

Malaria

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President Ellen Johnson Sirleaf
“This World Malaria Day, we can say that a malaria-free Africa is within our reach”

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How Sri Lanka has been successful in defeating malaria **ONLINE**

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Tackling drug resistance
Read exclusive content from Dr David Reddy, CEO, MMV on the ambitious 2030 goals **ONLINE**

Closing the prevention gap

There is certainly much to celebrate on World Malaria Day. Many countries with ongoing malaria transmission have reduced their disease burden significantly, says Dr Pedro Alonso, Director of the World Health Organization (WHO) Global Malaria Programme.

The latest estimates from the World Health Organization (WHO) show that between 2010 and 2015, the global rate of new malaria cases fell by 21 per cent. Malaria death rates fell by 29 per cent in the same 5-year period.

In sub-Saharan Africa, where the disease is heavily concentrated, a concerted effort to reach the most vulnerable groups is bearing fruit. Since 2010, there has been a sharp increase across the region in malaria diagnostic testing for children. Access to preventive

treatment for pregnant women has increased five-fold.

But our work is incomplete. In 2015 alone, the global tally of malaria reached 212 million cases and 429,000 deaths. Too many people still lack access to the arsenal of effective, WHO-recommended tools that prevent, diagnose and treat the disease. This is particularly true in low-income countries with a high malaria burden.

This year, as we commemorate World Malaria Day, WHO is placing a special focus on prevention, a critical strategy for saving lives and accelerating progress in the



Dr Pedro Alonso
Director, WHO Global Malaria Programme

global malaria fight. The organization is calling on all countries and their development partners to CLOSE THE GAP in access to proven prevention tools, including long-lasting insecticidal nets, indoor spraying of insecticides and preventive therapies for vulnerable groups.

With the required resources and all partners united, we can transform our common vision of a malaria-free world into a shared reality.

Read an exclusive Q&A with Dr Alonso online at: malariaawareness.co.uk

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New drugs play a vital role in eliminating malaria

By Kate Sharma

Collaboration between industry and academia is accelerating the development of new drugs to combat malaria. Numerous research projects are underway into future antimalarials including 11 in early-stage clinical trials in patients in the global malaria drug portfolio.

Dr David Reddy, CEO of Medicines for Malaria Venture (MMV) said, "This is an extremely exciting time to be involved in malaria drug development. The new drugs attack the parasites in different ways compared to treatments currently available; these new mechanisms of action are critical in the battle against drug resistance. Each of these projects has the potential to be a game changer."

Artemisinin-based combination therapies (ACTs) are currently the first line of treatment for malaria. However, resistance both to artemisinin and partner compounds used in combination therapies is threatening this progress. As of March 2017, WHO confirmed artemisinin resistance in five countries of the Greater Mekong Subregion; some parasites have shown resistance to almost all antimalarial medicines. Therefore, these patients must be treated with triple combinations.

Resistance is inevitable, but as financial and political commitments move the malaria agenda forward and pharmaceutical companies open up their libraries to researchers, new ways to attack the malaria parasite are being discovered. It's vital this momentum continues if we are to achieve the ambitious 2030 goal to reduce the malaria burden by 90 per cent. ■

Read more from David Reddy at malariaawareness.co.uk

Failing drugs and super bugs: the elimination race

The paradox of malaria: the rarer it becomes, the harder it is to fight. In the Mekong, drug-resistant strains threaten progress and pose new risks.

By Izaskun Gaviria, Senior Fund Portfolio Manager, Regional Artemisinin-resistance Initiative, the Global Fund to Fight AIDS, Tuberculosis and Malaria

The fight against malaria is one of the biggest success stories of the 21st century. The number of deaths caused by malaria globally declined 48 percent between 2000 and 2015, averting an estimated 6.4 million deaths, bringing more and more countries closer to malaria elimination than ever before. Malaria experts warn, however, that drug and insecticide resistance poses a serious problem.

In the Greater Mekong, the Global Fund is supporting a programme known as the Regional Artemisinin-Resistance Initiative. RAI is a collaboration of funders, multilateral agen-

cies, technical partners, scientific researchers, communities and governments to pursue the goal of malaria elimination in Myanmar, Thailand, Cambodia, Laos and Vietnam.

Despite a downward trend for malaria, antimalarial drug resistance is getting worse quickly, with resistance to both artemisinin and its partner drugs – the standard for malaria treatment – seen in all five countries. As countries whittle down areas and populations affected by malaria, only the strongest parasites hold out. Failing to eliminate malaria quickly could allow these difficult-to-treat, resistant strains to cause a resurgence.

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In Prongyeang, Cambodia, seasonal workers receive insecticide-treated nets to protect themselves and their families against malaria. Focussing prevention efforts on specific populations such as migrant and seasonal workers – who are particularly vulnerable because of their mobility – will enable the government’s malaria control programme to have a greater impact and reduce the chance that they will bring the malaria parasite to new communities when they move to their next job. Photo: The Global Fund / John Rae

Cambodia illustrates the problem: while there was only one malaria death nationwide in 2016, the country is down to a single effective treatment regimen – the other drugs are no longer effective there.

