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Technical feasibility for hypersensitive HRP2 infection detection test to support malaria elimination

According to the latest estimates, approximately 198 million cases of malaria occurred globally in 2013, and the disease led to 584,000 deaths (uncertainty range 367,000–755,000). The burden is heaviest in the World Health Organization (WHO) African Region (90% of all malaria deaths) and in children less than five years old (78% of all deaths). Insecticide resistance has been observed throughout malaria-endemic regions, and artemisinin resistance has been detected in five countries in the Greater Mekong subregion: Cambodia, the Lao People's Democratic Republic, Myanmar, Thailand, and Vietnam. The emergence of these forms of resistance threatens to undermine current control and elimination efforts. The "Accelerate to Zero" strategy aims to accomplish malaria eradication swiftly to minimize the deleterious effects and setbacks caused by resurgence and increased spread of multiple forms of resistance. Acceleration will require identifying both populations and individuals at increased risk of harboring and transmitting the parasite. Existing tools used for detecting clinical cases of malaria, including microscopy and rapid diagnostic tests (RDTs), lack the sensitivity required to detect most infections without clinical signs. Other tools, such as polymerase chain reaction (PCR) testing, lack key attributes (ease of use, low cost, short turnaround time, and portability) required for large-scale field use. To enable the most efficient malaria elimination interventions in the most challenging malaria-endemic environments, Bill & Melinda Gates Foundation is sponsoring the Infection Detection Test (IDT) Development Initiative focused on developing a more sensitive diagnostic test for *Plasmodium falciparum* (Pf) based on detection of the HRP2 antigen on an easy-to-use RDT platform. Under this initiative, the PATH DIAMETER (Diagnostics for Malaria Elimination toward Eradication) team is collaborating with key partners to develop and validate new diagnostic tests intended to identify individuals with low levels of infection who contribute to malaria transmission. Over the past 12 months, initiative partners have conducted new research and development projects, including an investigation of capture agents and prototype IDT evaluation. Together, these findings are being evaluated to inform technical feasibility of a new, ultra-sensitive IDT.

Biography

Paul LaBarre is a Senior Technical Officer at PATH. His primary focus is accelerating a portfolio of novel technologies in HIV and malaria diagnostics appropriate for low-resource settings. He is also Project Director for the Bill & Melinda Gates Foundation–funded DIAMETER project and Principle Investigator for the NIH–funded Non-Instrumented Nucleic Acid Amplification (NINA) platform development project. His background includes medical technology design for low resource settings, and prior to working in biotechnology, he served as a Nuclear Engineer Officer in the United States Navy. He received a Master's degree in Medical Engineering from the University of Washington.

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