Mathematical Modelling PhD Student Placement at UKHSA (x 3)

What is the UKHSA?

The UK Health Security Agency (UKHSA) is a newly formed executive agency, sponsored by the Department of Health and Social Care. The UKHSA will revolutionise UK health protection, providing intellectual, scientific and operational leadership at national and local level, as well as on the global stage. It will ensure the nation can respond quickly and at greater scale to deal with pandemics and future threats.

UKHSA will plan for the next phases of the pandemic, ensuring COVID-19 related activities are operating effectively to manage the transmission and impact of the virus. The agency will also help support wider key lessons learned from the pandemic to keep our nation safe, both now and in the future.

Science and research will be at the core of UKHSA. It will bring together world-leading public health science, cutting-edge capabilities in data analytics and genomic surveillance, and at-scale testing and contact tracing to respond appropriately to all potential health hazards.

The Agency will play a crucial role in global health security, providing public health leadership at international, national, and local levels, and working to reduce health inequalities.

Key strands of work will include:

- developing surveillance and modelling capabilities to inform action at national and local levels to protect the country's health
- increasing the country's world-leading genomic capabilities to respond rapidly to emerging threats through establishment of a New Variant Assessment Platform (NVAP)
- supporting and delivering clinical guidance and communications tailored to the needs of different populations and areas
- providing agile testing services at scale with rapid and effective contact tracing services, working in partnership with local authorities

You will be working with a highly motivated and passionate group of people, who have come together from across the country, to work on the biggest health and economic challenge that our nation has ever faced. You will be working alongside them in an exciting and fast paced environment with an unparalleled opportunity to make your mark on government policy and the future of UK health protection.

We have all been affected by COVID-19. This is a unique opportunity to help and make a difference, working to produce the evidence to support the most effective public health action on COVID-19 and wider global health security priorities.

What is the PhD student placement scheme?

The PhD student placement scheme is part of the Early Career Researcher (ECR) programme, which aims to improve organisational capability by bringing in specialist and expert skills to UKHSA and serves to attract a pipeline of future talent and strengthen organisational links with academia. These time limited PhD student placements provide benefits for both the organisation and individual, through increased organisational capability and by providing an exciting and varied career opportunity. As well as work

experience, the placement also provides a pastoral and development programme, together with opportunities for technical skills development.

What roles are available?

There are three roles available for PhD students with strong mathematics and statistical backgrounds for short-term placements from December 2021 /January 2022 until 31st March 2022.The UKHSA will buy out your stipend for the 3-motnhs of the placement. You will be placed into a role within either the Health Analysis Directorate and Data Directorate or Data Science Directorate and provided a project on which to work for 3-months.These are multi-disciplinary analytical directorates of more than 100 individuals each, working at the forefront of the response to COVID-19.

The work of the directorates spans a range of analytical objectives and themes across descriptive epidemiology, genomics, cluster analysis, vaccines, behavioural science, infectious disease and biostatistical modelling, strategic research partnerships and innovation, environmental monitoring and health protection and wastewater and product development/delivery.

The exact duties of the post holder will be determined by the current business requirements, which can change at pace. However, previous roles have included involved in Model development, Bayesian modelling of the pillar 4 prevalence studies, development, management, and running of the epidemiological modelling review group data pipeline, developing the deployment of epidemiological models for the generation of the R number, providing data engineering support for the epi-ensemble modelling group and case Fatality Risk Modelling.

Supervision would be provided on a day-to-day basis by the line manager with support from other team members. You will be part of the wider ECR Programme and so will have regular catch ups with the Programme lead to discuss development goals and wellbeing.

As the work is separate from your PhD and requires security clearance to conduct (see below), you will be unable to discuss the specifics of the work with others, including your PhD supervisor.

What would my responsibilities be?

We are looking for candidates who can

- Work within a team of analysts with a range of analysis, assessment and product development responsibilities, often working to tight timelines
- Deliver analytical skills and be adept at finding, analysing and manipulating large scale data sets
- Communicate and clearly present key insights to key stakeholders, from a variety of qualitative and quantitative sources
- Assist communicable disease control, health protection and public health colleagues across the UK during major health protection incidents
- Successfully manage your time and prioritise effectively, working under own initiative and responding to unexpected demands whilst maintain a professional, calm and efficient manner
- Engage with partners in wider government, academia and the private sector to gain access to new data sources and information
- Establish and maintain positive relationships and collaborations internally and externally and contribute to the culture and development of the Health Analysis Directorate, the ECR programme and the UKHSA as a whole

What knowledge and experience do I need?

Essential

- A PhD student who can work across different disciplines and specialises in epidemiology, statistics or mathematics or an allied discipline
  Experience in either R or Python or an equivalent mathematical programming language
- Excellent oral and written communication skills with proven presentation and scientific report writing skills
- Experience of working with complex and large datasets and information feeds to draw relevant conclusions
- Experience of working at pace to deadlines across multiple projects, being flexible and adaptable to change
- Able to build and maintain effective relationships with co-workers and key stakeholders across government and other departments to source data, enhance your analysis or set requirements
- Demonstrable experience of strong stakeholder management, both written and verbal, utilising your presentational skills to turn analysis into accessible and engaging products and presenting them to stakeholders

Desirable

- Experience in GIS, network analysis or SQL is desirable
- Knowledge and experience of common statistical tests, analyses and interpretation of results
- Experience of building and validating numerical mathematical models (preferably with a Bayesian element), interpreting and evaluating epidemiological data, sensitive health data analyses and performing analytical epidemiology in outbreak situation

The desirable skills can be developed in post.

