

Intended Result	Your Report	Your Score
Specimen 4685 Toxoplasma IgG antibodies negative Toxoplasma IgG avidity: borderline Toxoplasma IgM antibodies negative	Toxoplasma IgG antibodies negative Toxoplasma IgG avidity: borderline Toxoplasma IgM antibodies negative	2 Not scored 2
Specimen 4686 Toxoplasma IgG antibodies positive Toxoplasma IgG avidity: undetermined Toxoplasma IgM antibodies positive	Toxoplasma IgG antibodies positive Toxoplasma IgG avidity: undetermined Toxoplasma IgM antibodies positive	2 Not scored 2
Specimen 4687 Toxoplasma IgG antibodies positive Toxoplasma IgG avidity: low Toxoplasma IgM antibodies positive	Toxoplasma IgG antibodies positive Toxoplasma IgG avidity: low Toxoplasma IgM antibodies positive	2 Not scored 2

**Cumulative score information**

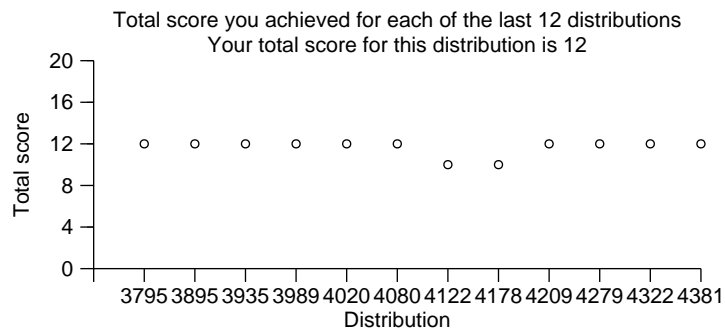
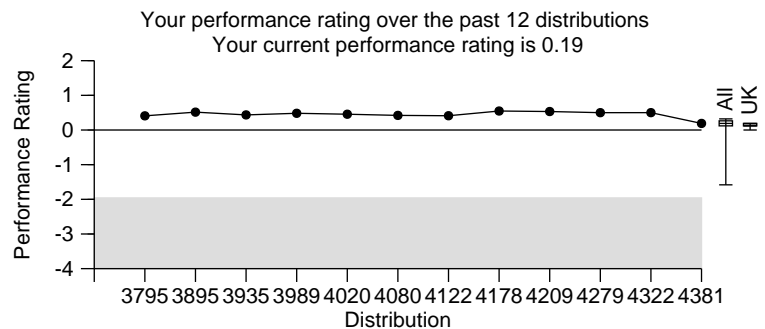
Total number of specimens sent to you for **UK NEQAS for Toxoplasma serology** over the last 4 distributions is 12  
 For these distributions specimen numbers 4163 4164 4165 4378 4379 4380 4510 4511 4512 4685 4686 4687 have been sent.  
 Number of specimens reported too late for analysis (not scored) 0  
 Your cumulative score for these specimens was 48 out of a possible total of 48  
 The mean score calculated from the reports returned by **UK** laboratories testing the specimen/test combinations you examined was 47.74 with a standard error of 1.38.

**Performance rating**

Your performance rating for **UK NEQAS for Toxoplasma serology** (i.e. the number of standard errors by which your cumulative score lies above or below the mean for **UK** laboratories) is 0.19.

A performance rating of more than 1.96 standard errors below the mean indicates possible poor performance. Your performance rating may change if other participants' results are amended.

No score penalty is incurred for non return of reports. However non return of results may be used as a measure of poor performance.



**Turn around time:** The time taken to report your results was 0 day(s). This information is provided for your own use and does not form part of your performance assessment.

**Comments**  
Participants' results for IgG and IgM analyses were in excellent agreement with the intended results obtained by the Toxoplasma Reference Laboratories.

The figures in the histograms and those in the overall results tables may differ (1) due to exclusion of kits displayed in the histograms resulting in apparently lower numbers of data sets in the histograms or (2) due to participants using more than one kit resulting in higher numbers of data sets in the histograms.

It was noted that many participants did not specify their kit details. Participants are advised to indicate which kit they use so that reports display accurate information. If the kit you use is not specified in the kit list displayed on the web reply form, please email [organiser@ukneqasmicro.org.uk](mailto:organiser@ukneqasmicro.org.uk) to ensure that your kit details are included.

