Introduction of a calibrator category to differentiate new Troponin reagent releases

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Introduction

Release of new instrumentation or reagent formulations can often result in a shift in external quality assurance (EQA) results which may be reflecting similar shifts in patient results or be due to a commutability difference with the EQA material. As laboratories adopt the new reagent, their EQA results can then flag outside the Analytical Performance Specifications (APS) on their survey reports. The flagging for the new method will be ongoing as long as the old method influences the median. Likewise, once the new method dominates the median, laboratories still on the old method will start flagging which may result in time and resources spent unnecessarily troubleshooting.

RCPAQAP is often contacted by manufacturers to introduce a new method group to cater for changes to reagent formulations, but it is not always warranted, especially when the old reagent is being phased out. In 2018, Beckman Coulter and Siemens Diagnostics introduced new Troponin I formulations with improved low-end limits of detection. Currently, QAP survey reports only show 4 categories for peer review – Method, Analytical Principle, Instrument and Reagent. A further "Calibrator" category is available in the online "Data Analysis" module, but is infrequently used for peer comparison.

We sought to accommodate the rollout of their new increased sensitivity formulations with an additional option for laboratories to be able to view how their relative sub-group was performing over this period.

Method

In consultation with the manufacturers, the previous "High Sensitivity" calibrator options were replaced with "Limit of Detection <= 5ng/L" and "Limit of Detection between 5 and 40 ng/L" categories. The manufacturers and participants were informed of the change which was implemented in April 2019.

Results

Figures 1A, 1B and 1C show the impact (bi-modal distribution) of the new Siemens reagent rollout where Figure 1A was pre the implementation, 1B during (with <5ng/L filter applied, yellow X's) and 1C post completion. There was a similar pattern observed for the new Beckman reagent.

There has been a positive uptake of the new calibrator options, with a 463% increase in the number of participants implementing the new calibrator options since their induction in April 2019 (Table 1).

Table 1. Uptake of new calibrator options by participants

	Cycle 111 Survey 1 (April 2019)	Cycle 112 Survey 3 (September 2019)
LoD – less than/equal to 5 ng/L	31	202
LoD – between 5 to 40 ng/L	7	12
Total	**38**	**214**

Discussion and Conclusion

Laboratories rely on EQA surveys to provide an assessment of their performance against other laboratories who share the same methodology. Where methods are known to differ, they should be appropriately distinguished by a separate method code classification. The results from this exercise demonstrate that a significant proportion of participants would have continued to be inappropriately flagged outside the APS if both old and new Troponin I reagent formulations continued to be offered by the manufacturers (which would have prompted new method codes). Implementing the new "calibrator" options enabled laboratories to analyse their results according to reagent sensitivity using the online "Data Analysis" application and by filtering by the "calibrator" method category. This allows for a more accurate peer group assessment. Based on the uptake of the new codes (Table 1) and manufacturer feedback, this interim measure was well received. A similar option could be applied to any quantitative assay in the future if required.

