3 Year PhD Studentship available for September 2019

Department: Health Sciences

Supervisors: Frank Dudbridge (Health Sciences) frank.dudbridge@leicester.ac.uk
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Eligibility: UK/EU applicants only

Project Title: Evaluating non-linear causal effects of lifestyle on health

Project Description: Is moderate drinking is better for health than no drinking or heavy drinking? Many studies have suggested so, but this may only be because people who drink moderately also follow a generally healthier lifestyle. Similarly, intermediate body weight is associated with better health than high and low body weight, but this may also only reflect lifestyle choices. In this project you will develop new methods to determine whether moderate alcohol consumption is really best for cardiovascular health, and whether intermediate body mass index is really best for respiratory health.

Ideally we would perform randomised trials to address such questions, but this cannot be done for lifestyle factors. Instead we will use genetic data in the method of Mendelian Randomisation. This uses people’s genes to mimic the randomisation in a trial, with different versions of the genes as markers for different lifestyle choices. This is a new and fast growing area, with excellent career prospects, in which our group are world leaders. However, Mendelian Randomisation cannot easily be applied to non-linear relationships such as these, where intermediate exposures have better outcomes than both high and low exposures. This is because very large data sets are needed, and also because a certain type of selection bias can arise.

These problems can now be overcome using big data such as the UK Biobank of half a million adults, and new methods of correcting selection bias developed by our group. In this project you will develop new methods of Mendelian Randomisation for non-linear effects by applying our new correction for selection bias to UK Biobank data, to determine the nature of the causal relationship between alcohol and cardiovascular traits, and between body mass index and respiratory traits.

You will write computer code to perform simulations comparing your new methods to existing approaches, download and analyse UK Biobank and other large data sets, and working closely with our clinical collaborators in the Leicester Biomedical Research Units, interpret your findings in the public health context. You will gain experience in statistics, epidemiology, data science and genetics, and will join a thriving group of over 30 researchers with world leading expertise in genetic epidemiology, big data and causal inference. You should be comfortable with managing large files.
within a programming (preferably Linux) environment, and with developing code in a statistical (eg RStudio) or scripting (eg Python) language.

References:

Funding details:
The College of Life Sciences (CLS) HDRUK Studentship will provide a tax-free stipend at RCUK rates (£15,009 for 2019/20) and UK/EU fees for 3 years.

Entry requirements:
Applicants are required to hold/or expect to obtain a data science related UK Bachelor Degree 2:1 or better (e.g. Computer Science, Bioinformatics, Biostatistics), and preferably also a similar MSc qualification. The University of Leicester English language requirements apply where applicable.

How to apply:
You should submit your application using our online application system.

Apply for a PhD in Health Sciences Research

In the funding section of the application please indicate you wish to be considered for a CLS HDRUK Studentship

In the proposal section please provide the name of the supervisor and project you want to be considered for – please list both your first and second choices.

Project / Funding Enquiries: Prof Frank Dudbridge frank.dudbridge@leicester.ac.uk

Application enquiries to pgradmissions@le.ac.uk

Closing date for applications: 3rd April 2019

Interviews are likely to be week commencing 8th or 15th April 2019