

Title of PhD project / theme	Animal Reservoirs of Human Pathogens in Mindanao, The Philippines
Supervisory team	LSHTM: Julius Hafalla (lead) , Martin Hibberd and Chris Drakeley NU: Shingo Inoue (lead) , Kouichi Morita
Brief description of project / theme	<p>Bats and non-human primates, particularly macaques, are increasingly recognised as reservoir hosts of emerging pathogens for humans. For example, the Ebola virus Reston strain, which was first reported in macaques from the Philippines, presumably originated from bats. Also, macaques that harbour the malaria parasites Plasmodium knowlesi and P. cynomolgi present risks for zoonotic transmission. Anthropogenic activities that increase exposure to bats and macaques favour ecological spill-over of these and other emerging pathogens to humans.</p> <p>The aim of this One Health project is to generate baseline data on the disease ecology of bats and macaques in forested areas surrounding Davao City in Mindanao, where local people come in contact with wildlife. We will generate data on pathogen diversity and look for evidence of transmission to humans. Animals are surveyed in this region by capture and release techniques, and we will take advantage of these samplings to apply cutting edge molecular and serological techniques to look for evidence of current and historical pathogen exposure. For identified pathogens, we will utilise the human serum samples from fever patients in Mindanao, investigated in our previous Newton-funded project to determine shared exposures.</p> <p>References:</p> <ol style="list-style-type: none"> 1. Daszak P, et al. 2000. Emerging infectious diseases of wildlife - threats to biodiversity and human health. Science, 287: 443-448. 2. 2. Calisher, et al. 2006. Bats: important reservoir hosts of emerging viruses. Clinical Microbiology Review. 19:531.

	<ol style="list-style-type: none"> 3. Cunningham AA, et al. 2017. One Health, emerging infectious diseases and wildlife: two decades of progress?. <i>Philosophical Transactions of the Royal Society B: Biological Sciences</i>, 372(1725), 20160167 4. 4. Hayman DTS, et al. 2013. Ecology of zoonotic infectious diseases in bats: current knowledge and future directions. <i>Zoonoses Public Health</i> 60: 2-21.
<p>The role of LSHTM and NU in this collaborative project</p>	<p>This project is based on an existing collaboration/project between the LSHTM and the Philippines (University of the Philippines – Mindanao). Notably, the NU and the Philippines have previously worked before. The LSHTM has expertise in genomics, immunology, epidemiology and data analysis. The NU has specific interests in the development of diagnostics for mosquito-borne infections.</p> <p>The LSHTM will take the lead in ensuring that the field work in the Philippines is in place, with proper ethical clearances and permits obtained. The LSHTM will direct the molecular surveillance, and will work closely with the NU in expanding and developing serological techniques for mosquito borne infections. The PhD student will spend time in the UK and in Japan to ensure that panels for both molecular and serological surveillance are comprehensive to meet the objectives of the project.</p>
<p>Particular <i>prior</i> educational requirements for a student undertaking this project</p>	<p>A 2:1 BSc degree or equivalent in the Biological Sciences, with basic knowledge of Immunology is required.</p> <p>A MSc degree in Molecular Biology, Immunology, Biology or related field is ideal.</p>
<p>Skills we expect a student to develop/acquire whilst pursuing this project</p>	<ul style="list-style-type: none"> • Molecular surveillance • Serological surveillance • Data analysis • Collaborative skills