UK NEQAS UNITED KINGDOM NATIONAL EXTERNAL QUALITY ASSESSMENT SCHEMES FOR LEUCOCYTE IMMUNOPHENOTYPING

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Post-SCT Chimerism: The More Markers the Better?

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INTRODUCTION

Chimerism testing is a routine clinical decision measure of donor engraftment level in the recipient following allogeneic stem cell transplantation (SCT), with small percentage reductions used in the determination of therapy. Data from the last 5 samples issued (a total of 337 results) to 78 international laboratories participating in the UK NEQAS Post-SCT Chimerism External Quality Assessment programme were examined to determine if the number of Short Tandem Repeat (STR) markers used impacted upon the results returned.

METHODS

- **To allow data comparison the consensus median for each sample and the delta values from the relevant consensus median were calculated for each individual result. The larger the delta value, the further that data point was from the consensus median.**
- **Data was then grouped by the number of markers used in the percentage donor calculation, and this grouped data further separated by methodology (namely in-house or commercial kit); Kruskal-Wallis one way ANOVA was used to test for significance.**
- **Additionally, data grouped by methodology, irrespective of number of markers used in their calculation, was subjected to a Mann Whitney U Test.**

RESULTS

Analysis showed that:

- **Number of markers used in percentage donor chimerism calculation had no significant impact on the calculated delta values (p=0.0873) (Figure 1).**
- **Additionally, no significant difference was found when results were grouped according to number of markers used, with or without further method separation (p=0.116 and p=0.0924).**
- **However when the methodologies were compared, (irrespective of the number of markers used in the calculation), the in-house median delta was significantly higher than the commercial kits median delta (p=0.0033) (Figure 2).**
- **Statistical comparison of the number of markers used in the calculation by in-house compared to kit users is difficult as there is little overlap between the two sets of data (in-house users mode=2 markers compared to kit mode=8 markers). However, when comparing in-house users to kit users: on average they have smaller panels available (12 vs. 14); analyse a smaller percentage of these available markers (74% vs. 98%); define a smaller percentage of these analysed markers to be informative (63% vs. 81%) and; use a smaller percentage of these informative markers in their final donor calculation (60% vs. 68%).**

