

Malaria

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Aloe Blacc

The singer speaks out on how we can be the generation to **#EndMalaria**

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The role of community volunteers in Kenya's fight against malaria **P4**

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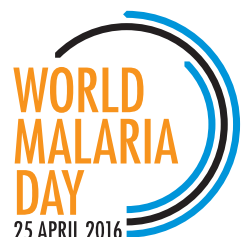
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The hardest task is yet to come

It's no understatement to say that historical, unprecedented progress has been made in the fight against malaria in the last 15 years. The situation we faced in the mid-1990s was out of control. More than a million people were losing their lives to the disease each year and we had no effective tools to combat it.

Today the picture is very different. Investment has been stepped up to more than US\$2.5 billion a year. It's

made a huge impact, averting an estimated 6.2 million deaths with an effective combination of vector control, improved diagnostics and treatment.

Tipping point

But the fight is far from over. There are still an astonishing 214 million cases of malaria each year and more than 400,000 deaths as a result.

Consequently, we find ourselves at the tipping point. We either accelerate or we run the risk of becoming



Dr Pedro Alonso
Director, WHO Global Malaria Programme

"The fight is far from over"

complacent. Up to now, the gains have been relatively easy, but the picture is becoming more complex. In addition to the challenges of reaching populations at risk of malaria, drug and insecticide resistance threaten to make the job even harder.

Malaria is a highly heterogeneous disease, and one approach will not fit all situations. Last May, the World Health Assembly approved a Global Technical Strategy for Malaria, which gives us a comprehensive framework that can be translated into

targeted action on a regional and country level.

We know we can deliver the results given the right investment. History has shown that. We need continued investment and commitment to deliver programmes on the ground. At the same time, we need to broaden our intelligence, develop alternative drugs and insecticides, explore new approaches to vector control and continue the search for a successful malaria vaccine. In many respects, the hardest task is yet to come. ■

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Within KABS (German Mosquito Control Association), around 100 communities have merged their interest in a unique mosquito control programme based on the use of *Bacillus thuringiensis israelensis*.

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Malaria and MDGs: mission accomplished?

“At the beginning of the millennium, the battle against malaria was being lost.” This is the sobering opening sentence of the joint report by WHO and UNICEF, launched on 17 Sept at the UK Houses of Parliament, on the malaria target of the Millennium Development Goals (MDGs): Achieving the Malaria MDG Target. However, this is the prelude setting the scene for the report’s very welcome news.

The headline achievement is the 60 per cent fall in the malaria-associated death rate — from 47 per 100,000 at risk in 2000 to 19 per 100,000 in 2015. This equates to a total of 6.2 million lives saved. Clearly a great achievement. Also, the report shows that incidence of malaria is in decline. Taken together, with the addition of achievements on children younger than five years sleeping under bednets and receiving antimalarials, the report states that this means that the malaria-specific target of the MDGs “has been met convincingly.”

The source data in the report were published simultaneously in a research article that mapped the effect of malaria control on *Plasmodium falciparum* in Africa over the lifetime of the



Onisillos Sekkides
Deputy editor, The Lancet Infectious Diseases

MDGs. Presented as heatmaps, this article shows the striking decline in *P falciparum* infection. One of the paper’s authors, Peter Gething, outlined the crucial contribution of this work: he said that since 2000 “surveillance has been transformed and this has similarly had a transformative effect on policy.”

However, throughout the launch event many speakers were keen to sound a note of caution and ensure the positive news in this report did not obscure the enormous task that still lay ahead. Just in 2015, there were an estimated 214 million new cases of malaria with 438,000 deaths. And despite progress, almost half the world’s population is still at risk of malaria. This acknowledgement of the work still needed prompted a reminder that despite the significant increase in funding for malaria it is still not enough. Not a message

the politicians in the room really wanted to hear.

The partnership between the UK and the USA was described as a gamechanger by Bernard Nahlen, the Deputy Coordinator of the US President’s Malaria Initiative. “This commitment has been crucial,” he said, “in 2000 there was evidence that interventions would work, but resources were lacking. Now these partnerships have provided those resources.” Providing additional emphasis of the importance of tackling malaria, he pointed out that the Roll Back Malaria Partnership’s report Action and Investment to Defeat Malaria 2016–2030 showed that “malaria represents an impediment to economic development.” This report outlines that if coverage were to revert to 2007 levels then US\$1.2 trillion of economic output would be foregone from 2016 to 2030. But Nahlen offered reassurances about the commitment of the USA to malaria because of its cross-party support in Congress.

Now that the MDGs have reached their conclusion, attention is shifting to the next set of goals: the Sustainable Development Goals (SDGs). Controversially, malaria is now one of nine targets for one of 17 goals. When

asked if the SDGs would undermine progress, Pedro Alonso, Director of the WHO Global Malaria Programme, said that this would “come down to investment and political support.” However, there was a “risk that dilution will reduce impetus.”

However, Nahlen was more optimistic: despite the minor mention of malaria among the SDGs, meeting these goals would inevitably mean addressing malaria. He also offered the reminder that, before the MDGs, African ministries of health were the source of the demand for action on malaria, and this would certainly continue to be the case. But his optimism came with a warning, if we “back off now, it will be a disaster.”

