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Performance Assessment of Point of Care Testing for Blood Glucose – a 5 Year Review

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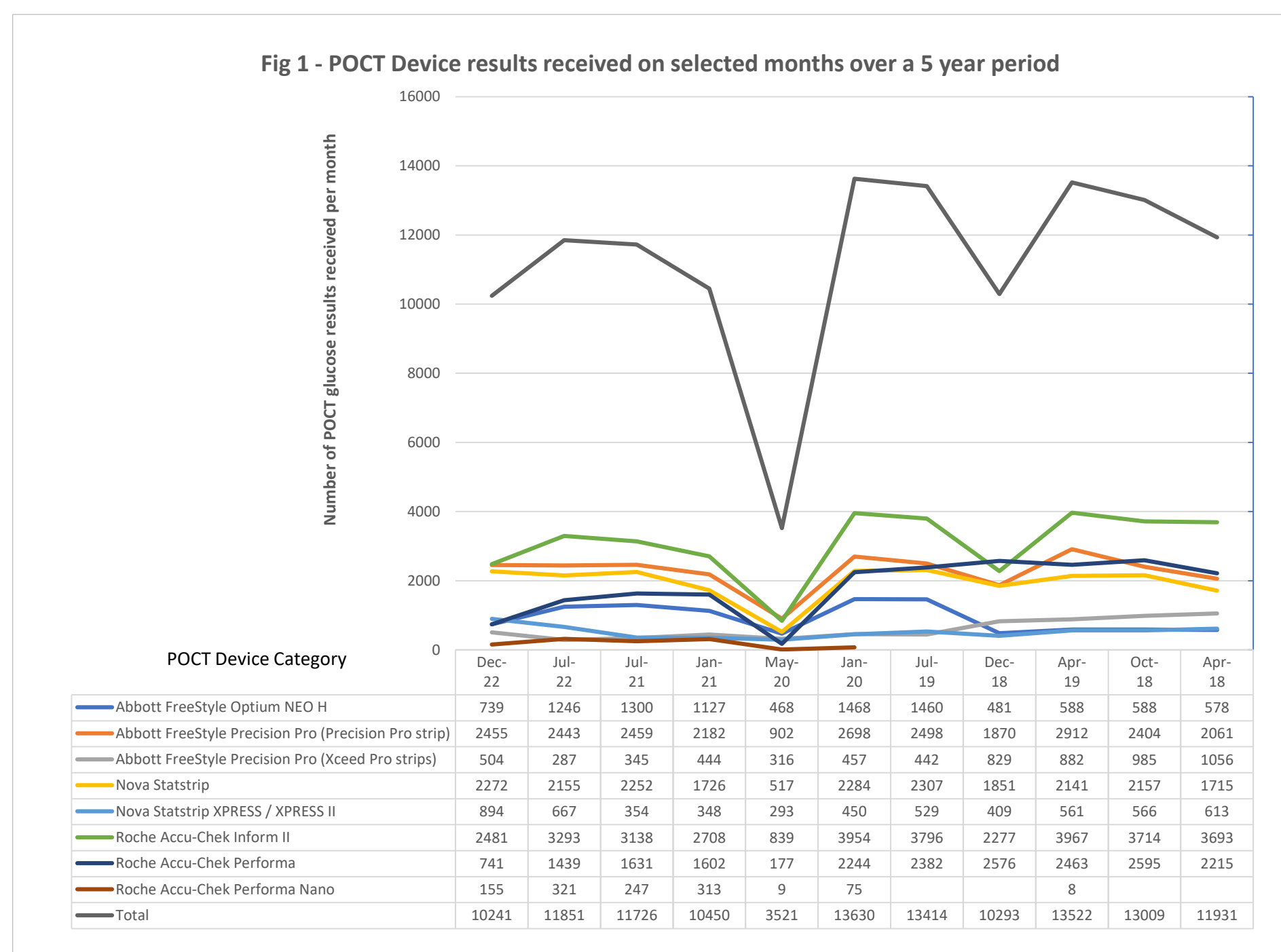
Introduction

Weqas is the largest Proficiency Testing (PT) or External Quality Assessment (EQA) provider for the Point of Care Testing (POCT) market within the UK, supplying samples and assessment to over 30,000 sites per month, with over 20 POCT Programmes across the entire healthcare sector. All Programmes are accredited to ISO 17043.