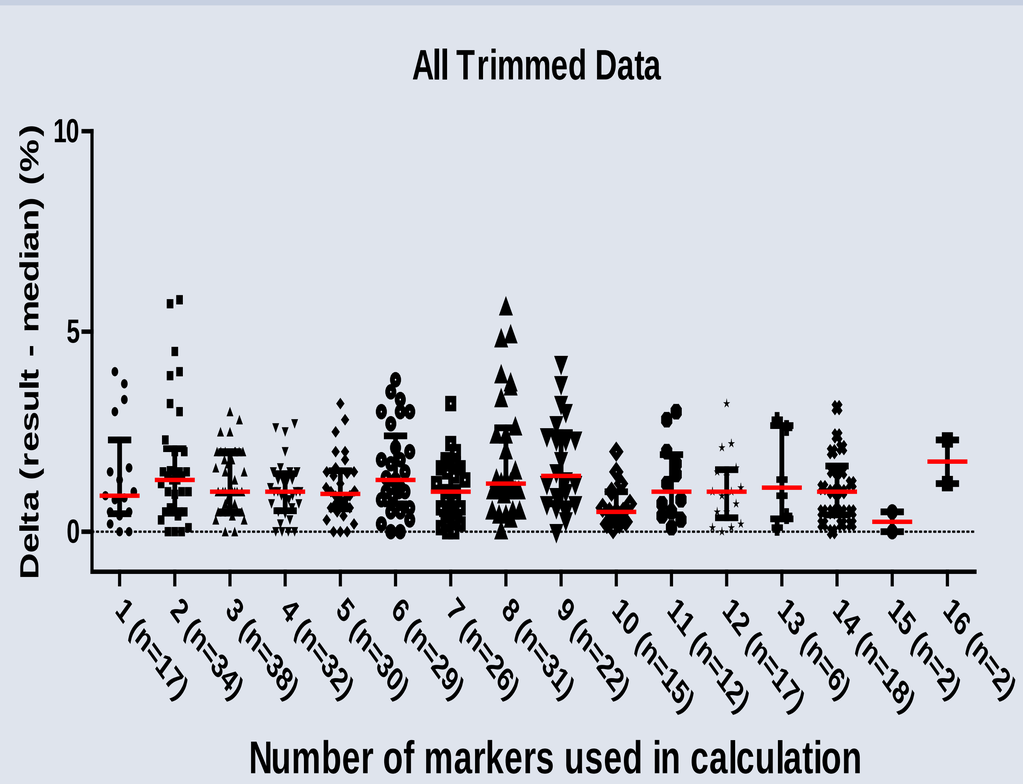

Figure 1 Graph showing the number of markers used in percentage donor calculation against the delta of each result from the consensus median. Number of markers used showed no significant impact on the delta values (p=0.0873)

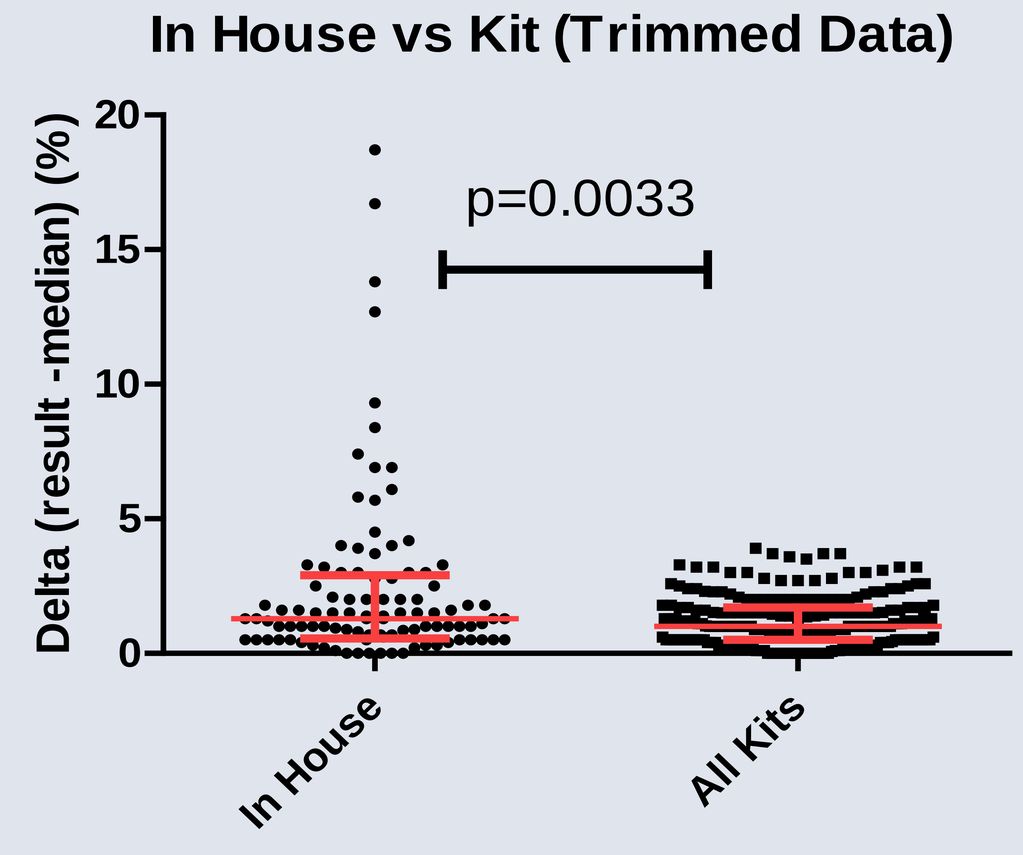

Figure 2 Graph showing the delta of each result from the consensus median grouped according to methodology; In house or using a commercial kit. The In House median delta was significantly higher than that where a commercial kit had been used (p=0.003).

CONCLUSION

- **In conclusion, our data has shown that statistically, results generated by in-house methodology have a larger delta value (further from the median) than those generated by a commercial kit.**
- **This difference may be due, in part, to the number of markers used in the calculation.**
- **This study has highlighted the urgent need for guidance and standardization in clinically significant post-SCT chimerism testing.**