Unwittingly, humans have helped the parasite develop resistance. A combination of drugs, including artemisinin, when taken correctly are effective at curing malaria. However, in some places people may never make it to clinics for diagnosis, they may fail to take complete courses of drugs, or

perhaps take sub-standard drugs, all of which drive drug resistance.

These are precisely the kinds of obstacles to elimination the Global Fund partnership is working to address through RAI. Together we are working to close gaps in supply chains so the right drugs are in the right places at the right time. A network of local organisations works to reach highly mobile and remote populations, such as rubber plantation workers, and ethnic minorities who historically have been under served

by health systems. Improved surveillance data means that when an outbreak flairs up, an appropriate response can be deployed.

The regional implementation of these strategies is key. In the Mekong, several distinct drug-resistant parasites are occurring at the same time. That is why RAI focuses on elimination, which requires regional coordination and cooperation.

The window of opportunity is limited and urgent action is needed. The Global Fund partnership will invest

more than US\$242 million through RAI over the next three years to help make a big strike. If we don’t eliminate malaria in the Mekong – and the drug-resistant strains along with it – there’s a risk that artemisinin resistance will spread to other countries and the fight will become a lot harder to win. ■



Read more on malariaawareness.co.uk



Medicines for Malaria Venture and partners have saved over **a million lives** from **malaria** by developing and delivering new medicines

Join the fight to end malaria

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NEWS

i INSIGHT**Jeremy Lefroy**

Member of Parliament for Stafford Constituency, Chair, All-Party Parliamentary Group on Malaria and Neglected Tropical Diseases and Chair, Parliamentary Network of the World Bank and International Monetary Fund

The enduring menace of malaria

Progress made in tackling malaria since 2000 has been one of unprecedented advance. Malaria deaths have decreased by 62 per cent over 2000-2015 and incidence has declined by 41 per cent. Since 2000, 17 countries have eliminated malaria and an estimated 6.4 million deaths have been prevented.

Increased attention by the malaria community and the World Health Organization (WHO) after resurgence in the late 1990s has been key. Funding has increased from US\$100 million per year in 2000 to US\$2,900 million in 2015. Of that, the UK contributed 16 per cent, second only to the US, which provided 35 per cent.

Investing in malaria is a clear example of the value of UK aid. It saves lives and improves the lives of millions each year. Political will in malaria endemic countries acknowledges the benefits of malaria reduction to improve and extend health services offered to their people. But the rise in insecticide and drug resistance presents a threat to humanity.

Research is shaping new drugs and insecticides. The first malaria vaccine has been WHO approved for piloting in sub-Saharan Africa. More work is being done in hard-to-reach areas like the Sahel, where seasonal malaria and conflict have prevented mass drug administration.

We must not be complacent thinking the problem is largely solved, however, it is not. Malaria takes advantage of any slackening in efforts. Global spending must double to reach the WHO's 2030 targets. Increased resources from endemic countries will be needed with increased investment by wealthy countries too. ■

Is Africa on target to eliminate malaria by 2030?

Malaria will be eradicated in Africa this century – but, first, there are significant challenges to overcome, says Joy Phumaphi, Executive Secretary, African Leaders Malaria Alliance (ALMA).

By Kate Sharma

What needs to happen in the short term to achieve malaria elimination in Africa by 2030?

We need to protect the gains we have made. To do that we must see a decrease in both the malaria incidence rate and mortality rate. This means we have to consistently increase coverage of vector control; there has to be rapid diagnosis of fever at community level and there has to be access to Artemisinin-based Combination Therapies (ACTs) at community level. Unfortunately, there are very few countries in Africa that have been able to achieve this. In fact, on the mainland of the continent there are only six countries that have been able to sustain the progress they have made.

How will African heads of state and government ensure that the continent achieves malaria elimination?

By working together. We know that progress happens when heads of state work closely with their minister of health and with partners, with a focus on accountability.

One of the things that has contributed to the success of

**Joy Phumaphi**

Executive Secretary, African Leaders Malaria Alliance (ALMA)

fighting malaria in southern Africa is cross-border control. For example, in the Lubombo region between Swaziland, South Africa and Mozambique, instances of malaria have been kept down because these three countries have worked together to control it. Compare that success with the region bordering Namibia and Angola where there hasn't been common agreement on how to fight malaria and, as a result, there are outbreaks on both sides every year.

How will ALMA encourage more domestic financing for malaria control and elimination?

We know we have to treble investment by 2030 to meet tar-

gets. This means we can no longer rely on aid. Public sector allocations have to increase and we have to take resources from the private sector too. So, at ALMA, we have been aggressively promoting the importance of an increase in public sector allocations. That has yielded results, although not on the scale that we would like to see. We are also establishing a fund, which will be crucial in terms of increasing public sector allocations, and tapping into resources from the private sector and from individuals in Africa.

