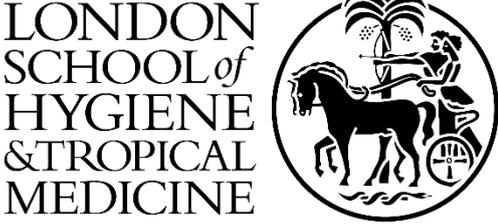


MRC LID Studentships: 2023-24 Research Project

	
<p>TITLE OF PROJECT</p>	
<p>Modelling the disorganised ecology of post-pandemic respiratory viruses</p>	
<p>SUPERVISORY TEAM</p>	
<p>Supervisor</p>	<p>Dr Rosalind Eggo Email: r.eggo@lshtm.ac.uk</p>
<p>Co-Supervisor</p>	<p>Professor Graham Medley Email: graham.medley@lshtm.ac.uk</p>
<p>PROJECT SUMMARY</p>	
<p>Project summary</p>	<p>The COVID-19 pandemic has disrupted the usually somewhat predictable parade of respiratory viruses in the UK. There are now epidemics out of season, changing age distributions of infections, modified vaccination schedules, and major non-pharmaceutical interventions.</p> <p>This PhD will examine what this disruption, and the following reorganisation of respiratory virus ecology can tell us about transmission. We will examine the dynamics of key pathogens, develop and test hypotheses using mathematical models, and fit those models to surveillance data using Bayesian methods.</p>
<p>Project key words</p>	<p>Mathematical modelling Epidemiology Respiratory viruses Methodological novelty</p>
<p>MRC LID themes</p>	<p>Infectious Disease Health Data Science</p>
<p>MRC Core Skills developed through this project</p>	<p>Quantitative skills</p>
<p>Skills we expect a student to develop/acquire whilst pursuing this project</p>	<ul style="list-style-type: none"> • Designing infectious disease models • Fitting infectious disease models to data • Bayesian methods for parameter inference and hypothesis testing • Subject-specific expertise on key pathogens • Programming and coding skills • Experience interpreting surveillance data • Scientific writing and presenting • Working as part of a team

<p>Is this project available for students applying for the 1+4 route? And possible Master's options identified by supervisory team</p>	<p>Route</p>	<p>1+4 = Yes +4 = Yes</p>
<p>Particular <u>prior</u> educational requirements for a student undertaking this project</p>	<p>Suitable Master's programmes</p>	<p>LSHTM - MSc Epidemiology LSHTM - MSc Control of Infectious Diseases LSHTM - MSc Medical Statistics LSHTM - MSc Health Data Science</p>
<p>PROJECT IN MORE DETAIL</p>		
<p>Scientific description of this research project</p>	<p>Prior to the COVID-19 pandemic, winter respiratory infections in the UK were somewhat predictable in timing, and depending on the pathogen, in the magnitude of the epidemic, and the age distribution of cases. Vaccination strategies for influenza were static, and surveillance systems were robust.</p> <p>The COVID-19 pandemic has thrown the regular seasonal patterns into disarray: RSV has caused epidemics in summer with older average age of infection, and one influenza strain (B/Yamagata) may have gone extinct. The effect on other infections (parainfluenzas, rhinovirus, adenovirus, human metapneumovirus) is less obvious, but all have been affected. A large amount of disruption is likely due to the intense non-pharmaceutical interventions employed, but there are also potentially biological impacts resulting from: changes in a variety of factors, including in sequence and frequency of early-life infections, in first exposure timing, seasonality, vaccination (for influenza).</p> <p>This PhD project will identify some hypotheses for the changes in epidemiology of these viruses (as above) with the focus determined in collaboration between the student and supervisors. We will then design novel transmission models that could address a hypothesis and fit these models to publicly available surveillance data.</p> <p>The overarching aim is to use the disruption to seasonal circulation to allow testing and inference on how the wintertime ecology of viruses in the UK is created and maintained, and potential outcomes.</p> <p>OBJECTIVES Determine biological or sociological mechanisms for the change in respiratory virus circulation in the UK following the COVID-19 pandemic.</p> <p>TECHNIQUES Hypothesis generation and testing. Mathematical modelling of virus transmission. Fitting models to observations using Bayesian methods.</p>	

	<p>DATA AVAILABILITY We will use publicly available surveillance data on respiratory pathogens drawn from UKHSA reports.</p>
<p>Further reading (Relevant preprints and/or open access articles)</p>	<p>https://doi.org/10.1038/s41591-020-0962-9</p> <p>https://rdcu.be/cXfV0</p> <p>https://pubmed.ncbi.nlm.nih.gov/17335858/</p>
<p>Additional information from the supervisory team</p>	<p>The supervisory team has provided a recording for prospective applicants who are interested in their project. This recording should be watched before any discussions begin with the supervisory team.</p> <p>To access the recording please contact the supervisory team by email. (You should provide them with the information outlined under MRC LID Applicant Guidance & FAQs Section 17. 'How do I start the conversation with the project supervisory team?'. They will then respond, and provide you with the recording to watch before further conversations are had.)</p>