SECURING BRITAIN'S FUTURE:

HOW INVESTMENTS IN ENDING MALARIA STRENGTHEN THE UK ECONOMY, LIFE SCIENCES SECTOR AND NHS

ZERO MALARIA | BRITAIN

CONTENTS

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We also extend our sincere thanks to our interviewees, whose contributions and insights have informed and improved this report:

- **Professor Andrew Tobin**, *Professor of Molecular Pharmacology, University of Glasgow*
- **Professor Angela Minassian**, *Associate Professor and Honorary Consultant, University of Oxford*
- **Professor Azra Ghani**, *Director, MRC-GIDA and Professor in Infectious Disease Epidemiology, Imperial College London*
- **Dr Sally Nicholas**, *Head of Vector Control & Therapeutics, Wellcome*
- **Professor Simon Draper**, *Professor of Vaccinology and Translational Medicine, University of Oxford*
- **Dr Stuart McElroy**, *Director of Biosciences, BioAscent Discovery*

ACRONYMS

GDP *Gross Domestic Product*
IGH *Impact Global Health*
IVCC *Innovative Vector Control Consortium*
LSHTM *London School of Hygiene and Tropical Medicine*
LSTM *Liverpool School of Tropical Medicine*
MABS *Monoclonal antibodies*
MMV *Medicines for Malaria Venture*
MNMUK *Malaria No More UK*
MRC-GIDA *Medical Research Council Centre for Global Infectious Disease Analysis*
ODA *Official Development Assistance*
PDP *Product-Development Partnerships*
RDT *Rapid Diagnostic Test*
R&D *Research and development*
UKHSA *United Kingdom Health Security Agency*
WHO *World Health Organization*

EXECUTIVE SUMMARY

Over the last two decades, enormous progress has been made in the fight against malaria – the mortality rate has halved.[1] The Global Fund to Fight AIDS, Tuberculosis and Malaria, since its creation in 2002, has helped deliver a British-backed, innovative and ever-growing toolbox which has helped save millions of children's lives.[2] However, despite these successes, the world now faces a perfect storm for a malaria resurgence, including extreme weather events, rising drug and insecticide resistance, funding shortfalls and conflict and global insecurity. As increased global insecurity also threatens the UK, tough decisions must be made, but this report will show that investing in the fight against malaria is also an investment in Britain's security and prosperity.

Previous research commissioned by Malaria No More UK has shown that ending malaria not only saves lives but offers economic benefits. Getting back on track to reach malaria targets by 2030 could boost the economies of malaria-endemic countries by $142.7 billion, as well as increase UK exports by almost half a billion. New research from Impact Global Health (IGH) also shows that UK investment in neglected disease research could generate £7.7 billion of additional GDP for the UK, of which over £2 billion can be attributed to investments in malaria R&D. It could also drive over £4 billion of private sector investment in R&D and create nearly 4,000 jobs.[3]

This report shows how support for malaria R&D offers both promising returns on investment and spillover benefits for the UK health system and life sciences sector. Expert interviews have revealed how a malaria research programme in Glasgow has helped attract new investment into diseases that directly affect the UK public, such as severe asthma, through a company called Keltic Pharma. They have also reinforced how investments in malaria research have attracted world-leading talent and ensured that our universities continue to be among the best in the world.

The COVID-19 pandemic taught us that disease does not respect borders. The UK's response to the pandemic was underpinned by decades of investment in malaria R&D.

From epidemiologists at Imperial College London to biomedical scientists at the University of Glasgow, malaria researchers and scientists were redeployed to guide government policy, enhance surveillance and develop diagnostics. We can continue to protect our health system and safeguard against future health crises by continuing to build a strong malaria R&D ecosystem here in the UK, building the technological capability and team of scientists that will help protect us from the next pandemic.

British-backed science has helped change the face of the malaria fight through the development of life-saving drugs, innovative vector control and ground-breaking malaria vaccines developed right here in the UK. Against a backdrop of multiple challenges, the malaria pipeline offers much hope, with Target Malaria's development of gene drive technology and MMV's new partnership with London-based artificial intelligence (AI) company deepmirror – the UK is at the cutting edge of science thanks to its support for malaria R&D.

However, these economic, scientific and health benefits can only be realised if the UK Government continues its support for the Global Fund and GAVI, the Vaccine Alliance. These organisations drive the development of new tools which the UK has long pioneered, they ensure the tools don't just sit in the labs but reach those that need them, and they help keep Britain safe by building strong health systems abroad that can quickly respond to new threats.

This report outlines why maintaining these investments are not only crucial for saving lives but also for Britain's economy, health system, and life sciences sector. A strong UK investment in global health can chart Britain's path toward a stronger, safer, more prosperous future – and, importantly, one that has played its part in ending malaria.

BY CONTINUING TO SUPPORT NEGLECTED DISEASE R&D, THE UK CAN

1.43 MILLION SAVE LIVES

183 MILLION PREVENT CASES OF MALARIA

4000 CREATE **JOBS** IN THE UK

£7.7 BILLION BOOST THE UK'S GDP BY

This report uses both GBP (£) and USD ($) to reflect the original values at the time of research. Given current exchange rate volatility, this approach helps preserve the accuracy and integrity of the calculations.