**At present, the IgG Avidity results are not scored whilst we collect data from different kits. Please note that for sample 4686 there was discrepancy in avidity data results between the different assays during pre-distribution testing (see Teaching notes for further discussions).**

Pre-distribution test results are available should you experience a technical failure and wish to discuss the results.

**Repeat specimens**

For repeat specimens please order using the web form or e-mail [organiser@ukneqasmicro.org.uk](mailto:organiser@ukneqasmicro.org.uk) stating your laboratory identification number, the distribution name and number, and specimen numbers. Participants are asked to request these as soon as the intended results are displayed on the web or on receipt of their report.

**Enquiries:** Telephone and written enquiries can be made to Dr. Jaya Shrivastava : +44(0)20 39081371 E-mail address: [organiser@ukneqasmicro.org.uk](mailto:organiser@ukneqasmicro.org.uk)  
**Participants are reminded to quote their Laboratory ID number in all correspondences.**

**This report was authorised by Professor P L Chiodini, Parasitology Scheme Organiser and Dr Jaya Shrivastava, Parasitology Scheme Manager.**

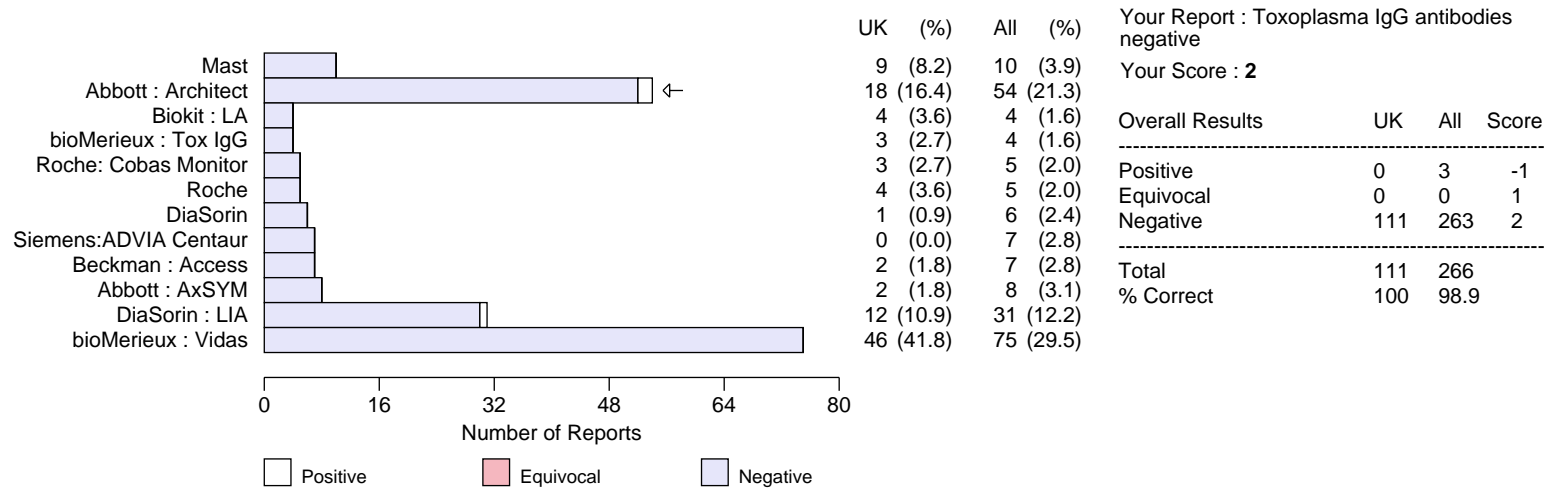
**Acknowledgements:** We thank colleagues from the Toxoplasma Reference Laboratories and the Department of Medical Microbiology, St George's Hospital, London for the provision of serum samples, for pre- and post-distribution testing and for their expert advice: Drs J.Johnson and D. Padley (London), Dr R. Evans (Inverness), Professor E. Guy, K. Stuart, S.Hadfield (Swansea) and J.Alli-Balogun (St. Georges).



