

Can existing UK NEQAS Full Blood Count survey material be used for Red Cell Distribution Width and Mean Platelet Volume measurement?

Susanne Kricke¹, Barbara De la Salle², Vatsala Soni², Dan Pelling³ and Carol D'Souza⁴

¹Great Ormond Street Hospital for Children, London, UK ; ²UK NEQAS Haematology, Watford, UK
³Imperial College Healthcare NHS Trust, London, UK; ⁴Univeristy of Westminster, London, UK

Introduction

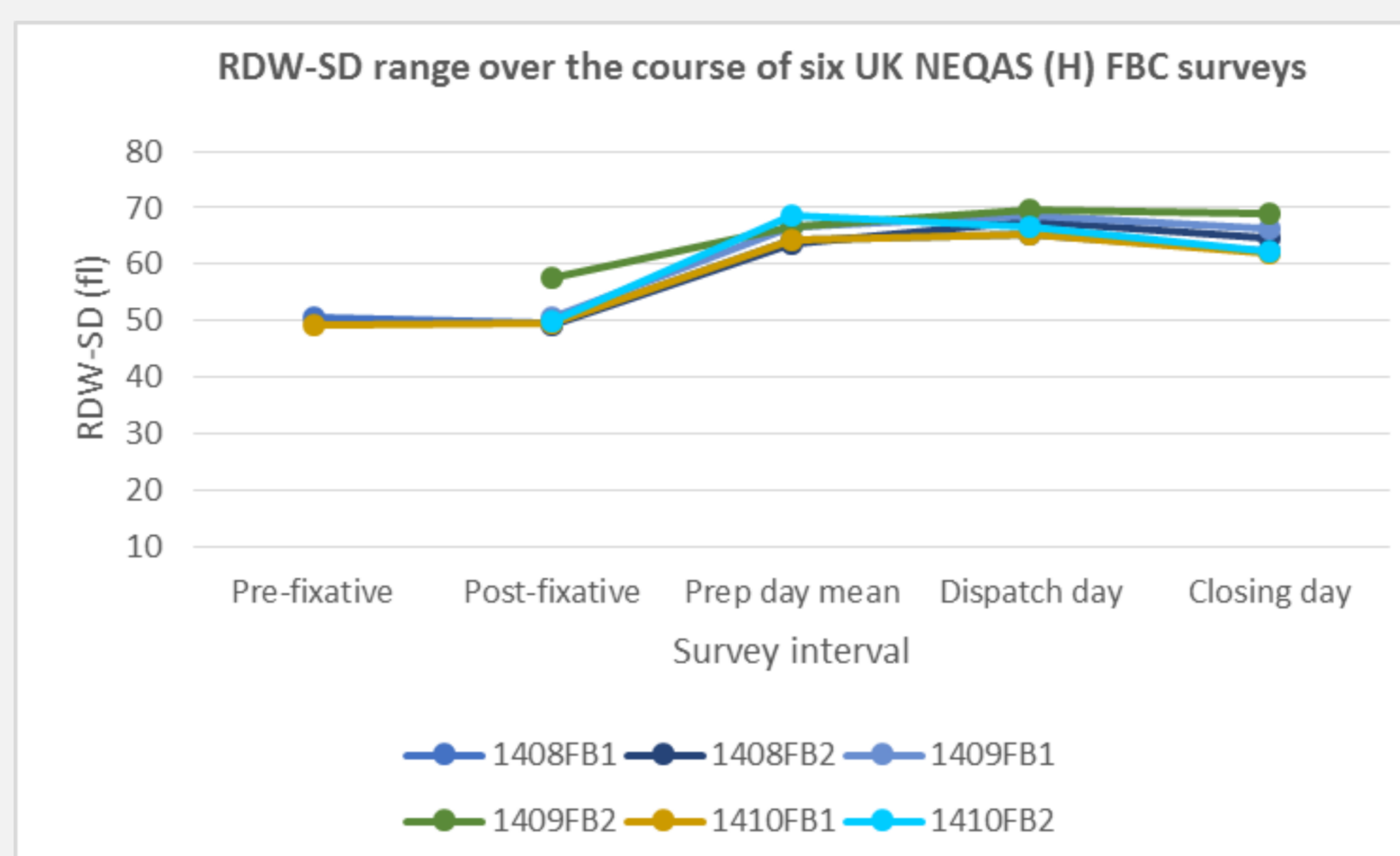
UK NEQAS Haematology have identified Red Cell Distribution Width (RDW) and Mean Platelet Volume (MPV) as parameters for possible addition to the Full Blood Count (FBC) survey profile. These parameters are becoming increasingly important clinically, but are not currently included in any external quality assessment schemes within the United Kingdom. Parameters currently included in the UK NEQAS FBC survey are haemoglobin, red blood count, haematocrit, mean cell volume, mean cell haemoglobin, mean cell haemoglobin concentration, white blood count and platelet count. The material used by UK NEQAS for FBC surveys is prepared from healthy donated blood components which are manipulated to simulate pathological conditions before partial fixation and addition of antibiotics. The suitability of current survey material for the measurement of RDW and MPV is unknown. Data from existing UK NEQAS FBC surveys has been retrospectively reviewed to assess the suitability of this material and to see whether RDW and MPV can be included into the current UK NEQAS FBC scheme.