Looking ahead, the WHO/UNICEF report says that “the rate or expansion of malaria programmes between 2016 and 2030 has been mapped out, and funding requirements to meet these milestones for 2020, 2025, and 2030 have been identified.” These requirements are \$6.4 billion by 2020, \$7.7 billion by 2025, and \$8.7 billion by 2030. Although the figures will make many politicians wince, against the backdrop of the potential cost of insufficient action they might be easy to swallow. ■

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INSPIRATION

 COLUMN



Dr Anne Musuva-Njoroge
 Director, malaria & child health, Population Services Kenya

Community volunteers are key to Kenya's fight against malaria

According to the World Bank, between 2003 and 2014, the percentage of households owning insecticide treated nets in Kenya rose from six per cent to 59 per cent. With the increased use of nets, currently around 42 per cent, the country has seen infant mortality fall by 7.6 per cent each year since 2005.

Despite the success of recent malaria control efforts, Dr Anne Musuva-Njoroge, director of malaria & child health at Population Services Kenya notes, "there is a reduction in coverage of nets between the mass net distribution campaigns which occur every three to four years."

Between 2014 and 2015 the country piloted a community net distribution programme targeting 60,000 people in 12,315 households to look for a more cost-effective and efficient way to sustain universal coverage. Through community health volunteers, families were provided with nets on a need by need basis, given education on how to use them and help to repair or replace them as and when required.

The pilot showed that universal coverage was increased from 48 per cent to 93 per cent in households who participated. "Going forward, we aim to scale the project up," continues Musuva-Njoroge. "We have strong leadership and commitment from the Ministry of Health, but the key to success will be community health volunteers who have been the cornerstone of the project." ■

New test revolutionises fight against malaria

In order to successfully eradicate malaria, you need to know where to find it. New technology could hold the key to identifying the hidden enemy and stopping it in its tracks


By Kate Sharma

While microscopy and rapid diagnostics testing is helping to diagnose a huge number of cases of malaria, some slip through the diagnostic net. There are cases of malaria which are submicroscopic, meaning they are unidentifiable under a microscope.

A recently launched malaria test, Illumigene Malaria, could hold the key to identifying the hidden threat. The test is much more sensitive than microscopy, more sensitive at detecting malaria parasites with conventional rapid tests, potentially revolutionising ma-





laria diagnosis. Using loop mediated isothermal amplification (LAMP) to identify the malaria parasite, the technology can produce results within an hour without the need for laboratory facilities. The ease with which the test can be used is of particular significance considering the greatest burden of malaria remains in regions where healthcare facilities are often few and far between.

For Professor Daouda Ndiaye, chief of the laboratory of parasitology and mycology at Cheikh Anta Diop University at UCAD CHU Le Dantec, who runs the clinical studies on this new technology, this is not merely a scientific breakthrough, it's a personal one. "My own commitment to the fight against malaria began

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New technology
has a central role to play in
the fight to eradicate malaria

PHOTO: VESTERGAARD

as a child growing up in Senegal," he recalls. "I survived severe malaria. My brother also contracted the disease. I was still at an early stage of my medical studies but, thankfully, I was able to recognise the symptoms and identify it so he could be treated."

Advancements in research

Ndiaye has devoted his life to studying the disease and achieved his PhD at the Department of Immunology of Infectious Diseases at Harvard University, before returning to Senegal where he now leads the team working to control malaria and eliminate the disease. One of the problems Ndiaye noted was that



**Professor
Daouda Ndiaye**

Chief of the laboratory of parasitology and mycology at Cheikh Anta Diop University at UCAD CHU Le Dantec

benchmarks of success rely on malaria indicators like parasite prevalence. However, the traditional methods of diagnosis, such as microscopy and rapid diagnostic testing, lack the sensitivity to identify submicroscopic parasitemia.

As malaria can be transmitted from human to vector in pre-elimination settings, the sub-microscopic malaria is not just for the carrier but also for the community they live in. Adults with malaria may express low or delayed symptoms which might be transmitted to the youngest in the community. This ongoing threat of submicroscopic infection has justified the development of the newly launched LAMP molecular test.

"Faster and more accurate diagnosis is vital in the fight against malaria," says Ndiaye. "Because of submicroscopic parasitemia carriage among the populations, a robust, sensitive and field community-deployable screening tool is needed to track the malaria reservoir in pre-elimination regions. The study we run in Senegal shows that tests such as this newly launched LAMP malaria test have this capacity."

Whilst sub-Saharan Africa continues to bear the greatest burden of malaria, as populations travel more, so malaria cases in Europe and the Middle East are also increasing. As a result, the new LAMP molecular test is good news for us all. ■

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NEWS

STATISTICS

214 million

There were 214 million new cases of malaria worldwide in 2015.

Source: WHO Facts from World malaria report 2015

438 000

There were 438 000 deaths caused by malaria in 2015.

Source: WHO Fact sheet on malaria

57 countries

Between 2000 and 2015, 57 countries achieved reductions in new malaria cases of least 75%.

