Risk prediction of time to onset of Alzheimer's disease using imaging modalities within DPUK

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Predicting the time to onset of Alzheimer's disease is challenging, but predictions will help to identify patients at risk and help to identify patients that may benefit from new developments in care and treatment. Building a robust prediction model requires incorporating multiple biomarkers with variable selection, possibly model selection, and validation of predictions. The last decade has seen an increase in high quality and large scale neuroimaging being included within studies that are suitable for building Alzheimer's risk prediction models. However imaging data present substantial challenges, not least the large dimensionality of the data and how to apply dimension reduction or variable selection approaches, such as region of interest derived measures or voxel-based reduction methods like independent component analysis. Further, there are typically multiple imaging modalities available such as structural Magnetic Resonance Imaging (MRI), functional MRI, resting-state MRI, and Positron Emission Tomography (PET); how to incorporate multiple highly correlated high dimensional biomarkers with potentially repeated measures over time is the focus of this project.

The MRC Biostatistics Unit is a partner in the Medical Research Council (MRC) Dementia Platform UK (DPUK) Consortium, this study includes participants with longitudinal observations and multiple imaging modalities. The project will use data from the DPUK to investigate methodological issues on using imaging modalities within risk prediction models, whether selection into imaging sub-studies could influence findings and the problem of high-dimensional imaging as a biomarker in a risk model.

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