Researchers warn victory remains a long way off

The biggest threat to the campaign against malaria is the perception that the war has already been won, writes Andrew Ward.

Success can be a dangerous thing in the world of global health. It can encourage complacency, foster complacency, and even lead to the abandonment of efforts that are not perceived as being immediately successful. This was the case in Ghana, where the country's government has been praised for its success in fighting malaria, which has led to a reduction in the number of cases and deaths.

But, while the country has made significant progress, there are still many challenges that need to be addressed. For example, the use of insecticide-treated bed nets, which are a key component of malaria control efforts, has been declining in recent years.

Researchers estimate that, if the country were to continue with its current approach, it would take approximately 10 years to eliminate malaria from the country. However, if the government were to increase its efforts and invest more resources, it could potentially achieve this goal within five years.

The key to success is to maintain a sustained and focused effort, and to be prepared to adapt strategies as necessary. This requires a commitment from all stakeholders, including the government, civil society, and the private sector.

In addition to reducing the number of cases and deaths, the elimination of malaria would also have significant economic and social benefits. It would reduce the burden on healthcare systems, free up resources that could be used for other purposes, and improve the overall health and well-being of the population.

The goal of eliminating malaria is within reach, but it will require continued effort and investment. It is important to remember that, while the war against malaria may have been won in some areas, the battle is far from over.

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FT SPECIAL REPORT

FTHealth Combating Malaria

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Gold miner and the metal itself help in fight against the disease

Case study
Andrew Ward looks at how a business in Ghana is taking a leading role

When AngloGold Ashanti started a malaria control programme in 2008, it was only the fifth company to do so in Ghana. Today, the company is one of the leading businesses in the country, and has helped to save millions of lives.

The programme, which focuses on providing mosquito nets and treatment to employees and their families, has been a huge success. In 2013, the company reported a 90% reduction in malaria cases compared to the previous year.

In addition to providing nets and treatment, the company has also invested in research, and is working with local governments to develop effective strategies for malaria control.

The programme has helped to reduce the cost of healthcare for the company, and has also improved the well-being of its employees. It has been praised for its innovative approach, and is seen as a model for other businesses to follow.

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ROLL

Global Partnership for a Malaria-free World

Invest in the Future: Defeat Malaria

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The Last Mile to Defeat Malaria

Improving Malaria Management through Medicine Vendors’ Associations

Malaria remains a leading cause of death in Nigeria, accounting for 15% of maternal and 20% of under-five deaths each year. Early and accurate diagnosis of malaria followed by prompt treatment through the duration of the illness, prevents the progression to severe illness, and reduces deaths from malaria. However, achieving quality malaria treatment services is challenging for many Nigerians – especially in rural areas, where public health facilities are scarce, and poverty prevents many from seeking prompt medical attention.

Nigeria estimated 115,000 ‘patient-activated vouchers’ (PAVs) could be part of a solution.

Due to the widespread presence of the Plasmodium falciparum strain, there is a need for an early detection and rapid treatment strategy. In Nigeria, PAVs are provided to all individuals over the age of five and 15 years of age, and children under five years of age are offered to improve quality of diagnosis provided before being sent to the nearest centre. Within one week, the patient is required to return to the nearest centre and take the drugs prescribed, and only then is the voucher validated. The group is currently distributing 115,000 PAVs to McMaster University, and the World Health Organization.

The group teamed up with the Peace Care and began visiting villages, finding out how many people had and whether they would return with the appropriate number of PAVs. They were trained to identify the people in need of treatment and ensure that they received it. By the time the group finished this process, the villages were more than 90% covered with malaria.

In other words, the last mile – short code text messages and the final step in the product service model – must reach the individual customer.

People need to be able to access the product, and that is why vouchers were invented – to ensure people could get their hands on them. However, to tackle such problems of access are far from straight forward.

Some of these came from the very industry that gave rise to the term ‘last mile’. As Mr Edlund notes, ‘Last mile’ is a concept that developed in Africa, and a product that would subsequently be distributed throughout the African continent and beyond. There was no obvious mechanism, and no clear way to do it, to do this, and a concept that was somewhat vague and somewhat confusing.

Thank you for widespread mobile phone use in Africa, African countries played a major role in the success of the product. Mobile networks were already in place, and mobile phone users were already well-established.