INTRODUCTION

Despite huge progress over the last two decades in halving the mortality rate, every minute a child still dies from malaria.[5] The global malaria fight faces a critical crossroads in 2025. If the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund) doesn't get increased funding in its next replenishment, there will be a malaria resurgence in the years to come – as many as 300,000 more lives could be lost – most of them children.[6]

The world is currently facing an ever-changing and more challenging political context, and the UK is no exception. The concurrent need to protect Britain's economic interests and meet domestic policy challenges whilst navigating threats of war on European borders has never been more acute in the last 50 years. However, the balancing act between ensuring greater UK security and economic growth need not be the antipathy of one another. In the choppy seas ahead, this report charts how strong UK investments in global health, and particularly malaria, can both grow the UK and global economy, and realise greater health security for the UK and the world.

Research commissioned by Malaria No More UK has shown that getting back on track to reach global malaria targets could boost the Gross Domestic Product (GDP) of malaria-endemic countries by as much as $142 billion collectively by 2030 and there would be direct benefits to the UK in the form of increased exports to endemic countries of $453 million.[7] New research from Impact Global Health (IGH) also shows that UK investment into neglected disease research could generate £7.7 billion of additional GDP for the UK, of which over £2 billion can be attributed to investments in malaria R&D. It could also drive over £4 billion of private sector investment in R&D and create nearly 4,000 jobs.[8]

There is still much hope for the malaria fight and ending this deadly disease. Much of this optimism is down to the role the UK has played in supporting and leading on malaria science and innovation. Thanks to British scientists, institutions and funding, malaria has one of the strongest innovation pipelines for any disease including exciting new artificial intelligence (AI) technology being used for drug discovery. Research by MRC Centre for Global Infectious Disease Analysis (MRC-GIDA) at Imperial College London estimates more than 13.2 million lives could be saved over the next 15 years from existing and future malaria tools combined.[9] Many of these tools are being developed right here in the UK in close partnership with African researchers.

However, the reduction in Official Development Assistance (ODA) from G7 governments, including the UK, could have far reaching consequences if investments in malaria R&D as well as key multilaterals the Global Fund and Gavi, the Vaccine Alliance (Gavi) are not maintained. Representatives from some of the leading UK science institutions have told us that there may be job cuts, reduction in the quality of research and reduced resources for capacity building in African countries. Many reported significant impacts because of the cuts and that gains towards malaria elimination could be lost. Impact Global Health's research shows that if late-stage trials do not reach the market because of UK ODA cuts, it could result in over 113,000 lives lost and if the rollout of products already launched is disrupted, there could be as many as a million additional lives lost.[10]

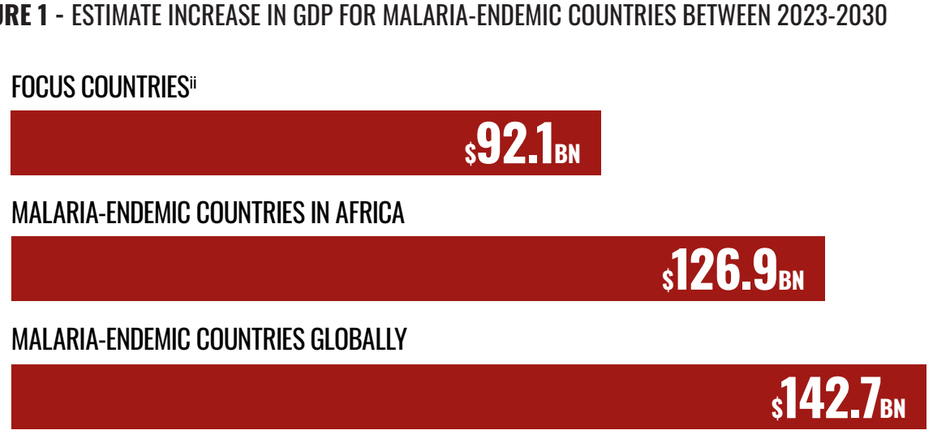
This report outlines why maintaining these investments are not only crucial for saving children's lives but also for Britain's economy and health system.

SECURING ECONOMIES BY INVESTING IN SCIENCE AND ENDING DISEASE

In a world where there is greater geopolitical uncertainty, and the threat of war on Europe's border looms large, it is important that the UK considers the impact of a wide range of investments that might at first not appear to be directed towards defence or contribute to economic growth. Investment in global health has important benefits to the UK's ability to strengthen its own economy and help grow the global economy. This section explores how the UK's investment in global health research, science and programmes, particularly for malaria, is not only saving lives but directly contributing to Britain's economy.

