Title of PhD project	**Can machine learning applied to cardiac imaging help to understand the pathology of premature heart disease in South Asian populations?**	
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Co-Supervisor	Dr Sreenivasa Rao Kondapally Seshasai	SGUL
Co-Supervisor	Dr Poppy Mallinson	LSHTM
Co-Supervisor	Professor Sanjay Kinra	LSHTM
Brief description of project	Various ethnic minority groups such as South Asians have a high burden of heart disease. This PhD will use a unique and large dataset of cardiac ultrasound images from a rural population in India alongside other biochemical markers of cardiac pathology. The PhD will involve applying state-of-the-art machine learning techniques to over 5000 cardiac ultrasounds to automate detection of cardiac structures and pathology. To date most of these techniques have been limited to Caucasian populations in high-income countries. If successful, these techniques will have direct clinical impact in lower resource settings. The successful candidate will work as part of an international team of experts in this field, with opportunities for travel, collaboration, and training as per to the candidate's interests. They will generate novel and translatable insights into basic disease processes in this under-represented population group, as well as developing skills/methods in latest machine learning and statistical methodology. The supervisory team consists of clinicians, clinical epidemiologists and data scientists that have extensive subject knowledge.	
Skills we expect a student to develop/acquire whilst pursuing this project	Use and evaluation of AI-enabled algorithms to medical imaging; skills in machine learning-based statistical methods.	
Particular prior educational requirements for a student undertaking this project	Essential: Strong quantitative skillset, demonstrated by Masters' level training (e.g. epidemiology, biostatistics, data science) or equivalent.	

	Desirable: Background or interest in disease mechanisms/aetiology (in particular cardiometabolic/ cardiovascular diseases).
Project key words	Cardiac pathology Echocardiography Imaging Machine learning Statistics Disease mechanisms India
Possible under 1+4 route? Master's options identified.	Yes LSHTM - MSc Health Data Science LSHTM - MSc Epidemiology LSHTM - MSc Medical Statistics
MRC Core Skills developed through this project	Quantitative skills Interdisciplinary skills
MRC LID themes	Global Health Health Data Science
Further reading	[Artificial intelligence and echocardiography](#) [Deep learning evaluation of biomarkers from echocardiogram videos](#) [Machine Learning to Predict the Likelihood of Acute Myocardial Infarction](#)