

New malaria test kit gives a boost to elimination efforts worldwide

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A new, highly sensitive blood test that quickly detects even the lowest levels of malaria parasites in the body could make a dramatic difference in efforts to tackle the disease in the UK and across the world, according to new research published in the *Journal of Infectious Diseases*.

In two studies led by researchers in the UK and Switzerland, the new LAMP (loop-mediated isothermal [amplification](#)) test was compared to existing methods in London laboratories that deal with imported cases of malaria to the UK, and to diagnostic methods used in the field in Uganda, where malaria is a leading cause of illness and death.

The simple test, which can be performed by a non-specialist health worker and does not need refrigerating like other tests, requires a sample of blood to be processed and placed in a test tube with a reactive powder then heated. If the malaria-causing [Plasmodium parasites](#) are present, the tube glows green. The whole process takes less than an hour.

The first study, led in London by the Hospital for [Tropical Diseases](#) (HTD), the London School of Hygiene & [Tropical Medicine](#) and the Foundation for Innovative New Diagnostics (FIND), compared LAMP to existing laboratory diagnostic methods on 705 blood samples of suspected imported malaria cases in the UK.

Dr Colin Sutherland, Clinical Scientist at HTD and Reader in Parasitology at the Malaria Reference Laboratory at the London School of Hygiene & Tropical Medicine, said: "According to data collected for

Public Health England by the London School of Hygiene & Tropical Medicine, the UK treats at least 1,500 cases of imported malaria every year. Despite the very best efforts of the NHS, a handful of malaria related deaths still occur annually in UK hospitals. The new LAMP test for malaria performed very well when tested in the parasite reference laboratory at HTD, and correctly identified every malaria patient out of 705 malaria tests performed.

"An important advantage of LAMP is that non-specialist staff in any hospital in the UK will be able to accurately and rapidly detect the presence of malaria parasites, and immediately begin treatment without waiting for confirmation from local experts or specialist laboratories. This speed of diagnosis can make the difference between an uncomplicated episode of malaria that rapidly responds to treatment, and progression to severe disease, organ failure and heightened risk of death. It could also save the NHS a significant amount of money from having to treat the complications of malaria."

LAMP was faster than PCR (polymerase chain reaction) tests, which require specialised laboratory equipment, costly reagents and advanced training. It was also more accurate than microscopic examination of blood slides, which require a trained specialist to identify the malaria parasites.

In the second study, researchers from HTD, FIND, the London School of Hygiene & Tropical Medicine and the Uganda Ministry of Health, Kampala, looked at the accuracy of the test at a rural clinic in [Uganda](#).

Blood samples from 272 patients with suspected malaria were tested using LAMP using a simple generator to provide electrical current. These results were compared with expert microscopy and PCR performed at central reference laboratories. LAMP detected cases of low-level [malaria parasite](#) infection that were missed by expert

microscopy, and achieved accuracy similar to that of PCR down to very low levels. The researchers say these findings have important implications for eliminating malaria, which causes an estimated 660,000 deaths worldwide every year.

Dr Sutherland, who worked on both of the studies, said: "Patterns of malaria disease in Africa and elsewhere across the tropics are becoming much less predictable, and control of malaria needs an appropriate test to identify infected individuals in the populations at risk. These people may not display any malaria symptoms. We have begun using LAMP as a new tool for identifying "hot spots" of malaria infections which can be mopped up quickly through a combination of drug treatment, house spraying and distribution of bed-nets.

"LAMP will potentially contribute to saving many families and communities from the blight of a disease that keeps children from succeeding at school, prevents adults from growing food or working, holds back regional economies and exacts an annual death toll in the hundreds of thousands."

The LAMP malaria test will now be used in the Malaria Reference Laboratory at the London School of Hygiene & Tropical Medicine to help identify imported cases of malaria in the UK as well as being used by health workers in the field in [malaria](#) endemic countries.

Provided by London School of Hygiene & Tropical Medicine

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