Modelling by Oxford Economics Africa, commissioned by Malaria No More UK, has also shown the economic benefits of investing in malaria control. The research shows that getting back on track to global malaria targets, which can only be done with the help of new tools and a strong innovation pipeline, could boost the GDP of malaria-endemic countries by as much as $142 billion collectively by 2030 (*Illustrated in Figure 1*).[11] This would have positive ramifications for the UK through increased trade totalling $453 million and a $3.9 billion increase in G7 exports to key African countries if the targets are met.[12]

FIGURE 1 - ESTIMATE INCREASE IN GDP FOR MALARIA-ENDEMIC COUNTRIES BETWEEN 2023-2030



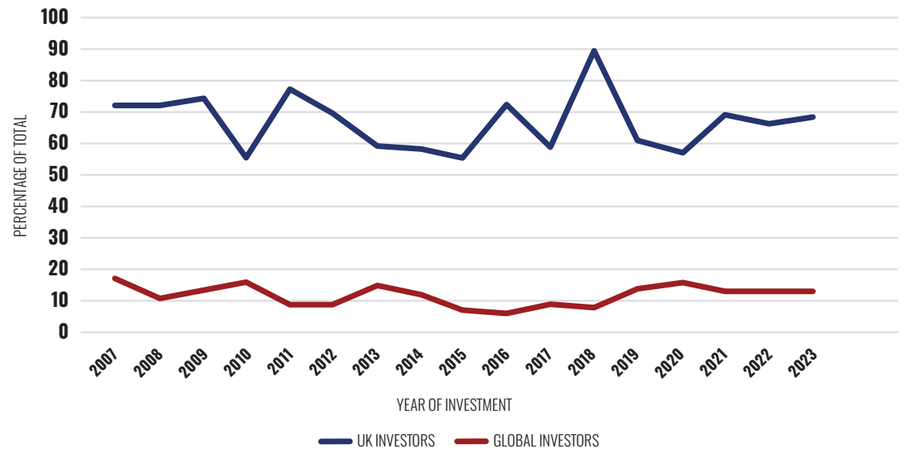
Sum of GDP 2023-2030 for each Group.

New research from IGH demonstrates that since 1994 the UK has invested £2.2 billion in neglected diseases research (including TB, HIV, malaria, the majority of the WHO neglected tropical diseases and several other diseases).[13] It is estimated that since 2000, this funding has saved 380,000 lives and prevented 26 million cases of disease. If the UK continues to invest at this level, IGH estimate that an additional million lives could be saved from 2025 to 2040.[14] Over the 40-year period, UK funding into neglected diseases research is predicted to save 1.43 million lives and avert 183 million disease cases.[15] The research shows that more than three quarters of the potential health impact of this investment is yet to come.[16]

In order to ensure that the £2 billion already invested is maximised and does not go to waste, it is crucial that both the Global Fund and Gavi are successfully replenished in 2025 to roll out the new tools including the new dual-insecticide treated nets, malaria vaccines and effective drugs, and that the UK continues to support the development of tools currently in clinical trials.

Together, malaria, HIV and TB have received 60% of all UK Government neglected disease research funding since 2007, with malaria R&D funding accounting for over a quarter of this investment (27%)[17] – the highest contribution for a single disease. The UK Government has also been a big supporter of product development partnerships (PDPs), such as the Medicines for Malaria Venture (MMV) and the Innovative Vector Control Consortium (IVCC) with over half (51%) all UK Government funding since 2007 going to PDPs.[19] PDPs are essential to helping innovations grow from early research to usable and accessible tools at scale. PDPs are not-for profit organisations which bring together industry, academia, non-profit and private sector to create tools that address global health problems.

FIGURE 2 - FUNDING GIVEN TO UK INSTITUTIONS BY UK INVESTORS[iii] AND GLOBAL INVESTORS[iv]



Not only does the UK's commitment to global health research save lives but it reaps economic benefits for us abroad and at home. This investment could generate a £1.39 trillion societal return, with nearly £7.7 billion of additional economic activity in the UK directly, driving over £4 billion of private sector investment in R&D and creating nearly 4,000 jobs.[20] Since malaria accounts for 27% of the funding,[4] we may attribute 27% of the economic impact of these investments to malaria. Therefore, UK investment in malaria R&D could generate a boost of $2.07 billion to UK Gross Domestic Product (GDP) directly.

This underscores the economic benefits of ending malaria, not just for affected nations but for the global economy as a whole. Without continued investment in multilaterals, such as the Global Fund and Gavi, not only will the lives and wellbeing of millions be threatened, but it will leave billions of dollars of economic progress unrealised.

[ii] The 13 focus countries refer to the ten countries most affected by malaria: Nigeria, the DRC, Uganda, Mozambique, Angola, Burkina Faso, Mali, Tanzania, Niger, and Côte d'Ivoire; and Ghana, Zambia, and Kenya.

[iii] 'UK investors' is defined in this case as investors whose 'Donor country' in the G-FINDER survey is 'United Kingdom.' This includes government departments, private sector, and public funders.
[iv] 'Global investors' is defined in this case as investors whose 'Donor country' in the G-FINDER survey is any country other than 'United Kingdom.' This includes government departments, private sector, and public funders.