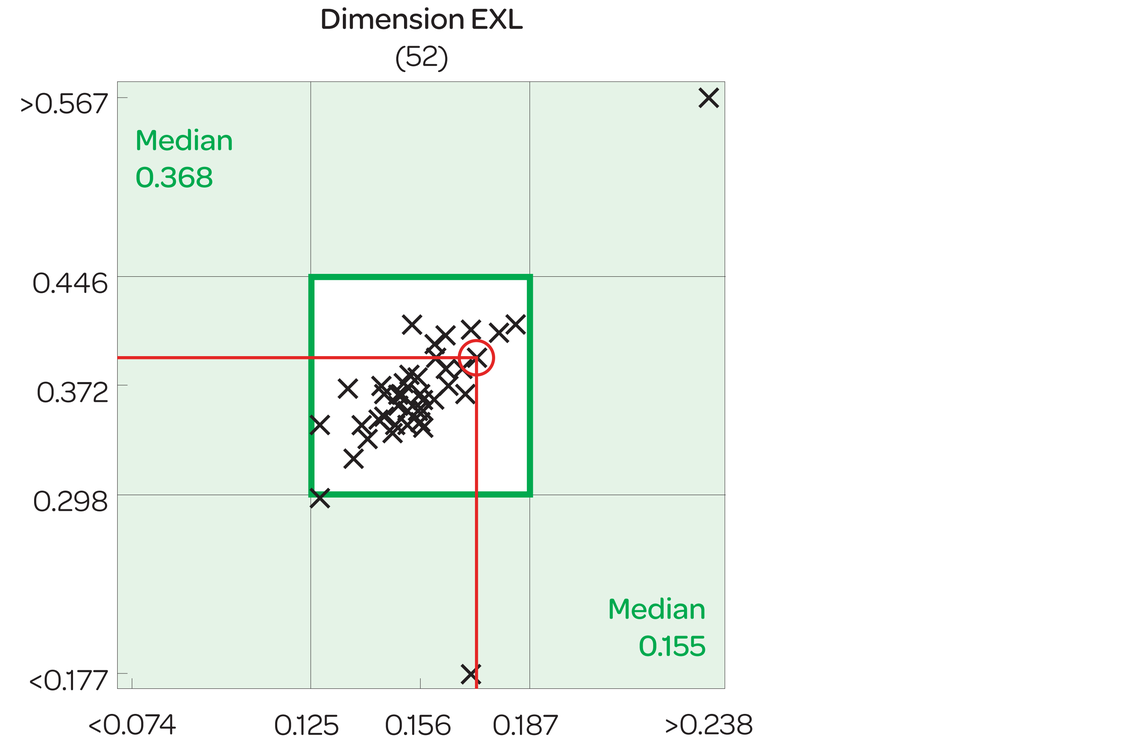

Figure 1A. Troponin I (ug/L) Cycle 110, Survey 6 March 2019 (pre-rollout)