In order to reduce the number of people who would go to the hospital or go to the doctor in the first place, the idea was to start with a mobile phone network and a product that would reach that same population.

But Mr Edlund did not think this was a viable solution for the problem. ‘You would need to be able to do a mass campaign with television, too, and make it public. When people are able to use access and have a product available to them, they will come across a fever that might be malaria. However, in this case, your goal is to problems of service access are far from straight forward.

The group also recommended that PAVs provide appropriate treatment and follow-up care for people who are treated. This includes providing a supply of the drug to be used in the treatment of malaria.

In order to ensure that the health authorities in improving registration policy around PAVs, and around the product, we would like to encourage the Ministry of Health to make sure that people who have been identified are going to be registered.

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This falls into what the UN’s Population Planning Program calls ‘the last mile’ – taking something that originally started in a certain area, then make sure the product is produced in a certain area.

How do you find people? One way is to use a mobile phone network. While previously it had recommended focusing distribution efforts on pregnant women and children, one of the things that happens in Senegal starting in 2008.

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As the middle class in these regions grows, too, more and more countries will start to look at their own products.

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Call for greater penalties for peddlers of fake remedies

Counterfeits Few people are being brought to court anywhere in the world for manufacturing useless copies of drugs, writes Andrew Jack

In 2012, customs officers in the Angola port of Luanda decided to inspect a shipment of hi-fi speakers at random. They discovered 32m tablets of fake antimalarials. The tablets were worth $800,000 and were intended for distribution to hospitals across the country. These tablets, known as Coartem, are the most effective drugs against malaria, but not a single person was treated with them.

The seizure contained 32m tablets of fake Coartem, which is made by a pharmaceutical group that has donated it free of charge to help restrict access to regulated supplies where they are available free to patients – engineering a shortage of $1bn worth of genuine medication.
An effective vaccine may have to last in sight

**Opinion**

**Joe Cohn**

In 1987, I started work on malaria vaccines. I was an employee of a non-profit, the Novartis Institute for Tropical Diseases (NITD), and had a limited mandate: to use our expertise in immunology and biochemistry to design a protein that would induce antibodies against the malaria parasite. We used a modern technique of molecular biology: we inserted a malaria gene into bacteria, and then harvested the bacteria to get the protein.

At NITD, we had learned from the Pasteur Institute that one of the essential components of the malaria parasite is a protein called malarial antigens. This protein is expressed on the surface of the parasite and is used to attach it to the human red blood cells. We thought that if we could design a protein that looked like malarial antigens, and was then inserted into the bacteria, the immune system would produce antibodies against it. These antibodies would then neutralize the effects of the real malarial antigens in the human body.

After years of work, we finally succeeded in designing a protein that looked like malarial antigens. We tested it in monkeys and found that it was effective in inducing antibodies against the malaria parasite. We then tested it in human volunteers and found that it was also effective. However, we encountered a major setback when we tried to test the vaccine in a human trial.

In the mid-1990s, we began a large trial in Africa to test the vaccine. However, we were unable to recruit enough volunteers to complete the trial. This was because the local authorities were concerned about the safety of the vaccine. They feared that the vaccine might cause serious side effects.

In the end, we were able to complete the trial, but we were unable to conclude that the vaccine was effective. However, we were able to conclude that the vaccine was safe. This was a major breakthrough, as it showed that it was possible to design a vaccine that could be tested in humans.

Since then, we have continued to work on malaria vaccines. We have designed several different proteins that look like malarial antigens, and we have tested them in monkeys and human volunteers. We are now in the process of testing one of these proteins in a human trial in Africa.

The vaccine is called Malaria protein vaccine (MPV) and it is designed to protect against Plasmodium falciparum, the most deadly strain of malaria. We have been able to test it in several countries and have found that it is effective in inducing antibodies against the malaria parasite.

We are now in the process of testing the vaccine in a large trial in Africa. If the trial is successful, we hope to bring the vaccine to market in the near future.

**Technology gives you a temporary edge, but the parasite is also moving to outwit you**

In trying to beat technology, the malaria parasite is always one step ahead. It has evolved several strategies to avoid detection and treatment. For example, it can change its surface antigens, making it difficult for the immune system to recognize it. It can also mutate its DNA, allowing it to adapt to new treatments. The parasite can even enter into a dormant state, allowing it to survive in the body without being detected.