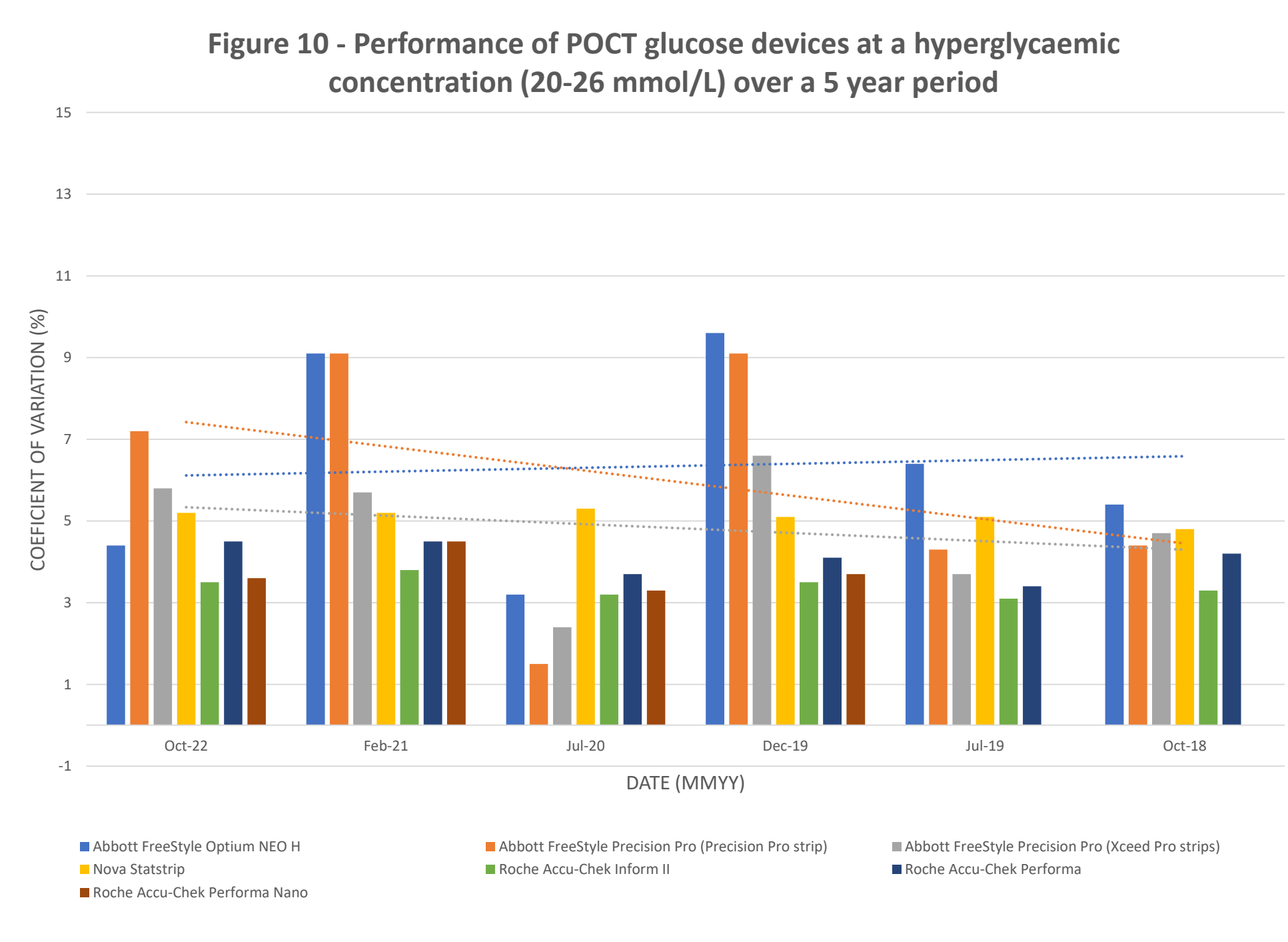
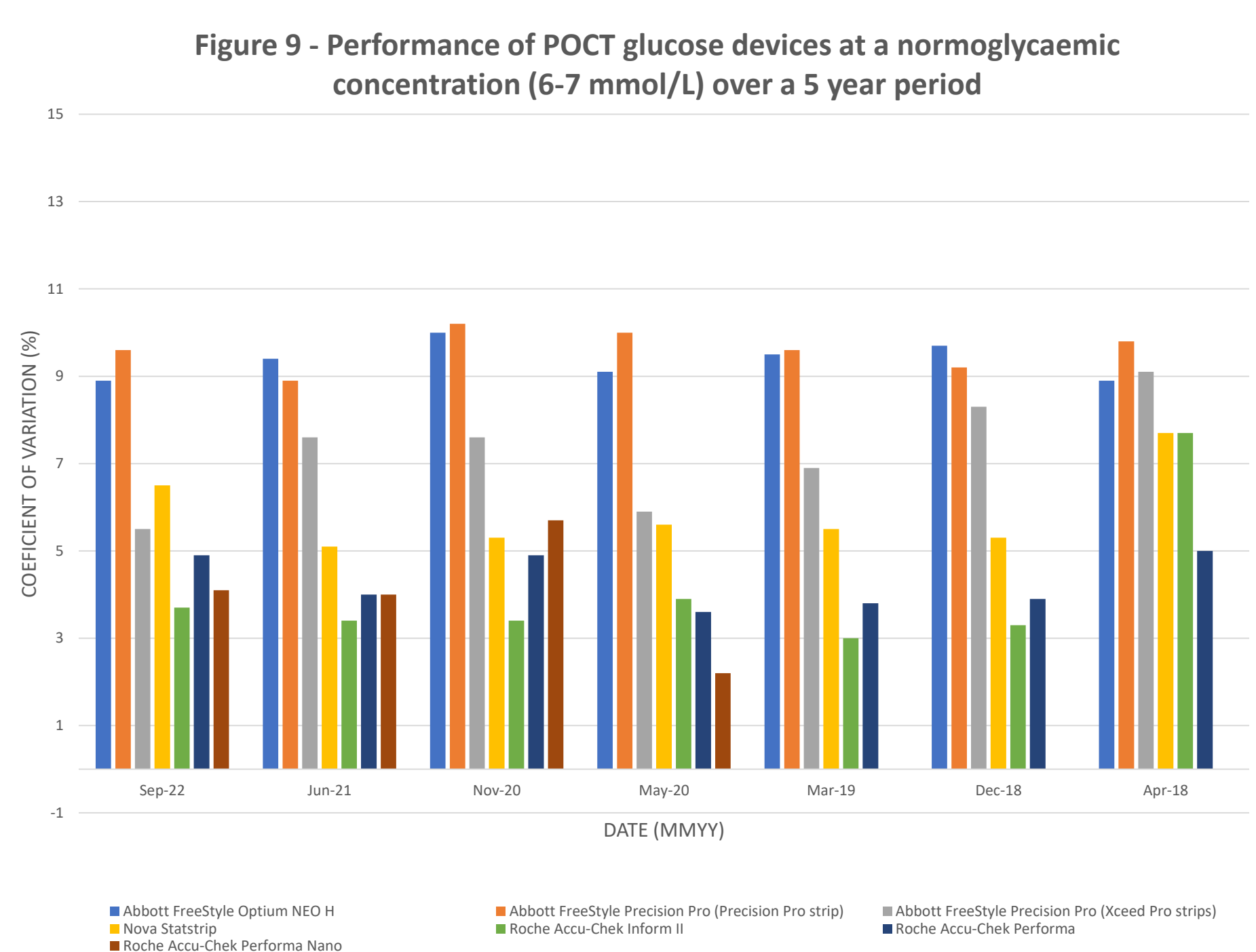
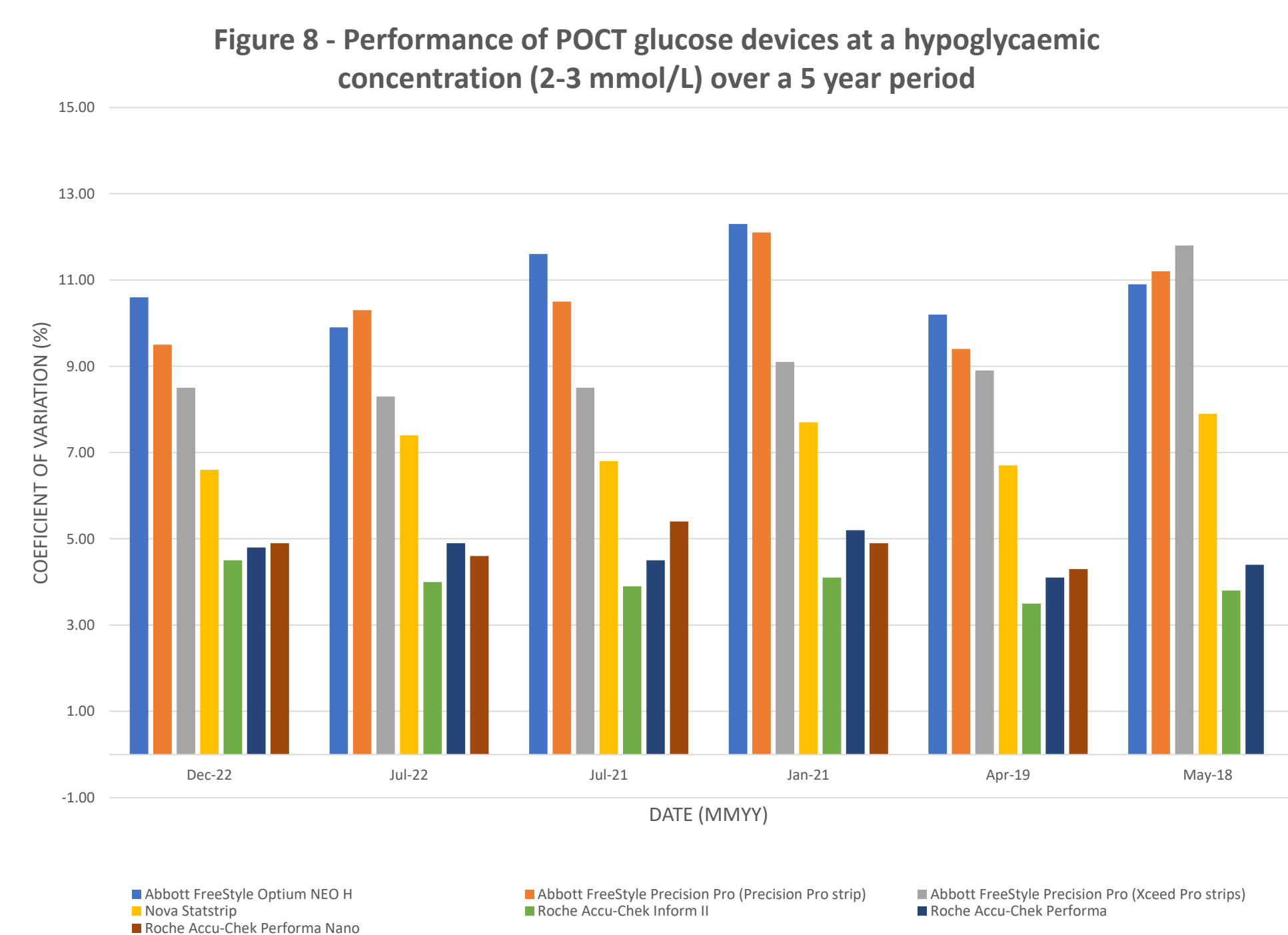
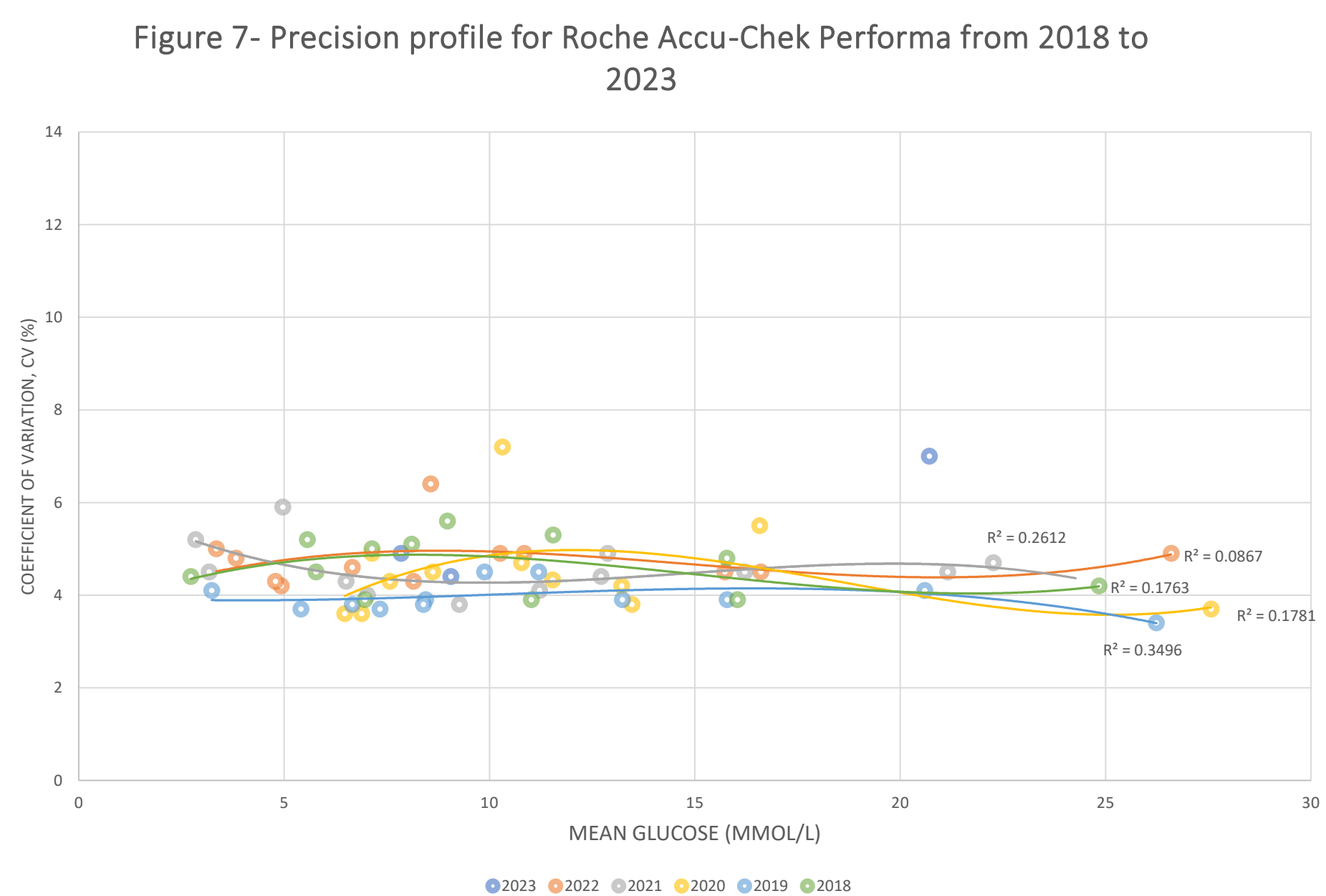
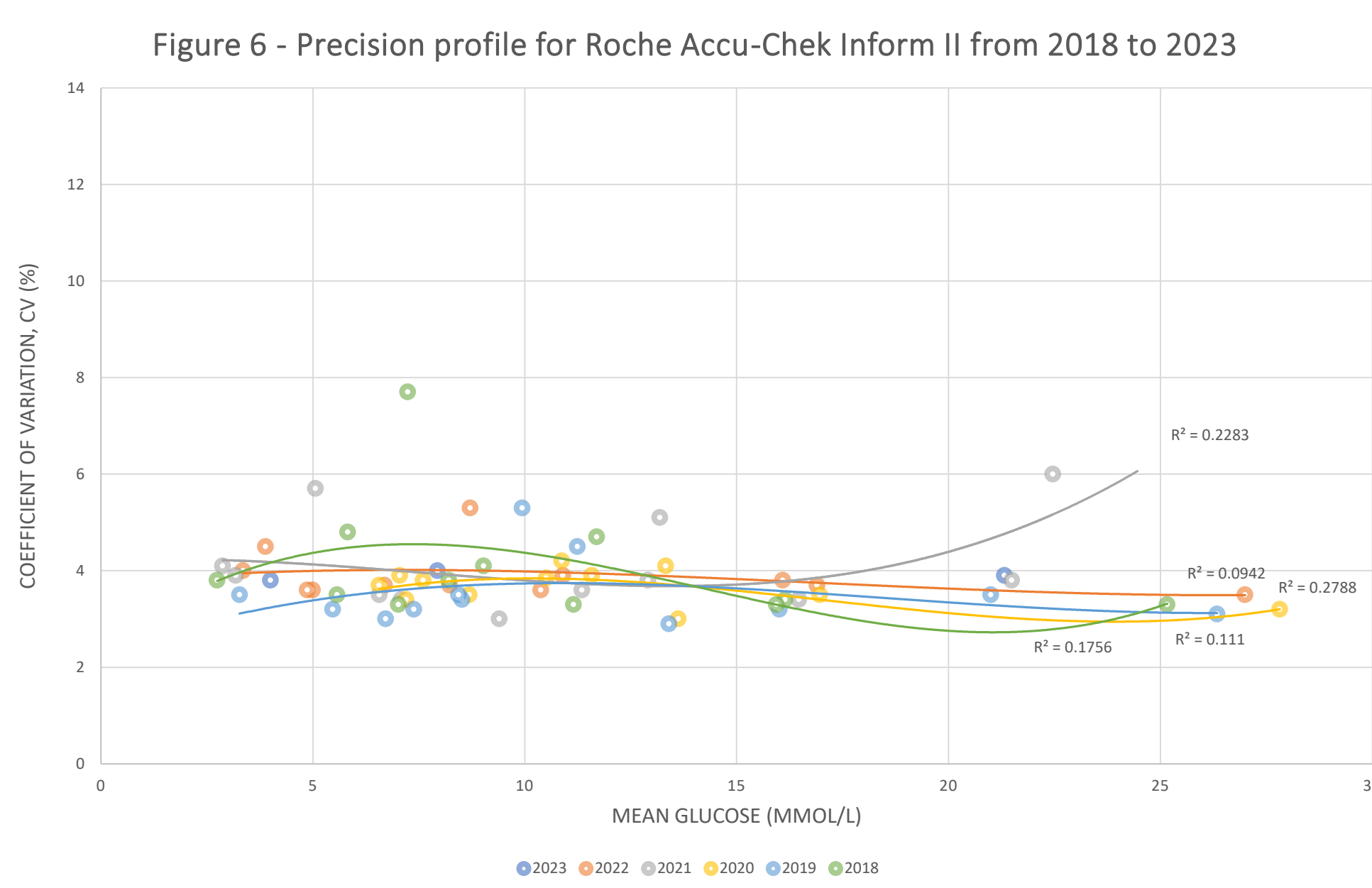
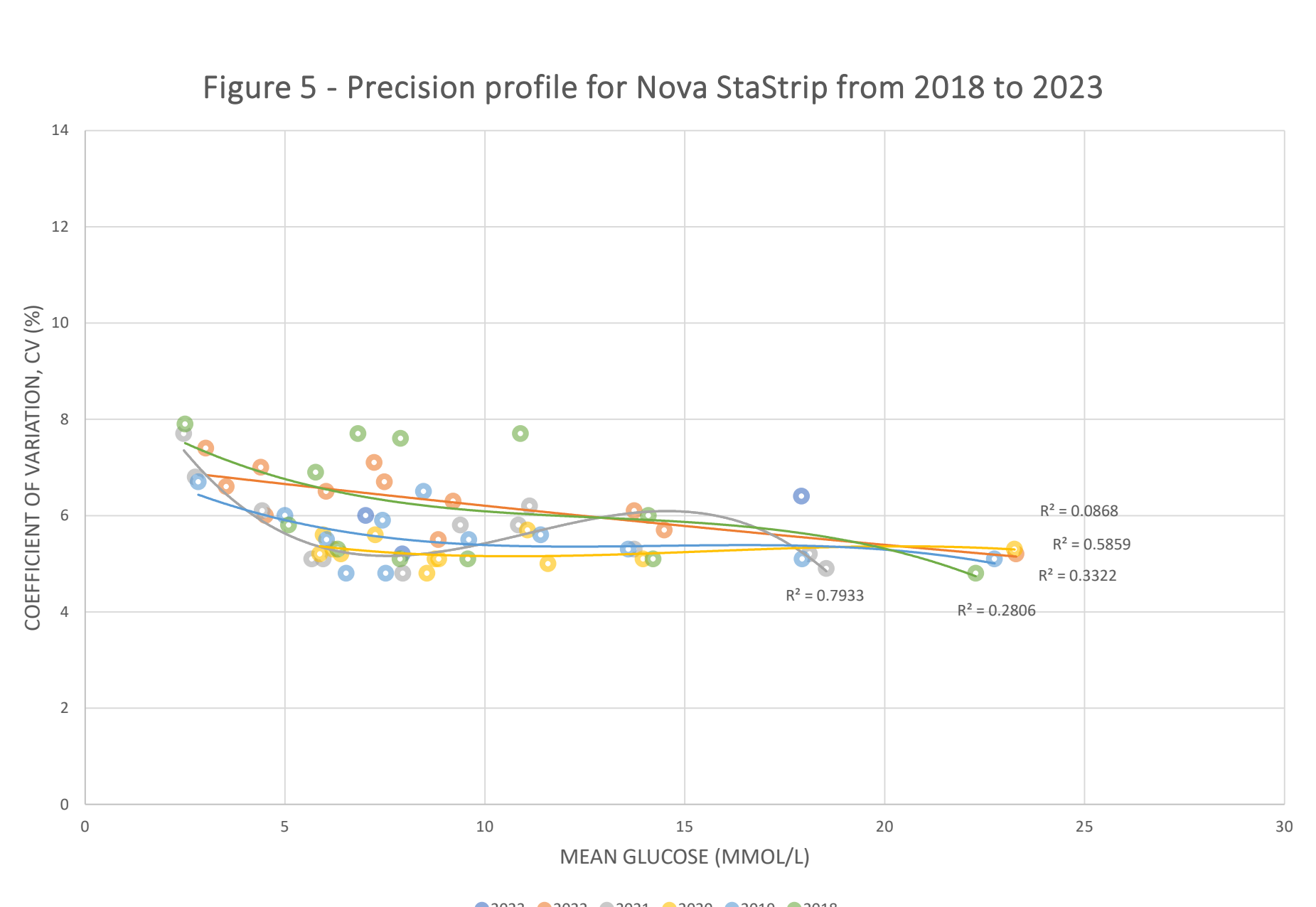
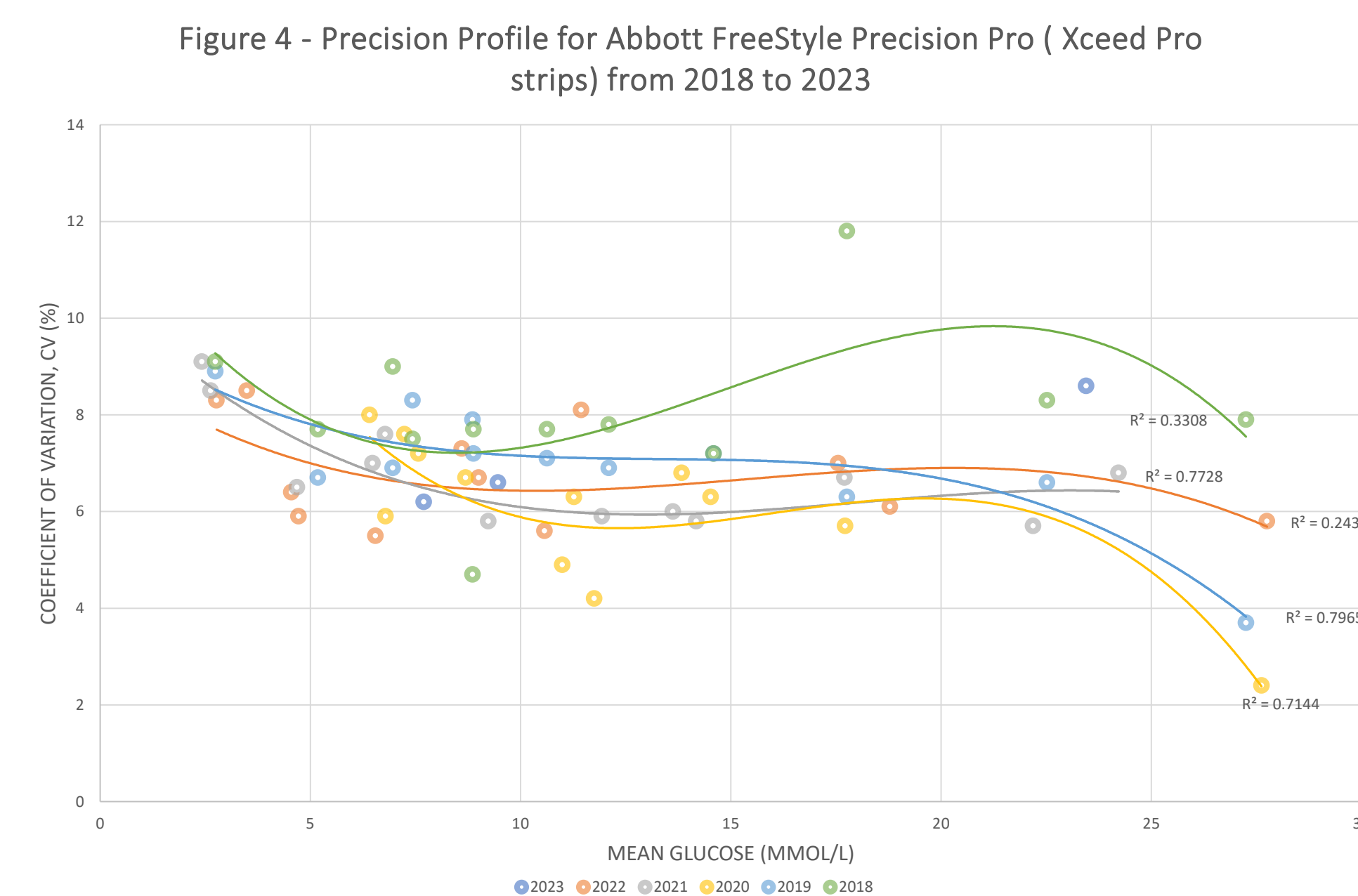
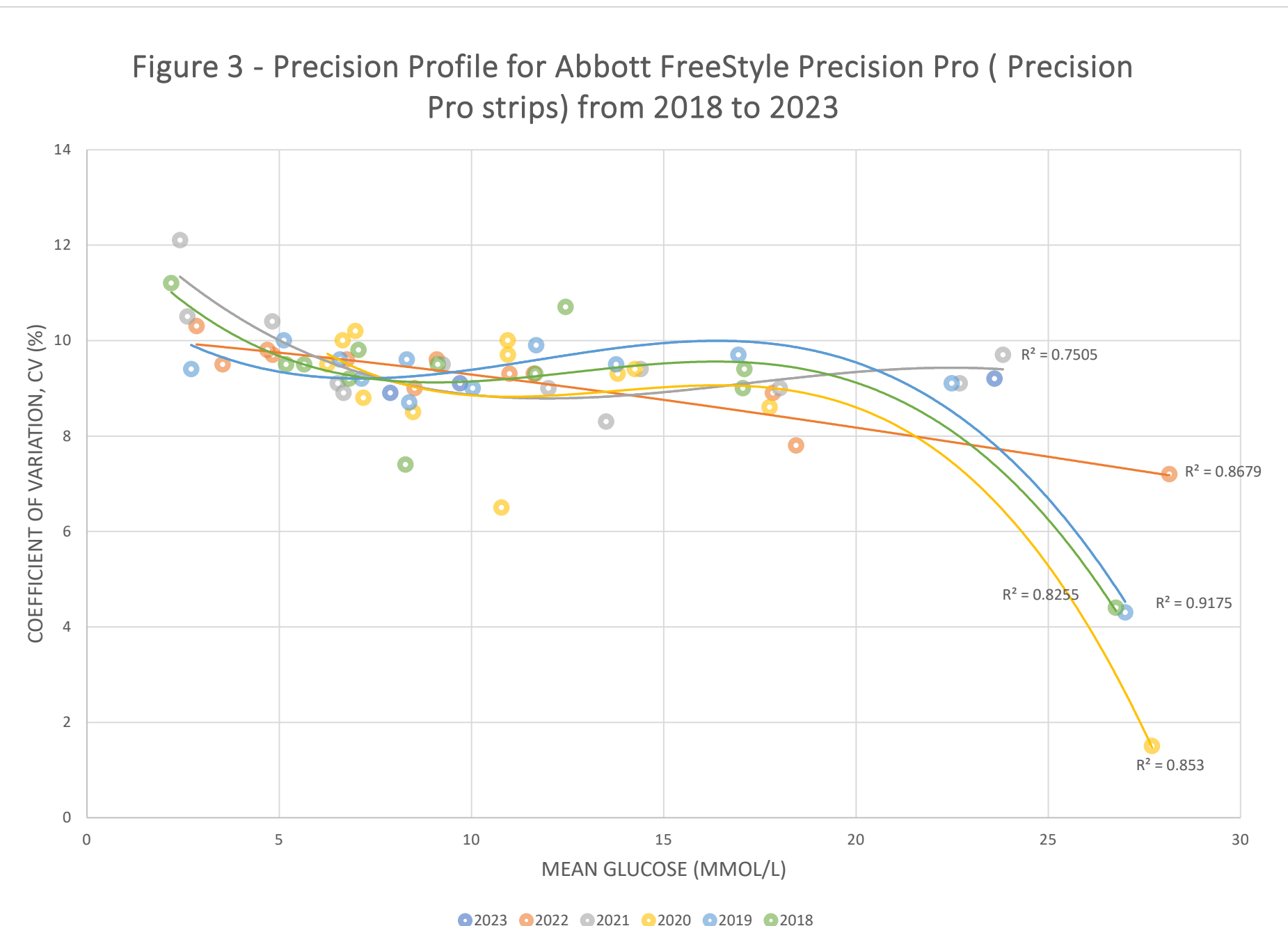
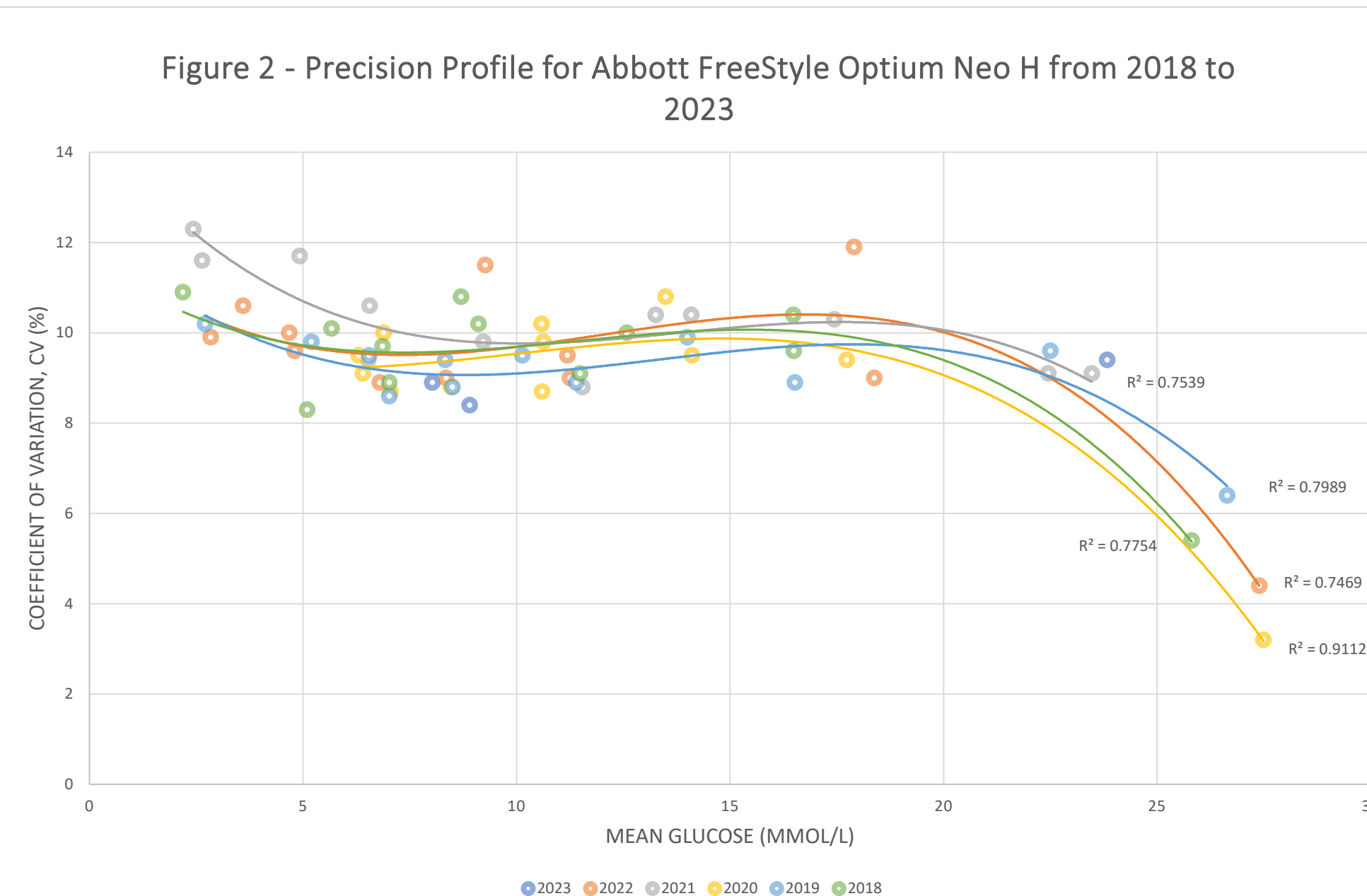
The aim of the programme is to provide support to POCT Co-ordinators, to identify non compliant sites and improve the analytical performance of users. Most of the programmes are