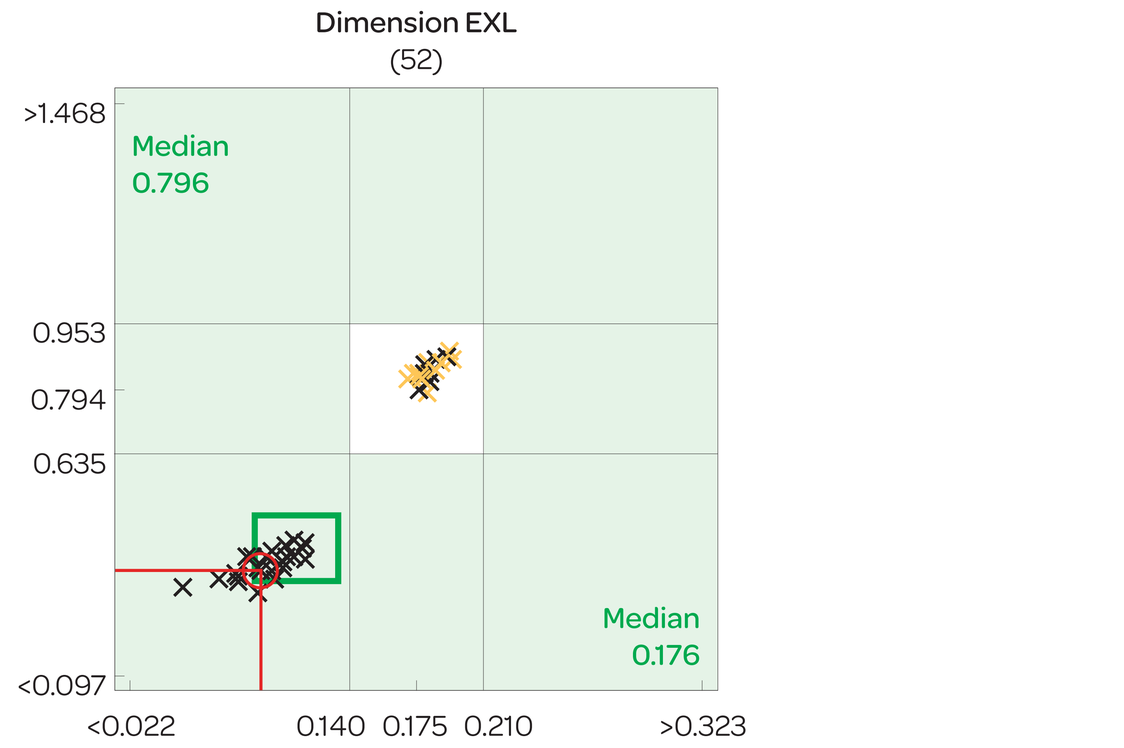

Figure 1B. Troponin I (ug/L) Cycle 111, Survey 2 May 2019 (during rollout), with calibrator filter applied

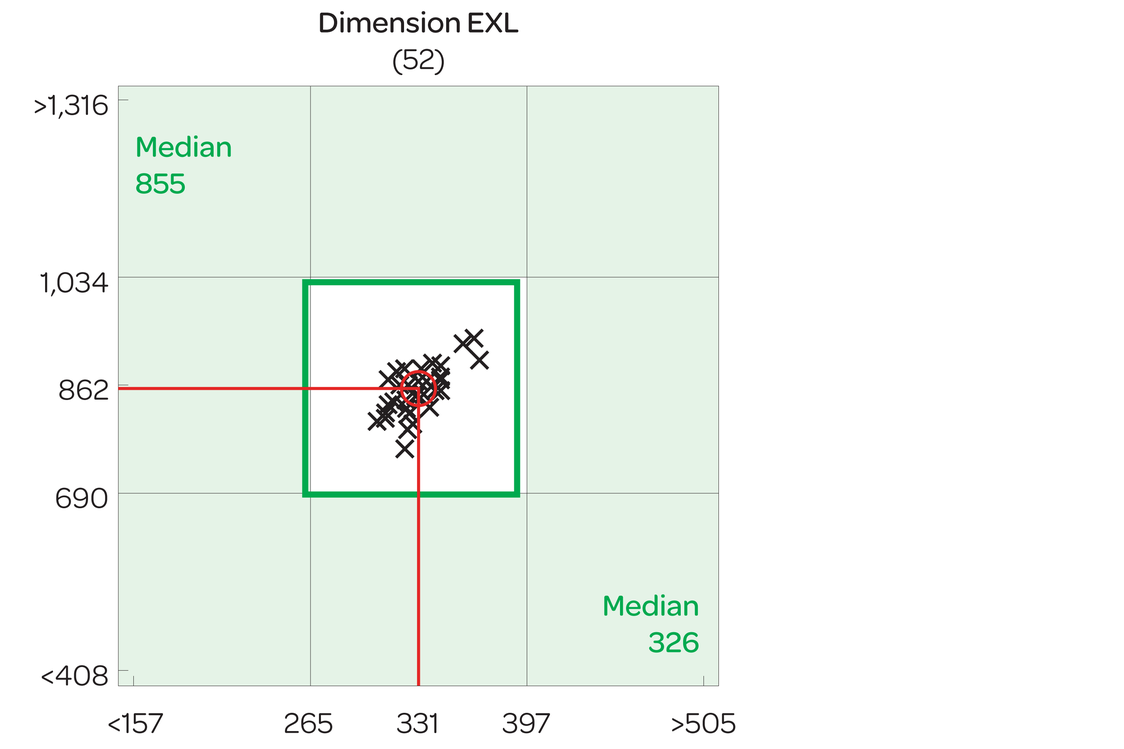

Figure 1C. Troponin I (ng/L) Cycle 112, Survey 3 September 2019 (post-rollout)