Modelling the association between blood pressure variability and cardiovascular disease

Supervisors: Jessica Barrett and Stephen Kaptoge (CEU)

Evidence has been growing in the medical literature for an association between the variability of a person’s blood pressure and their risk of cardiovascular disease\(^1\); those with more variable blood pressure measurements appear to be at greater risk of disease. But sub-optimal statistical methods have generally been used to estimate the association, such as using the standard deviation of each individual’s measurements as a risk factor in a survival model for the time to first cardiovascular event. Limitations with this approach include (i) failure to account for measurement error in the estimated standard deviations and (ii) those who experience an early cardiovascular event having fewer blood pressure measurements, leading to differing levels of measurement error between individuals. This project will explore the use of joint models of longitudinal and survival data to overcome these problems by simultaneous analysis of the repeated blood pressure measurements and the time to the first cardiovascular event\(^2\). The new methods will be applied to data from the Emerging Risk Factors Collaboration, a consortium led by the Cardiovascular Epidemiology Unit consisting of more than 130 prospective studies providing individual-participant data with the aim of studying novel risk factors for cardiovascular disease. Dr Stephen Kaptoge from the Cardiovascular Epidemiology Unit will also advise on the applied aspects of this research.

References

Start date: Easter Term (April) or Michaelmas Term (October) 2019

All application queries regarding eligibility should be directed to phdstudy@mrc-bsu.cam.ac.uk

How to Apply: Applications should be made on-line via www.graduate.study.cam.ac.uk/applicant-portal selecting course details MDBI22 PhD in Biostatistics

Deadline for applications: 3rd January 2019