Background There are no primary measures to prevent people from contracting Buruli ulcer, mainly due to poor understanding of its epidemiology. The current control strategy emphasises early diagnosis and prompt treatment, with the goal of avoiding the complications associated with advanced stages of the disease. There is no diagnostic test for the disease appropriate for use at the primary health care level where most cases are detected and treated. Diagnosis based on clinical signs is unreliable in inexperienced hands and complicated by infections that have similar presentations. This study was to develop and evaluate the use of recombinase polymerase amplification (RPA) assay for the detection of Mycobacterium ulcerans at the point of patient care.

Methods A specific fragment of IS2404 of M. ulcerans was amplified in 15 min at a constant temperature of 42°C, using the RPA assay and analysed on a portable fluorometer. The method was tested for sensitivity and specificity with molecular standard of IS2404 DNA fragment, various M. ulcerans strains, other mycobacteria and environmentally associated bacteria. Additionally, the assay performance as a diagnostic tool was tested with archived DNA from symptomatic patients. All results were compared with that of a highly sensitive IS2404 PCR.

Results The detection limit was 50 copies of IS2404 in 15 min using plasmid standard and 125 fg with genomic Mt DNA equivalent 25 genomic copies. The assay was highly specific in detecting all strains of M. ulcerans with no observed cross-reactivity with other mycobacteria and common skin colonising bacteria. The clinical sensitivity and specificity of the BU-RPA assay using clinical samples was 86% and 100% respectively.

Conclusion We have developed a real-time isothermal RPA assay for the detection of M. ulcerans as a cheaper alternative to PCR. Combining this assay with a simple extraction protocol will maximise its use as point-of-care test for Buruli ulcer.

Background Leprosy is a debilitating, infectious disease caused by Mycobacterium leprae leading to skin and nerve damage and often lifelong handicaps. The unobated rate of new leprosy case detection indicates that transmission of M. leprae is persistent and that current measures for prevention and multidrug therapy (MDT) are insufficient. Contact with M. leprae-infected individuals is a risk factor for development of leprosy. Thus, detection of M. leprae-infected individuals without clinical symptoms, allowing informed decision making on who needs treatment at a preclinical stage, is vital to interrupt transmission and can help prevent leprosy.

Immunophylaxis by vaccination or post-exposure prophylaxis (PEP) with antibiotics provide effective strategies for the prevention of leprosy. To target individuals unknowingly spreading leprosy bacilli, methods allowing objective measurement of M. leprae infection are needed. Besides antibody (Ab) levels that correspond with bacterial load and higher risk of progression to leprosy, detection of cytokine profiles can provide significant added value to identify infection.

Methods Quantitative detection of anti-PGL-I IgM antibodies, and cytokines such as IP-10 was performed on lateral flow (LF) test strips utilising the luminescent up-converting particle (UCP) technology. Precise amounts of fingerstick (FS)-blood samples were collected using disposable heparinised capillaries.