Title of PhD project	**Spatial transmission of influenza and dengue fever in the Western Pacific**
Primary Supervisor	**Dr Adam Kucharski**, LSHTM
Associate Supervisor	**Prof John Edmunds**, LSHTM
Brief description of project	Acute infections such as influenza and dengue fever are responsible for substantial disease burden in the countries of the Western Pacific. The re-emergence of dengue virus serotype-3 in 2013 and its rapid spread across the region has highlighted the need to understand routes of disease transmission, and implications for disease control. In particular, it is important to establish which factors influence the spatial spread of dengue fever and influenza, and whether certain areas act as hubs for infection. Such information could also provide insights into the transmission of other human-to-human and vector borne infections, including novel emerging pathogens.
	To address these questions, the project aims to investigate disease transmission patterns within and between the 23 countries of the Western Pacific region. This will involve combining surveillance data from these countries with mathematical models of disease transmission and statistical inference methods. Data include reports of influenza-like and dengue-like illness; virological confirmation and sequence data; and commercial airline data on flight routes and passenger volumes between countries.
	The project will be in collaboration with WHO Division of Pacific Technical Support (Fiji), and may require travel to the region to conduct research. By developing a better understanding of the spatial spread of dengue fever and influenza in the Pacific, the work will provide important guidance for preparing and responding to communicable disease outbreaks in the region.
Particular <u>prior</u> educational requirements for a student undertaking this project	The project will require some prior knowledge of epidemiology and statistics. Experience of programming, for example with R, and of using mathematical models would also be beneficial.
Skills we expect a student to develop/acquire whilst pursuing this project	- Learn to design and construct disease transmission models relevant for public health. - Develop knowledge of statistical inference and techniques for analysis of large datasets, including phylogenetic methods.