

Expanding malaria treatment could help accelerate elimination

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A clinical trial by Menzies School of Health Research (Menzies) published in *The Lancet* today has revealed promising results to reduce malaria relapses, through the broader use of primaquine.

Primaquine is a medication used for more than 60 years to target vivax malaria parasites in the liver and prevents infection from continuing. Usually only patients who are infected with *P. vivax* malaria receive this treatment.

This study assessed the use of primaquine in patients with another malaria species, *P. falciparum*. Those patients received one of two treatments. One group received the current recommended treatment for *P. falciparum*, which only targets the blood form of the parasite. The second group received this treatment as well as primaquine.

Patients who received the additional treatment had significantly fewer relapses of *P. vivax*. This study also provided reassuring evidence on the safety of primaquine at a higher dose than used in most countries.

Led by Menzies Principal Research Fellow, Associate Professor Kamala Thriemer, this multi-centre study was conducted in Bangladesh, Indonesia and Ethiopia.

P. vivax malaria affects more than 7 million people each year, mainly throughout the Americas, Africa and the Asia-Pacific. It puts 40 per cent of the world's population at risk of the infection. Once infected, *P. vivax* can hide in the liver for long periods of time before reappearing and causing a malaria relapse.

Locations where both *P. falciparum* and *P. vivax* are present are known as co-endemic countries. In these settings, the risk of a *P. vivax* relapse after a *P. falciparum* infection is significantly higher compared to the risk of *P. vivax* relapse from an initial *P. vivax* infection.

More people with malaria means more opportunities for the disease to be spread by mosquitos. Treating the liver forms of the *P. vivax* parasites at the point of care for a *P. falciparum* infection can contribute to improved malaria control and ultimately elimination.

These findings provide significant evidence towards new innovative ways to reduce malaria cases, supporting malaria elimination goals.

The study was funded by grants from the Australian Academy of Science Regional Collaborations Program, Bill & Melinda Gates Foundation and National Health and Medical Research Council.

The study is available online: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(23\)01553-2/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(23)01553-2/fulltext)

Quotes attributable to Menzies School of Health Research Principal Research Fellow and lead author of the study, [Associate Professor Kamala Thriemer](#):

“Malaria elimination requires wide-scale provision of safer and more effective antimalarial treatments, this is particularly the case for vivax malaria.

“We know that in areas where the two most important malaria species are present, the risk of a *P. vivax* relapse after a *P. falciparum* infection is high.

“This clinical trial found that using radical cure in patients with *P. falciparum* malaria has the potential to reduce the risk of future *P. vivax* episodes. In patients who received radical cure the risk of *P. vivax* reinfection was 5 times lower than in participants who received standard treatment.

“This provides an opportunity to treat more patients who are at risk at the point of care, ultimately contributing to better malaria control.”

Quotes attributable to Asia Pacific Malaria Elimination Network (APMEN) Vivax Working Group, co-Chair, Dr Neena Valecha:

“Primaquine is safe for most patients, but the drug can induce a severe form of anaemia (called haemolysis) in patients with a particular enzyme (G6PD) deficiency.

“With availability of novel diagnostic tools for point of care G6PD testing, universal radical cure can be provided safely and effectively and can help National Programmes to accelerate towards the goal of malaria elimination.

“Moreover, uniform treatment for both species can be user friendly and simpler to implement.”

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Menzies School of Health Research

Menzies is one of Australia’s leading medical research institutes dedicated to improving the health and wellbeing of Aboriginal and Torres Strait Islanders, and a leader in global and tropical research into life-threatening illnesses. Menzies continues to translate research into effective partnerships and programs in communities across Australia and the Asia-Pacific region.

Fast Facts:

- Malaria is a life-threatening disease, spread to humans through bites from infected *Anopheles* mosquitoes. There are 6 kinds of malaria parasites, including *Plasmodium falciparum* (*P. falciparum*) and *Plasmodium vivax* (*P. vivax*).
- Fever is the most common symptom of malaria.

***P. falciparum*:**

- *P. falciparum* is known as the most dangerous of the malaria parasites, due to its ability to escalate to severe illness and death within 24 hours.
- It is characterised as uncomplicated or severe, depending on how bad the symptoms are.



- Symptoms of uncomplicated *P. falciparum* malaria include fever, chills, headache, loss of appetite and coughing. The diversity of symptoms can make these cases tricky to diagnose.
- Severe *P. falciparum* is diagnosed by identifying both the parasite in the blood, and at least one of the following symptoms: severe weakness, respiratory distress, abnormal bleeding, jaundice or acute kidney injury or impaired consciousness.

***P. vivax*:**

- *P. vivax* is one of the most common malaria parasites and has a complex life cycle. It can remain undetectable and dormant in the liver, and can reactivate weeks or months after the initial infection.
- This means one bite of a mosquito infected with *P. vivax* can result in multiple malaria episodes and further transmission of the disease.
- A *P. falciparum* malaria infection or an illness causing a fever may be a trigger for reactivating the dormant liver stage of *P. vivax*.

Treatment of malaria:

- Malaria medications target the parasites in the blood or the liver. Treatments that target both areas are known as radical cure.
- Due to the life-cycle of *P. falciparum*, only medications targeting the blood-stage are required.
- For *P. vivax*, both blood and liver medication are required to eliminate the parasite. Primaquine is the most commonly used liver stage drug and is used in-conjunction with a malaria blood-stage drug to achieve radical cure.