Research Fellow in Mathematical Modelling

FURTHER PARTICULARS

The School

The London School of Hygiene & Tropical Medicine is a world-leading centre for research and postgraduate education in public and global health. Our mission is to improve health and health equity in the UK and worldwide; working in partnership to achieve excellence in public and global health research, education and translation of knowledge into policy and practice.

Founded in 1899 by Sir Patrick Manson, the School has expanded in recent years at its two main sites on Keppel Street and Tavistock Place. The School’s multidisciplinary expertise includes clinicians, epidemiologists, statisticians, social scientists, molecular biologists and immunologists, and we work with partners worldwide to support the development of teaching and research capacity.

Research income has grown to over £85 million per year from national and international funding sources including the UK government, the European Commission, the Wellcome Trust and philanthropic sources.

Education programmes have grown to more than 1,000 London-based Master's and Research students, 2,900 studying Master's by distance learning and 1,000 on short courses and continuous professional development. We have also launched a series of free online courses, and more than 15,000 people registered on the first of these, Ebola in context. Our staff, students and alumni work in more than 150 countries in government, academia, international agencies and health services.

The School is highly ranked in various university league tables. It was named the world’s leading research-focused graduate school in the Times Higher Education World Rankings in 2013. In 2014, it was ranked in the top 10 universities in the world for citation rate by the new EU-supported U-Multirank database, fourth in the world for impact in medical sciences by the Leiden Ranking and third in the world for social science and public health in the US News Best Global Universities Ranking. According to the results of the UK government’s Research Excellence Framework, published in December 2014, the School was ranked second overall (after the Institute for Cancer Research) on the key measure of impact.

THE FACULTY

The Faculty of Epidemiology & Population Health (EPH) houses a large group of epidemiologists, demographers, statisticians and nutritionists working on issues of major public health importance in the UK and globally. EPH has approximately 400 staff members organised into four research departments.
The Faculty has a teaching programme consisting of ten MSc courses: Epidemiology, Demography and Health, Medical Statistics, Public Health in Developing Countries (run jointly with the Faculties of Infectious & Tropical Diseases and Public Health & Policy), Nutrition for Global Health, Reproductive & Sexual Health Research, Veterinary Epidemiology (run jointly with the Royal Veterinary College), Global Mental Health (run jointly with Kings College London - Institute of Psychiatry) and the Distance Learning courses in Epidemiology and Clinical Trials. The Faculty also has approximately 120 research students studying for an MPhil, PhD or DrPH degree.

The Dean of Faculty is Professor John Edmunds.

The Department

The Department of Infectious Disease Epidemiology conducts research on the epidemiology and control of infectious diseases of public health importance. It also conducts research on maternal and neonatal health. Work is carried out in low, middle and high income countries, including the United Kingdom. Research ranges from ecological studies of variations in disease frequency in different populations, through observational case-control and cohort studies to define risk factors for disease, to randomized controlled trials to test the impact of specific preventive and curative interventions.

The Vaccine Centre

The Vaccine Centre at the London School of Hygiene & Tropical Medicine is a newly formed consortium of over 100 scientists based at the school and among its partner institutions with a common interest in research and training on vaccines. The Centre encompasses a tremendous breadth of vaccine research from vaccine design and immunological characterisation through clinical trials, and on to epidemiological evaluation, vaccine safety, economic modelling, social science and policy analysis. Centre scientists work in over 50 different countries worldwide and contribute to some of the principal global networks of vaccine investigation. The portfolio of current projects includes research on vaccines to control malaria, tuberculosis, pneumococcal and meningococcal diseases, influenza, measles, HPV, rotavirus, Hib, Hepatitis B, sleeping sickness and traveller’s diarrhoea as well as veterinary pathogens. The Centre also aims to enhance the teaching of vaccine research skills spread across the School’s post-graduate training programmes and in the short course for the Epidemiological Evaluation of Vaccines run each July.

Centre for the Mathematical Modelling of Infectious Diseases (CMMID)

The Centre for the Mathematical Modelling of Infectious Diseases is a multidisciplinary grouping of epidemiologists, mathematicians, economists, statisticians and clinicians from across all three faculties of the LSHTM. Research focuses on understanding and predicting the epidemiology of infectious diseases so that more effective control programmes can be devised. Researchers are developing and applying mathematical models to a range of infections including HIV and other sexually transmitted infections, HPV, tuberculosis, hepatitis C, influenza, rotavirus, measles, varicella, pneumococcal disease, Hib, malaria and sleeping sickness. More fundamental research includes developing methods to measure underlying contact patterns, sampling hard-to-reach populations (such as drug users), efficiently fitting complex mathematical models to data, and the integration of epidemiological models with economic analyses. CMMID runs the
flusurvey, an online influenza surveillance platform. CMMID is actively engaged in developing links with other modelling groups; members of the CMMID include mathematical modellers working at Public Health England (formerly the HPA) and the Royal Veterinary College.

Public Health England

Public Health England provides strategic leadership and vision for protecting and improving the nation's health. Its ambition is to lead nationally, and enable locally, a transformation in the health expectations of all people in England, regardless of where they live and the circumstance of their birth. It will achieve this through the application of research, knowledge and skills. PHE is an executive agency of the Department of Health. It is a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

Within Public Health England, Health Protection Services carries out a broad spectrum of work relating to prevention of infectious disease. Its remit includes infectious disease surveillance, providing specialist and reference microbiology and microbial epidemiology, coordinating the investigation and cause of national and uncommon outbreaks, helping advise government on the risks posed by various infections and responding to international health alerts.