Methods

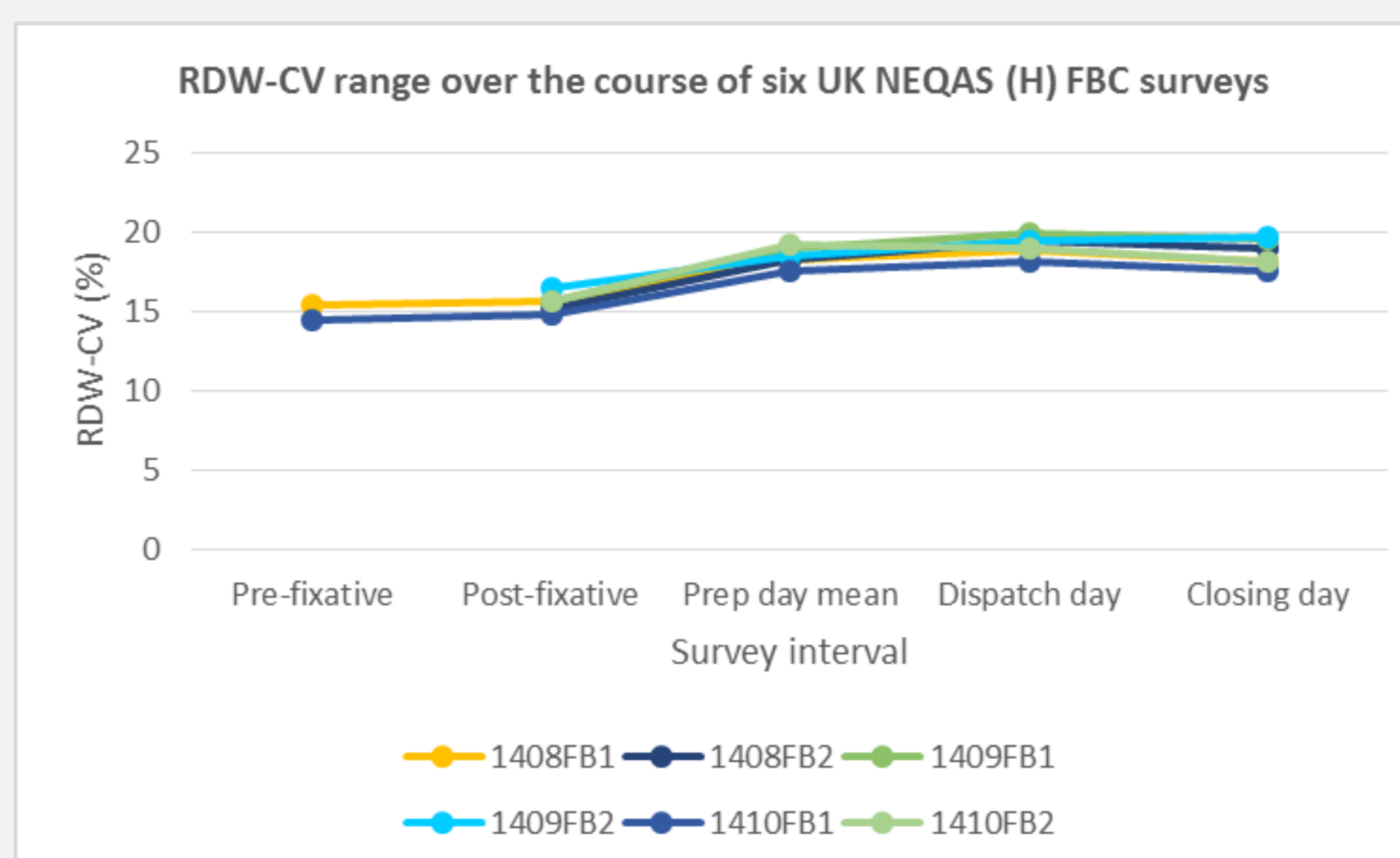
Data sets for six UK NEQAS FBC surveys were examined retrospectively. RDW-CV, RDW-SD and MPV ranges were examined at each stage of the survey interval (preparation day, dispatch day and closing day). The overall CV was calculated for the entire survey interval, with an acceptable CV set at $\leq 5\%$. This data was used to examine the effects of survey preparation and duration on RDW-CV, RDW-SD and MPV. Where possible, a FBC was performed on samples pre- and post-partial fixation in order to examine the effects of survey material preparation directly on RDW-CV, RDW-SD and MPV. Additional information on how each UK NEQAS FBC was prepared has been linked to the raw data and examined for potential trends.