STRENGTHENING THE UK'S LIFE SCIENCES SECTOR WITH MALARIA SCIENCE AND INNOVATION

The UK life sciences sector benefits the UK economy by bringing billions into the economy and creating tens of thousands of jobs.[21] After being elected in 2024, the new Labour Chancellor presented a budget which prioritised policies which could support further expansion of the life sciences sector. Indeed, a record £20.4 billion of investment in the Autumn Budget for UK R&D speaks to a recognition of the important role that science and innovation have in our economy.[22] UK-backed R&D into malaria is an important part of this landscape, with innovations across every part of the sector: drugs, vaccines, diagnostics, basic research, and biological and vector control.[23]

Beyond direct health impacts, malaria R&D significantly boosts the UK's life sciences sector – creating jobs, companies, and expertise that keep Britain at the cutting edge of biomedical innovation. The UK ranks as the second-largest recipient of global malaria R&D funding,[24] which provides jobs and stimulates the economy domestically. Scientists, technicians, and support staff are employed on malaria projects at universities from London to Glasgow, biotech start-ups are launched to commercialise breakthroughs, and international grants bring revenue into British cities.

ELEVATING THE UK'S GLOBAL STANDING AND ENHANCING CUTTING-EDGE CAPABILITIES

Breakthroughs in malaria R&D have elevated the UK's global scientific standing and international influence. By consistently delivering high-impact discoveries (such as new medications, vaccine candidates or vector control tools), the UK secures its reputation as a science superpower on the global stage. This soft power pays diplomatic dividends with UK scientists sought for international collaborations and advisory roles, giving the UK a voice in setting global health agendas. Once more, the collaboration of scientists from the UK and Africa helps build trust in African countries, which can support UK-Africa bilateral relationships that extend far beyond health.[25]

> "UK scientists are well respected globally. We have a voice globally,"
>
> Dr Sally Nicholas, Wellcome Trust[26]

Malaria research often intersects with cutting-edge fields (genomics, gene editing, vaccine platforms), increasing the UK's capacity in those fields too. For instance, the gene drive research led by Imperial College's Target Malaria on genetically altering mosquitoes positions the UK at the forefront of genetic engineering.[27]

ATTRACTING WORLD-LEADING TALENT

Malaria-focused R&D also helps the UK attract and retain top scientific talent, reinforcing its global standing as a life sciences hub. The country's long leadership in malaria – from Sir Ronald Ross's Nobel Prize-winning discovery of transmission,[28] to today's world-class research centres – has built a reputation that draws brilliant minds to British institutions. Many leading malariologists and immunologists from around the world come to work or train at places like Imperial College London, the London School of Hygiene & Tropical Medicine (LSHTM) or the Liverpool School of Tropical Medicine (LSTM). These experts not only contribute to malaria advances but often stay in the UK or collaborate long-term, adding to the nation's skill base.

"We absolutely attract global talent because… top scientists want to work on the big problems, and they want to work on things that are going to have a global impact. Malaria is also a big challenge in terms of its complexity and it's interesting scientifically. So, we get a lot of applications from across the globe." Professor Azra Ghani, MRC-GIDA[29]

STRENGHTENING AND LEVERAGING THE PRIVATE SECTOR

IGH's research shows how the UK's investment in global health research could drive £1 billion of private sector investment in neglected disease research in the short term, and over £4 billion in the long term.

"Our research in infectious diseases builds on the UK infectious disease ecosystem, such as scientific, epidemiological and economic research done in leading UK research centres and universities, like at the London School of Hygiene and Tropical Medicine or the Liverpool School of Tropical Medicine.

This work informs our research, and it also helps to inform global health priority setting, programme funding, procurement decisions, and implementation plans that pave the way to access innovative tools for the prevention and control of malaria.

The knowledge generated maintains the UK's role as a thought leader in global health; and keeps Britain at the cutting edge of tackling infectious diseases, making the world healthier and more secure and ensuring a thriving research sector here at home." Ariane McCabe, Lead Global Health Policy & Advocacy, GSK

Investment in academic institutions working on malaria has also stimulated the creation of private sector companies covering a range of disease areas. For example, Keltic Pharma is a spin-out company from the University of Glasgow that was started with seed funding from a venture loan from the European Union which the existing malaria programme attracted. This funding helped set up a commercial arm of Keltic Pharma which now not only works on malaria but other diseases that directly impact the UK population, such as severe asthma, thereby contributing to the UK's thriving life sciences sector and broader public health infrastructure.

"The malaria programme attracted £1.5 million of seed funding into a commercial arm of Keltic Pharma… We've been able to employ the best part of 13 scientists in Glasgow to pursue this commercial element [and continue the malaria programme]….The outcome we hope, is a universal drug discovery platform which could be used to…develop medicines for neurodegenerative disease and severe asthma… both of which impact UK health." Professor Andrew Tobin, University of Glasgow[30]

PROTECTING THE WORLD AND BRITAIN FROM HEALTH SECURITY THREATS

Just as we saw with the COVID-19 pandemic, ending disease saves lives and strengthens communities. So as the world and the UK embrace changing politics and respond to emerging threats, now is not the time to step back from facing down health security threats that we know can bring so much instability.

Malaria research has delivered far-reaching benefits not only in saving lives abroad but also in strengthening the UK's own health system. The innovations spurred by decades of British-backed malaria R&D have enhanced diagnostics, vaccination technology, and drug discovery – many of which have strengthened our domestic healthcare. The collaborative networks and infrastructure built for malaria, including the vital work of the Global Fund, have greatly improved the UK's preparedness for pandemics and other emerging health threats. It was only because of long-standing research into diseases like malaria, that the UK was able to respond so quickly to the new coronavirus threat when it emerged in 2020.

