# Analysis of nucleic acids extracted from rapid diagnostic tests reveals a significant proportion of false positive test results associated with recent malaria treatment

**JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**

**ID** 4651629
**Author(s)** Hosch, S.; Yoboue, C. A.; Donfack, O. T.; Guirou, E. A.; Dangy, J. P.; Mpina, M.; Nyakurungu, E.; Blöchliger, K.; Guerra, C. A.; Phiri, W. P.; Ayekaba, M. O.; García, G. A.; Tanner, M.; Daubenberger, C.; Schindler, T.

**Author(s) at UniBasel** Hosch, Salome ; Yoboue, Aya Charlene ; Guirou, Etienne ; Dangy, Jean-Pierre ; Mpina, Maximillian ; Blöchliger, Koranan ; Tanner, Marcel ; Daubenberger, Claudia ; Schindler, Tobias ;
**Year** 2022

**Title** Analysis of nucleic acids extracted from rapid diagnostic tests reveals a significant proportion of false positive test results associated with recent malaria treatment

**Journal** Malar J

**Volume** 21

**Number** 1

**Pages** / **Article-Number** 23

**Mesh terms** Antigens, Protozoan, analysis; Coinfection, epidemiology; Diagnostic Tests, Routine, statistics & numerical data; Equatorial Guinea, epidemiology; False Positive Reactions; Incidence; Malaria, epidemiology; Malaria, Falciparum, epidemiology; Nucleic Acids, analysis; Plasmodium falciparum, isolation & purification; Plasmodium malariae, isolation & purification; Plasmodium ovale, isolation & purification; Population Surveillance; Protozoan Proteins, analysis; Retrospective Studies

Background: Surveillance programmes often use malaria rapid diagnostic tests (RDTs) to determine the proportion of the population carrying parasites in their peripheral blood to assess the malaria transmission intensity. Despite an increasing number of reports on false-negative and false-positive RDT results, there is a lack of systematic quality control activities for RDTs deployed in malaria surveillance programmes. Methods: The diagnostic performance of field-deployed RDTs used for malaria surveys was assessed by retrospective molecular analysis of the blood retained on the tests. Results: Of the 2865 RDTs that were collected in 2018 on Bioko Island and analysed in this study, 4.7% had a falsenegative result. These false-negative RDTs were associated with low parasite density infections. In 16.6% of analysed samples, masked pfhrp2 and pfhrp3 gene deletions were identified, in which at least one Plasmodium falciparum strain carried a gene deletion. Among all positive RDTs analysed, 28.4% were tested negative by qPCR and therefore considered to be false-positive. Analysing the questionnaire data collected from the participants, this high proportion of false-positive RDTs could be explained by P. falciparum histidine rich protein 2 (PfHRP2) antigen persistence after recent malaria treatment. Conclusion: Malaria surveillance depending solely on RDTs needs well-integrated quality control procedures to assess the extent and impact of reduced sensitivity and specificity of RDTs on malaria control programmes.

**URL** https://doi.org/10.1186/s12936-022-04043-7

**edoc-URL** https://edoc.unibas.ch/90547/

**Full Text on edoc** Available;

**Digital Object Identifier DOI** 10.1186/s12936-022-04043-7

**PubMed ID** http://www.ncbi.nlm.nih.gov/pubmed/35073934

**ISI-Number** WOS:000746587700001
**Document type (ISI)** Journal Article