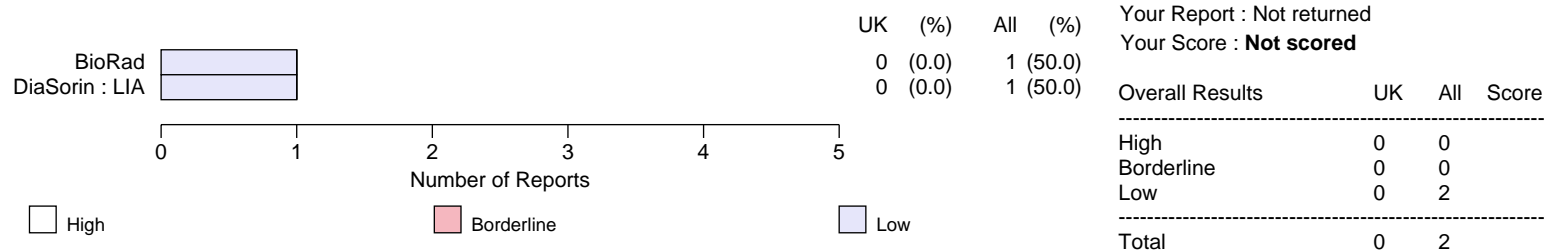
Three serum specimens were dispatched for the detection of Toxoplasma IgG/total antibodies, IgM antibodies and IgG Avidity. All three specimens were taken from commercially bought single donations.

Specimens returned to the UK NEQAS Parasitology team from 5 randomly selected labs were analysed by a Toxoplasma Reference Lab and gave the intended results.

**Specimen : 4685** 23 year old woman, 21 weeks pregnant with 2 week history of mild "flu-like illness".  
Toxoplasma IgG/total antibodies negative



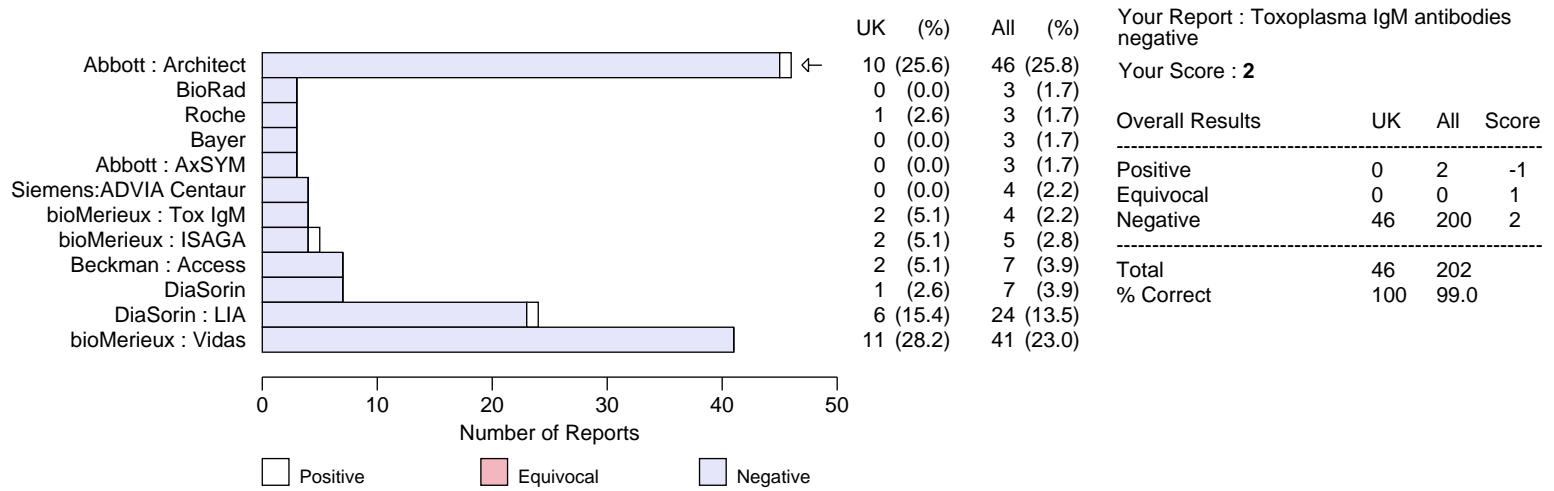
**Specimen : 4685** Toxoplasma Avidity: not applicable



Three serum specimens were dispatched for the detection of Toxoplasma IgG/total antibodies, IgM antibodies and IgG Avidity. All three specimens were taken from commercially bought single donations.

Specimens returned to the UK NEQAS Parasitology team from 5 randomly selected labs were analysed by a Toxoplasma Reference Lab and gave the intended results.