How optimistic are you that malaria will be eliminated in Africa?

Very optimistic. It's important to note that Africa has made more progress in fighting malaria in the last 10 years than it did over the whole of the last century. Also, African countries now appreciate the economic benefits of combating malaria and are determined to make its elimination a reality. We're aiming to do that by 2030: but even if we fall short of that target, we will definitely get rid of malaria in Africa in the first half of this century. ■



Read more on malariaawareness.co.uk



Uganda's tailored approach to malaria control can guide other countries

By Mikkel Vestergaard

Malaria is one of the greatest global health success stories. Since 2000, 6.2 million lives have been saved and there's been a 37 per cent reduction in new cases.

In Africa, long-lasting insecticidal bed nets (LLINs) have been credited with nearly 70% of that reduction. On the flip side, there is the serious threat posed by mosquitoes that are becoming increasingly resistant to the only insecticide available today for use in LLINs. This year, Uganda became the first country in Africa to attack this problem by adopting a tailored approach to malaria prevention.

Uganda has the sixth highest number of annual deaths from malaria in Africa and some of the

highest reported malaria transmission rates in the world. In 2013/2014 the government distributed over 20 million bed nets throughout the country. Yet, despite the increased protection, northern Uganda experienced a six-fold increase in malaria cases after the withdrawal of indoor residual spraying, even in the presence of high bed net coverage.

As a result, the Uganda government made a data-driven decision to deviate from the standard one-size-fits-all approach when planning their 2017 net distribution campaign. The government initiated a rigorous year-long evaluation to determine the most appropriate nets to procure and distribute. They concluded that, in areas where insecticide treated nets no



Mikkel Vestergaard
CEO, Vestergaard

longer function according to WHO criteria, they would deploy an alternative to the standard LLIN. This other net uses a synergist (piperonyl butoxide or PBO) that enhances the effect of the insecticide by blocking the metabolic en-

zymes within the mosquito that break down the insecticide and make mosquitoes resistant.

Uganda became the first country to deploy PBO nets at scale (five million out of 24 million LLINs being distributed). They also initiated a monitoring component that will generate data to determine the efficacy of the nets in resistance settings. This tailored approach can inspire other countries to let science dictate decision making for vector control interventions. We must sustain our commitment to fight malaria with the smartest ways forward. Thanks to the government of Uganda for leading the way. ■



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INSPIRATION



Philippe Guerin

Professor of Epidemiology and Global Health and
Director of the Infectious Diseases Data Observatory

Dealing with the dangers of drug resistance

Malaria is a complex problem for which there is no silver bullet. The solution will be multi-dimensional and result from partnership and collaboration. Resistance to malaria medicines threatens to destroy the gains we have made in fighting the disease in recent years.

Artemisinin used in combination with other medicines is currently the cornerstone of malaria treatment and has helped to reduce mortality rates. Yet malaria killed approximately 429,000 people in 2015, most of them children under the age of five, in Africa. To see artemisinin resistance — identified in Cambodia, Thailand, Vietnam, Laos, South China and Myanmar — spread to India and Africa could be devastating.

There are currently no new non-artemisinin based drugs in the pipeline. That is why it is vital that we maintain the efficacy of artemisinin combination therapies until new medicines are developed over the next decade. ■

A malaria-free Africa is **within** **reach**

Stunning progress against malaria in the past decade has allowed the world to imagine a different future. This World Malaria Day, we can say that a malaria-free Africa is within our reach.

By President H.E. Ellen Johnson Sirleaf, President, Liberia

The next chapters of our fight will be the most difficult yet. Eliminating malaria will take bold commitments from African leaders in the public and private sectors and continued global aid commitments that recognise and leverage country ownership.

We must double down on existing malaria control efforts and think creatively about new funding sources, innovative new tools and unique partnerships to drive down cases and deaths and move more countries toward elimination.

Strong leadership has been key to progress. Since 2000 we have cut malaria mortality rates in Africa by 62 per cent. Ten years ago, malaria was killing a child every 30 seconds

on our continent and only five per cent of the at-risk population slept under insecticide-treated mosquito nets.

Now, more than half of the at-risk population sleeps under bed nets. These are extraordinary achievements. Our continent is demonstrating that we can lead the charge in the malaria fight. But malaria still ravages our families, communities and economies.

Finance malaria control

So why are we hopeful? Momentum is building across the continent. In Nigeria, which shoulders 29 per cent of the global malaria burden, the public and private sectors are joining forces. Last year, the Nigerian Health ministry and the Dangote Foundation

Providing data-sharing platforms to improve the treatment and control of infectious diseases affecting the most vulnerable populations

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Vaccines for Tomorrow



The fight continues. President H.E. Ellen Johnson Sirleaf visits school children in Liberia.

launched the Private Sector Engagement Strategy, which leverages business expertise and innovation and capitalises on the strength of government efforts to control malaria.

