

MALARIA IN BRAZIL



The burden^{1,2,3}

- Malaria threatens the lives of 20% of Brazil's population
- ~270,000 confirmed and 2.6 million suspected cases in 2011
- *P. vivax* (relapsing) malaria is responsible for 87% of cases
- Symptoms include fever, severe anaemia, respiratory distress, malnutrition and potentially coma and death

“ Better anti-relapse drugs would make malaria elimination in Brazil a real possibility. ”

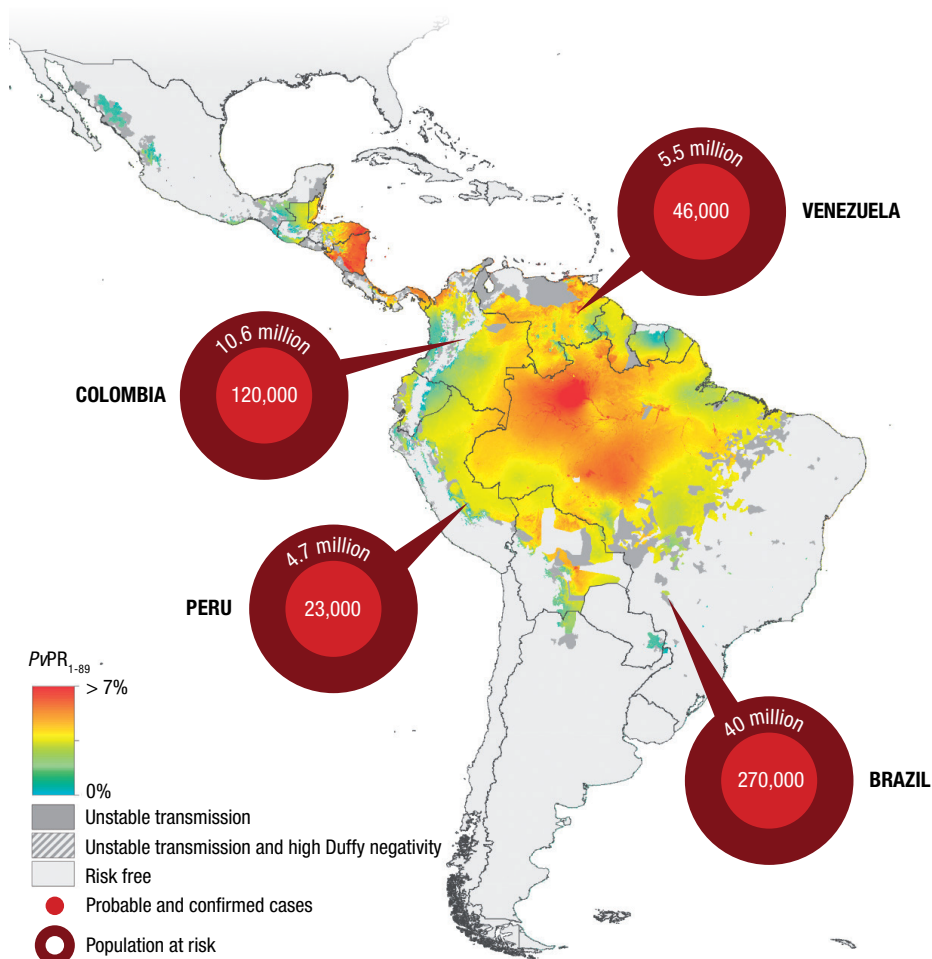
Prof. Marcus Lacerda,

Fundação de Medicina Tropical Dr. Heitor Vieira Dourado, Manaus, Brazil

In the not too distant past, malaria could be found all around the globe – from China to Australia, Russia to South Africa and Canada to Argentina. Today, thanks to significant public health efforts over recent years, the malaria map has successfully been reduced to a fraction of its former self. Nevertheless, the disease continues to plague many countries in Asia, Africa and Latin America.

In Latin America, the vast majority of the continent's cases occur in Brazil. The burden is particularly high in Amazonia,⁴ where continued development in construction, mining and farming enables the disease to spread rapidly.

The reduction of the burden of malaria is one of the main objectives of the Millennium Development Goals (MDGs) and one the



Relapsing malaria endemicity in South America in 2010³

Brazilian Government is striving for in its 'Brazil Without Misery' plan. Thanks to the implementation of effective control efforts, recent years have seen a significant fall in the number of people suffering from malaria in Brazil (from over 600,000⁵ confirmed cases in 2000 to 270,000¹ in 2011). Yet the burden remains devastating.

Owing to the repeated bouts of fever, anaemia, respiratory distress and malnutrition associated with malaria, hundreds of

thousands of work-days and school-days continue to be lost every year.⁶ Studies have also shown that malaria can have adverse effects on children's cognitive ability.⁷ In the most severe cases, it is not just time, capability and potential that is lost, but lives.

As a consequence of this loss of life and productivity, this tiny parasite traps families and communities in an endless cycle of poverty – hindering social and economic development.