Source: WHO Facts from World malaria report 2015



PHOTOS: HILARY RANSON



Insecticide resistance threatens malaria fight

By Kate Sharma

Advancements in the fight against malaria could be lost if we fail to tackle insecticide resistance in vector control.

Great gains have been made in the fight against malaria and wide spread vector control initiatives have played a major role. However, insecticide resistance threatens to reverse these fragile gains.

At present there are three main techniques used to prevent mosquitoes from transmitting malaria. Long lasting insecticide treated bed nets (LLIN) are used extensively to kill mosquitoes and prevent them from biting. Indoor residual spraying (IRS) is also used to cover homes with insecticide to kill the insects and larvicide destroys mosquito larvae before they mature.

The problem is that vector control is highly dependent on the



Professor Hilary Ranson

Head of vector biology, Liverpool School of Tropical Medicine

use of pyrethroids, which are the only class of insecticides currently recommended for bed nets and also a primary agent used in indoor spraying.

At the moment, there are few, cost-effective alternatives to pyrethroid based sprays and no alternatives at all to the pyrethroid treated nets. "In some regions of Uganda and Burkina Faso where we have a high

coverage of bed nets, we've seen incidence of malaria remain static or even increase," explains Professor Hilary Ranson, head of vector biology at Liverpool School of Tropical Medicine. "If we don't respond the trajectory is going to be pretty bleak."

Scientists have been exploring treating nets with an additional synergist to offer increased efficacy, but while these may help maintain control in the short term it's certainly not a long-term solution. "We're getting to the point where the existing tools we have aren't fit for purpose," says Ranson. "We need to maintain the political momentum and the appetite for change or we risk reversing years of progress." ■



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COMMERCIAL FEATURE

Insecticide resistance threatens the potential for the malaria community to stay focused on global eradication



Mikkel Vestergaard
CEO, Vestergaard

Malaria control over the past 15 years has been one of the greatest global health success stories. The World Health Organisation (WHO) estimates that more than 6.2 million lives have been saved, and attributes much of this success to the use of long-lasting insecticidal nets (LLIN). LLINs have been credited for reducing malaria deaths by 68 per cent in Africa, and over half of Africa sleeps under a bed net today.

However, the effectiveness of bed nets is being threatened.

Malaria-carrying mosquitoes are increasingly resistant to the only class of insecticides, the pyrethroids, approved by WHO for use on bed nets. Since 2010, more than 75 per cent of the 78 countries reporting data on insecticide resistance monitoring in malaria vectors have found resistance to at least one insecticide.

In a recent report in *The Lancet*, experts cautioned that “the threat of resistance derailing malaria control has become an issue of urgency that can no longer be ignored without risking a global public health catastrophe.” This concern is echoed by Mikkel Vestergaard, CEO of the family-owned global health company that bears his name. Vestergaard is the largest manufacturer of LLINs under the PermaNet® brand. Introduced in 2004, PermaNet® 2.0 was the first LLIN brought to scale, and since then the company has pro-

duced more than 660 million PermaNet® bed nets, protecting more than a billion people.

As a research driven company, Vestergaard has been investigating solutions to overcome insecticide resistance. In response, it developed PermaNet® 3.0, a new net that incorporates a synergist, called piperonyl butoxide (PBO), with the pyrethroid. PBO enhances the effect of the insecticide by blocking the metabolic enzymes within the mosquito that break down the insecticide and make mosquitoes resistant.

PermaNet® 3.0 is the only next-generation LLIN so far to have its product claim for increased efficacy against resistant malaria-mosquitoes substantiated by WHO. However, deployment of this net at scale has been delayed as countries and donors wait for normative guidance from WHO to determine where and

when PermaNet® 3.0, and subsequent products that enter the new product class, will be used.

Vestergaard recognises that “the future of vector control depends on a technology race,” but he points out that “we will only be able to beat malaria with a highly concerted effort and sense of urgency on the part of all stakeholders. Funding must continue to flow, governments must continue to provide tools to their communities at risk, and the World Health Organisation must understand the urgency and provide guidance to scale up proven innovations so they get into the hands and homes of the people at risk of malaria.”

For many families living in malaria zones, their best hope is not to get bitten by malaria-carrying mosquitoes. They need to have their world covered by the most effective mosquito nets available now. ■



Insecticide resistance threatens to derail malaria control

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MALARIA IN NUMBERS

55 countries are on track to reduce malaria case incidence rates by **75%**, by 2015 (no confirmation yet).

The malaria mortality rate was reduced in 2000 – 2013

Globally: by 47%

WHO African Region: by 54%



Fighting malaria: a new way of thinking

What's the most dangerous animal on the planet? It's not a lion, a shark or even a human. The world's biggest killer is a mosquito and it's putting up a hard fight

By Kate Sharma

According to the World Health Organisation (WHO) an estimated 438,000 people lost their lives to malaria in 2015 alone, which is a 48 per cent decrease from the estimated 839,000 individuals who died from the disease in 2000.

Undeniably great progress has been made, but statistics only tell part of the story. Success has been isolated and the burden of malaria remains firmly on the shoulders of a small number of countries. In fact, 80 per cent of all malaria cases can be found in just 18 countries mainly in West and Central Africa.