In 2005, there was no data on how many Liberians were dying from malaria. Nor did national health care officials know how many children with a fever had the disease. So Liberian health and finance ministers, non-governmental organisations and others joined forces.

They strengthened diagnostic capacity at the local level, improved case supervision at the county level, and enhanced management sys-



President H.E. Ellen Johnson Sirleaf

President, Liberia and Nobel Peace Prize Laureate

tems for health data. Ten years later, Liberia's malaria-related deaths have been cut in half. Today, all public and private health facilities are supplied with rapid diagnostic tests.

High-level advocacy

Similar advancements are under way across Africa thanks to the efforts of the African Leaders Malaria Alliance, a coalition of heads of state and government from African Union-member countries fighting malaria through high-level advocacy and action.

Both the ALMA Scorecard for Accountability & Action and the ALMA 2030 Scorecard towards Malaria

Elimination are helping track country-by-country progress and drive action on control and elimination.

The need for renewed leadership to fight malaria is why we, along with other African leaders, joined the End Malaria Council. The Council is a group of public and private sector leaders committed to keeping malaria elimination high on the global agenda.

All of us have a role to play in ridding the world of this disease. The rest of the world should take heed and support this effort, which will save lives and unlock new economic opportunity. The end of malaria starts now. ■

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NEWS



PHOTOS: The MENTOR Initiative

Famine and malaria – a lethal combination

20 million people in Yemen, South Sudan, Somalia and Nigeria are on the verge of starvation – **so why should we be concerned about malaria as well?**

By Kate Sharma

The UN has classified the current situation as possibly the worst humanitarian crisis since 1945. International food distribution campaigns are underway for what is clearly a desperate situation. However, tackling food insecurity alone is not enough to prevent the appalling loss of life in the region, warns Richard Allan, CEO of Mentor Initiative, an organisation that saves lives in emergency situations through tropical disease control.

“Malaria is the most pervasive disease on earth. We ignore it at our per-

il,” warns Allan. “A simple infection for someone who has severe malnutrition becomes life threatening. The death rate for a severely malnourished child might be about 10 per cent, that can be reduced to 1 or 2 per cent with the right management, but add to that malaria and it could increase to as much as 40 per cent.”

The speed with which infection can take hold of an individual can be so rapid in someone who is malnourished that there is little time to respond. With the symptoms of malaria being so similar to many associated with malnutrition, the disease can be hard to spot. Consequently, for some,

it can be merely hours between diagnosis and death.

The problem is further compounded by the fact that those who are severely malnourished can't simply be given the same treatment as regular malaria patients. “The lining of the stomach changes dramatically in someone who has malnutrition,” explains Allan. “The stomach lining is grass like in structure, but in someone who is malnourished the fibres are folded over which reduces the absorptive capacity by up to 50 per cent. As a result, regular artemisinin combination therapies used to treat malaria just don't work.”

The good news is that there are alternatives. Treatments are available that can be administered intravenously and intramuscularly - where the antimalarial is injected straight into the blood or the muscle. Alternatively, there are some that can be taken intra-rectally as suppositories.

It is worth remembering that many of those countries currently in the throes of food insecurity are also experiencing internal conflict. Not only do conflict zones provide the perfect unsanitary environment that malaria parasites thrive in, they also create challenging conditions in