Health Protection Research Unit (HPRU) in Immunisation

The National Institute for Health Research (NIHR) Health Protection Research Unit in Immunisation is a unique partnership between the London School of Hygiene & Tropical Medicine and Public Health England creating a dynamic fusion of academic research and public health implementation that rapidly translates scientific advances in immunization into measurable benefits for society.

The immunisation system is one of the most powerful tools available to protect the health of the population and, in England, it is one of the most highly developed in the world. Each new vaccine is assessed by monitoring the amount of disease that occurs in the population, estimating the effect of the vaccine on that disease burden using mathematical models, and calculating the costs and the health benefits of the vaccine programme using economic analyses.

The HPRU sustains and refines this process by optimising the tools for surveillance and evaluation and increasing health benefits across the whole of society. We use state-of-the-art electronic health record systems to streamline the evaluation of disease burden in the population and produce rapid assessments of vaccine impact and vaccine safety. We explore the differences in uptake of vaccines in different groups and research the factors driving these differences in order to improve vaccine coverage and generate an equitable health protection system through immunisation. We investigate the delivery of vaccines through general practices, pharmacies and schools to work out the most efficient methods for giving each type of vaccine and we examine the way the NHS works with society in order to optimize vaccination uptake.

The results of our work are delivered rapidly to the Joint Committee on Vaccination and Immunisation, the policy-setting body within the Department of Health, in order to impact quickly on immunization policy and optimize the vaccine programme in England and Wales.

***************************************************************************************************************************************
Job Description

POST (FTE): Research Fellow  
RESPONSIBLE TO: Dr. Katherine Atkins

We are seeking an enthusiastic Research Fellow to join the Health Protection Research Unit (HPRU) in Immunisation. The successful candidate will work with the mathematical modelling and economic evaluation team to understand the impact of immunisation on vaccine-preventable disease. The post-holder will be a member of both the Vaccine Centre and the Centre for the Mathematical Modelling of Infectious Diseases and will be based within the Department of Infectious Disease Epidemiology, but will also work closely with modellers and epidemiologists at Public Health England. The post-holder will design and apply mathematical models to address policy decisions around vaccination in England. The person appointed will prepare research findings both for policy makers as well as for scientific publication.

Duties and responsibilities

Core activities

Research  
The post holder will be expected to:

- Lead the design and application of mathematical models to address policy questions about vaccination in the UK.
- Work with epidemiologists and surveillance scientists at PHE in order to analyse surveillance data to inform model design/parameterisation, as well as to give input on the design of future surveillance activities.
- Keep abreast of relevant scientific and policy developments related to vaccination in the UK and abroad.
- Understand and discuss methodological research in topics relevant to vaccine modelling, such as uncertainty analysis, model calibration, statistical inference and high performance computing.
- Collaborate closely with economists for the development of cost-effectiveness models of vaccination.
- Collaborate with modellers and other technical experts in the UK and abroad who are working on related topics.
- Write academic papers for peer-reviewed journals.
- Communicate model results in both reports and oral presentations to inform evidence-based policy decisions (such as advising the Joint Committee on Vaccination and Immunisation).
- Work independently, but with the support of others in the modelling and economic evaluation team.
- Lead and/or contribute to reports and other updates to provide timely and accurate information about the progress of work to funders.
- Contribute appropriately to the academic life of the Department, Faculty and School.
- Undertake other duties as may be required by his/her line manager.

Teaching

- The post-holder will be expected to contribute up to 15% of their time to teaching in the Faculty to be negotiated with their line manager and the Faculty Taught Course Director. This may include: tutoring 1-2 MSc students (or distance learning equivalent); teaching
seminar or practical groups; undergoing training in teaching skills (essential unless you have done this training before).

Citizenship

- To present work to School staff at Departmental seminars, and to other audiences at conferences, as requested.

Person Specification

Essential criteria

- PhD in mathematical modelling or equivalent research experience
- Experience in mathematical modelling of infectious diseases
- Proven ability to use a coding language to solve modelling problems (e.g. R, Matlab, C++, Python etc.)
- Proven ability, as evidenced by existing or potential publications, to publish in leading journals
- Evidence of ability to work independently and meet tight deadlines

Desirable criteria

- Experience in Bayesian model fitting techniques
- Experience in modelling using ordinary differential equations
- Experience in health economic evaluation
- Knowledge of vaccine-preventable diseases, such as rotavirus

Salary and conditions of employment

The post is full time and is available immediately until 31 March 2017 initially, with the possibility of extension. The appointment will be made on the Academic Pathway Grade 6 scale £37,889-£43,028 per annum inclusive. The post will be subject to the LSHTM terms and conditions of service. Annual leave entitlement is 30 working days per year. In addition to this there are discretionary “Director’s Days”. Membership of the Pension Scheme is available.

ASYLUM & IMMIGRATION

The School will comply with the Immigration, Asylum and Nationality Act 2006, which requires all employees to provide documentary evidence of their legal right to work in this country prior to commencing employment. Candidates will be required to bring their passport (and visa if applicable) to interview so that it can be copied and verified.

Applications from candidates who require sponsorship to work in the UK will be considered alongside other applications. Applicants who do not currently have the right to work in the UK will have to satisfy UK Visas & Immigration regulations before they can be appointed.

Further information about Certificate of Sponsorship and eligibility to work in the UK, can be found at: www.ukba.homeoffice.gov.uk/employers/points