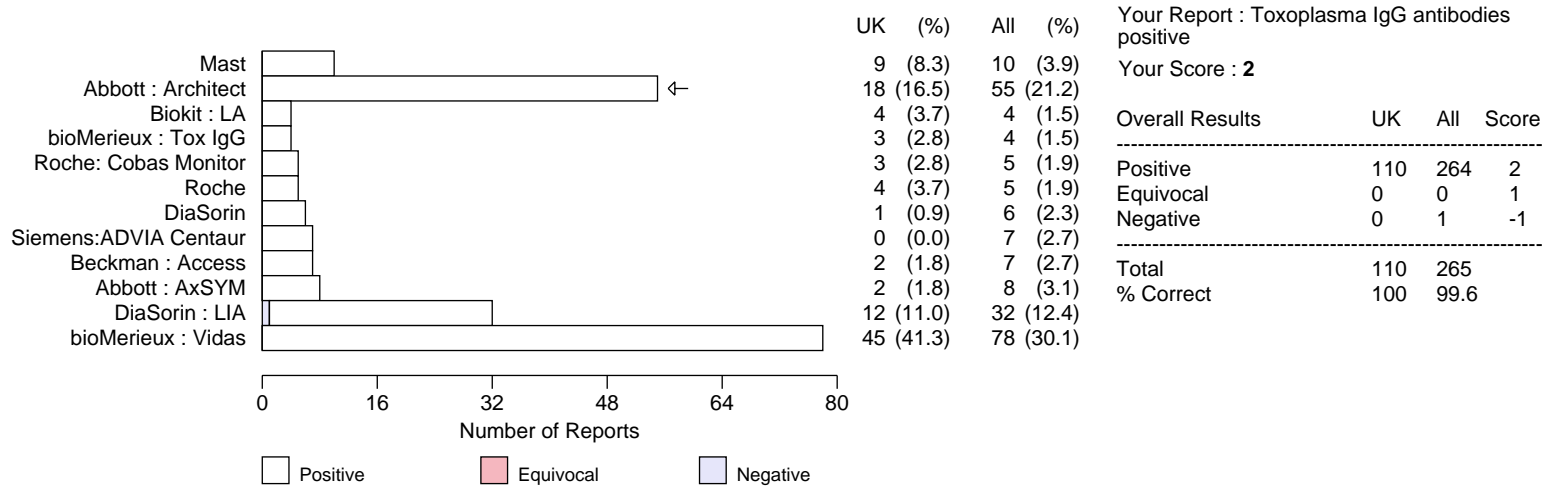
**Specimen : 4685** Toxoplasma IgM antibodies negative



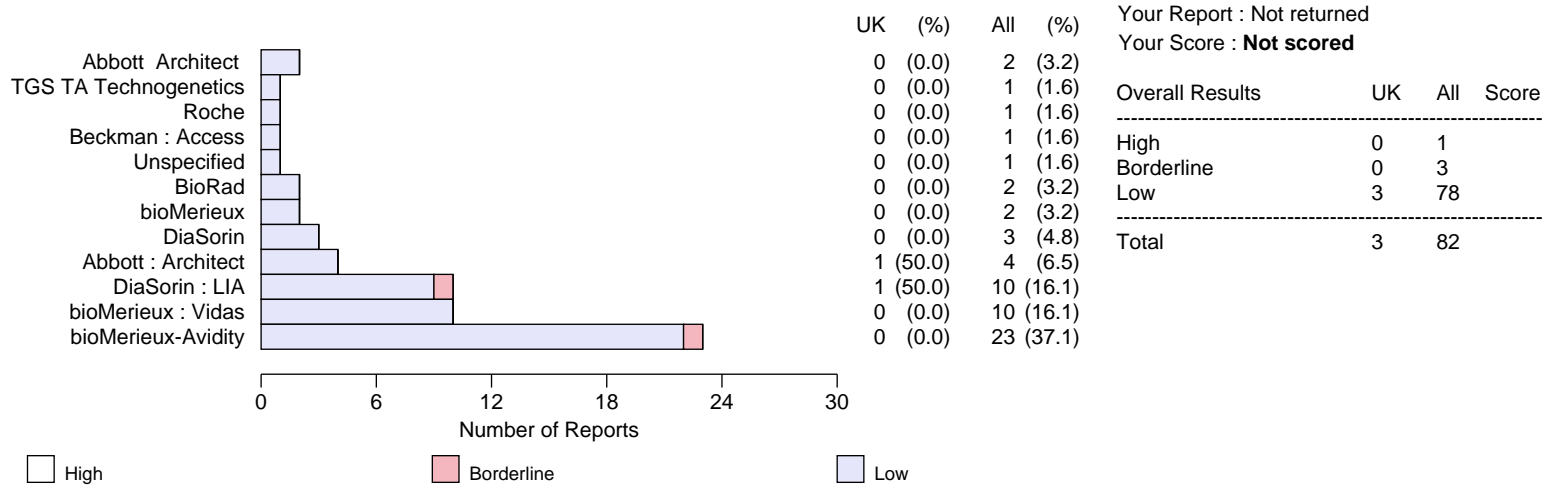
Three serum specimens were dispatched for the detection of Toxoplasma IgG/total antibodies, IgM antibodies and IgG Avidity. All three specimens were taken from commercially bought single donations.