Results

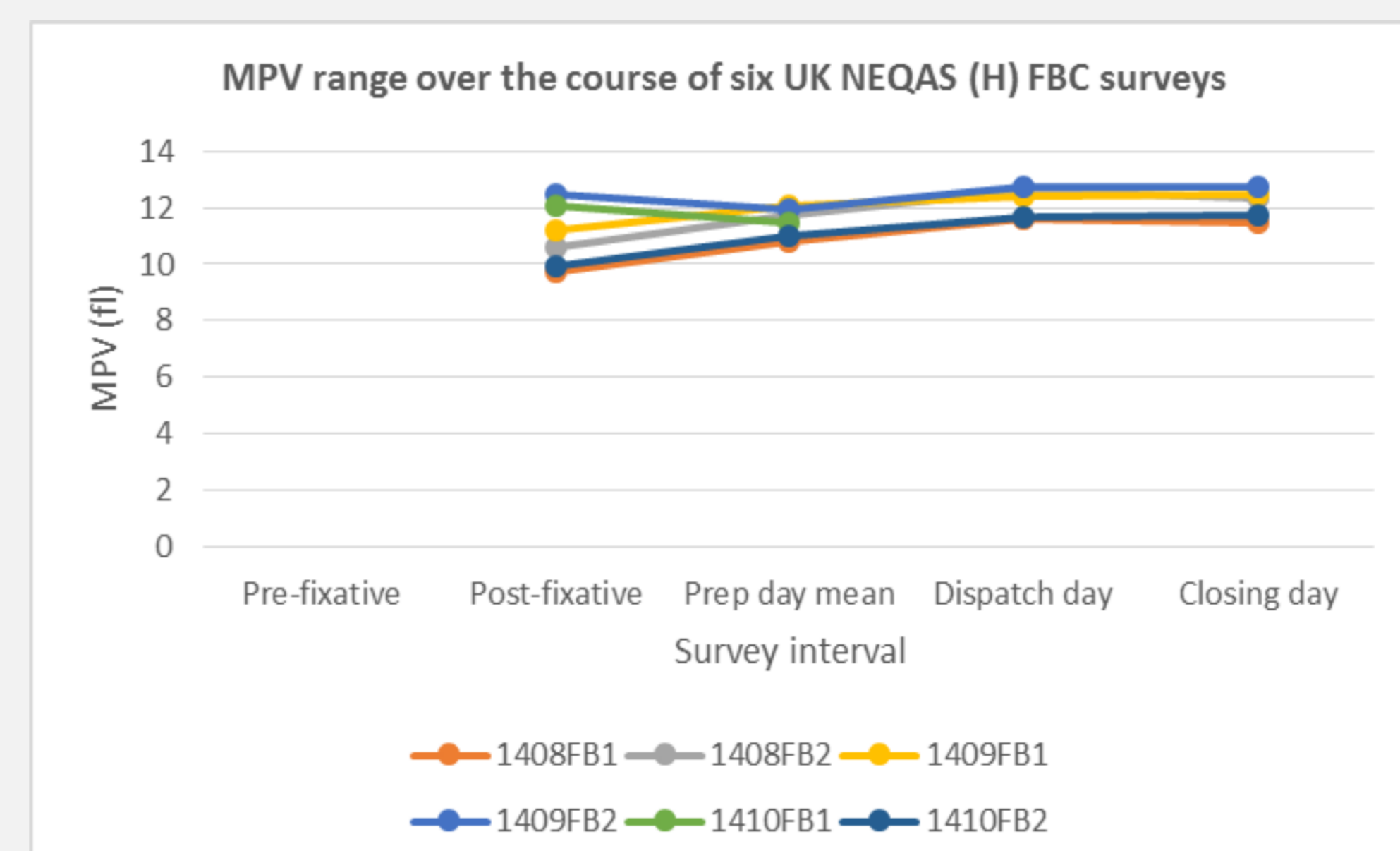
The FBC data review showed no immediate effect of material manipulation on RDW-SD and RDW-CV. For MPV only post-partial fixation data is available. A significant increase in RDW-SD, RDW-CV and MPV has been observed for all specimens from preparation day (post-partial fixation) to dispatch day, indicating that partial fixation was not immediately effective (see Graph 1 to 3).