Richard Allan, founder and director of the Mentor Initiative, suggests that the real situation could



Richard Allan

Founder and director, The Mentor Initiative

be even worse. "Many of the statistics are only estimations based on mathematical modeling from countries that are not representative of

high transmission areas. In some cases, I believe incidence may have actually increased."

High Transmission Areas

The regions where the disease is most prevalent are those that have experienced humanitarian crises and natural disasters. "In West Africa, the Ebola crisis essentially shut down the health systems for more than a year," explains Allan. "As a result, tens of thousands of people died from malaria and progress has been set back at least a decade."

In many Central African countries, conflict remains the greatest barrier to overcome. Countries such as Burundi and South Sudan have had their infrastructure, healthcare systems and governance decimated by civil war.

Combating malaria requires a completely different approach in countries where there is little structure or governance.

A new way of thinking

The good news is that integrated vector management, through long lasting insecticidal nets, residual spraying and destroying mosquito larvae before they hatch, is working. These preventative measures, when used alongside rapid diagnostics and treatment through artemisinin-based combination therapy (ACT) can reduce incidence of the disease and the number of deaths.

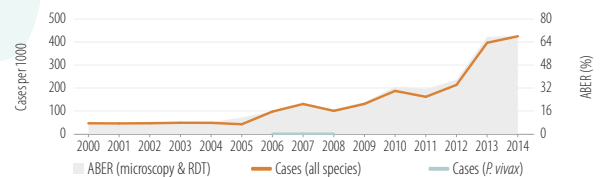
The challenge is delivering this programme in unstable and insecure environments. However, the problem is not insurmountable. Following its independence in 2011,

But these 55 countries only account for **4%** of the total estimated malaria cases

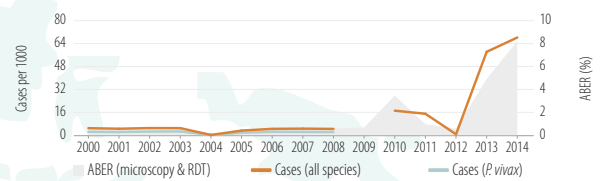
- In 2014, **97** countries had on-going malaria transmission
- 3.2 billion (1/2 world population) at risk, of whom
- 1.2 billion are at high risk
- 198,000,000 (globally) cases in 2013
- 584,000 deaths, estimated in 2013
- 90% of these occurred in sub-Saharan Africa
- 78% of deaths were children under five
- 80% of all malaria deaths now occur in 18 countries**
- 40% of malaria deaths occur in Nigeria and the D.R.C**

The burden lies in countries experiencing, or recovering from humanitarian crises. i.e. these graphs show that in each of these conflict-affected counties, the number of people developing severe malaria and dying has increased significantly since 2009 (or earlier in the case of DR Congo) and that the significant overall rise in deaths has not been abated by control efforts to date

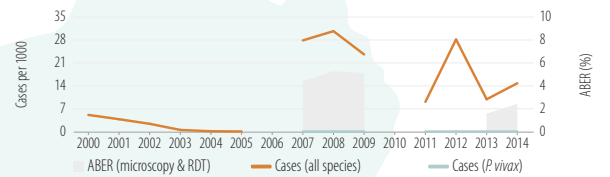
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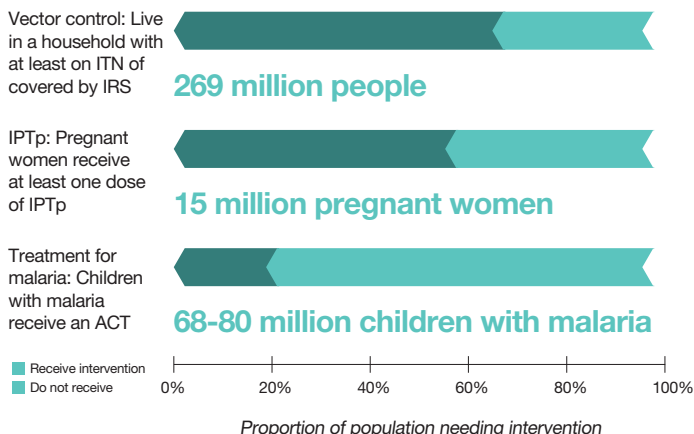
Chad



Congo



Proportion and number of people not receiving an intervention, sub-Saharan Africa, 2014



ACT, artemisinin-based combination therapy; IPTp, intermittent preventive treatment in pregnancy; IRS, indoor residual spraying; ITN, insecticide-treated mosquito net
Source: Insecticide-treated mosquito net coverage model from the Malaria Atlas Project

funding poured into South Sudan and huge efforts were made to work directly with community leaders and equip local health workers to take the lead in fighting malaria.

“For three years there were no malaria epidemics in South Sudan,” confirms Allan. “Despite an initial scale up of emergency funding by the international community, when civil unrest broke out again in 2014, funding for malaria control amongst displaced and conflict affected communities was almost completely cut by the start of 2015. In June last year, the country experienced the worst malaria epidemic it’s ever had.”

