

# Accelerating the elimination of *P. vivax* malaria

## About PAVE

The Partnership for Vivax Elimination (PAVE) led by PATH and Medicines for Malaria Venture (MMV) brings together National Malaria Programs (NMPs), researchers, funders, and other organizations to support countries as they strive to achieve their elimination goals through:

- Working with NMPs to identify optimal radical cure tools and strategies for their given contexts.
- Generating and sharing high-quality evidence on *Plasmodium vivax* (*P. vivax*) case management to inform policy decisions and implementation by national governments
- Advancing the development and availability of quality-assured medicines and diagnostics for *P. vivax*.

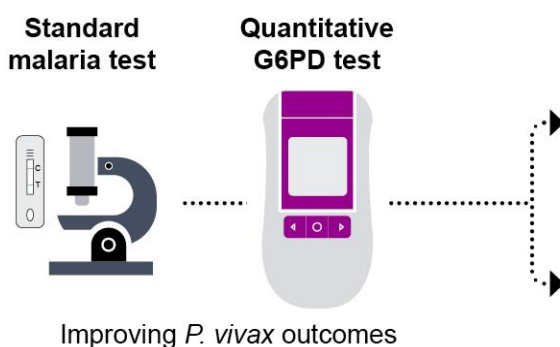


PAVE facilitates access to new and existing malaria diagnostics and treatments for *P. vivax* elimination

## Eliminating *P. vivax* malaria

Eliminating malaria is an ambitious goal, and relapsing *P. vivax* malaria presents a major obstacle to its achievement. In countries approaching elimination, the decline in *P. vivax* burden often lags the decline of *P. falciparum*. The *P. vivax* parasite has a dormant liver stage—the ‘hypnozoite’—that can be activated weeks, months, or years after the initial infection, making it difficult to eliminate. Diagnosis, and radical cure treatment requires coordinated use of (1) a malaria blood-stage diagnostic (either a rapid diagnostic test or microscopy), (2) a glucose-6-phosphate dehydrogenase (G6PD) diagnostic test, (3) a blood-stage antimalarial, either chloroquine (CQ) or an artemisinin-based combination therapy (ACT) (based on national strategies), and (4) tafenoquine (TQ) or primaquine (PQ) to clear parasites from the liver and prevent relapse. TQ and PQ can both cause severe hemolysis in G6PD deficient patients. As a result, G6PD testing is mandatory before using TQ, as patients can only be treated if they have enzyme activity  $\geq 70\%$ . G6PD testing is also recommended before using PQ to guide appropriate use and dosing.

## New Tools for Radical Cure



		Day	1	2	3	4	5	6	7
7/14 DAY TREATMENT	PQ	Week 1	●	●	●	●	●	●	●
		Week 2	●	●	●	●	●	●	●
	CQ/ACTs		■	■	■	*option for 7 day 0.5mg/kg/day			
3 DAY TREATMENT	TQ		●						
	CQ		■	■	■				

## Quantitative test to measure G6PD activity

The STANDARD™ G6PD Test provides a quantitative measure of a patient's G6PD enzyme activity levels. The SD Biosensor handheld device provides a patient's G6PD level and hemoglobin measurement in 2 minutes based on a finger-prick. As of August 2022, the test is registered/available in over 18 countries. In addition, the test received Australian Therapeutic Goods Administration (TGA) approval in 2021 and Global Fund Expert Review Panel for Diagnostics approval until July 2023.

## Tafenoquine—a single-dose relapse prevention treatment

TQ is a single-dose liver-stage treatment that provides radical cure for *P. vivax* malaria when used in combination with CQ. The Australian TGA and United States Food and Drug Administration approved TQ in 2018 for patients aged 16 years and over. It is now registered for the same population in Brazil, Colombia, Peru, and Thailand. In March 2022, the Australian TGA approved the use of TQ for children aged 2 years and above. The approval includes a novel 50 mg tablet that can be dispersed in water to facilitate use in children.

## Pediatric primaquine for relapse prevention

PAVE is supporting Fosun Pharma to develop a 2.5 mg and 5 mg dispersible PQ tablet addressing the supply gap in pediatric treatment for relapsing malaria. If approved by WHO prequalification, it will be the first quality-assured pediatric PQ formulation available.

## Generating evidence on *P. vivax* case management

In support of ministries of health, and led by in country research partners, PAVE is conducting feasibility studies to investigate the best use of *P. vivax* treatments and diagnostics to support malaria elimination. Studies are planned in Peru, Ethiopia, Indonesia, and Papua New Guinea. For more information visit the [P. vivax information hub](#).

PAVE collates evidence to support national policy decisions of malaria-endemic countries. Country landscape reports have been developed or are underway for most *P. vivax* endemic countries. Roadmaps for integration into national strategic plans are being developed through readiness planning workshops in Pakistan and Papua New Guinea. Visit the [study database](#) for an overview of vivax research studies; and the [G6PD Operational Research Community of Practice site](#) for practical information regarding the use of the G6PD test.

## Progress

### The Americas

In Brazil, the Tafenoquine Roll-out Study (TRuST) results are expected in Q4 2022. In Colombia, a pilot educational program is underway to evaluate the effectiveness of training community health workers and other health personnel in diagnosing G6PD deficiency. Peru's ministry of health approved a country adoption roadmap, developed with PAVE.

### Asia-Pacific

PAVE provided technical support to the NMPs of Cambodia and Lao PDR in becoming the first countries in the region to rollout G6PD testing. In Thailand, the Assessing Radical Cure Treatment in routine Care (ARCTIC) study is underway with results expected in Q1 2023. In Vietnam and Myanmar, PAVE supported the NMPs to update their *P. vivax* training materials. Vietnam is expected to rollout G6PD testing in Q4 2022. In conjunction with the APMEN Vivax Working Group, a prioritization exercise was conducted to identify current priorities and gaps in support of *P. vivax* elimination. PAVE participated in the WHO Joint Monitoring Mission for Malaria in India, which provided the opportunity to shine a spotlight on *P. vivax*, G6PD testing and radical cure.

### Horn of Africa

PAVE participated in a malaria performance review meeting, and the national malaria scientific forum in Ethiopia.

PAVE consolidates project work from multiple funders and is aligned with country partners and the WHO to accelerate progress. The partnership combines investments from Unitaid, the Bill & Melinda Gates Foundation, the UK Foreign, Commonwealth and Development Office (FCDO) and MMV core funding, among others. For additional information regarding our work, reach out to: [pave@path.org](mailto:pave@path.org)

Estimated *P. vivax* cases 2020, by country

