

Title of PhD project / theme	Viruses and at-risk populations – the epidemiology and dynamics of respiratory viruses in groups with COPD and asthma
Supervisory team	<p>LSHTM supervisor: Rosalind Eggo (lead)</p> <p>Nagasaki supervisors: Lay Myint Yoshida, Michiko Toizumi</p>
Brief description of project / theme	<p>Respiratory viruses can be very dangerous for people who have pre-existing conditions, especially chronic respiratory conditions. Understanding how the changing circulation of viruses in the general population impacts the timing of risk of disease in these groups is needed, so that we can design interventions to prevent their spread.</p> <p>This PhD project will use hospital records from Nha Trang, Viet Nam, together with respiratory virus surveillance data from the same area (Yoshida et al. 2014), to understand the links between the timing of hospitalizations, the circulation of viruses, and other factors (such as climate) on populations with COPD and asthma.</p> <p>We will use paediatric respiratory clinical-epidemiological and virus surveillance data available from 2007 to 2018, and healthcare records available for the last 5 years. The surveillance data have age, date, and PCR test for pathogens. The healthcare records have principal reason for admission/attendance, age, date, and in some cases comorbidity information. It may be possible to use chart review to determine other factors.</p> <p>The project will involve epidemiological analysis of COPD and asthma hospitalisations in the study population. Then we will build mathematical models of respiratory virus transmission, and fit those models to available data using Bayesian methods (Eggo et al. 2016). The project also aims to run a prospective study to detect viruses in COPD and asthma patients admitted to hospital in Nha Trang. Prof Yoshida currently runs a viral surveillance programme in children in Nha Trang, which will support the further study in the COPD/asthma population.</p> <p>This project will contribute to understanding the transmission dynamics of common respiratory viruses and how those affect sub-populations who are more at risk of severe outcomes, due to pre-existing conditions like COPD and asthma.</p> <p>Eggo, Rosalind M, James G Scott, Alison P Galvani, and Lauren</p>

	<p>Ancel Meyers. 2016. "Respiratory Virus Transmission Dynamics Determine Timing of Asthma Exacerbation Peaks: Evidence from a Population-Level Model." <i>Proceedings of the National Academy of Sciences of the United States of America</i> 113(8): 2194–99.</p> <p>Yoshida, Lay-Myint et al. 2014. "Population Based Cohort Study for Pediatric Infectious Diseases Research in Vietnam." <i>Tropical medicine and health</i> 42(2 Suppl): 47–58.</p>
<p>The role of LSHTM and NU in this collaborative project</p>	<p>Prof Yoshida has a long-standing and impressive record in utilising the valuable data from the longitudinal paediatric surveillance study. Dr Eggo works on the dynamics and role of viruses in triggering COPD/asthma exacerbations in populations in the UK. This project offers an excellent opportunity to collaborate and bring complementary skills to an interdisciplinary project.</p>
<p>Particular <i>prior</i> educational requirements for a student undertaking this project</p>	<p>An MSc in a quantitative subject.</p>
<p>Skills we expect a student to develop/acquire whilst pursuing this project</p>	<p>The student will learn methods in epidemiology, statistical analysis, mathematical modelling of infectious disease, Bayesian parameter inference, and study design.</p> <p>They will build skills in scientific writing, as well as critical reading of the literature. The student will also learn to give clear scientific presentations communicating their work.</p>