Job title	Postdoctoral Researcher
Division	Medical Sciences
Department	Nuffield Department of Medicine
Location	Pandemic Sciences Institute, Li Ka Shing Centre for Health Information and Discovery, Old Road Campus, Oxford, OX3 7LF
Grade and salary	Grade 7: Salary in range £36,024 - £44,263 per annum
Hours	Full time
Contract type	Fixed-term contract for 30 months Funding provided by the Wellcome Trust
Reporting to	Research Fellow
Vacancy reference	169094

Hybrid working arrangements	**The successful person will need to work on site for a minimum of 3 days per week**
Additional information	This role meets the eligibility requirements for a Skilled Worker Certificate of Sponsorship or a Global Talent Visa under UK Visas and Immigration legislation. Therefore, the Nuffield Department of Medicine welcomes applications from international applicants who require a visa.
About us	• University of Oxford - www.ox.ac.uk/about/organisation • Nuffield Department of Medicine (NDM) - https://www.ndm.ox.ac.uk • Unit - https://www.psi.ox.ac.uk/
What we offer	https://hr.admin.ox.ac.uk/staff-benefits • An excellent contributory pension scheme • 38 days annual leave • A comprehensive range of childcare services • Family leave schemes • Cycle loan scheme • Discounted bus travel and Season Ticket travel loans • Membership to a variety of social and sports clubs • A welcoming and diverse community

The role

We are seeking a Postdoctoral Researcher to build new methods and frameworks for understanding and predicting the spread of infectious disease using serologic and virologic data. This post is funded by the Wellcome Trust award: *Developing the next generation of epidemiological analytics using individual-level virologic and serologic data*. You will work closely with Dr James Hay to develop alternative approaches to infectious disease surveillance through understanding the pathogen, immunological and operational factors which guide our interpretation of epidemiologic data collected through routine surveillance and testing.

The project

Individual-level, quantitative biomarker data, such as antibody titers and viral loads, are now routinely collected at scale. Our work has shown that these data can be analysed at a population level to estimate epidemic trends, inform testing strategies for outbreak management, and reconstruct individual-level immune profiles. This is an exciting area of infectious disease epidemiology with much room for innovation (e.g. see https://doi.org/10.7554/eLife.58989, https://doi.org/10.1126/science.abj4185). In this project, you will conduct research to better understand how within-host and epidemiological factors, choice of diagnostic test and sampling strategy affect the interpretation of biomarker data collected through routine testing. This will help to design improved epidemic surveillance strategies and studies, as well as providing methods for improved situational awareness and epidemic forecasting using existing data streams. We will primarily use data from the ONS Covid Infection Survey and REACT study to model viral and antibody kinetics of SARS-CoV-2 but will generate insights applicable to a range of pathogens. You will have the opportunity to work on a range of infectious disease modelling projects depending on your skills and interests.

You will be part of a highly collaborative, multi-disciplinary group with a track record of supporting career development and training. In addition to writing scientific publications, you will have the opportunity to learn and apply a range of transferable analytical skills including mathematical modelling, Bayesian statistics, and machine learning tools.

The group

The post is based within the Pandemic Sciences Institute based at the University of Oxford. We develop mathematical and epidemiological models to better understand infectious disease epidemiology and immunology from serologic and virologic data. Our overarching goal is to improve the way that we track and predict the spread of infectious diseases, focusing on the interaction of pathogen and host factors, which can be measured in the lab, with epidemiological factors, measured at the population level. We use a combination of mathematical models (e.g., compartmental models, agent-based models) and statistical methods (e.g., hierarchical Bayesian models, custom Markov chain Monte Carlo algorithms), and thus there are opportunities to develop a wide range of skills during the position. You will become part of a large network of infectious disease modelers with collaborators around the world.

You will also be part of the Pathogen Dynamics group, led by Professor Christophe Fraser. The group works on a range of pathogens and approaches in genetics and modeling, ranging from HIV genomics to COVID-19 contact tracing apps, and thus the post offers substantial opportunities for collaboration and career development.

