease control but also to ensure the supply of the right amount of commodities to the right place at the right time. WHO, in their 2012 World Malaria Report, estimates that malaria surveillance systems detected only 10% of the global number of cases. A reliable malaria assessment was not possible in 41 countries, representing 85% of estimated malaria cases, due to incomplete or inconsistent reporting. Surveillance systems are weakest where malaria burden is highest and need to be strengthened to enable timely and tailored responses to malaria; to improve the tracking of progress; and to ensure that governments and the global malaria community are held to account.

The roll out of malaria diagnostics provides an opportunity to take the guess work out of malaria diagnosis and to count cases with confidence. RDTs allow not only the improved treatment of individuals but can also guide appropriate resource allocation and enhance the monitoring of progress with malaria control. The new WHO “T3: Test. Treat. Track.” initiative, launched in 2012, aims to scale up diagnostic testing, quality-assured treatment and surveillance.

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**Figure 8: Supply logistics systems in Kenya, 2007. Source: IHP+ presentation to APPG.**
Co-ordination of in-country partners

During the last year the APPMG received a presentation from the International Health Partnership (IHP) which involves countries, development agencies and civil society organisations to accelerate better health service provision and health outcomes. IHP advocates for stronger government leadership in defining national health priorities, and in promoting coordination behind one national health plan. The aim is to build on the principles of the Paris Declaration of aid effectiveness and reduce the management burden of dealing with multiple partners, which can be considerable (figure 9). This has the potential to make more time available for implementation, leading to better results. The various in-country actors support one national health strategy through inclusive, better aligned national planning and a joint assessment process; unified support for national plans; more harmonized financial management; a single results monitoring platform to track strategy implementation; and greater mutual accountability by monitoring progress against commitments.

“The roll out of malaria diagnostics provides an opportunity to take the guess work out of malaria diagnosis and to count cases with confidence”

Figure 9: Unintended burden of multiple missions at district level. Source: IHP+ presentation to APPG (from McKinsey: in-country interviews and DMO visitor log)

Missions can consume 10-20% of a DMO’s time:
Number of one-day missions to Temeke during last 6 months

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Report writing can consume even more time
Number of full days per quarter spent on writing reports (Morogoro)

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* Assumes around 50 working days per quarter and 100 per half year although reported to work in excess of that
Case study: New malaria drugs

There has always been a paradox at the heart of drug treatment for acute *P. falciparum* malaria: 86% of those who die are children under 5 years old, yet available drugs have always been developed as tablets for adults and therefore need to be broken up or crushed for children, making it difficult to give the exact dose. Additionally, many of the most widely available antimalarials are bitter to taste, causing children to gag or spit out the very medicine that could save their lives.

Even more challenging, after the first dose is given by a healthcare professional, parents or caregivers must continue to treat their sick children at home. This makes it hard to guarantee they will complete their treatment course, which is critical to ensure a complete cure and reduce the risk of emerging drug resistance.

Responding to the international community’s call for the development of paediatric formulations of medicines, Medicines for Malaria Venture (MMV; a Product Development Partnership) signed an agreement with the drug company Novartis in 2003 to develop the first antimalarial especially for children. The result was Coartem® Dispersible, a sweet-tasting, dispersible formulation, which eases administration and ensures effective dosing for young children.

Since its launch in 2009, over 200 million treatments of this life-saving medicine had been delivered to more than 50 malaria-endemic countries, at a cost as low as $0.38 per course of treatment.

Rose Aluoch Ngala and her daughter Shanrol, Kamagaga, Kenya.

Rose describes her experience treating Shanrol’s episode of malaria with Coartem Dispersible: “This medicine is good because the child can swallow it fast and it does not have any side effects, such as rashes. The fever also goes down very fast.”

*Photo courtesy of Novartis*
The ambition to eliminate malaria deaths by optimised malaria control and, eventually, to eradicate malaria across the world. It is simply intolerable that malaria, preventable and curable as it is, should continue to reap such an unacceptable toll in disease and death.

Malaria caused by *Plasmodium falciparum*, the parasite responsible for the vast majority of malaria deaths, can be prevented and treated effectively with the tools that are available today. However, to use these tools to maximal effect, local knowledge of local problems is needed, and the capacity to research and deploy workable solutions needs to be built and maintained. An underlying and under-appreciated need is the development of local capacities to deliver control strategies and to research local solutions to local problems. The building of such capacity needs to play a more prominent role in longer-term plans to control malaria.

The availability of rapid diagnostic tests and new information technologies should revolutionise the way that health information is collected, collated and used to inform supply chains. Examples exist of programmes in which SMS messaging from mobile phones provides information on stocks of drugs and diagnostics, and disease burden data. So far these programmes have been undertaken on disease-specific, time-limited, well-resourced but probably unsustainable bases. The time is right to build systems for the future and to introduce a step change in malaria control efforts.

Local information will facilitate the development and implementation of local solutions. District health teams can be empowered by providing timely information about where the problems with malaria or commodity provision lie. Information is impotent if not linked to an ability, at the district level, to respond appropriately. The local responses will involve investigation — checking net coverage in households, the availability of treatment in health facilities and shops, etc — and the ability to mobilise resources outside the district, such as insecticide spray teams at the regional or national levels, to respond to local needs.

