WTDTP Projects for September 2023

Project Reference: T3/48

Project Title: **Providing up-to-date risk estimates from prognostic models: further development and application of temporal recalibration**

Theme(s): Theme 3: Genetically informed causal inference and risk prediction

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Project Summary: Prognostic models estimate an individual’s risk of future outcomes conditional on their characteristics (e.g. age, ethnicity, and biomarker levels). Many prognostic models are published annually, but most suffer from methodological issues. One major limitation is that models are developed from existing datasets without accounting for improvements in prognosis over time.

To address this specific issue, we recently proposed novel methodology called temporal recalibration. Temporal recalibration works by fitting a standard model to obtain the relative effect estimates using the whole development dataset. It then uses just the most recent time-period of data (period window) to obtain updated, appropriate estimates of the baseline absolute risk to form final predictions.

The overall objective of this project is to enable better-calibrated prediction models in practice by improving and extending temporal recalibration. The specific aims are:

* + - * + Further develop temporal recalibration for use in competing risk settings to give clinically useful predictions.
        + Provide guidance on the sample size required and how to identify the period window to use for the baseline risk estimation.
        + Extend the approach to a polygenic risk score setting.