Title of PhD project	**Using Wastewater Based Epidemiology (WBE) to Support Public Health**	
Supervisor	Dr Kath O'Reilly	LSHTM
Co-Supervisor	Dr Henry Staines	SGUL
Brief description of project	Wastewater Based Epidemiology (WBE) has been in use to understand circulation of pathogens and other public health challenges for decades, but in the midst of the COVID-19 pandemic WBE was rapidly expanded as part of the public health response in England. This included uses such as estimates of regional prevalence of infection and identify hotspots for incidence that were otherwise not detectable using clinical surveillance. This research was carried out in a collaboration with the Environmental Monitoring for Health Protection (EMHP) group, part of the UK Health Security Agency and LSHTM. As the UK emerges out of the pandemic, WBE will pivot towards other public health challenges. In this PhD, the student will have a unique opportunity to work closely with within the EMHP and acquire experience in how scientific research is used within government. An analysis of the impact of COVID-19 restrictions on prevalence (estimated using WBE) will be carried out using the available data and statistical analyses. At SGUL there will also be the opportunity to learn and undertake elements of wastewater testing. In particular, the development of cost-effective, mobile testing will be investigated for use in low resource settings, including for use in LMICs. For this, the student will make use of a battery operated, PCR-based testing platform that can detect SARS-CoV-2 within 30 minutes, developed by an industrial collaborator.	
Skills we expect a student to develop/acquire whilst pursuing this project	The ideal candidate would be keen to develop both quantitative skills, laboratory skills (e.g. processing and analysis of wastewater samples, using PCR assays) and interest in how science informs policy, with very good communication skills in order to communicate between different groups of experts.	

Particular <u>prior</u> educational requirements for a student undertaking this project	The ideal candidate would have both skills in quantitative analysis (e.g. statistics) and laboratory experience (e.g. molecular biology).
Project key words	Data science Modelling Policy Infectious diseases PCR
Possible under 1+4 route? Master's options identified.	No
MRC Core Skills developed through this project	Quantitative skills Interdisciplinary skills
MRC LID themes	Global Health Health Data Science Translational and Implementation Research Infectious Disease
Further reading	The QuantuMDx Q-POC™ SARS-CoV-2 RT-PCR assay for rapid detection of COVID-19 at point-of-care: preliminary evaluation of a novel technology Estimating SARS-CoV-2 prevalence from large-scale wastewater surveillance: insights from combined analysis of 44 sites in England