Project title: Modelling the effect of gender on survival in cystic fibrosis patients

Supervisor(s): Jessica Barrett (MRC BSU) and Brian Tom (MRC BSU)

Abstract:

Cystic fibrosis (CF) is a genetic condition affecting more than 10,000 people in the UK. Cystic fibrosis patients commonly experience respiratory symptoms, but the disease can also affect the digestive system, liver and bones. Understanding how symptoms evolve over time is important to inform the monitoring and treatment of CF-related symptoms.

The aim of this project is to use dynamic path analysis methods to explore the role of gender in the lifespan of patients with cystic fibrosis. Dynamic path analysis is a method which seeks to infer causal pathways by modelling the time-ordering of changes in the variables of interest. Methods will be applied which use observed measurements of those variables, and extensions to joint longitudinal and survival models will be developed.

In patients with cystic fibrosis females tend to experience poorer survival rates than males, the reverse of the effect observed in the general population. It has been postulated that this could be because females tend to have poorer lung function than males, but it is unknown whether this gender effect is mediated entirely through lung function, or whether other factors may be involved. This project will explore the roles played by lung function and BMI in the causal pathway between gender and survival.

In addition to the names supervisors above, this project will will have input from other statisticians and clinicians engaged in cystic fibrosis research, including Dr David Taylor-Robinson (University of Liverpool), Dr Ruth Keogh (London School of Hygiene and Tropical Medicine) and Dr Daniela Schlueter (University of Lancaster).

Start Date: Easter Term 2020 (UK applicants only) or Michaelmas Term 2020 (all applicants)

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: 7th January 2020