Defeating Malaria Together



Malaria hinders economic development

- One episode of malaria keeps a child from school or an adult from work for at least 3 days⁶
- In high-transmission areas children may suffer up to four episodes in a year⁷
- Malaria has adverse effects on cognitive development: even one episode of malaria can compromise a child's school performance⁸
- Malaria traps people in poverty
- Through lost productivity and income, malaria hinders economic development
- Globally, relapsing malaria is estimated to cost between USD 1.4-4.0 billion per year²

Current solutions are insufficient

A major problem facing efforts to control malaria is the lack of effective tools to treat it. This is especially true for *Plasmodium vivax*, the species of parasite responsible for 87% of malaria cases in Brazil.¹ This parasite can lie dormant for weeks, even years, in a patient's liver, to appear again and again without warning, each relapse leading to the feverish symptoms of malaria.⁹ Only one medicine is currently available to stop the relapse – primaquine; but the treatment regimen is long, associated with side effects and often not efficacious.

Searching for solutions for and with Brazil

Part of the solution for malaria in Brazil is the development of new medicines to treat relapsing malaria. Together with partners around the world, MMV is working to discover and develop new effective medicines to cure relapsing and uncomplicated malaria, as well as block the transmission of the disease between humans and mosquitoes.

The lead contender to replace primaquine is currently being trialed with partners in Brazil, Peru, Thailand and India. Early studies show this new medicine could be more effective in a single dose than primaquine.^{10,11}

As we continue our work, we look forward to forging new partnerships in Brazil and helping to train and develop the next generation of researchers to defeat malaria.

Partnering with MMV provides...

- The key to an international research network
- Access to antimalarial research data
- Exchange of best practices and methods
- Research capacity development
- The chance to accelerate the R&D for new tools to defeat malaria in Brazil

Defeating malaria will help...

- Alleviate poverty: Complete cure of relapsing malaria can help sufferers help themselves out of poverty.
- Reduce the malaria burden on healthcare: A single-dose radical cure for relapsing malaria could be sufficient to ensure no relapses and no need for further treatment.
- Boost economic development: More effective medicines will reduce the number of school/work days lost to malaria.
- Enable the global community to reach Millennium Development Goal 6: Combat HIV/AIDs, malaria and other diseases.
- Help to achieve the "Brazil Without Misery" plan.

**Join us in the fight.
Be part of the solution.**

GIVING CAN ACHIEVE TANGIBLE RESULTS

MMV is leading the way to develop and facilitate the delivery of new, affordable medicines that address unmet medical needs for malaria, including relapsing malaria.

The goal is to help vulnerable populations break the cycle of disease and poverty and build a better future for their families and communities.

To date, MMV and partners have brought four new medicines through regulatory or WHO approval towards patients in need.

Investment in MMV can help ensure new medicines advance through clinical trials, receive regulatory approval and reach those who need them most.

→ USD 14 million will enable MMV to co-fund a pivotal study for the clinical development of a new anti-relapse medicine to completely cure *P. vivax* malaria

→ USD 100,000 per year will fund a project to help identify the next generation of anti-relapse drugs

References

1. World Health Organization World Malaria Report 2012: apps.who.int/malaria/publications/world_malaria_report_2012/wmr2012_full_report.pdf
2. Price RN et al. "Vivax malaria: Neglected and not benign." *Am J Trop Med Hyg* 77: 79-87 (2007).
3. Cruz LR et al. Malaria in South America: a drug discovery perspective. Submitted to *Malaria Journal* (2013).
4. Gething PW et al. "A long neglected world malaria map: *Plasmodium vivax* endemicity in 2010." *PLoS Negl Trop Dis*. 9(9):e1814 (2012).
5. Pan American Health Organization Malaria Surveillance Indicators: ais.paho.org/phis/viz/malaria_surv_indicators_popup.asp
6. Carlton JM, Sina BJ, Adams JH. "Why Is *Plasmodium vivax* a Neglected Tropical Disease?" *PLoS Negl Trop Dis*. 5(6): e1160 (2011).
7. Vitor-Silva S et al. "Malaria is associated with poor school performance in an endemic area of the Brazilian Amazon." *Malar J*. 8: 230 (2009).
8. Prof. Marcus Lacerda, Fundação de Medicina Tropical Dr. Heitor Vieira Dourado, Brazil, personal communication, 18 Dec 2012.
9. Baird JK et al. "Prevention and treatment of vivax malaria." *Curr Infect Dis Rep*. 9(1):39-46 (2007).
10. Walsh DS. "Randomized trial of 3-dose regimens of tafenoquine (WR238605) versus low-dose primaquine for preventing *Plasmodium vivax* malaria relapse." *Clin Infect Dis*. 39(8):1095-103 (2004).
11. Walsh DS et al. "Randomized dose-ranging study of the safety and efficacy of WR 238605 (Tafenoquine) in the prevention of relapse of *Plasmodium vivax* malaria in Thailand." *J Infect Dis*. 180(4):1262-7 (1999).

Photos: © 2011 Neil Palmer/CIAT for CIFOR used under a Creative Commons license (CC BY-NC-ND 2.0)

For more information and partnership opportunities contact **Andrea Lucard** at lucarda@mmv.org; +41 79 846 2048