This section explores how sustained investment in malaria research is translating into tangible advantages for the UK health system.

DIAGNOSTICS & SURVEILLANCE

Investment in diagnostics, bioscience and epidemiology for malaria have significantly enhanced the UK's pandemic preparedness and health security through improved surveillance, data analytics, and global networks. Skillsets developed through malaria research – such as epidemiology and modelling – have been redirected to domestic use to protect the NHS and the British public.

"*Having that global surveillance system… needs to be a global effort… These are things that support and protect us in the UK.*" Dr Sally Nicholas, Wellcome Trust[31]

For example, the University of Glasgow collaborated with the Scottish Government, BioAscent, University of Dundee and the Cancer Research UK Beatson Institute to leverage their expertise and top malaria bioscientists and parasitologists to work on the first Lighthouse Lab in 2020. This was set up to dramatically increase the number of COVID-19 tests that could be processed.[32,33,34]

Dr Venugopal from the University of Glasgow *"By training and practice I am a molecular parasitologist. I study malaria which is a tropical infectious disease and so my skills in molecular cell biology have been useful to the testing centre."*[35]

'I'm very proud that members of my group [at University of Glasgow] were able to transfer from the biomedical programmes that we've got running here, which includes malaria, to help set up that that Lighthouse lab. They were perfectly trained to do that.' Professor Andrew Tobin, University of Glasgow[36]

Substantial investments in malaria R&D also allowed staff from MRC-GIDA at Imperial College London to be trained on general infectious disease epidemiology, creating a strong team of researchers that were quickly able to pivot the COVID-19 effort.[37] The team was used to understand the severity of the pandemic on the UK health system, modelling the impact of the virus on NHS bed capacity and guiding the UK government on its COVID-19 policies. Without the UK's investment in the malaria R&D ecosystem this team may not have even existed and would not have been able to carry out such vital work for the UK.

'In January and February 2020, we had a team almost entirely made-up from people who were previously working on malaria research [now working on the COVID-19 response]' Professor Azra Ghani, MRC- GIDA[38]

VACCINES

The development and production of the R21 malaria vaccine, by the University of Oxford's Jenner Institute, has contributed significantly to the UK's vaccine development capabilities. The collaboration between the Jenner Institute and the Serum Institute of India for large-scale production of R21 illustrates how established partnerships in malaria vaccine production and delivery facilitated the rapid scaling and deployment of the Oxford-AstraZeneca COVID-19 vaccine.[39] Once more, work by the Jenner Institute on an experimental malaria vaccine laid the technological groundwork for the COVID-19 vaccine. Not only do investments in malaria R&D benefits millions around the world, but they have direct benefits to the UK's domestic vaccine development and deployment.

SUPPORTING DRUG DEVELOPMENT FOR OTHER DISEASES

Malaria drug research is helping UK scientists to develop treatments for other disease areas including cancer. Results from an early clinical trial conducted by researchers at the University of Oxford have shown that an anti-malarial drug called atovaquone (often known as Malarone when combined with Proguanil) could improve treatment outcomes in non-small cell lung cancer. A follow-up trial has now completed, and initial results look promising with full results expected later this year. Similarly, mouse cancer models have shown that atovaquone may also improve immunotherapy in cancer treatment.[40]

The malaria fight has functioned as a training ground for the experts that were so vital to the UK's response to the COVID-19 pandemic. By continuing to invest in malaria research, we are ensuring that these experts and technologies continue to develop and are ready to pivot again if another deadly disease threatens the NHS. However, without organisations such as the Global Fund, which drive the development of malaria tools by ensuring there is a funding mechanism to purchase and deploy them, the R&D sector would not thrive as it does now and those great minds and technologies that were utilised for the UK's COVID-19 response may not be there in the future to tackle another deadly threat.

'It's very hard to make the case for investment into new diagnostics or vaccines for infections that haven't yet hit us… there is a long list… from UKHSA of priority pathogens [for the UK], many of which aren't causing any burden [yet]… So, making an investment case or manufacturing case for products in those pipelines is very challenging. But you can develop quite a lot of transferable technology and life sciences skills along the whole spectrum, working on another infection [such as malaria]' Professor Azra Ghani, MRC-GIDA[41]

The evidence speaks for itself, if the UK wishes to protect citizens from health threats and the economic repercussions – then it should continue to prioritise multilaterals such as the Global Fund and Gavi as well as R&D investment into diseases like malaria. Ending malaria doesn't just make sense for securing the UK's health, it makes economic sense too.