Specimens returned to the UK NEQAS Parasitology team from 5 randomly selected labs were analysed by a Toxoplasma Reference Lab and gave the intended results.

**Specimen : 4686** 48 year old man. Floaters in right eye for 3 months.  
Toxoplasma IgG/total antibodies positive.



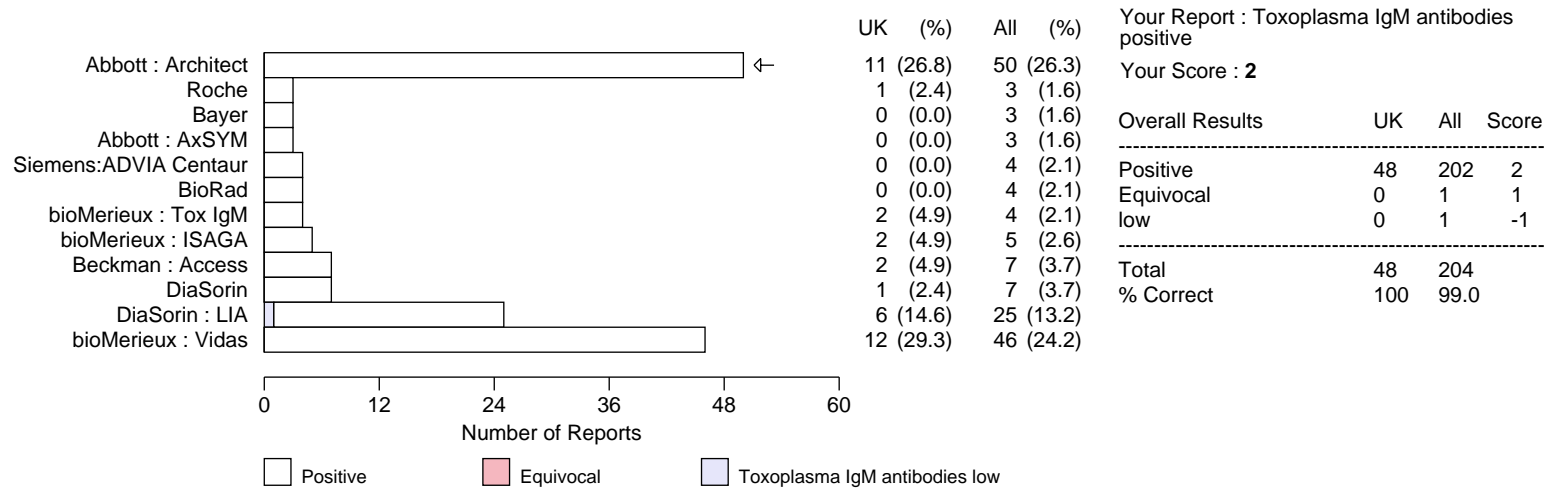
**Specimen : 4686** Toxoplasma Avidity: undetermined



Three serum specimens were dispatched for the detection of Toxoplasma IgG/total antibodies, IgM antibodies and IgG Avidity. All three specimens were taken from commercially bought single donations.

Specimens returned to the UK NEQAS Parasitology team from 5 randomly selected labs were analysed by a Toxoplasma Reference Lab and gave the intended results.

