

Project Details	
Project Code	PHS27Br Lee
Title	From Prediction to Practice: Improving Diabetes in Primary Care
Research Theme	Population Health Sciences
Project Type	Dry lab
Summary	Healthcare is generating more data than ever. This data is being used to develop tools that help clinicians make diagnosis and treatment decisions. Yet most tools never become part of routine healthcare. This PhD will investigate how data-driven tools can be introduced into general practice to improve patient care. Based across the Universities of Bristol and Exeter, the student will develop expertise in both qualitative and quantitative research, including literature reviews, interviews with patients and clinicians, and analysis of healthcare datasets. Together, these approaches offer a unique opportunity to explore how healthcare innovations move from research into everyday clinical practice.
Description	Brief Background Healthcare is generating more data than ever. The shift from paper to electronic health records has accelerated the development of clinical prediction tools. These computer-based tools use patient information to help clinicians make decisions about diagnosis and treatment. For example, they can identify people at high risk of disease, refine diagnoses, and support more personalised treatment decisions. This is a rapidly evolving field, particularly with the emergence of artificial intelligence. However, most clinical prediction tools never become part of routine practice. Important questions remain about how they should be implemented, evaluated and monitored to improve patient care. These questions are particularly important in primary care. Most NHS patient contacts take place in primary care, where clinicians make decisions under conditions of uncertainty, competing priorities and limited consultation time. Clinical prediction tools may help clinicians make more informed decisions, but their successful implementation depends on factors such as usability, integration into clinical systems, and the needs of both patients and clinicians. Understanding these factors is essential if the benefits of clinical prediction tools are to be realised in routine care. We have developed clinical prediction tools to support diabetes diagnosis and treatment. These include tools that identify patients who may have been given the wrong type of diabetes diagnosis and tools that help predict which glucose-lowering treatment is most likely to work best for an individual patient. These tools have been evaluated using large electronic health record datasets and in routine healthcare settings. Considerable effort has focused on developing and evaluating clinical prediction tools. Far less attention has been given to understanding how they are adopted in practice, why they are used successfully in some settings but not others, and how their performance changes over time. Addressing these questions is essential if the benefits of clinical prediction tools are to be realised for patients, clinicians and healthcare systems. Key Research Question

	From Prediction to Practice: How and under what circumstances are clinical prediction tools successfully implemented and sustained in primary care? This project will link closely with ongoing MRC-funded research developing and evaluating clinical prediction tools to support diabetes care in primary care. The student will develop mixed-methods expertise in qualitative and quantitative research. Training will include evidence synthesis, interviews with patients and clinicians, and analysis of healthcare datasets. The project will combine these methods within a realist-informed framework to understand not only whether clinical prediction tools are used, but how, why, for whom and under what circumstances they are effective. To address this question, the project will comprise three work packages. (1) Work Package 1: Systematic Review and Realist Synthesis Objective: To develop an initial programme theory describing how clinical prediction tools influence practice. Description: The student will undertake a systematic search and evidence synthesis to identify how clinical prediction tools are implemented and used in primary care. Realist principles will then be used to develop an initial programme theory describing the contexts and mechanisms associated with successful implementation. To ensure feasibility, the review will focus a limited set of theories that can be tested and refined in the subsequent work packages. (2) Work Package 2: Qualitative Research Objective: To refine and test programme theories with patients and clinicians. Description: Building on findings from the realist synthesis, the student will undertake interviews and/or think-aloud studies with patients and clinicians in primary care. This work will explore trust, usability, communication of risk, integration into clinical workflows and factors influencing adoption in routine primary care. The findings will be used to refine the programme theories developed in Work Package 1 and identify factors that influence successful implementation across different primary care settings. (3) Work Package 3: Quantitative Data Analysis and Real-World Evaluation Objective: To evaluate the real-world use and equity of clinical prediction tools. Description: Using routinely collected healthcare data, the student will examine patterns of tool use, characteristics of users, and equity of access. This may include data from the Exeter Genomics Laboratory, which records referrals for genetic testing in diabetes and captures use of online diabetes classification tools developed by the research team. These data provide an opportunity to evaluate how clinical prediction tools are used in routine clinical practice. Student Ownership and Project Development During the preparatory period, the student will work with the supervisory team across the Universities of Bristol and Exeter to refine the review question, develop the realist-informed framework, and identify priorities emerging from the literature and ongoing research within the group. Depending on their interests, the project may place
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	greater emphasis on diabetes diagnosis, treatment selection, health inequalities, clinician decision-making, implementation of new technologies, or long-term monitoring of clinical prediction tools. Project Outcome The findings from all three work packages will be synthesised into an evidence-informed implementation framework describing how clinical prediction tools can be successfully introduced, evaluated, and sustained within primary care.
Can be completed part time?	No
Supervisory Team	
Lead Supervisor	
Name	Dr Charlotte Lee
Affiliation	Bristol
College/Faculty	Population Health Sciences
Department/School	Bristol Medical School
Email Address	charlotte.lee@bristol.ac.uk
Co-Supervisor 1	
Name	Dr Beverley Shields
Affiliation	Exeter
College/Faculty	Health and Life Science
Department/School	Exeter Medical School
Co-Supervisor 2	
Name	Professor Maggie Shepherd
Affiliation	Exeter
College/Faculty	Health and Life Science
Department/School	Exeter Medical School
Co-Supervisor 3	
Name	Professor Penny Whiting
Affiliation	Bristol
College/Faculty	Population Health Sciences
Department/School	Bristol Medical School