Responsibilities

You will:

- Contribute to research projects in the field of infectious disease epidemiology and mathematical modelling.
- Manage own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work to meet deadlines.
- Design, adapt and implement models, statistical methods, and simulations for analysing serologic and virologic data.
- Stay up to date with the latest advancements and publications in the field and engage in regular scientific discussions with the team.
- Adapt and apply existing epidemiolocal inference methods (e.g. Rt estimation) as a benchmark for evaluating new methods based on virologic and serologic data.
- Manage and curate sensitive datasets of individual-level biomarker data.
- Lead and contribute to the production of scientific publications and submit presentations to international conferences.
- Develop and publish well documented, open-source tools implementing new inference methods for use by other researchers and public health analysts.
- Collaborate in the preparation of scientific reports and journal articles and occasionally present papers and posters.
- Represent the research group at internal and external meetings/seminars, either with other members of the group or alone.
- Act as a source of information and advice to other members of the group and collaborators on best-practice methodologies.
- Participate in and support the public engagement and widening access activities of the Department and the University. This is anticipated to be not more than 2 days per year.
- Undertake mandatory training as required by the University, Division and Department. The specific list of training courses may change from time-to-time, in response to both legal and internal University requirements.

Selection criteria

Essential

- Hold a PhD/DPhil (or close to completion) in a relevant quantitative field (e.g. infectious disease epidemiology, biostatistics, mathematical biology etc).
- Proficiency with the statistical programming language R (or a related programming language such as Python or Julia).
- Track record of developing and sharing analytical methods for general use.
- Record of excellent scientific publication(s).
- Excellent communication skills, including the ability to write for publication, present research proposals and results, and represent the research group at meetings.
- Excellent organizational skills for time management, progress reports and completing tasks to agreed deadlines.
- Demonstrated independence, initiative, and willingness to work towards a common goal.

Desirable

- Experience working with epidemiological data or individual-level biomarker data, such as serosurveys, viral load measurements, sequence data etc.
- Prior experience in infectious disease modelling and/or statistics.
- An interest in the intersection of public health, infectious disease epidemiology, immunology, and virology.
- Experience using version control (GitHub) and high-performance computing clusters.

Pre-employment screening

Standard checks

If you are offered the post, the offer will be subject to standard pre-employment checks. You will be asked to provide: proof of your right-to-work in the UK; proof of your identity; and (if we haven't done so already) we will contact the referees you have nominated. You will also be asked to complete a health declaration so that you can tell us about any health conditions or disabilities for which you may need us to make appropriate adjustments.

Please read the candidate notes on the University's pre-employment screening procedures at: https://www.jobs.ox.ac.uk/pre-employment-checks

Hazard-specific / Safety-critical duties

This job includes hazards or safety-critical activities. If you are offered the post, you will be asked to complete a health questionnaire which will be assessed by our Occupational Health Service, and the offer of employment will be subject a successful outcome of this assessment.

The hazards or safety-critical duties involved are as follows:

- Travel outside of Europe or North America on University Business

How to apply

Applications are made through our e-recruitment system and you will find all the information you need about how to apply on our Jobs website https://www.jobs.ox.ac.uk/how-to-apply.

If you would like to apply, **click on the Apply Now button** on the 'Job Details' page and follow the on-screen instructions to register as a new user or log-in if you have applied previously.

As part of your application you will be asked to provide details of two referees and indicate whether we can contact them now. You will be asked to upload a CV and a supporting statement. The supporting statement must explain how you meet each of the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants). Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

Please upload all documents **as PDF files** with your name and the document type in the filename. Please note using a long file name may prevent you from uploading your documents.

- http://www.ox.ac.uk/about_the_university/jobs/research/

All applications must be received by **midday** UK time on the closing date stated in the online advertisement

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing department(s).

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments).

If you need help

Application FAQs, including technical troubleshooting advice is available at: https://staff.web.ox.ac.uk/recruitment-support-faqs. Non-technical questions about this job should be addressed to the recruiting department directly recruitment@ndm.ox.ac.uk

To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will receive an automated email from our online recruitment portal to confirm receipt of your application. **Please check your spam/junk mail** if you do not receive this email. Important information for candidates

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: https://compliance.admin.ox.ac.uk/job-applicant-privacy-policy. The University's Policy on Data Protection is available at: https://compliance.admin.ox.ac.uk/data-protection-policy.

The University's policy on retirement

The University operates an Employer Justified Retirement Age (EJRA) for very senior research posts at **grade RSIV/D35 and clinical equivalents E62 and E82**, which with effect from 1 October 2023 will be 30 September before the 70th birthday. The justification for this is explained at: https://hr.admin.ox.ac.uk/the-ejra.

For **existing** employees on these grades, any employment beyond the retirement age is subject to approval through the procedures: https://hr.admin.ox.ac.uk/the-ejra.

There is no normal or fixed age at which staff in posts at other grades have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time.

Equality of opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.