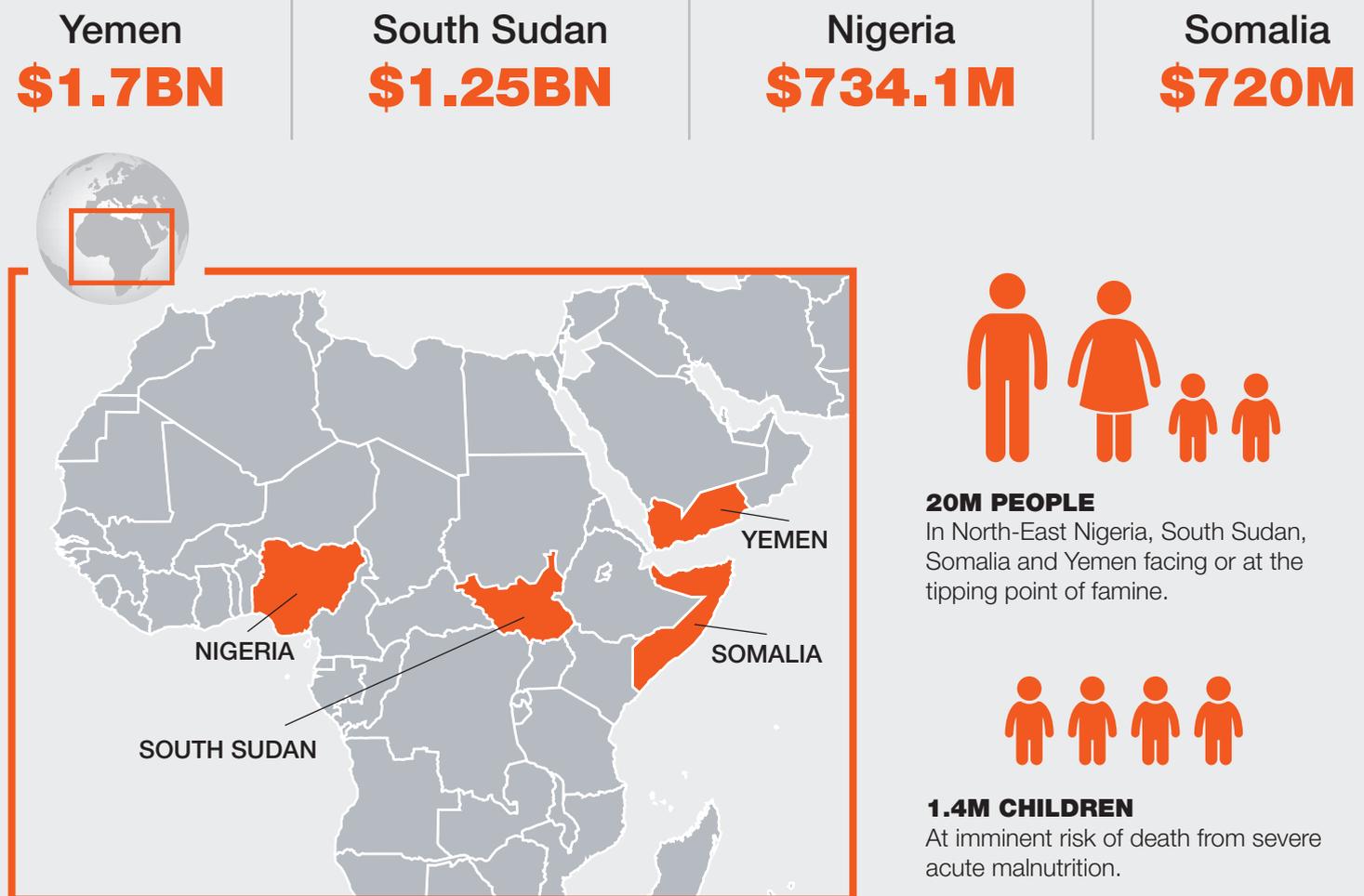
Urgent humanitarian operations needed

Source: OCHA
7/3/2017

NORTH-EAST NIGERIA, SOUTH SUDAN, YEMEN AND SOMALIA: PREVENT FAMINE AND SUPPORT RESPONSE

CRISIS OVERVIEW

More than 20 million people in North-East Nigeria, South Sudan, Yemen and Somalia are facing famine or a credible risk of famine over the coming six months. Some 1.4 million children are currently at imminent risk of death from malnutrition. To avert a major humanitarian catastrophe the United Nations and its partners must massively scale up efforts now. To do this, humanitarian operations in the four countries require more than US\$5.6 billion in 2017, of which at least US\$4.4 billion are required urgently.



which to treat the disease. In Yemen, South Sudan, Somalia and Northern Kenya millions of people have been displaced from their homes and find themselves living in communities where there simply isn't the health infrastructure in place.

Whilst the problems are immense, Allan is quick to point out that they are not insurmountable. The tools to fight the disease are there, we just need to be more proactive and pre-emptive in the way we use them. "Automatic screening is really important so we diagnose conditions early. We need to see the routine use of the most effective



Richard Allan
CEO, The MENTOR Initiative

medication and therefore health workers need better training, technical support needs to be upgraded and supply chains upscaled so resources can be deployed to the right areas," says Allan.

Alongside a more pro-active approach to diagnosing and treating patients, preventative methods also need to be stepped up. Allan is urging the more extensive use of indoor residual spraying in famine areas at risk of malaria epidemics, as it is very effective, and has been conducted previously and successfully, in South Sudan, Somalia, NE Kenya and Yemen. In South Sudan, a pilot is also

underway to replace the commonly used pyrethroid bed nets with those that use a combination of chemicals to combat the issue of pyrethroid resistance in partnership with UNICEF, UNF and MOH.

Whilst the world's focus is very much on fighting famine, if attention is not given to putting in place effective prevention, diagnosis and treatment of malaria now, then when the rains do finally arrive in these famine-stricken nations and the mosquitoes start to breed, then the tragedy could be even more colossal than the one we are currently witnessing. ■

Clinical trials 'essential' in the fight against malaria

In the fight against malaria, clinical research collaborations between European and sub-Saharan African partners are a way of sharing expertise to develop life-saving medicines and vaccines.

By Tony Greenway

The figures are stark admits Dr Michael Makanga, Executive Director of the European & Developing Countries Clinical Trials Partnership (EDCTP), which funds collaborative research to accelerate the development of new or improved medicines and vaccines to fight poverty-related infectious diseases in sub-Saharan Africa. "Globally, there are 850,000 deaths from malaria every year, with over 90 per cent of these occurring in sub-Saharan Africa," he says. "And the majority of these are children under five."