designed to allow the full assessment of all devices within the organisation at either monthly, bimonthly or quarterly intervals. A Co-ordinator in each organisation is given a Group Administrator function for the EQA website and maintains the database for its own organisation. The role of performance surveillance is therefore devolved to each individual Co-ordinator at a local level and monitored nationally by the EQA organiser. The powerful database gives POCT Co-ordinators a wealth of information on method and analyser performance both within their own organisation and between organisations. Organisation performance summary reports, distribution letters, non-compliance reports, poor performance reports and cumulative reports are generated from one system. The POCT Users are also provided with a simple traffic light system with clear action limits. For the POCT glucose programme one sample is distributed each month with samples covering a range of 2 to 28 mmol/L annually.

Methods

A review of performance was undertaken between January 2018 and March 2023 for the POCT Glucose programme for a selection of devices. Sixty three samples with varying glucose concentrations were distributed over this time period. Devices that were no longer available were excluded as were devices with < 200 users in the group. This represented data from 10,312 devices per month in January 2018 and 12,178 in January 2023. A breakdown of the number of results for each device category on selected months over this period is illustrated in Figure 1.



Performance was assessed as the coefficient of variation, (CV%), calculated after outlier exclusion, from glucose results received across all users and hospital sites in the UK and Ireland for each device and for each of the 63 samples distributed over this period. This represented analysis of over 600,000 results. Precision profiles, calculated as the CV (%) for each sample across the clinical range of glucose concentrations is illustrated in figures 2 to 7 for each of the major devices in use over the 5 year period. The performance at clinically important concentrations of hypoglycaemia, normoglycaemia and hyperglycaemia are further illustrated in figures 8 to 10 respectively.



Results

At hypoglycaemic concentrations, there was generally no further improvement in the performance of devices with an initial CV ≤ 5% in 2018, however at this concentration there was a slight improvement observed for the Abbott devices. For the normoglycaemic samples, there was no further improvement from December 2018 apart from the Abbott Freestyle Precision Pro (Xceed pro strips). For the hyperglycaemic samples, the majority of devices reported an initial CV ≤ 5% which remained relatively consistent apart from the Abbott devices where the CVs varied greatly from sample to sample. It was noted that the participation rates during the pandemic plummeted to < 30% of previous rates, however there was no observed deterioration in performance.

Conclusion

Despite improvements in technology, and the introduction of more robust oversight processes by healthcare organisations managing their POCT services, there was little evidence to suggest that the performance of POCT glucose devices had improved significantly over the last 5 years.