Making change happen

WHO estimate that US\$ 5.1 billion is needed every year if sustainable development goals are to be met.

To date, Allan points out that, “95 per cent of investment has been focused on countries with better governance, better infrastructure and easier access.”

If progress is to be made, intervention must be made on the basis of need, rather than the ease with which a country can respond.

“We have to be ready and willing to change our mindset,” continues Allan. “We need to realise that we have to invest three or four times as much into countries with the highest transmission rates and that change will take time.”

We know where the need is greatest and we have the tools to respond. The only thing preventing action is the willingness to invest money and time on behalf of those who live in the world’s most challenging countries. ■

INSPIRATION



COLUMN

**Dr David Reddy**

CEO, Medicines for Malaria Venture

Malaria and the SDGs

Fighting malaria is essential to the success of the Sustainable Development Goals

In January, the 17 Sustainable Development Goals (SDGs) adopted by world leaders in September 2015—officially came into force. The targets aim to build on the success of the Millennium Development Goals (MDGs) and recognise that ending poverty is multifaceted.

“By addressing malaria you can make a positive impact on a number other SDGs too,” states Dr David Reddy, CEO of Medicines for Malaria Venture. “For example, goal 3.1 and 3.2 are focused on reducing global maternal and child mortality respectively. With malaria taking the lives of more than 10,000 women in child birth and more than 300,000 children in Africa each year, it’s easy to see the link between the fight against malaria and improvements in maternal and child health.”

There are other links, too, relating to reducing infant mortality, improving access to education and gender equality. Within the framework of the World Health Organisation’s Global Technical Strategy for Malaria, Reddy believes we have the tools and knowledge to build upon the success of the MDGs. ■

Making the impossible, possible

Mark Dybul, Executive Director of the Global Fund to Fight AIDS, Tuberculosis and Malaria, explains how the fight against malaria can be fought – and won

By Mark Dybul

What are the greatest achievements to date in fight against malaria?

■ The fight against malaria is one of the biggest success stories of the 21st century. This has been possible mostly due to the massive rollout of prevention and treatment tools, smarter diagnostic tests, and greater availability of antimalarial drugs. In sub-Saharan Africa, more than half of the population is now sleeping under insecticide-treated

mosquito nets, compared to two percent in 2000. By working together and by involving people affected by the diseases, civil society, the private sector, donors and implementing governments, we have cut malaria mortality by 60 percent since 2000, saving millions of lives.

What are the greatest challenges we’ll face in the next 5-10 years?

■ The most urgent challenge is the emergence and spread of resistance to the drug



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Mark Dybul

Executive director of the Global Fund to Fight AIDS, Tuberculosis and Malaria

artemisinin - the most commonly used drug against malaria. This threatens to undo hard-fought gains, not only in the Mekong region where it has been detected but worldwide. Artemisinin-resistant malaria could be globally devastating if it arises independently in other geographies or crosses more borders. Mosquito-borne parasites know no borders, as the Zika virus has reminded us this year. While the impact of Zika is still being assessed, we know that malaria kills

“Mosquito-borne parasites know no borders”

hundreds of thousands of people a year, most of them young children.

Do we need to change our current strategy to reach more communities?

■ To defeat these diseases we must follow the people, wherever they are. We need to reach the high transmission areas, deepening cross border collaboration and regional data sharing. In Southeast Asia, for example, the Global

Fund partnership is backing a smart regional initiative with a US\$100 million grant to tackle artemisinin resistance in Myanmar, Thailand, Vietnam, Laos and Cambodia, with a special focus on mobile populations such as farming communities and seasonal agricultural workers.

How do you empower communities to take ownership of their malaria response?

■ Country ownership is in the genetic code of the Global Fund partnership. This means that people and governments determine their own solutions to fighting these three diseases, and take full responsibility for them. This approach puts people affected by the diseases at the heart of the decision-making and response.

How will we end malaria as a public health threat?

■ To end malaria, we need to work in partnership: governments, the private sector, communities, advocates and civil society. There are also substantial cost savings and benefits to working together and pooling resources; for example, the Global Fund’s procurement approach has achieved substantial cost savings, enabling partners to purchase more mosquito nets and reach more families. Defeating malaria requires sustained commitment, funding and innovative approaches. If not, we risk a resurgence of the diseases, and undermine the last decade of investments in global health. ■



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NEWS

 COLUMN
**Aloe Blacc**

Singer-songwriter and Malaria
No More UK Special Ambassador

We can be the generation to #EndMalaria

The moment you become a parent your life changes forever, it's a feeling I will never forget. At the start of the year I became a dad for the second time and it's the most important role I've ever had. I would do anything to protect my children. But imagine if you couldn't protect them. Imagine if you couldn't afford the life-saving medication that costs £1 to treat your child. Imagine if you didn't have access to a mosquito net to stop your loved ones being bitten at night. Imagine your child develops a terrifying high fever and there's nothing that you can do. Unimaginable right? Yet this horror is the daily reality for thousands of parents in Africa.