Clearly, what is needed — and urgently — are more antimalarials, vaccines, diagnostics and interventions in vector control (an essential part of malaria prevention). Before these can come to market, however, clinical research and clinical trials are necessary to ensure they are safe and effective for humans under controlled and real life situations.

Priorities

Unfortunately, trials are agonisingly slow, taking many years on average,

yet their outcomes have eventually yielded successful treatments for, for example, children and more evidence for better clinical management of pregnant women with malaria, and malaria patients who have other infections, such as HIV. Their importance cannot be overstated. The medicines developed and future vaccines as a result of clinical trials save lives.

Currently, about 15 drugs and 18 vaccines are in clinical development, and 28 diagnostics and 12 vector control candidates are in combined early and late development around the world. "Not all will be successful," cautions Makanga. "But even those which provide negative results can help prevent either further damage, or show other funders not to waste resources in a particular area." Trials also highlight where research priorities should be focussed. In the field of diagnostics, for example, this includes infection identification, drug resistance and tracking patients' progress. "We prioritise research and development on novel drugs and combinations, especially non-artemisinin products and



Dr Michael Makanga
Executive Director, EDCTP

studies in children, pregnant women and drug-drug interactions in malaria patients with co-infections. For prevention we aim to invest in the development of second generation vaccines that target both *Plasmodium falciparum* and *vivax* species of malaria.

Expertise

In the fight against malaria, shared expertise is vital, which is why the EDCTP supports clinical research collaborations with European and sub-Saharan African partners. "Malaria is predominantly a sub-Saharan African problem," says Makanga. "So,

in order to address the issue in the most relevant and appropriate way, we have to engage people in the affected countries at all levels, including policymakers. The research has to be driven by local needs and we're not simply generating scientific data. We are generating knowledge to be translated into policy and practice." Involving European partners is not only important for their financial and technical resources, the results will be of direct benefit to Europe too, given the global nature of many infectious diseases and, secondly, the global population movements through tourism, trade, employment and migration.

An important research enabling challenge is to ensure strong ethical review and regulatory oversight of clinical research in Africa. "All research should be of the highest scientific and ethical rigour, irrespective of where it is conducted," says Makanga. "Improved capacity in these areas prevents major bottlenecks in research and development and ultimately speeds up the process of bringing treatment to market." ■



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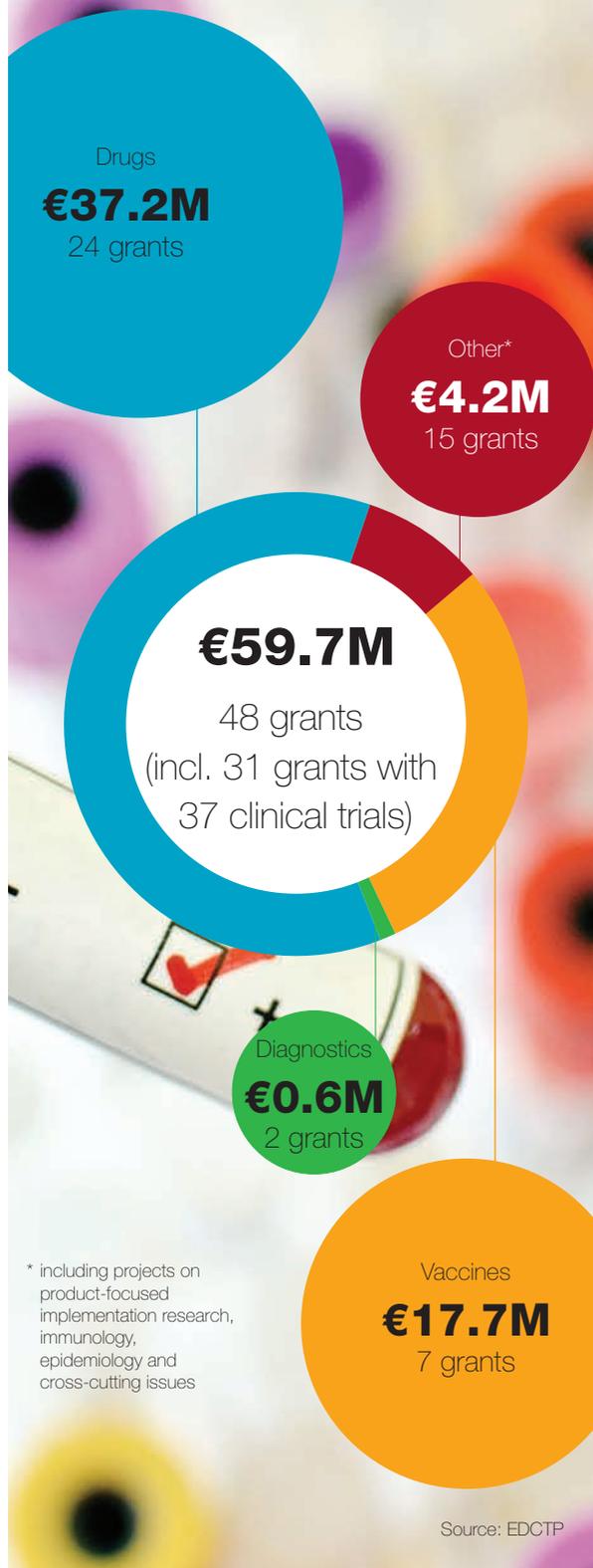
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ABOUT EDCTP