What qualifications do I need?

Essential

- Enrolled on a PhD in a relevant discipline (e.g., Statistics, Mathematics, Data science, Research methods, Genomics, Public health policy, Epidemiology, Infectious diseases, Social and Behavioural Sciences or similar)
- A 2:1 degree in a relevant discipline (e.g. Statistics, Mathematics, Biological Sciences, Social Research or similar)

What technical skills do I need?

We'll assess you against these technical skills during the selection process:

- Use of new data sources to solve complex analytical questions, this may refer to a data set presented during the interview for those candidates invited for interview.

- Understanding of epidemiological techniques and their application to real-world, complex problems
- Application and interpretation of new or incomplete data sets
- Presentation and visualisation of complex data

We ask for evidence of these technical skills on your application form:

- Application and interpretation of new or incomplete data sets

What are the benefits?

Visiting worker agreement with UKHSA that enables access to the below:

- Stipend reimbursement for 3 months, paid to your University/Research Body.
- Travel expenses up to the value of £2,400 for the duration of the placement, on provision of approved receipts
- A development opportunity to gain experience, exposure, skills, knowledge and network
- Access to ECR Training Programme, previous sessions have included Leadership, Constructive Conversations and Project Management
- Membership of the ECR Network, including a buddy system
- Access to the UKHSA Seminar programme (e.g. Lunch and learns, seminars and lectures with partners including the Alan Turing Institute and the Joint University Pandemic and Epidemic Response (JUNIPER) modelling consortium
- Learning and development tailored to your role
- An environment with flexible working options
- A culture encouraging inclusion and diversity
- An opportunity to understand how research impacts on policy and practice and have an insight into policy making.

Where will I be located?

Currently, this role will be home-based with travel to UKHSA office in London if required. Please note, the department may change the place of work to any place within reasonable travelling distance of your home address if there is a business need to do so. This should be considered when applying for this role. You must be a habitual resident in the UK to apply for this role and your home address, from which you would undertake this role if successful, must be in the UK.

Security

Successful candidates must pass a disclosure and barring security check.

People working with government assets must complete basic personnel security standard checks. As part of this you must provide appropriate documentation to verify ID, nationality, employment and/or academic history and criminal record (unspent convictions only).

UKHSA reserves the right to request additional security checks, should the nature of the work necessitate this.

Nationality requirements

This job is broadly open to the following groups:

UK nationals

Students who can demonstrate a right to work in the UK before starting the placement

How do I apply?

1. If you have informal enquiries about the process of application, the UKHSA and the type of experience you will gain from the placement, please use the contacts below.

2. Please check that you have the permission of your supervisor (and funder, if applicable) to apply. You will need agreement that you can be released from your PhD (i.e. take a 3-month pause of studies) to take on the full-time position (37.5 hours FTE, or in line with student visa allowances).

3. Please send the below to JBC.researchandpartnerships@dhsc.gov.uk by 23:55 15th November 2021
   a. Your CV (2 sides max) without identifying details (e.g. remove your name, contact details, academic institution)
   b. Tell us about piece of analysis, including a description of the data sources, methods, limitations, results and conclusions (250 words)
   c. A statement demonstrating application and interpretation of new or incomplete data sets (250 words)
   d. Confirmation of relevant permission(s)

4. Applications will be assessed for suitability and candidates will be invited for an informal interview (via Microsoft Teams) with prospective line managers at UKHSA. The interview will include an assessment of technical skills. You will be provided with a 'data task' 1 hour prior to your interview slot via email. You will then present your analysis in a presentation during your interview. The data task is aimed at understanding how you approach the data and problem and there are no right or wrong answers.

5. Sifting and interview dates are to be confirmed. Feedback will only be provided if you attend an interview.

6. Applicants who are successful at interview will be invited to begin the security clearance procedures and be asked to sign the Visiting Worker Agreement. Appointment is subject to successful clearance of security checks, which must be completed before the placement can begin and an expected start date is December 21 or January 22. Students are advised to wait until their start date is confirmed, before 'pausing' their PhD.

In summary, applications will open from 11th October and close on 15th November 2021.

Reasonable Adjustment

The Civil Service embraces diversity and promotes equal opportunities. As such, we run a Disability Confident Scheme (DCS) for candidates with disabilities who meet the minimum selection criteria. If you

need a change to be made so that you can make your application, you should: Contact us via JBC.researchandpartnerships@dhsc.gov.uk as soon as possible before the closing date to discuss your needs.

Contact Details

For informal enquiries on the placement, please contact Matt Butchers matt.butchers@ktn-uk.org and Professor David Abrahams ida20@cam.ac.uk . Both Matt and David are experienced in facilitating placements between academia, industry and government and can answer any general questions you or your supervisors may have.

For queries on the outlined role please contact Sophie Walsh at JBC.researchandpartnerships@dhsc.gov.uk

Data sharing

Your application may be shared and discussed between UKHSA and representatives from the KTN and Isaac Newton Institute, who have helped to facilitate this opportunity.