Another moment that I'll never forget was back in 2012 when I visited Ghana with Malaria No More UK to see how a mosquito net campaign was saving lives. I visited a primary school and asked a classroom of kids to put their hand up if they'd been affected by malaria. I was genuinely shocked when every single pupil put their hand up. I think it was the scale of this disease that took me back – a disease that affects so few of us in the Western world yet disproportionately affects so many in Africa, mainly young children. What is tragic is that malaria is so easily preventable and treatable. No child should die from a mosquito bite. That's why I'm supporting Malaria No More UK – I can't just stand by while other parents around the world suffer this injustice.

Although this is a bleak situation, we know we can change things. Thanks to a major global push and the work of organisations including the Global Fund, the world's largest funder of malaria programmes, millions of lives have been saved. In fact child deaths have been slashed by 65 per cent since 2000 – a spectacular achievement.

I'm pleased to announce that I'm planning a project later in the year with Malaria No More UK to engage and inspire more people in the global malaria campaign and to get fans excited about the fact that we can be the generation to end malaria – once and for all. I'm certainly excited about it – watch this space! ■

Meet the women fighting

🕒 The battle against malaria is being fought on many levels; one of the most effective is the grassroots offensive of women across the world

**Jo Yirrell**

Special Ambassador for Malaria No More UK

World Malaria Day may not be the most well known day in the UK, but for me, it's hugely important. Why? Because my beautiful son Harry died from malaria just over 10 years ago, and I believe that raising awareness of this disease is the best thing I can do in Harry's memory.

Harry was volunteering in Ghana and having the time of his life when he contracted the disease. He had given his malaria tablets to local children, believing their need was greater than his, but a few days after coming home he became unwell and was admitted into hospital, ten days after that, he was gone.

His death still haunts me – knowing now that malaria is so easy to prevent and treat. That's why since 2009 I have been working with Malaria No More UK, a charity

determined to end malaria for good. My story was part of the inspiration for the character of Martha in the 2013 film written by Richard Curtis, *Mary and Martha*. And three years on – I'm as dedicated as ever to the fight against malaria. We truly have come so far; malaria deaths are down by a tremendous 60 per cent (that's more than six million lives saved) in the past 15 years, yet half the world is still at risk. And in 2016, this is simply not acceptable.

I find it unbelievable that every two minutes another mother loses a child to malaria – a disease that costs less than £1 to treat. But I know that if we all work together, we could prevent so much heartbreak for families around the world. Heartbreak I know only too well.

As more countries work towards eliminating malaria

we have to keep up the momentum by increasing financing and political commitment. In January the UK Government recommitted to investing in the global malaria campaign for the next five years, and that makes me really proud to be a Brit. I know this will dramatically reduce malaria deaths: aid is working, and it will give so many mothers the chance to see their children grow up and watch as their futures unfold – something that I was tragically denied with Harry.

We are on the cusp of a historic moment and I hope others join me in seeing how important it is for us to act now so parents stop losing their children to this horrific disease. One day soon we could truly be the generation to beat malaria once and for all. And I vow to keep telling Harry's story until that day comes. ■

FIND 
Because diagnosis matters

www.finddx.org



Photo by © FIND/SC. Dugan

malaria head on



Maurine Murenga

Kenyan Mother, Global Fund Advocate, malaria survivor and person living with HIV

The Global Fund to Fight AIDS, TB and Malaria is saving lives from deadly yet preventable diseases; 17 million so far to be exact. Having seen and experienced these diseases first hand – I can categorically say that aid is working.

I first learnt about The Global Fund during a difficult time in my life; in 2002 when I was diagnosed with HIV whilst pregnant. Back then the healthcare system in Kenya was a mess, treatment was hard to access and discrimination was rife. It felt like my life had no hope.

But my struggles don't end with HIV. I have lost count of the number of times my children and I have had malaria. It used to be very common in Kenya,

particularly during the rainy season. Every day the village would echo with cries from families mourning the loss of a child; tragic, needless deaths.

I had malaria three times alone when I was pregnant. Fortunately I was diagnosed early and received treatment quickly, but only because I knew pregnant women are more susceptible to malaria as immunity is lower, what symptoms to look out for and how to get the right medicine. The reality is, this is not the case for many women, in fact, a friend of mine tragically died while pregnant. She became ill during her last trimester and was given improper medical advice and treatment – by the time she got to hospital it was too late, and she died five hours later. It was devastating.

The situation in Kenya has improved now and malaria cases have dramatically declined. But there is much more still to do. In particular, we must scale up rapid diagnosis and treatment during outbreak seasons, increase the supply of mosquito nets, and do more community outreach around malaria prevention. HIV treatment and transmission has improved too, and women now deliver HIV free children. Discrimination is still a big issue though.

Watching your children suffer is heart-breaking. But the good news is that we have the tools to prevent further suffering if we give ambitiously to The Global Fund to reach more people, in more countries. Together, I know we can stamp out these epidemics. ■

I am a school teacher. But until a few years ago I spent most of my time looking after my pupils instead of educating them. Up to 10 of them at a time would fall sick from malaria. Some of them would be so ill that they would start convulsing on the floor.