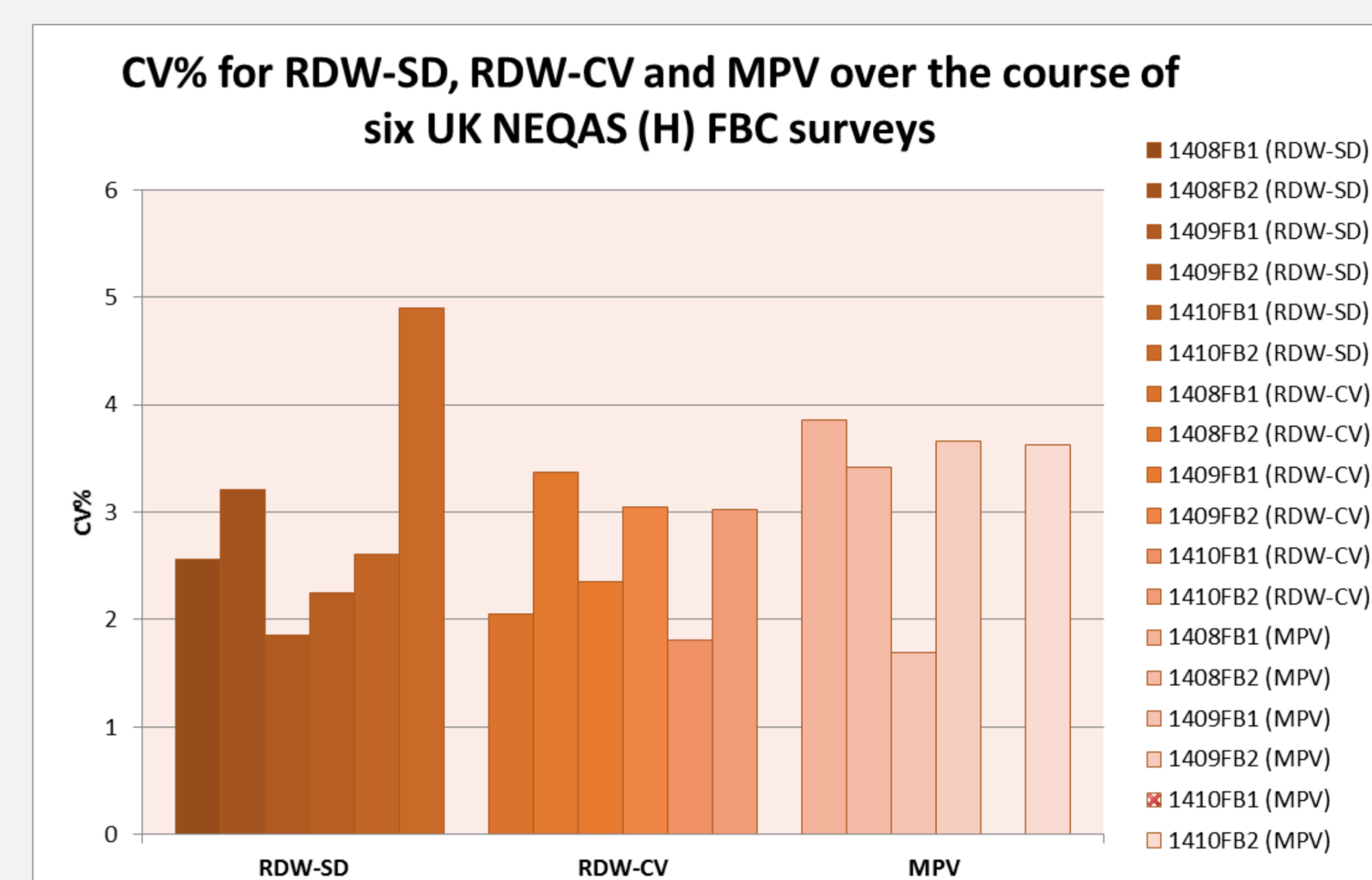
Graph 1: The RDW-SD range within a survey interval has been examined for six individual UK NEQAS FBC surveys.



Graph 2: The RDW-CV range within a survey interval has been examined for six individual UK NEQAS FBC surveys.



Graph 3: The MPV range within a survey interval has been examined for six individual UK NEQAS FBC surveys. No pre-fixation data is available for MPV.



Graph 4: The CV% for RDW-SD, RDW-CV and MPV for the preparation day to closing day interval has been compared for all six UK NEQAS FBC surveys. An acceptable limit of CV $\leq 5\%$ has been set. No MPV data available for survey 1410FB1.

When pre- and post-partial fixation day measurements are omitted, the CV% results for RDW-SD, RDW-CV and MPV are within acceptable limits (CV% < 5) on all occasions indicating that the material is stable for the duration of a survey interval.

Discussion

This data review gave a good indication of the stability of RDW-SD, RDW-CV and MPV for the duration of a UK NEQAS survey as the effect could be observed directly on actual survey specimens. The data shows that once the maximum change post-partial fixation has been achieved, RDW-SD, RDW-CV and MPV are stable. This confirms that current UK NEQAS FBC survey material is indeed suitable for the performance assessment of these parameters. However, MPV generally showed a poorer performance with repeated measurement failures. The parameter is known to be very specific to technologies. Including MPV into any existing scheme may raise technical issues by having to account for individual technologies used by laboratories such as impedance or light scattering technology. Decisions are pending on whether RDW-SD, RDW-CV and MPV performance assessment will tie in with the existing UK NEQAS FBC survey or will be offered as an additional module. A large scale pilot exercise along with detailed feedback questionnaires will be distributed to a selected group of participating laboratories prior to implementation.

Data Review

Pilot exercise

Implementation