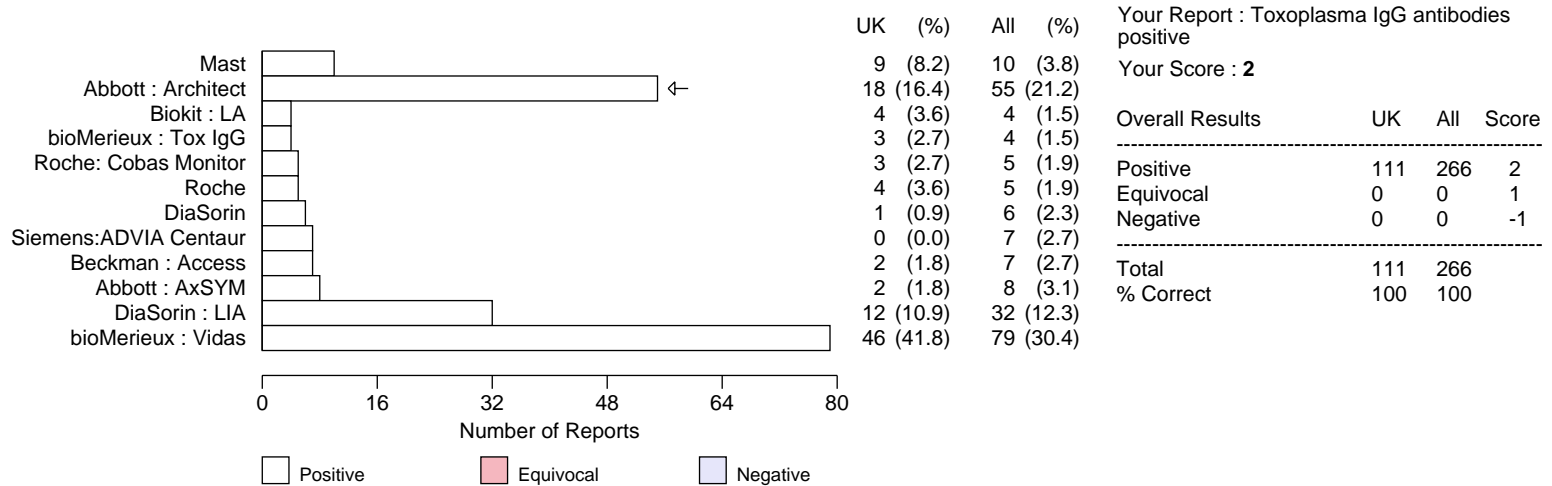
**Specimen : 4686** Toxoplasma IgM antibodies positive



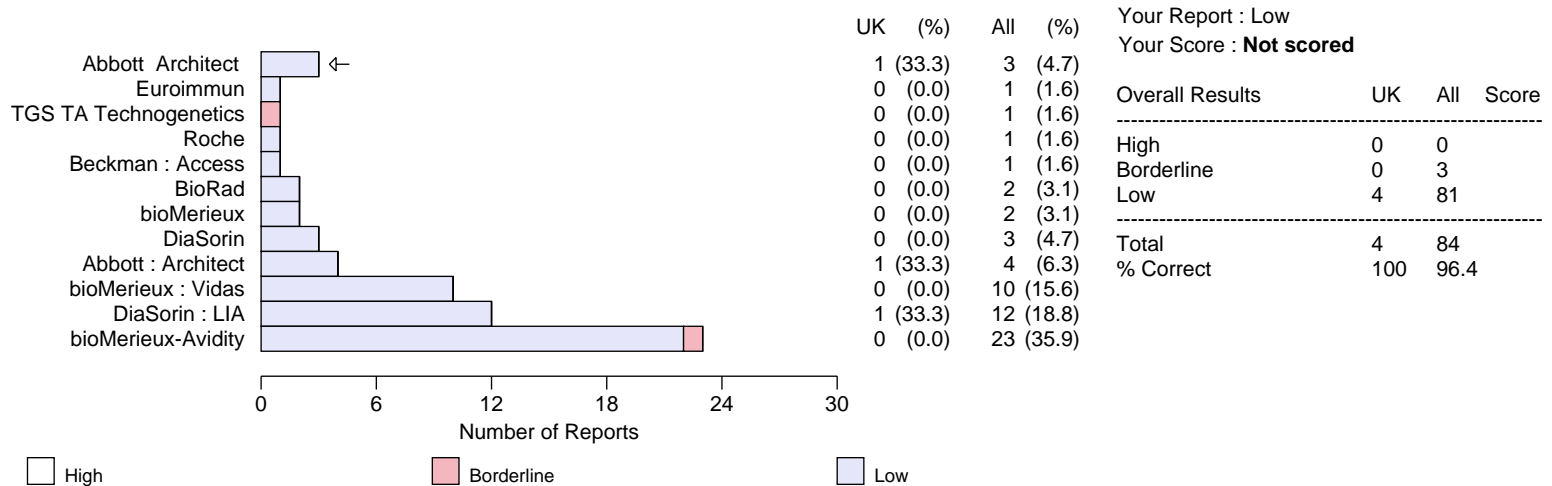
Three serum specimens were dispatched for the detection of Toxoplasma IgG/total antibodies, IgM antibodies and IgG Avidity. All three specimens were taken from commercially bought single donations.

