**Funding Source:** Self-funded**.** Applicants must be able to fund their own study or have their own sponsor

**Proposed start date:** 2022/23 to be agreed with successful applicant

**Closing date for applications:** Open until filled

**Eligibility:** UK and International applicants

**Department/School:** The PhD will be based in Health Sciences.

With supervision provided across College of Medicine, Biological Sciences and Psychology, Diabetes Research Centre, Leicester Real World Evidence Unit

**Supervisors:** Atanu Bhattacharjee (ab1183@le.ac.uk), Francesco Zaccardi (fz43@le.ac.uk), Kamlesh Khunti (kk22@le.ac.uk)

**Project Title:** Personalising thresholds of risk factor control for prevention of cardiovascular disease in subjects with diabetes

**Project Description**

Type 2 diabetes is a cardio-metabolic chronic condition with worldwide increase in prevalence and incidence. The control of glucose levels and of other risk factors, such as lipid levels and blood pressure, is essential to reduce the risk of cardiovascular complications.

Although there are recommendations around the ideal levels of the risk factors, such levels may vary according to the characteristics of the patient (for example, gender or ethnicity). The evidence to support personalised thresholds is however limited. This PhD project aims to use different statistical models and machine learning algorithms with the aim to identify personalised thresholds for the prevention of cardiovascular complications in subjects with diabetes. We will use a data-driven approach (including k-nearest neighbour, classification and regression trees, and supervised principal component analysis) to update the threshold value of the HbA1c.

The student will be embedded within a team of experts in clinical diabetes, epidemiology, and statistics, and receive training in a broad range of statistical methods used to investigate cross-sectional and longitudinal real-world data, as well as in machine learning and statistical modelling approaches.

The Ph.D. project will be integrated into a vibrant postgraduate research community within the Real-World Evidence Unit and the Diabetes Research Centre, University of Leicester, and help advance the aims of the National Institute of Health and Care Research Leicester Biomedical Research Centre (BRC) and East Midlands Collaboration for Leadership in Applied Health Research and Care (ARC).

**References:**

1. A novel diabetes typology: towards precision diabetology from pathogenesis to treatment. Diabetologia. 2022 Jan 4. doi: 10.1007/s00125-021-05625-x.
2. Validation of the classification for type 2 diabetes into five subgroups: a report from the ORIGIN trial. Diabetologia. 2022 Jan;65(1):206-215.
3. Insulin resistance versus β-cell dysfunction in type 2 diabetes: where public and personalised health meet. Lancet Diabetes Endocrinol. 2020 Feb;8(2):92-93.

**Entry requirements:**

Applicants are required to hold/or expect to obtain a UK Bachelor Degree 2:1 or better in a relevant subject. The University of Leicester [English language](https://le.ac.uk/study/research-degrees/entry-reqs/eng-lang-reqs) requirements apply where applicable. You will need a good honours degree and a Master’s degree in Statistics, Biostatistics or Data Science.

**Application advice:**

To apply please use the application link at the bottom of the web page <https://le.ac.uk/study/research-degrees/research-subjects/health-sciences>

With your application, please include:

* CV
* Personal statement explaining your interest in the project, your experience, why we should consider you in addition to confirmation of how you will pay your fees.
* Degree Certificates and Transcripts of study already completed and if possible transcript to date of study currently being undertaken
* Evidence of English language proficiency if applicable
* In the reference section please enter the contact details of your two academic referees in the boxes provided or upload letters of reference if already available.

In the funding section please state **HS-SF- Bhattacharjee**

In the proposal section please provide the name of the supervisors and project title (a proposal is not required)

**Project/Funding Enquiries:** Atanu Bhattacharjee (ab1183@le.ac.uk ), Francesco Zaccardi (fz43@le.ac.uk),

**Application enquiries to** **pgradmissions@le.ac.uk**