Growing up in Uganda, I became used to the constant threat of malaria. My sister died when she was six after contracting the disease. My own five children regularly fell sick, as did I. Malaria is life-threatening, but it is preventable.

Malaria Consortium gave me the chance to train as a volunteer health worker in my village. I learnt how to spot the first signs of the disease, diagnose malaria and provide treatment in simple cases.

I'm very proud of the work I do. It's so easy for me to spot malaria now, and it feels good to help others and make a positive contribution to my community.

Expectant mothers and their children come to me for help.

Students in my class still get ill from the disease, but it's become much less common since more people have become volunteers and started raising awareness about malaria. I give frequent health talks, especially on using mosquito nets, and teach adolescent health and life skills. Malaria is still a threat in our village, but I don't live in fear any more. ■



Immaculate Nasigye

Ugandan mother-of-five, teacher and volunteer health worker with Malaria Consortium, which receives funding from Comic Relief

Effective treatment requires accurate diagnosis

FIND, an international non-profit, supports global goals in malaria control and elimination by accelerating the development and use of high-quality diagnostic tests.

NEWS

 **FACTS ABOUT MALARIA**


Malaria is a life-threatening disease **caused by parasites** that are transmitted to people through the bites of infected female mosquitoes



Malaria is caused by Plasmodium parasites.

The parasites are spread to people through the bites of infected female Anopheles mosquitoes, called "malaria vectors." There are 5 parasite species that cause malaria in humans, and 2 of these species – *P. falciparum* and *P. vivax* – pose the greatest threat.

P. falciparum is the most prevalent malaria parasite on the African continent. It is responsible for most malaria-related deaths globally.

P. vivax has a wider distribution than *P. falciparum*, and predominates in many countries outside of Africa.



Symptoms

Malaria is an acute febrile illness. In a non-immune individual, symptoms appear 7 days or more (usually 10–15 days) after the infective mosquito bite. The first symptoms – fever, headache, chills and vomiting – may be mild and difficult to recognise as malaria. If not treated within 24 hours, *P. falciparum* malaria can progress to severe illness, often leading to death.

Children with severe malaria frequently develop one or more of the following symptoms: severe anaemia, respiratory distress in relation to metabolic acidosis, or cerebral malaria. In adults, multi-organ involvement is also frequent. In malaria endemic areas, people may develop partial immunity, allowing asymptomatic infections to occur.

Source: WHO



Game changing malaria vaccine

By Kate Sharma

After more than 20 years of research, 2015 saw the first malaria vaccine successfully complete pivotal Phase 3 testing to obtain a positive scientific opinion.

After years of research, the RTS,S/AS01 (RTS,S) malaria vaccine is the first new tool in the fight against malaria in more than 15 years. "The importance of this step cannot be overstated," says Professor David Schellenberg, professor of malaria and international health at London School for Health and Tropical Medicine. "Given the enormous burden of malaria on the world and the lack of new tools to deal with it, this is a really important step."

While excitement for the vaccine is understandable, it is certainly not a miracle cure. Clinical trials show the vaccine has an efficacy of around 50 per cent at best, which is modest in comparison to most other vaccinations.

Schellenberg is keen to point out that administering vaccines within the highly monitored environment of a clinical trial is also very different from the reality in the



Professor David Schellenberg

Professor of malaria and international health at London School for Health and Tropical Medicine

field. More research is needed to assess the feasibility and impact of the vaccine when used in 'real life', before it becomes widely available.

One of the major considerations is the fact that, unlike most other vaccines that require one to three doses, RTS,S requires infants and young children to receive four doses: the first three doses at monthly intervals and a fourth dose 18 months later. This poses a number of challenges in communities where the majority of healthcare is administered through private or informal settings.

Rollout

A pilot implementation of RTS,S is currently being

planned for children aged five to seven months in a number of sub-Saharan African countries. The outcome of this project, which will take roughly four years, will enable the World Health Organisation to make recommendations on a larger roll out of the vaccine. Another consideration is the cost of the vaccine: the manufacturers of RTS,S need to find the most cost-effective way to provide it on a large scale.

"Whatever the results, the vaccine won't be prioritised over other methods to prevent malaria," states Schellenberg. The current methods of using insecticide-treated mosquito nets and indoor spraying, alongside rapid diagnostic testing and anti-malarial drugs, whilst not perfect, are certainly working. The addition of a malaria vaccine will strengthen the arsenal of tools to fight what remains the world's most deadly disease.

