

## SENSITIVITY AND SPECIFICITY OF LAMP TESTS FOR MALARIA DIAGNOSIS USING DRIED-BLOOD SAMPLES OF SUSPECTED MALARIA PATIENTS IN LAO PDR

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### Introduction

For malaria diagnosis in the endemic areas

- Microscopy and rapid diagnostic test (RDT) are widely used.
- However, sub-microscopic and sub-RDT malaria infections have been reported from several endemic areas.
- Thus, highly sensitive and simple tests are expected to be adopted.

### Objective

To evaluate a performance of malaria-LAMP (loop-mediated isothermal amplification) tests using dried-blood samples (DBSs) collected in Lao PDR

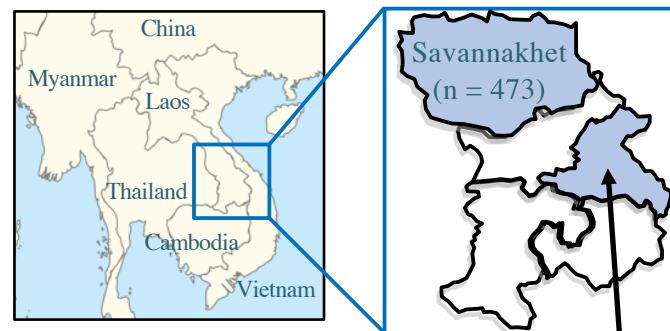


Loopamp™ Malaria Pan/Pf/Pv Detection Kit (Eiken Chemical Co., Ltd.)

### Materials and Methods

- DBSs were collected from suspected malaria patients (microscopy or RDT positive) in Savannakhet (n=473) and Sekong (n=430) provinces in Lao PDR in 2015.
- The LAMP tests were performed using Loopamp™ Malaria Pan/Pf/Pv Detection Kit (Eiken Chemical Co., Ltd., Tokyo).
- Sensitivity and specificity of the LAMP tests were calculated based on the malaria PCR test results.

### Study Area



Map of Great Mekong Subregion

Sekong (n = 430)

### Results

Table 1. Performance of the LAMP tests based on a comparison with the PCR (%)  
Sekong province (n = 430)      Savannakhet province (n = 473)

	Pan	Pf	Pv		Pan	Pf	Pv
Sensitivity	100.0	91.4	99.7	Sensitivity	95.3	93.3	89.9
Specificity	90.0	97.8	86.9	Specificity	86.4	93.7	92.9
PPV	99.8	96.1	94.2	PPV	97.7	95.0	85.4
NPV	100.0	94.9	99.2	NPV	75.0	91.5	95.3
Accuracy	99.8	95.3	95.6	Accuracy	94.1	93.4	92.0

Pan: all *Plasmodium*; Pf: *P. falciparum*; Pv: *P. vivax*; PPN: Positive predictive value; NPV: Negative predictive value

### Summaries

- The sensitivity and specificity of the LAMP tests were slightly lower than those of the malaria PCR tests (86.4%-100.0%). The procedure of the LAMP tests was found to be simpler and easier than the PCR tests.
- The LAMP tests solely require a single 65°C incubator and the test kit could be stored at room temperature (2°C–30°C), which means neither freezer nor refrigerator is needed for the LAMP tests.
- The LAMP tests can be reliably and usefully performed as a **point-of-care testing** at the endemic areas where the PCR testing is not available.