Specimens returned to the UK NEQAS Parasitology team from 5 randomly selected labs were analysed by a Toxoplasma Reference Lab and gave the intended results.

**Specimen : 4687** 38 year old woman with 5 months history of cervical lymphadenopathy.  
Toxoplasma IgG/total antibodies positive.



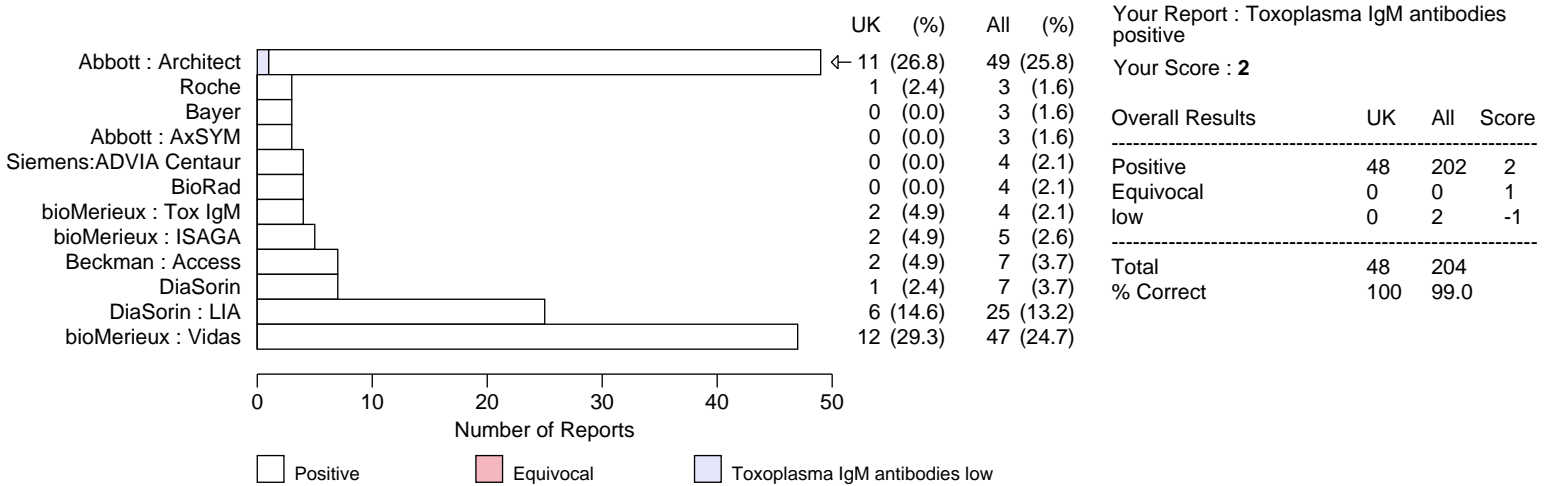
**Specimen : 4687** Toxoplasma Avidity: low



Three serum specimens were dispatched for the detection of Toxoplasma IgG/total antibodies, IgM antibodies and IgG Avidity. All three specimens were taken from commercially bought single donations.

Specimens returned to the UK NEQAS Parasitology team from 5 randomly selected labs were analysed by a Toxoplasma Reference Lab and gave the intended results.

**Specimen : 4687** Toxoplasma IgM antibodies positive



**Specific comments for Distribution 4381**

**Specimen No** 4685

**Clinical details** 23 year old woman, 21 weeks pregnant with 2- week history of mild "flu- like illness.

**Results**

Dye test	<2 IU/mL
IgG ELISA (In house)	Negative
Abbott Architect (IgG)	Negative
Biokit IgG ELISA	Negative
IgG Avidity	Not applicable
IgM ELISA (In house)	Negative
Abbott Architect (IgM)	Negative
Biomérieux ISAGA	Negative

**Specific comment** No serological evidence of Toxoplasma infection.

**Specimen No** 4686

**Clinical details** 48 year old man. Floaters in right eye for 3 months

**Results**

Dye test	500 IU/mL
IgG ELISA (In house)	Positive
Abbott Architect (IgG)	Positive
Biokit IgG ELISA	Positive
IgG Avidity	Undetermined
IgM ELISA (In house)	Positive
Abbott Architect (IgM)	Positive
Biomérieux ISAGA	Positive

**Specific comment** Serological evidence that Toxoplasma infection has occurred at some time. Presence of IgM suggests recent infection. These findings support a diagnosis of ocular toxoplasmosis.