"We can do an awful lot more to improve our malaria response and having new tools is essential," concludes Schellenberg. "This disease is preventable and we must do better. It doesn't have to be like this." ■

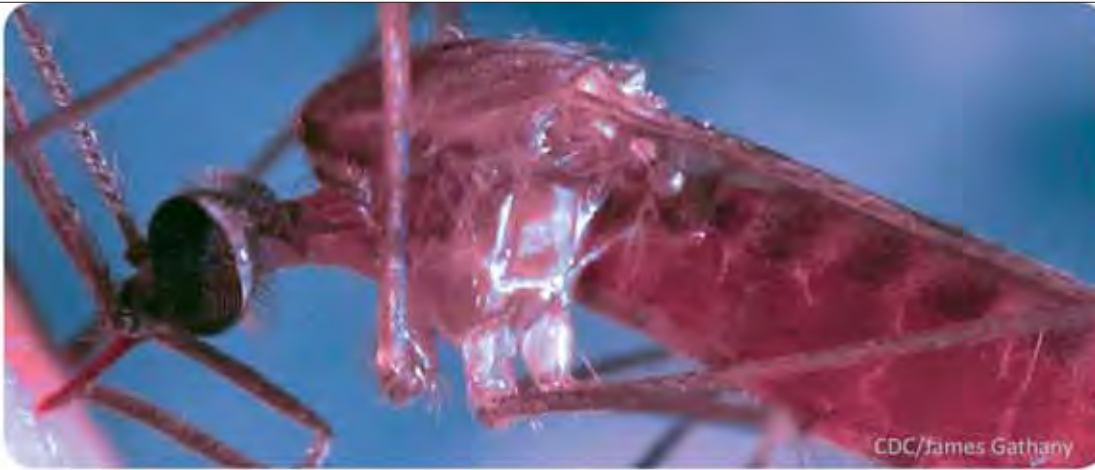
INVESTING IN THE FUTURE OF MOSQUITO CONTROL.

We believe that people around the world deserve to live their lives uninterrupted by malaria. We have introduced Actellic® 300CS for pyrethroid resistance management and longer lasting performance in indoor residual spraying. And in partnership with IVCC, we are actively developing a rich pipeline of insecticides for the future.

For more information email vector.control@syngenta.com

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Malaria kills more than **400,000** people each year—and a child every two minutes.

What does it take to develop a malaria vaccine?

A first malaria vaccine—RTS,S—has been recommended for pilot implementation in Africa by the World Health Organization, a history-making milestone in malaria vaccine development. At PATH's Malaria Vaccine Initiative, we are proud to be a partner with GSK in developing RTS,S—working with scientists, communities, and thousands of people in Africa, Europe, and worldwide.

Meet some of the people who have played a role in developing RTS,S and learn more at www.malariavaccine.org.



Toward a world free from malaria

mvi  **PATH**
MALARIA VACCINE INITIATIVE



Science For A Better Life

Doing our bit to end malaria for good

Our 360° approach has life itself in focus

At Bayer, we apply science and innovation in the fight against malaria. Our commitment is based on multiple solutions, supporting the shared goal to end malaria for good. In this fight, insecticide resistance is the major challenge so we have increased our investment and focus to develop new options for malaria control programs. Through partnerships with leading scientists we ensure robust evaluation of new malaria vector control tools and are working with local communities to help them take ownership in the fight against malaria and improve their quality of life.

Find out more at vectorcontrol.bayer.com and follow us on Twitter @BayerMalaria

No one should die from malaria today



In collaboration with our partners, Novartis has contributed to a dramatic reduction of the malaria death toll.

Since 2001, the **Novartis Malaria Initiative** has delivered **more than 750 million antimalarial treatments** for adults and children, without profit, to **more than 60 countries**.

Thank you to all our partners for their contribution to this extraordinary achievement and for supporting our efforts toward a malaria-free world. #EndMalaria



Novartis launches first ACT in a fixed-dose form

Novartis launches first dispersible pediatric ACT with Medicines for Malaria Venture (MMV)

Novartis launches high dosage strength ACT which is first to obtain WHO prequalification in 2015

1994

1999

2001

2009

2010

2013

2015

Collaboration between Novartis and Chinese partners to develop artemisinin-based combination therapy (ACT)

Memorandum of understanding with the WHO to supply ACTs without profit to the public sector

Novartis spearheads SMS for Life to reduce stock-outs of antimalarials in sub-Saharan Africa

750 million treatments, including 300 million pediatric treatments, delivered without profit since 2001
Dr Youyou Tu receives the Nobel Prize for her discovery of artemisinin in 1972



www.malaria.novartis.com

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Mango – the mobile application platform for Malaria programmes



Proven surveillance, monitoring, and evaluation solution for Malaria programmes.

- + Used nation-wide by health programmes in 10 Sub-Saharan countries.
- + Tracking millions of patient cases and commodities every month.
- + SMS data collection connects thousands of facilities to one data repository, using technology already available on-site.
- + Active monitoring of Malaria commodities, diagnostics and treatment performance.

The Mango platform is a complete surveillance, monitoring and evaluation solution. Mango gives you better visibility into your operations, so you can make fast and accurate decisions to improve performance management.

Data collection systems powered by Mango are designed to operate in any environment, including remote areas with limited or poor quality communications services.

Mango supports SMS, USSD, mobile applications, and web forms to collect data. Almost any mobile or internet connected device can be used, and most Mango installations require only the technology already available on-location.

Greenmash designs and implements Mango applications at any scale including multi-country solutions that monitor and evaluate multiple millions of data points every month.

Proven benefits when using Mango include:

- + Reduction of stock outs of anti-Malaria commodities
- + Real time reporting even across whole countries
- + Real time integration with DHIS2
- + Saves time, money and resources
- + High response rates
- + Excellent accuracy

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