We are working on several strategies to combat this. We are developing new diagnostic tests that can detect the parasite at an early stage. We are also developing new drugs that can target different stages of the parasite's life cycle. We are also working on developing vaccines that can protect against multiple strains of the parasite.

We believe that a combination of these strategies will give us the best chance of overcoming the malaria parasite. We are also working on developing new strategies to treat the disease, such as gene therapy and new drug combinations.

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**FT Health Combating Malaria**

**Complexity of life-cycle also offers opportunities**

**Science** New methods of controlling the spread of the disease are being tested, but they need time to be developed, reports Clive Cookson

From the biological point of one, malaria is a particularly formidable foe. It is spread by an interval pathogen, the protozoan Plasmodium, which, in its entomological guise, has an extremely involved life cycle involving both the host, the mosquito, and the human. And there can be realized by new molecular techniques such as genomics and proteomics.

One of the most urgent jobs is to discover how and why Plasmodium becomes resistant to antimalarials, which has been the most effective antimalarial drug available.

In January, an international team of researchers reported in the journal Nature, after using a battery of techniques to identify a particular marker of antimalarial resistance, the scientific fact that Plasmodium strain in the laboratory that marked the resistant parasite. This revelation has currently is a gene called K13 that marked the resistant parasite.

This study in particular, showed that the same K13 marker characterised the phenotype in the wild.

“Chris Plowe of the University of the Triangular complexity involved protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem. The triangular complexity involves protozoa, people and insects presents a formidable problem.
Favoured way to fight disease faces increased resistance

Insecticides

An alternative to impregnated bed nets has yet to be found, says Rose Trowbridge

Experts say victory is a long way off

Cover-up nets are still proving to be effective in most situations

Malaria

AIDS, TB and Malaria are still killing.

New medicines can save their lives

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MMV and partners develop:
- better medicines for uncomplicated malaria
- medicines for children and pregnant women
- new medicines to help eradicate malaria

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Contributors

Clyde Cockburn Deputy editor
Andrew Jack Deputy editor
Rose Jacobs Freelance writer
Amy Kamrin South Asia correspondent

Steven Bird Senior reporter
For advertising details, contact: Sue Edmonds
(+44) 207 377 7070, or
David Appleby
(+44) 207 377 7117, or
Steven.Bird@ft.com

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MMV

MMV is a not-for-profit R&D organisation founded in 2003 to develop essential medicines for malaria and related diseases. MMV collaborates with partners to develop new medicines and diagnostics for these diseases. MMV concentrates on the scientific and technical aspects of developing new compounds, while leaving the manufacturing and marketing to its partners, which include both large and small companies. MMV’s mission is to develop new medicines that are effective, affordable and accessible to those who need them most.

MMV partners

MMV has a number of partners, including large pharmaceutical companies, small biotech companies, universities and research institutes. MMV’s partners include:

- GlaxoSmithKline
- Merck
- Novartis
- Roche
- Bristol-Myers Squibb
- Eli Lilly
- Novo Nordisk
- Sanofi-Aventis
- Abbott
- AstraZeneca
- Pfizer
- Janssen
- Johnson & Johnson
- Gilead
- GSK
- Merck
- Novartis
- Roche
- Bristol-Myers Squibb
- Eli Lilly
- Novo Nordisk
- Sanofi-Aventis
- Abbott
- AstraZeneca
- Pfizer
- Janssen
- Johnson & Johnson
- Gilead

The list of partners is subject to change as MMV continues to develop new medicines. MMV’s partners are committed to helping MMV to achieve its mission of developing new medicines for malaria and related diseases. MMV is committed to sharing its knowledge and expertise with its partners to ensure that the new medicines are effective, affordable and accessible to those who need them most.

MMV’s mission

MMV’s mission is to develop new medicines that are effective, affordable and accessible to those who need them most. MMV believes that the development of new medicines is essential to the fight against malaria and related diseases. MMV is committed to working with its partners to develop new medicines that are effective, affordable and accessible to those who need them most.

MMV’s approach

MMV takes a collaborative approach to developing new medicines. MMV works with partners to develop new medicines that are effective, affordable and accessible to those who need them most. MMV’s partners include large pharmaceutical companies, small biotech companies, universities and research institutes. MMV’s partners are committed to helping MMV to achieve its mission of developing new medicines for malaria and related diseases.

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