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Section 2 – *Project Information*

Project Title	Validation and Equity Assessment of the CHA_2DS_2-VASc Score Across Ethnic Groups in Atrial Fibrillation

Project Summary

Atrial fibrillation (AF) is the commonest heart rhythm condition seen in clinical practice that affects millions of people worldwide and dramatically increases the risk of stroke. To help prevent these strokes, a simple tool called the CHA_2DS_2-VASc score is used to decide who should receive anticoagulation treatment. Although this score is widely used in the NHS and internationally, it was originally developed using mainly White European populations. This raises an important question: Does it work equally well for everyone?

We know from UK research that stroke risk, underlying health conditions, and healthcare experiences can differ across ethnic groups. If a risk tool is less accurate for some groups than others, this could lead to unfair differences in treatment—meaning some people may miss out on lifesaving therapies while others receive unnecessary medication. Understanding whether this tool performs fairly is therefore essential for improving health equity and supporting better clinical decisions.

In this PhD, you will use large, linked NHS datasets—including primary care, hospital care, and national mortality records—to examine how well the CHA_2DS_2-VASc score predicts stroke risk across major ethnic groups in the UK. You will assess whether the tool over- or under-predicts risk for different communities and explore why these differences occur.

You will also investigate practical ways to improve fairness and accuracy, such as adjusting the score or updating parts of the model. Your findings will contribute to national discussions about health inequalities and could directly influence how AF is managed in everyday clinical practice.

This project offers an exciting opportunity for a student interested in data science, biostatistics, or public health. You will gain hands-on experience with real-world electronic health records and contribute to a growing area of research focused on fairness in healthcare algorithms. Your work has the potential to make stroke prevention more accurate, more equitable, and more aligned with the needs of diverse patient communities.

You will receive comprehensive training in medical statistics, prediction modelling, and the use of large electronic health record (EHR) datasets. You will learn advanced analytical techniques (e.g., survival analysis, model validation, coding in R or Stata) and best practices in reproducible research. You will also have opportunities to attend specialist workshops, present at national conferences, and develop transferable skills in scientific writing and open science. Throughout the PhD, you will be supported by an experienced supervisory team and embedded within a collaborative research environment focusing on cardiovascular health and health inequalities.

References

1. Lip, G.Y., et al., Refining clinical risk stratification for predicting stroke and thromboembolism in atrial fibrillation using a novel risk factor-based approach: the euro heart survey on atrial fibrillation. Chest, 2010. 137(2): p. 263-272.
2. Olesen, J.B., et al., Validation of risk stratification schemes for predicting stroke and thromboembolism in patients with atrial fibrillation: nationwide cohort study. Bmj, 2011. 342.
3. Borre, E.D., et al., Predicting thromboembolic and bleeding event risk in patients with non-valvular atrial fibrillation: a systematic review. Thrombosis and haemostasis, 2018. 118(12): p. 2171-2187.
4. Collins, G.S., et al., Transparent reporting of a multivariable prediction model for individual prognosis or diagnosis (TRIPOD): the TRIPOD statement. Journal of British Surgery, 2015. 102(3): p. 148-158.
5. Wolff, R.F., et al., PROBAST: a tool to assess the risk of bias and applicability of prediction model studies. Annals of internal medicine, 2019. 170(1): p. 51-58.