POWERING THE MALARIA INNOVATION PIPELINE WITH BRITISH-BACKED SCIENCE

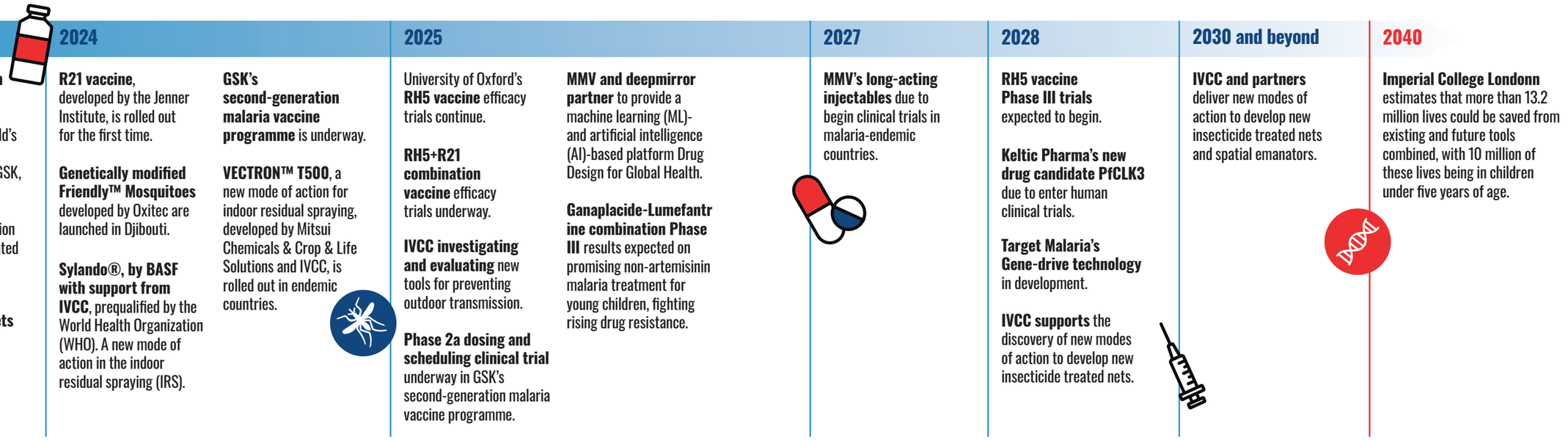
Despite huge challenges for the malaria fight, there is a rich pipeline of new innovations on the horizon – many of them powered by British-backed science in close collaboration with partners in African countries. A recurring theme in the UK's support and leadership on malaria is the indispensable role of UK partnerships with African countries. Virtually every innovation – vaccine, drug, insecticide or technology – relies on collaboration for development, testing, and deployment.

"*[Partnerships] are so incredibly valuable because it gives us as scientists different perspectives and different ways of thinking and addressing the same problem. And there's no reason why we shouldn't be considering these partnerships as a two-way thing, that people could also be thinking of innovative ways to address challenges that we have in the UK.*" Professor Azra Ghani, MRC- GIDA[42]

From next-generation vaccines to novel drug approaches and cutting-edge vector control and genetic tools, British-backed researchers and institutions are helping to develop the breakthroughs that could finally end malaria. MRC-GIDA at Imperial College London modelling shows that by combining the tools we have now with the potential of future tools, such as gene drive and second-generation vaccines, we could save 13.2 million lives over the next 15 years.[43]

However, in order to realise economic growth across Africa, open up trade opportunities for the UK, and provide essential economic and health security for the world, the innovative malaria science and medical developments that the UK backs, it must reach the people at risk of malaria.

FIGURE 3 - MALARIA INNOVATION PIPELINE



The role of the Global Fund is crucial in both ensuring that, if proven successful, these new tools get to the people that need them most but also in providing researchers with a broad overview of the unmet need and identifying the research gaps that drive the pipeline.

'They [the Global Fund] give us a more cohesive global picture of what is needed… they identify the research gaps… and I think it's really useful for the science community to understand what the challenges are on the ground' Professor Azra Ghani, MRC- GIDA[44]

INNOVATIVE APPROACHES TO PREVENTIVE AND THERAPEUTIC MALARIA DRUGS

The UK is also supporting the development of triple artemisinin-combination therapies through its funding to MMV as well as a promising new non-artemisinin-based therapy (Ganaplacide-lumefantrine) with Novartis, with Phase 3 trials expected at the end of 2025.[45,46]

Last year, Medicines for Malaria Venture (MMV) and Quotient Sciences, a UK-founded organisation which began from a spin-out from the University of Nottingham and the Royal Free Hospital London, began the first clinical trial for a long-acting injectable (LAI) preventive drug for malaria. The injectable could be a gamechanger, offering an affordable, long-lasting (up to three months of protection) option protecting against all types of malaria (and helping combat resistance) and people of all ages. The trial is taking place right here in the UK and, if successful, wider clinical trials in malaria-endemic countries could start as early as 2027.[47]

Another cutting-edge example is being spearheaded by Glasgow-based Keltic Pharma, their new drug could help combat the spread of treatment- resistant malaria, be given as a one-dose cure (rather than the need for multiple doses over multiple days) and potentially developed as a long lasting injectable.

This is the first time an approach from cancer treatments has been used to tackle malaria. The new drug works by targeting a protein called PfCLK3 and killing the parasite before it can spread.

There is hope from the researchers that the drug will kill the parasite at all stages of its life cycle – both treating infection and blocking transmission – which isn't possible with the current artemisinin-based treatments. This is in the early stages and hopes to enter human clinical trials within three years.[48]

'We're interested in developing a drug which will be a radical cure for malaria. And what that means is that we want to cure [not only] the symptoms of disease, but we also want to block transmission from the human back to the mosquito' Professor Andrew Tobin, University of Glasgow[49]

These innovative drug therapies are crucial to ensure that treatments continue to be effective and tackle the rising resistance to artemisinin.