**Specimen No** 4687

**Clinical details** 38 year old woman with 5- month history of cervical lymphadenopathy.





**Results**

Dye test	250 IU/mL
IgG ELISA (In-House)	Positive
Abbott Architect (IgG)	Positive
Biokit IgG ELISA	Positive
IgG Avidity	Low
IgM ELISA	Positive
Abbott Architect (IgM)	Positive
Biomérieux ISAGA	Positive

**Specific comments**

Serological evidence that toxoplasmosis infection has occurred at some time. Presence of IgM suggests recent infection. This is supported by IgG avidity test result.

**USE OF IgG AVIDITY IN ESTIMATING DURATION OF INFECTION**

The expected IgG avidity result for Specimen 4686 in the current distribution is classified as 'Undetermined' since the avidity levels obtained in pre-distribution testing were discrepant between the assays used. While one assay consistently returned a 'high' avidity result, the other consistently found the specimen to have "low" avidity. Despite this apparent discrepancy with only one assay finding high avidity, the durations of infection indicated by each assay were not, in fact, mutually exclusive. This is because the high avidity result for the first assay suggests this is not an early infection, while the interpretation for the low avidity result in the second assay was that no significance could be placed on this regarding duration of infection.

One major difficulty in comparing performance of different IgG avidity assays is the lack of standardisation for; *Measurement* of the IgG avidity index, *Definition* of low and high avidity levels, and *Interpretation* of these avidity levels in the context of estimating duration of infection. However, a likely cause for the discrepancy seen in this particular case may be the reportedly poor correlation between low IgG avidity levels and recent infection<sup>1-3</sup>. Thus, while a high IgG avidity result provides strong evidence to exclude early infection, a low IgG avidity result alone, cannot confirm very recent infection.

Interpretation of all serological results for Specimen 4686 confirms this is a relatively recent infection on the basis of positive IgM and IgG findings, and IgG avidity results are consistent with an infection of greater than 3 months duration. Thus, these findings fit well with the clinical history and support a diagnosis of ocular toxoplasmosis associated with relatively recent infection.

**Use of IgG avidity in assessing risk during pregnancy**

In most clinical scenarios confirmation of acute or active toxoplasma infection by detection of IgM and IgG, or direct detection of the parasite by PCR, is sufficient to adequately inform clinical management. In the pregnant mother with acute infection, however, assessing the risk of transmission to the unborn child requires a more precise estimate of when maternal infection was



acquired in relation to the date of conception. This is because infection acquired before conception presents no significant risk to the pregnancy in the immunocompetent mother while risk of transmission to the unborn child will exist where infection is acquired after conception.

**Based on the limitations described above, the use of IgG avidity as a standalone assay is not recommended. However, in investigations during pregnancy, it can be helpful in looking for evidence to exclude recent infection where an expectant mother has been found to be IgG and IgM positive.**

### References

Jose G. Montoya, Heather B. Huffman, J. S. Remington. Evaluation of the Immunoglobulin G Avidity Test for Diagnosis of Toxoplasmic Lymphadenopathy. *Journal of Clinical Microbiology*. Oct 2004, 42 (10) 4627-4631.

O. Villard, L. Breit, B. Cimon, J. Franck, H. Fricker-Hidalgo, N. Godineau, S. Houze, L. Paris, H. Pelloux, I. Villena, E. Candolfi the French National Reference Center for Toxoplasmosis Network. Comparison of Four Commercially Available Avidity Tests for *Toxoplasma gondii*-Specific IgG Antibodies. *Clin. Vaccine Immunol.* Jan 2013, 20 (2) 197-204.

Findal G, Stray-Pedersen B, Holter EK, Berge T, Jennum PA (2015) Persistent Low Toxoplasma IgG Avidity Is Common in Pregnancy: Experience from Antenatal Testing in Norway. *PLoS ONE* 10(12): e0145519.



**Suggested algorithm for the use of IgG avidity testing in pregnancy**