Trials to make breakthroughs in sub-Saharan Africa

By Tony Greenway

The European & Developing Countries Clinical Trials Partnership (EDCTP), which currently has 14 European and 14 African member countries and is supported by the European Union, has been behind numerous research and development success stories in the field of malaria treatment.*

Clinical trials are on the increase in sub-Saharan Africa. "This is how it must be if we are to appropriately address the greatest unmet medical needs in this region," says Dr Michael Makanga. "Sub-Saharan Africa is the region of the world that is most affected by malaria so, for new medicinal products to be investigated properly, this is where the clinical trials need to happen."

EDCTP funds collaborative R&D involving European and African institutions and researchers in collaboration with global public and private product developers in phase I-IV investigational clinical studies, with particular emphasis on phase II and III trials. Under the first programme (2003-2014) EDCTP invested almost €50.2 million in 42 malaria projects. Under the current programme (2014-2024), 6 projects in malaria research have been funded so far to a total amount of €9.5 million.

EDCTP also invests in much needed African research capacity. A recent EDCTP bibliometric analysis showed that sub-Saharan Africa accounts for just 21 per cent of the world's output of malaria research, whereas Europe accounts for 43.4 per cent.

Success

Over the years, research funded by EDCTP has contributed to numerous success stories in the field of malaria treatment, including five clinical trials investigating the

"In addition to the usual project funding, the partnership plans to broaden its funding approach to include funding of portfolios of projects in collaboration with other interested R&D partners able to provide cash co-funding"

prevention and treatment of malaria in pregnancy. "The findings of these studies have been shared or reported to the World Health Organization in order to inform its latest malaria treatment guidelines," says Dr Makanga. EDCTP-funded trials have also contributed to European Medicines Agency (EMA) approval of the drug dihydroartemisinin-piperazine to treat children and label extension and paediatric treatment with artesunate-pyronaridine for uncomplicated malaria in sub-Saharan Africa.

"From 2018, EDCTP will implement three year planning cycles," says Dr Makanga. "In addition to the usual project funding, the partnership plans to broaden its funding approach to include funding of portfolios of projects in collaboration with other interested R&D partners able to provide cash co-funding." ■

* EDCTP's funding scope comprises the following poverty-related diseases: HIV, tuberculosis, malaria, neglected infectious diseases, diarrhoeal diseases, lower respiratory tract infections and emerging and re-emerging infectious diseases.

Read more on malariaawareness.co.uk



NEWS

Insecticide resistance is reaching the tipping point

Commitment to develop new public health chemicals is vital as insecticide resistance threatens to undermine gains made in the fight against malaria.

By Kate Sharma

Vector control, through long lasting insecticide treated nets (LLIN) and the use of indoor residual spraying (IRS), has been instrumental in cutting global malaria mortality rates by 29 per cent since 2010, according to World Health Organisation statistics. However, resistance to synthetic pyrethroids, which is the chemical class of active ingredients used in 100 per cent of LLINs and roughly 60 per cent of IRS, is now undermining these advances. 60 of the 73 countries who monitor resistance have already noticed resistance to at least one class of the insecticide and 50 have identified resistance in at least two.

“No one has been looking for a new chemistry because there is no significant market for it,” explains Dr Nick Hamon, CEO of the Innovative Vector Control Consortium (IVCC) and an adjunct Professor of Entomology at North Carolina State University. “We are seeing resistance to pyrethroid in-

secticides and other classes of chemistry almost everywhere we look for it. Insecticide resistance is now reaching the tipping point.”

Research into vector control is focussed on three main areas: finding active ingredients with novel modes of action, repurposing current insecticides and targeting outdoor transmission. In recent years, alternative agents have been used in IRS and additional chemicals added to LLINs, but this is not enough. Bed nets are the main form of defense and chemicals used in them need to have very specific properties; they need to provide protection for least three years, be strong enough to kill mosquitoes, safe to sleep under and able to withstand 20 washes.

Over the past few years, with the support of product development partnerships like IVCC, major players in the agro-chemical industry have opened up their chemical libraries. These contain more than 4.5 million chemical compounds to allow re-



Dr Nick Hamon

CEO, IVCC and adjunct Professor of Entomology, North Carolina State University

“Insecticide resistance is now reaching the tipping point”

searchers to look for high potential chemistry for public health use. Five chemical classes and nine compounds have been identified as having potential use and are currently undergoing a major synthesis programme. Dr Hamon is hopeful that within the next 12 months at least three will be put forward for rigorous trials in order to assess their safety and performance.