PIONEERING VECTOR CONTROL

Over 38 million dual active ingredient nets, supported by Liverpool-based IVCC, have been distributed as part of the New Nets Project, and, along with additional nets deployed with support from the Global Fund and President's Malaria Initiative (PMI), have led to a total of 56 million next-generation nets deployed across 17 countries in sub-Saharan Africa, helping to avert an estimated 13 million malaria cases and 24,600 deaths.[50] However, the work doesn't end there. To stay ahead of insecticide resistance nets with new modes of action need to be developed. A primary goal of IVCC is the discovery and development of novel insecticides which can be used across the spectrum of vector control tools (including nets, indoor residual sprays and spatial emanators). IVCC is also looking to support new technologies that are designed to address outdoor transmission.[51]

British-backed scientists are conducting ground-breaking research into gene drive technology for malaria. Target Malaria, part of Imperial College London, are using gene drive technology, a type of genetic modification, to reduce the population of malaria-transmitting mosquitoes and reduce the transmission of the disease. New mathematical modelling has shown that gene drives could reduce malaria-carrying mosquito population by 71%-98% in West Africa. When combined with existing interventions such as vaccines and new nets, the modelling shows that gene drives could prevent 60% more malaria cases.[52]

HARNESSING THE POWER OF AI

The UK is harnessing power of AI through malaria diagnosis and drug discovery. Researchers at the University College London Hospital (UCLH) have developed an AI-driven microscope, which can identify malaria parasites in blood samples almost as accurately as expert clinicians.[53]

MMV have also teamed up with London-based AI-software company deepmirror to create a platform called the Drug Design for Global Health (DD4GH), which aims to accelerate the identification and selection of promising compounds to expedite the development of effective medicines. MMV and deepmirror have committed to, where possible, make the platform free of charge to scientists based in the Global South who are working on diseases which threaten health security, such as malaria and tuberculosis. The UK government's continued commitment to MMV therefore supports innovation that not only builds capacity in African countries but strengthens our global health security.[54]

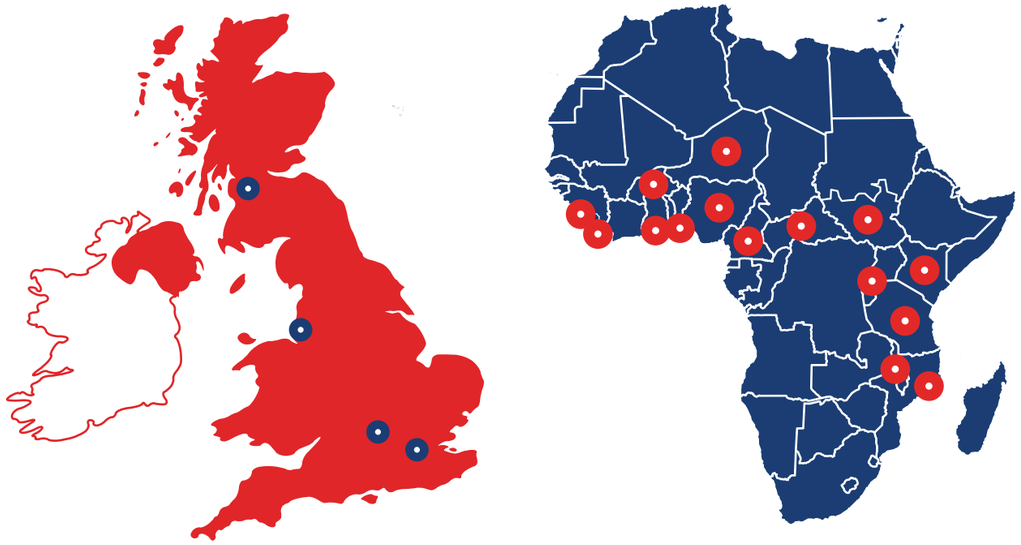
SECOND-GENERATION VACCINES

British-backed science led the way with the world's first ever malaria vaccine, RTS,S, developed by GSK. Building on the science that took around 30 years to perfect, the University of Oxford's Jenner Institute, created the second malaria vaccine R21. Both are ground-breaking discoveries and with the crucial support of Gavi have now been rolled out to 18 countries across Africa.[55] Not only are malaria vaccines strengthening the malaria fight today, but they also offer a bright future. There are now several British-backed 'next generation' vaccines in the pipeline. For example, the University of Oxford is developing a blood-stage vaccine called RH5 which targets the malaria parasite at its most devastating stage – the rapid replication of the organism in human red blood cells. The 'blood stage' is where clinical disease and all malaria-associated illness and death occurs. GSK have recently announced its Second-Generation Malaria Vaccine Programme.

The Oxford team are also investigating the possibility of combining R21 (anti-infection vaccines) with RH5 (anti-disease vaccines). In doing so, a multi-stage vaccine is created which targets multiple stages of the parasite's lifecycle – this could be game-changing with a much more effective vaccine deployed in the future.

