Title of PhD project / theme	**Development of novel mosquito sampling tools / methods**
Supervisory team	Nagasaki team: Tomonori Hoshi (lead) / Satoshi Kaneko LSHTM team: James Logan (lead) / Victor Brugman
Brief description of project / theme	Mosquitoes are the most medically important biting insects, responsible for significant morbidity, mortality and economic burden worldwide. Surveillance of local mosquito populations is an integral component of vector-borne disease risk monitoring, and intervention planning and evaluation. Sampling of adult vector populations is routinely carried out through adult-trapping, although the cost and design of currently available traps can be a major obstacle to obtaining essential data. Moreover, the logistics of sourcing additional traps or replacement components in the field can be extremely challenging. Our previous study demonstrated how 3D-printed trap could be used to overcome such challenges in the UK (Hoshi et al, 2019). This project will further address these problems by utilising recent advances in low-cost 3D printing technologies.
The role of LSHTM and NU in this collaborative project	Specifically the project will: • Utilise the technical capacities and expertise of Nagasaki University to identify low-cost 3D printing technologies relevant to trap printing and field-deployment. • Utilise the expertise and knowledge base at LSHTM in mosquito behaviour and chemical ecology to develop improved trap designs tailored to specific mosquito species. • Generate prototype traps that and utilise free-flight facilities at LSHTM to test optimise trap designs. • Utilise established LSHTM collaborations and field sites to test prototypes in a relevant field setting (e.g. the collection of *Aedes aegypti* mosquitoes in Cali, Colombia; and the collection of *Anopheles* species on the Bijagos islands of Guinea-Bissau). • Investigate the feasibility of integrating 3D printers in field environments as part of ongoing vector surveillance measures.
Particular *prior* educational requirements for a student undertaking this project	The ideal candidate will possess a masters or undergraduate degree (minimum) and have a passion for innovation, design and controlling vector-borne disease. Experience of entomological methods and fieldwork would be an advantage.

Skills we expect a student to develop/acquire whilst pursuing this project	Students will develop the following skillsets: • 3D modelling software and use of 3D printing hardware • Mosquito sampling and identification techniques • Experimental design of laboratory and field studies • Data handling and statistical analysis • Presentation and dissemination of results to different audiences