



Title of PhD project	Novel satellite technologies and machine learning methods for big data environmental health studies	
Supervisor	Professor Antonio Gasparrini	LSHTM
Co-Supervisor	Dr Ai Milojevic	LSHTM
Brief description of project	<p>There is an increased interest on the impacts of environmental factors, such as air pollution and extreme temperature, on human health. The availability of new big data technologies, coupled with recent developments in health data science methods, offer tremendous opportunities to advance knowledge in this research area.</p> <p>This PhD project aims at extending epidemiological research on environment-health associations in the UK, making use of novel data and analytical resources such as satellite technologies and machine learning methods to produce, link and analyse country-wide environmental and health databases .</p> <p>The project will involve the development and application of hybrid spatio-temporal machine learning models to produce high-resolution exposure maps of environmental stressors. These data will be linked to health database to perform cutting-edge epidemiological analyses to estimate health risks across large populations.</p> <p>The PhD will involve training and research opportunities that will equip the student with high-level quantitative and technical skills in a promising research area.</p>	
Skills we expect a student to develop/acquire whilst pursuing this project	<p>The student will develop high-level quantitative skills in data analysis and regression modelling, in particular in the analysis of complex and large datasets. At the end of the PhD, the student will master sophisticated statistical methods, such as spatio-temporal modelling, machine learning, regression analysis, and statistical computing, potentially applicable in various research areas within beyond environmental epidemiology.</p>	
Particular <u>prior</u> educational requirements for a student undertaking this project	<p>The candidates are expected to have substantial skills in quantitative methods, including data analysis and computing, and an interest in environmental health research.</p>	

	<p>Knowledge of the R software and in epidemiological modelling is desirable, although not essential.</p> <p>The student will benefit from the availability of MSc modules and short courses on topics related to the PhD project, organized within LSHTM. In addition, the student will benefit from, and contribute to, the related themes within the Centre for Statistical Methodology at LSHTM.</p>
Project key words	<p>Big data Machine learning Satellite remote sensing Computing Air pollution Climate change</p>
Possible under 1+4 route? Master's options identified.	<p>Yes LSHTM – MSc Health Data Science LSHTM – MSc Medical Statistics</p>
MRC Core Skills developed through this project	Quantitative skills
MRC LID themes	Health Data Science
Further reading	<p>A satellite-based spatio-temporal machine learning model to reconstruct daily PM2.5 concentrations across Great Britain</p> <p>The case time series design</p>