Malaria has one of the most diverse and exciting pipelines out there, with much of it being driven by British-backed science. However, the new tools will be useless if they just remain in the labs. That is why it is vital that the Global Fund and Gavi are successfully replenished in 2025.

FIGURE 4 - UK-AFRICA PARTNERSHIPS IN MALARIA R&D



Innovation is key if we are to get ahead of malaria, which is why GSK is developing a new malaria vaccine designed to improve protection for children against the deadliest form of malaria, Plasmodium falciparum.

First-generation vaccines target the sporozoite - or early stage of the life-cycle, so scientists from our Global Health team are designing and testing a new vaccine component to specifically target the later blood stage of the life-cycle.

Four decades after the foundational technology of the first-generation malaria vaccines was developed by GSK, PATH and partners, the roll-out of those vaccines for the prevention of P. falciparum malaria in children began in January 2024 in endemic countries, where they are already demonstrating public health impact.

Building upon the extensive research and development efforts of the global health community since then, GSK's second-generation malaria vaccine programme aims to apply the latest vaccines science to evolve and expand the global malaria "toolbox", in support of elimination efforts.

KATIE EWER
LEAD SECOND-GENERATION MALARIA VACCINE PROGRAMME
GLOBAL HEALTH, GSK

RECOMMENDATIONS

Since its inception in 2002, the Global Fund has saved 65 million lives and cut the combined death rate from HIV, tuberculosis and malaria by 63%.[56] Likewise, in the past 25 years, Gavi has vaccinated over 1 billion of the world's poorest children and prevented more than 17.3 million future deaths, helping to halve child mortality in 78 lower-income countries.[57] The UK has long been a key partner and advocate for these organisations as cost-effective and impact-driven multilateral organisations driven by partnership working.

Later this year, there is an opportunity for the UK to re-commit its support to these organisations and to British science. It is clear from the evidence provided in this report that a strong investment in the Global Fund and Gavi is a commitment from the UK to save the lives of some of the most vulnerable people, to bolster the UK's economy and protect our NHS. It is therefore critical that the UK continues to prioritise global health through Official Development Assistance to shore up the UK and the world's economic and health security.

1. **Ensure that major multilateral organisations The Global Fund and Gavi have the necessary funding** to deliver resilient health systems around the world and that life-saving tools developed in places like the UK reach the communities that need them.

2. **Continue to encourage a thriving life sciences sector in the UK** to accelerate innovative R&D targeted at protecting the most vulnerable communities in the world and to develop the next generation of tools needed to combat challenges like growing insecticide resistance. This must include ensuring that vital Product Development Partnerships have the multi-year funding they need to invest in long-term research.

APPENDIX

METHODOLOGY: G-FINDER DATA

Malaria No More UK analysed the G-FINDER portal data, hosted by Impact Global Health, to track investment trends in malaria and global health research and development (R&D).[58] The survey tracks annual investment into R&D to address global health challenges disproportionately affecting the world's most disadvantaged populations. New products and technologies covered in the report include diagnostics, drugs and vaccines.[59] The G-FINDER data portal is updated annually and currently covers data between 2007 and 2023.

MNMUK used the G-FINDER portal to assess the following:

- Annual investments by UK investors[iv] into malaria R&D (average and total);
- Investments in 2023 by UK investors into UK R&D institutions;
- Investments into PDPs by UK investors;
- Main investors of malaria R&D in the UK;
- Variance across 2007-2023 of funding invested into UK institutions by UK investors and global investors[v]; and
- The total invested into PDPs over the 2007-2023 period by UK investors and global investors.

TABLE 1 – SHARE OF INVESTMENT GIVEN TO MALARIA R&D IN 2023 BY UK INVESTORS (USD)

Investor	Investment in 2023 (USD)	Percent of total
UK FCDO	$21,082,895	42.9%
Wellcome	$16,142,634	32.8%
UK MRC	$7,762,702	15.8%
Innovate UK	$3,007,700	6.1%
LifeArc	$625,648.3	1.3%
UK DHSC	$219,741	0.4%
UK Biotechnology Research Council	$186,109	0.4%
UKRI	$59,239.87	0.1%
Others	$79,083.73	0.2%

TABLE 2 – UK INVESTMENTS IN MALARIA R&D, 2007-2023 (USD)

Year	Annual funding for malaria R&D (USD)
2007	$51,438,078
2008	$51,290,196
2009	$54,163,658
2010	$80,395,216
2011	$72,606,194
2012	$57,848,729
2013	$77,829,201
2014	$63,621,720
2015	$49,570,831
2016	$44,118,303
2017	$96,789,910
2018	$69,209,105
2019	$82,102,242
2020	$73,662,169
2021	$49,271,844
2022	$45,106,873
2023	$49,165,753
Total	$1,068,190,022
Average	$62,834,707.18

[iv] 'UK investors' is defined in this case as investors whose 'Donor country' in the G-FINDER survey is 'United Kingdom.' This includes government departments, private sector, and public funders.

[v] 'Global investors' is defined in this case as investors whose 'Donor country' in the G-FINDER survey is any country other than 'United Kingdom.' This includes government departments, private sector, and public funders.

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