The tools exist to turn dry data into a powerful knowledge-based strategy where appropriately trained people have the systems to act on data and deliver effective malaria prevention and treatment. This will provide funders with the wherewithal to focus on outcomes and impact, rather than inputs.

New tools for malaria prevention and treatment will result from the continued investment in R&D to make available safe and effective insecticides and drugs, and sensitive and reliable diagnostic field tests. The development of a malaria vaccine has been an elusive goal for decades. The vaccine RTS,S is being developed by a partnership involving GSK, MVI and 11 African research centres in a pivotal phase III clinical trial. Information on RTS,S will be reviewed by regulators and WHO in 2015 that will enable them to determine whether the vaccine should be licensed and recommended for use. As with any new product, there will then be a need for post-licensure phase IV studies to consolidate safety information and to document effectiveness when deployed as part of immunisation programmes in sub-Saharan Africa.

The private sector is increasingly recognised as an important player in malaria control efforts. First, private sector investment is required to bring new products to market. Second, the contribution of the private sector in service and commodity provision warrants appropriate recognition. The extent of this contribution varies from one setting to another but constitutes the vast majority of sources for anti-malarials in Nigeria and DRC, the two countries most heavily burdened with malaria in the world. The private sector’s role warrants acknowledgement and its players should be integrated into the broad picture of the health systems in those settings. The Affordable Medicines Facility for malaria (AMFm) pilot has shown the power of the private sector to make commodities available, even in remote rural settings, and revealed the potential for the public sector to take advantage of this capacity. There is also a need to capture information from the private sector in a country’s assessment of its malaria disease burden. Finally, there is great potential for the local private sector, as well as local offices of international companies, to play a role in domestic investment for malaria control through the provision of malaria services in the workplace and surrounding communities. This is particularly important in areas of rapid economic development and extensive migration, such as South East Asia, and may be considered part of the corporate social responsibility of individual companies.
Low levels of malaria transmission will be achieved through improved supply of effective commodities and recognised by enhanced information systems. A plan for elimination – interrupting the transmission of malaria in a country – can then be developed and evaluated so that no commitment is made before a realistic expectation exists as to what will be required to eliminate malaria. Local and national understanding about what is involved in the elimination plan, how to make it happen and how to sustain the political and financial commitment will be needed to make elimination a reality.

The Millennium Development Goals, and beyond

There is still much work to be done to meet the Millennium Development Goals (MDGs). Malaria features as a specific indicator for MDG 6 but also contributes to other MDGs, including poverty, education, child survival and maternal health. Whilst great progress has been made and 50 countries are on track to reduce malaria cases by 75% by 2015, these account for only 3% of the total estimated cases worldwide.

The malaria and global health communities must commit to completing the “Unfinished Business” of the MDGs. It is not clear how malaria will fit into the post-2015 agenda but it will continue to be relevant to the goals proposed by the UN High Level Panel, co-chaired by the Rt Hon David Cameron MP (Witney). In order to be effective, cost-efficient and sustainable, malaria control efforts will need to be better integrated into the overall development agenda and the work of non-health sectors – including water and sanitation, housing, infrastructure, environment, finance, mining, industry, tourism and education. All sectors should use a malaria lens to consider the potential broader economic, environmental and social impacts of their activities in endemic countries.

A better appreciation of the inter-dependencies between sectors is beginning to dawn, as evidenced by the July 2013 multi-sectoral RBM meeting on the social determinants of malaria. Projects were discussed which show how strengthened cross border collaboration can lead to harmonization of approaches and methods, synchronisation of activities, exchanges of information and experience, as well as cross sector work on malaria. Strong government commitment is critical, though it takes time to bring colleagues from other sectors on board and to recognise the malaria considerations as an added benefit rather than a complication to their activities. The potential for impact is likely to be considerable: the elimination of malaria in England was less due to specific interventions than to progressive social, economic, educational, medical and public health improvements, which also had major non-malarial benefits.

“All sectors should use a malaria lens to consider the potential broader economic, environmental and social impacts of their activities in endemic countries.”

**Recommendations**

i. We recommend that the UK government, civil society in endemic countries and all partners in the fight against malaria encourage endemic country governments to fulfil their pledges to commit 15% of government expenditure to health.

ii. We recommend that the UK and endemic country governments position malaria as a cross-cutting issue. Non-health sectors should use a malaria lens to consider the potential broader economic, environmental and social impacts of their efforts, and integrate anti-malarial activities into their work.

iii. We recommend that the UK government continue its support to WHO’s GMP and to the RBM Partnership, to ensure sound technical leadership and co-ordination of activities at the global level.

iv. We recommend that the UK government continues and increases its efforts to coordinate activities with other donors in the malaria research and control fields, to ensure investments are made strategically and to take into account the differing budget cycles and priorities of partners.

v. We recommend that the UK ensures that adequate support is available for the full range of R&D for malaria, including in the development of products and strategies which will contribute to the longer term elimination and eradication goals. It would be unwise to exclude any category of tools given the increasing pressure on existing interventions, due in particular to resistance.