“We are hopeful that from these we will develop three new classes of chemicals that can be used in LLINs and IRS. Ideally we need to have three that can be used in rotation over the course of the next few decades in order to reach our target of eradication by 2040,” explains Dr Hamon.

Time is very much of the essence, but many, like Dr Hamon, believe that with current advances in vector control alongside developments in treatments, technology and education, a tool box of solutions can be created that will provide front line staff with the resources they need to end the scourge of malaria. ■



GOOD LABORATORY PRACTICE

BUILDING CAPABILITY, EXPERTISE AND QUALITY

DELIVERING NEW VECTOR CONTROL INTERVENTIONS THROUGH GOOD LABORATORY PRACTICE

New vector control tools are needed to maintain the gains made against malaria transmission in recent years and to meet the goals of elimination and eradication. Generating data against local mosquitos in the setting where products are going to be used is an essential part of the process.

Supported by IVCC and the London School of Hygiene and Tropical Medicine, Kilimanjaro Christian Medical University College (KCMUCo) in Moshi, Tanzania, recently became the first African vector control field trial site to achieve Good Laboratory Practice (GLP) certification, a significant step forward in vector control testing.

Certification is granted to field trial sites that demonstrate uniformity and consistency in testing, ensuring the quality and reliability of the data collected. As more trial sites across Africa achieve GLP certification, manufacturers of vector control products will be able to generate critical field data that can be used to support regulatory submissions for product approvals.

LEARN THE FACTS: IVCC.COM



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Stronger together

Collaboration is being encouraged to tackle disease in some of the world's most volatile environments, says Richard Allan, CEO, The MENTOR Initiative.

By Kate Sharma

In 2014 the Department for International Development (DFID) brought together a consortium of leading aid agencies in the Central African Republic (CAR) to tackle malaria. In 2016, the consortium, which includes Oxfam, The MENTOR Initiative, Cordaid and International Medical Corps UK, began a second two-year project to tackle the largest killer in the troubled African nation.

CAR is considered by the United Nations Development Programme's Human Development Index to be the second least developed place on earth. After years of conflict and political uncertainty, a complex web of interlocking issues has left an estimated 390,000 internally displaced and a further 2.3 million people need aid according to The Mentor Initiative.

Funded by the UK government, the consortium brings together experts in areas of secondary health provision, primary health care, water and sanitation and emergency relief, not only to share their knowl-

edge, but to work together to develop best practice and standardisation in their approach to tackle malaria in the country. All the agencies involved have extensive experience of working in the region and cover a vast area between them.

"When you get people around the table, there are a lot of benefits to the people we serve when we can standardise and harmonise our approach," says Richard Allan, CEO of The Mentor Initiative. "When you have the right agencies with the right skill sets then the quality of planning on the ground improves." The benefits are far reaching; primary health care workers can gain a boarder range of skills, prevention methods can go hand in hand with improved sanitation and standards are being raised across the board.

The economic benefits are clear too. With greater collaboration comes greater efficiencies in areas such as practical procurement and shipping supplies. At a time when international aid budgets are under greater scrutiny than ever before, the consortium offers a financially



Richard Allan

CEO, The MENTOR Initiative

astute proposition and additional levels of accountability.

Around 438,000 people are already served by the consortium in some of the country's hardest to reach places. It is important to note that whilst the consortium is responding to emergency needs, it's doing so in a way

that lays a springboard for development. The agencies involved aren't merely working to avert a crisis, they are working alongside the ministry of health in CAR to develop local health provision and robust infrastructure – not just for malaria provision, but for the diagnosis and management of a wide range of diseases.

"Malaria is the pathfinder to improve the overall capacity for prevention, diagnosis and treatment," continues Mr Allan. "If we get this right, we can reduce the burden for a whole range of diseases."

Collaboration within development certainly isn't new, but if the next two years in CAR go as planned, we could see the consortium-style approach to public health management in developing countries become increasingly common. ■



Since 1990, Population Services Kenya (formerly Population Services International Kenya), a local NGO has been supporting the Ministry of Health in Kenya in addressing public health priorities with national and community-level programs focusing on social marketing, behavior change communications (BCC) and capacity building.

ACTwatch is a multi-country research project implemented by Population Services International (PSI) and is designed to provide timely, relevant, and high quality antimalarial market intelligence, including information on ACTs and malaria testing. With four rounds of data collection so far conducted in Kenya (2010, 2011, 2014 and 2016), the evidence has helped the MoH and partners to identify gaps and improve engagement with various sectors for improved malaria case management.



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Novartis Social Business
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The fight against malaria continues to advance, led by the hard work of countless people like nurse Agnes Akoth, who regularly visits schools in southwestern Kenya to help them better understand how to minimize the risks they face.

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