

Information on Scoring

EQA is an educational process intended to challenge a laboratory's total quality system. The quality system is intended to ensure that a suitable specimen is collected from the patient, appropriate tests are performed and the correct results are reported back to the clinician responsible for the care of the patient in a timely manner. The clinician is primarily responsible for interpreting the results (often with advice from the laboratory performing the tests) and using the results to assist in the diagnosis and the treatment of the patient.

Scoring of EQA performance is not a straightforward process. Variability in testing regimes, local testing algorithms and interpretation of results are complicating factors. At its simplest, an EQA scoring scheme would be limited to assessing a laboratory's performance in obtaining a 'correct' result for a specimen using a particular assay, i.e. measuring the precision of the result (the 'correct' result having been pre-determined by replicate testing with the assay). Of course this doesn't guarantee that the 'correct' result is right. Complications to this simplistic method of assessing performance are the various methods and assays, both commercial and in-house, used by laboratories. This means that for some methods or assays there are too few laboratories performing the assays for direct performance comparison.

The UK NEQAS schemes assess performance from the time the specimen is received in the laboratory to the time the report is issued: i.e. it challenges the quality system by ensuring the correct results, for the specimen, are reported. Basic clinical information is generally supplied with the specimens, however full interpretation is not generally required.

Specimens sent for educational and training purposes are not scored.

Scoring policy

Qualitative reporting

For the **general bacteriology** scheme, scoring is implemented for specimens when 80% or more of the 100 best performing laboratories (over the previous year, randomly selected by the computer) report a correct result.

The **mycology** scheme is similar except that the 50 best performing laboratories are used. Due to the lower numbers of participants compared to the general bacteriology scheme only the best 50 are considered.

For the other bacteriology schemes (for example, antimicrobial **susceptibility**, **mycobacterium culture**, **AAFB microscopy** and **community medicine**) the **qualitative molecular** schemes and the **virus identification** scheme, no fixed criteria apply. However, if less than 80% of laboratories report a correct result, the specimen is not normally scored. For the antimicrobial susceptibility scheme, the consensus result used to calculate 80% performance level includes participants reporting an intermediate susceptibility interpretation.

For the **serology** schemes, the EQA specimen is characterised using a range of assays and specimens are scored where pre-distribution results concur. Participating laboratories are then scored on their ability to obtain the consensus pre-distribution result; this is relatively straightforward for assays with a qualitative result and when only one assay is used by the laboratory. However, for some infections (often those of higher medical / legal importance) laboratories routinely perform more than one assay. In general, participants are scored on their **overall report** for any one disease or marker for that disease. Therefore if the participating laboratory is small and performs one test on a specimen, it is scored on that result. However, if it is a larger laboratory routinely performing a range of tests, it is marked on the overall result.

Special exceptions are made in a few cases. Reagin results for treponemal antibody positive specimens are not scored if the Reagin results in pre-distribution tests are <1:4. For Rubella IgG and HBs antibody, specimens that give results close to the cut off are generally not scored if the results are likely to straddle the qualitative result categories. Therefore rubella IgG and HBs antibody specimens with non-consensus pre-distribution results or antibody levels between 9 and 11 IU/mL or mIU/mL respectively, are excluded from scoring.¹

Quantitative reporting

For **quantitative molecular** schemes, due to the variability of quantitative results in terms of absolute values between the assays, proficiency is assessed by comparing performance in terms of the reported difference in concentration between specimen pairs. This strategy is comparable to routine clinical practice where laboratories monitor the effectiveness of patient treatment therapy over time. Currently performance is considered adequate if laboratories report to within $\pm 0.3 \log_{10}$ of the median difference in concentration between the specimen pair for HCV, HIV and HBV; this equates to an acceptable $0.6 \log_{10}$ range. For the molecular quantification of EBV and CMV DNA the state of the art is not so well developed (in-house assays account for up to 50% of the testing) and the acceptable range for these schemes is $1 \log_{10}$ (within $0.5 \log_{10}$ of the median difference).

Time to reporting

The time taken to report results back to UK NEQAS is displayed on the individual participant's report for each distribution. Ideally participants should examine EQA specimens in real time as though they are actual patient samples. By doing so it is then possible use this information as a marker of quality of the pre/post-analytical phase. Turnaround times are provided to participants for information only and are not scored.

¹ At the time of publishing, debate continues regarding the cut-off level and performance of kits regarding rubella immunity. Participants will be kept updated when required.