vi. We recommend that DFID develops a strategy to ensure that funding is in place to see products through sequential stages of development all the way to completion, which may be many years in the future.

vii. We recommend that as an EU Member State and strong supporter of the European and Developing Country Trials Partnership (EDCTP), the UK government supports the expansion of EDCTP’s mandate to include Phase IV studies – this will ensure adequate evaluation of the safety and effectiveness of new products for malaria control in sub-Saharan Africa.

viii. We recommend that the UK government plans its future financial investments in global health taking into consideration the likely availability of new health interventions and strategies.

ix. We recommend that Governments of the UK and endemic countries support work to improve the tracking of domestic investment in malaria research and control.

x. We recommend that all stakeholders in malaria increase the attention they pay to delivering malaria treatment and prevention tools so that access is improved for those who need it most.

xi. We recommend that the UK government and all stakeholders support the development of capacity at national and sub-national levels for robust disease surveillance, the monitoring of the quality of service delivery, and action based on the data. This will be essential for sustainable malaria control and will have benefits for the control of other diseases.

xii. We recommend that all stakeholders work to understand the broad economic impact of malaria control, and the implications of losing control.

*We should all “act with urgency and determination” to maintain and accelerate progress in malaria prevention and treatment. There is no time for complacency in the fight against malaria.*
July: Strengthening health systems: the cross-over between NTDs and Malaria control

- Dr Phyllida Travis, International Health Partnership Core Team, Department of Health Systems Policies & Workforce, WHO. Explored aid effectiveness, the international health partnerships and human resources for health and supply chain management.

- Elaine Ireland, Head of Policy, Sightsavers. Explored the need for more effective use of human resources in the strengthening of health systems to ensure access to better treatment for NTDs.

- David Jamieson, Director, Global Partnerships, Partnership for Supply Chain Management. Introduced JSI’s recent document “Getting Products to People, The John Snow Inc. Framework for Integrated Supply Chain Management in Public Health”.

December: Christmas Reception

- Professor Chris Whitty, Chief Scientist at DFID. End of year round up of the global developments and progress in Malaria Control.

January:

- Parliamentarians visited Tanzania from 30th December- 5th January. A separate report was published on this visit.

February: Focus on Health in Tanzania:

- Jeremy Lefroy MP (Stafford), reported on the APPMG’s field trip to Tanzania, supported with a contribution from Susan Dykes, the Co-ordinator.

April: The World Malaria Day Event
Invest in The Future: Defeat Malaria

- Dr Rob Newman, Head of the Global Malaria Programme, WHO, gave a comprehensive overview of the global malaria control programme and its successes.

- Dr Shunmay Yeung, Deputy Director of the ACT Consortium and clinical senior lecturer at LSHTM, spoke about developments in diagnostics.

- Dr Tim Wells, Chief Scientist MMV, updated the APPMG on MMV’s progress on drug discovery & development.

- Dr David Kaslow, Director MVI spoke of the new technologies that could result in new vaccines.

- Dr Kolawole Maxwell, Malaria Consortium Nigeria Country Director, talked about the implementation of his programmes on the ground.

- Megan Owen, a sixth former from Stafford Grammar School read out her letter to Jeremy Lefroy, her local MP, saying it was great that the British Government had committed to help halve malaria deaths by 2015.

April: The Global Fund

A joint meeting with the All-Party Parliamentary Groups on HIV/AIDs and TB.

Dr Mark Dybul, Executive Director of the Global Fund

Simon Bland, Chair of the Board of the Global Fund

Maureen Mauren Murenga, ‘Here I am Ambassador’ for the Global Fund from Kenya

- 2013 is a critical year for the Global Fund, as it is a year when new funding has to be agreed. The UK has been a key donor to the Fund and also has a key role to play in mobilising support from other donors. The speakers reflected on the impact of the Fund’s work, the need which still exists to combat the three diseases and the role that the UK and other donors can play in supporting the vital work of the Fund.

May: How are people in the Diaspora dealing with Malaria Control within their own Communities?

- Dr Jane Zuckerman, Director WHO Collaborating Centre for Travel Medicine, Director UCL Medical Student Occupational & Royal Free Travel Health Centre, gave a talk on her work with travellers to Africa on the prevention of Malaria.

- Ralph Tanyi, MCMI, Cameroon Forum, spoke of some of the activities in which the Diaspora community has been involved in raising awareness within their communities.
• Alistair Soyode, Chairman of Ben Television, the largest Diaspora television broadcaster with audiences across the EU, discussed how the Diaspora is leveraging power in the media. His TV Station informed and educated its viewers, advising them on how to prevent and control malaria.

June: Insecticide Resistance

• Dr Tom McLean, Chief Operating Officer, Innovative Vector Control Consortium (IVCC) Liverpool School of Tropical Medicine, spoke of managing insecticide resistance: progress, the challenges and opportunities.

• John Lucas, Global Business Development Manager, Sumitomo Chemical and Adam Flynn, Global Vector Control Division, Sumitomo Chemicals spoke about their response to the increasing resistance threat, and the development of the Olyset Plus Net.