Title of PhD project / theme	A refugee birth cohort: using a unique big dataset to explore the effect of newborn health on subsequent child health and education outcomes, in a vulnerable population facing protracted conflict.
Supervisory team	Oona Campbell (oona.campbell@lshtm.ac.uk), from the LSHTM will be the lead supervisor. She has extensive PhD supervision experience and can address aspects relating to the epidemiology of maternal and newborn health (MNH). Two Nagasaki University professors will co-supervise this project: 1- Assistant Professor Miho Sato (mihos@nagasaki-u.ac.jp), from the School of Tropical Medicine and Global Health at Nagasaki University. Miho Sato has experience in research and development projects focusing on health systems and reproductive health and has worked in various Middle Eastern contexts on post-conflict health systems and on refugee health (Jordan, Afghanistan). 2- Professor Yasuhiko Kamiya (ykami@nagasaki-u.ac.jp), also from the School of Tropical Medicine and Global Health at Nagasaki University, is a Pediatrician with extensive experience in childhood infectious diseases in low and middle-income settings, and experience in the Middle East (Iraq) and refugees (UNHCR). He also brings the perspective of access for children with disability, which will be relevant for both access to health services and education We propose to use data from the United Nations Relief and Works Agency for Palestine Refugees (UNRWA), and have previously worked closely with the head of health in UNRWA, Dr Akihiro Seita. Dr Seita has an honorary appointment at Nagasaki University, and while he is not eligible to be a co-supervisor, he will be involved in the research that the PhD student undertakes. We will also work with Dr Hala Ghattas from the American University of Beirut.

Brief description of project / theme	In low-resource populations, relatively little is known about outcomes by gestation (besides mortality), particularly beyond the first months of life. The main design of this study is to build the first birth cohort of protracted refugees using linked mother and child health, nutrition and education records from existing data with unique identifiers.
	The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) has helped Palestinian refugees since 1950 in five countries/territories: Jordan, Lebanon, Syria, West Bank and Gaza, with Headquarters (HQ) in Jordan. UNRWA services include comprehensive health-care, education, social services, camp infrastructure and improvement, and emergency assistance. In recent years, UNRWA has invested substantially in an electronic data-infrastructure, generating several years' worth of electronic data that can be linkable through unique identifiers. The total UNRWA population of eligible beneficiaries is around 5 million refugees. This yields enormous statistical power to look at the individual and clustered data (144 health centres, 708 schools, 62+ geographic locations (camps/ multiple informal gatherings) and 5 countries/territories).
	The unique data have features rarely found in other longitudinal population studies or Health and Demographic Surveillance Sites (HDSS) in LMICs:
	● A large mainly urban-slum dwelling population. With exceptions (e.g. Brazil's 100-million cohort), large longitudinal population studies and HDSS are generally rural.
	● Geographical dispersion in 62+ camps/ gatherings within/across 5 countries/territories, seeking services in 144 health centres and 708 schools. These variations in geographies and facilities permit clustered analyses.
	● Settings that have undergone epidemiologic transition, with substantial non-communicable disease (NCD), mental ill-health and injury-associated burdens
	● A first for the Arab region, which currently has no HDSS or sizeable longitudinal population studies.
	UNRWA records include:
	● maternal health records (since 2013) on preconception care, antenatal care visit data (parity, blood pressure, glycemia…), place of birth, pregnancy outcomes, delivery care, post-natal care.
	● child health records (since 2013) including immunization and growth monitoring
	● child education records (since 2016) including socioeconomic status (Social Safety Net, parental education status and employment…) enrolment, transfer, grades, attendance, drop-out.

	The main design of this study is to build the first birth cohort of protracted refugees and link maternal and child health records to child education records. Our main research topic includes:
	Determining how gestational age, birthweight and mode of delivery characterize subsequent outcomes including mortality, child growth (5 years follow up), and morbidity and health-facility attendance rates.
	Exploring how different birth outcomes by gestational age and mode of delivery influence school enrollment age at school attendance and school academic performance. We note that except for Lebanon where are kindergartens, most children are enrolled at age 7 and so those born in 2013 will only just be starting school. This component will be a proof-of- concept
	We have a provisional agreement with UNRWA to use the data.
The role of LSHTM and NU in this collaborative project	We will conduct conversations to explore mutual interests and to focus the research question of interest in alignment with the mutual interests of the LSHTM and Nagasaki researchers, and UNRWA. Miho Sato brings experience working with refugees and a health systems perspective and Yasuhiko Kamiya brings experience in childhood infectious diseases and childhood disability and access. This complements Oona Campbell's knowledge of epidemiologic methods and maternal and child health issues and will build both organizations' capacities in the areas of health systems for vulnerable populations and to improve MNCH. At LSHTM we hope to learn from Japan's traditions of supporting good health management information systems data in LMICs. All three supervisors have experience in the Middle East.
	If successful, we will work to meet face-to-face, share responsibilities ensuring the student develops a good protocol, and meet regularly via skype or zoom. The student will spend time in the Japan and in the UK, as well as in the Middle East region and the relevant stages of planning, conducting the study, and writing up results. With agreement, it may be possible to host the student at the American University of Beirut Centre for Research on Population and Health or at UNRWA offices.
Particular *prior* educational requirements for a student undertaking this project	- Master's degree in relevant public health (epidemiology) or nutrition-related fields - Strong analytical, quantitative research skills; experience analysing quantitative data - Knowledge of Stata and/or R software - Proven excellent interpersonal, and organizational skills - Fluent in spoken and written English and Arabic - Demonstrated experience in working with refugees (highly desirable)
Skills we expect a student to develop/acquire whilst pursuing this project	By pursuing this study, the student will: Develop skills to manage big data and link multiple electronic records

	- Develop approaches and algorithms to assess data quality - Learn techniques to manage missing data (e.g. multiple imputation) - Learn to analyse longitudinal data from a cohort - Learn about substantive issues in the field of maternal, newborn, and child health and nutrition - Develop paper-writing skills