UK NEQAS for General Haematology

# Performance Assessment of Blood Parasite Identification in Haematology

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## Introduction

External Quality Assessment (EQA) must be seen as fair and relevant, with performance assessment objectives supported by participating laboratories. The UK National External Quality Assessment Scheme for General Haematology (UK NEQAS (H)) offers blood parasite identification EQA to nearly 500 haematology laboratories. The participants vary in the levels of service they provide; some offer just a screening service, referring all positive slides to a reference centre for definitive identification. Others provide full parasite identification. Feedback has shown that some feel the current performance assessment criteria do not take into account the scope of their clinical practice.

## Objective

To model a new, two stage performance assessment system for blood parasite detection and identification that will take account of the participant laboratory's expertise.

The proposal has been accepted for shadow scoring by the UK NEQAS (H) Steering Committee and the UK oversight National Quality Assessment Advisory Panel (Haematology)

## Current Performance Criteria

- **Non-return score:** adverse penalties applied for non or late return. This parameter will remain unchanged.
- **Critical omission:** adverse penalties for failing to identify *Plasmodium falciparum.*
- **Significant deviation:** adverse penalties for reporting a percentage parasitaemia count outside the median ± 3 standard deviation range.

Errors in two out of three consecutive surveys represents persistent unsatisfactory performance.

Participants who only screen slides for the presence or absence of parasites feel they are scored unfairly and this has been a source of complaint.

## Historical Data Modelling 2011 - 2012

The results returned on 16 slides distributed in the UK NEQAS (H) Blood Films for Parasite Identification scheme in 2011 and 2012 were scored for Parasite Detection (Stage 1) using the performance tariff in table 1. **A total of 7255 submissions from 490 UK and non-UK laboratories were scored.**

| Participant's result reported | Penalty |
|---|---|
| Correct (result as target) | 0 |
| Incorrect (incorrect parasite type reported) | 50 |
| False negative | 50 |
| False positive (negative slide reported as positive) | 50 |
| Correct parasite + 1 or more incorrect parasite (s) | 50 |

**Table 1. Tariff of performance scores. The tariff is designed so that errors in 2 out of 6 consecutive cases give a score of 100, the UK NEQAS Haematology action point for persistent unsatisfactory performance**

**Cases used for modelling**

9 thin films with single *Plasmodium* species:
- *P. falciparum (5)*
- *P. vivax (1)*
- *P. malariae (2)*
- *P. ovale (1)*

1 thick film with *P. falciparum*

1 thin film with dual *P. falciparum* and *P. ovale*

2 *Microfilaria* films

1 *Trypanosoma* film

2 films negative for blood parasites (1 thick and 1 thin)

## New Scoring Proposal

**Stage 1: Parasite Detection**

- **All participants**
- Thin and thick films included in Stage 1
- To report and be scored on:
  - the film as positive or negative for parasites
  - the parasite type (malaria, microfilaria, trypanosomes)
  - next actions
- Look up table for performance tariff
- Rolling time window of 6 slides (3 distributions) for cumulative scoring

**Stage 2: *Plasmodium* Species Identification**

- **Selected participants**
- Thin films only included in Stage 2
- To report and be scored on:
  - the *Plasmodium* species
  - the % parasitaemia for *P. falciparum* and *P. knowlesii*

## Outcomes

96% of returns were in consensus; 0.48% gave the incorrect parasite, 3.4% gave false positive / false negative results and 0.14% both correct and incorrect parasite (Fig. 1). 291 errors were recorded in 2 years; 61% of participants made no errors, 30% made 1 error, 14% made 2 errors and 9% made more than 2 errors (Fig. 2). An average of 7% of participants would have been persistent unsatisfactory performers in each year.

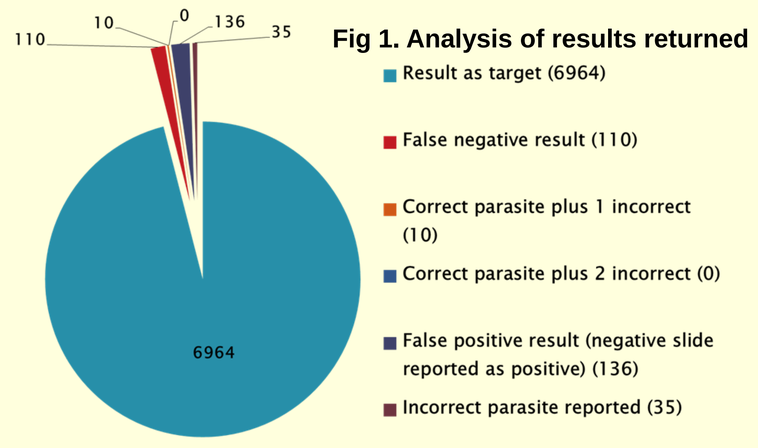


**Fig 1. Analysis of results returned**

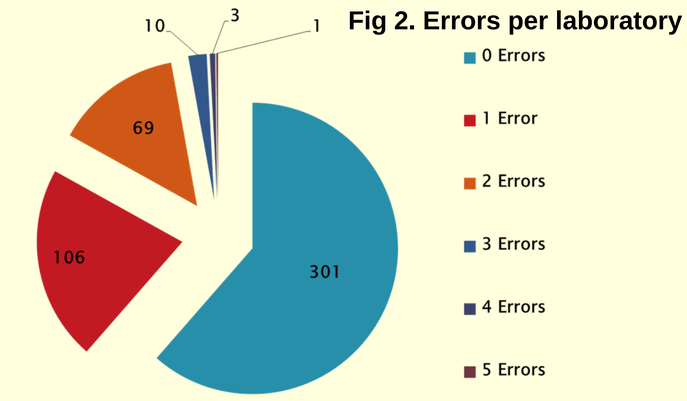


**Fig 2. Errors per laboratory**

**Data modelling** → **Implement screening assessment** → **Implement species identification**

**Development will be in several stages. This stage has entailed modelling historical data**

## Next Actions

- **A 'Patterns of Practice' Questionnaire to gather information on blood parasite detection and identification methods.**
- **Shadow scoring on live data submitted for surveys distributed in 2014.**