3 Year PhD Studentship available for September 2019

**Department:** Health Sciences & Cardiovascular Sciences

**Supervisors:** Dr Rhiannon Owen (Health Sciences) rhiannon.owen@le.ac.uk
Professor Tim Coats (Cardiovascular Sciences) tc61@le.ac.uk
& Dr Michael Sweeting (Health Sciences) michael.sweeting@le.ac.uk

**Eligibility:** UK/EU applicants only

**Project Title:** Development of Methods for Evaluating Use of Targeted Tests in Emergency Medicine

**Project Description:** Over the last 10 years within emergency and acute care there has been a rapid movement towards ‘near patient’ testing and early investigation with the presumption that earlier investigation will give rise to early decision making and hence reduced length of stay in hospital and better outcomes. At present diagnostic technologies (such as biochemical tests, haematological tests, clotting tests, ultrasound, and CT scanning) are being pushed forwards in the patient pathway, but near patient or immediate investigation often has an increased cost. The underlying presumption that early investigation ‘must be’ better has not been well tested and the costs and benefits of different diagnostic strategies have often not been evaluated. A new device for near patient testing simply has to show analytical equivalence to laboratory methods before receiving a “CE mark” and being marketed to the NHS. It is currently uncertain whether the health service is getting value for money from the move towards early investigation. Interventional studies of different diagnostic strategies are costly and time consuming to conduct, but the creation of a standardised modelling toolkit using electronic health records (EHRs) has the potential to aid NHS clinicians and managers when deciding whether or not to introduce near patient diagnostics or early investigation.

This project will explore the development and use of modelling methods for evaluating use of targeted ‘near patient’ tests and early investigation in Emergency Medicine. Working closely with an industry partner, NTT, this project will use linked EHR data from University Hospitals Leicester (UHL), to investigate the use and development of different statistical approaches in evaluating the optimal diagnostic care pathway. Using a variety of modelling approaches, including Bayesian Markov modelling, microsimulation, and discrete event simulation [1,2], this project will explore the utility of different (potentially hybrid) simulation approaches in evaluating the complexity of diagnostic care pathways for healthcare decision-making. This project will make use of simulation studies, using discrete event simulation to replicate the emergency medicine setting, to assess the robustness of simpler modelling approaches. Application of this methodology to linked EHR from UHL will enable
the identification of the optimal time of diagnostic testing in terms of minimising opportunity cost, NHS cost, and resource waste, whilst maintaining diagnostic scrutiny.

The project can be described under four key work packages:

- Systematic review of decision modelling approaches for diagnostic-related strategies
- Development and extension of modelling approaches (including hybrid models) to analyse the utility of targeted testing in the diagnostic care pathway
- Simulation study to assess the robustness of simpler modelling approaches
- Application to UHL emergency and acute care centre EHR


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: Dr Rhiannon Owen rhiannon.owen@le.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