



## UNIVERSITY OF CAPE TOWN

### DEPARTMENT OF PAEDIATRICS AND CHILD HEALTH

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### POST-DOCTORAL FELLOWSHIP IN HEALTH SCIENCES AT UCT

#### Postdoctoral Research Fellow in Data Science

Department of Paediatrics & Child Health, SAMRC Unit on Child & Adolescent Health,  
University of Cape Town

#### Purpose:

This is an exciting opportunity to join a multidisciplinary research team within the Department of Paediatrics & Child Health and the SAMRC Unit on Child and Adolescent Health, University of Cape Town. The research programme is centred on implementing and developing statistical machine learning models to understand the early life determinants of disease and disease progression from childhood to adulthood in a unique African birth cohort study, the Drakenstein Child Health Study. The research will be undertaken in collaboration with leading UK investigators of a consortium of 5 UK birth cohort studies. The research methodology is generalizable to profiling patients with greater accuracy to allow us to move towards more personalized disease management strategies through understanding disease heterogeneity and distinct genetic and environmental predictors of different subtypes of disease with a focus on asthma and allergy. The selected candidate will work within the study team for the Drakenstein Child Health Study (DCHS) and closely with a UK based team for Early Life Asthma Research (STELAR). STELAR is a consortium of complex, rich and expanding datasets from 5 existing UK birth cohorts. The DCHS is a complex, active birth cohort study following 1000 mother-child pairs from birth through at least 10 years of child age. This study supports over 30 postgraduate students and over 25 investigators. The main objective of this post is to implement and potentially develop innovative computational statistical methods to identify novel subtypes of childhood asthma, enabling investigation of subtype-specific environmental and genetic associates and discovery of distinct pathophysiological mechanisms in African children.

The fellowship is awarded to an emerging researcher for three years and the contract is full time, fixed term. The location of the research will be in Cape Town with travel to the UK for training. This is a collaborative project with Professor Adnan Custovic (Imperial College London), Professor John Holloway (University of Southampton), Dr. Diane Gray (UCT) and Professor Heather Zar (UCT). The fellowship is funded and awarded by the Medical Research Council UK.

#### Call for application

Applications are invited for a full-time Postdoctoral Research Fellow to work on projects investigating subgroups of disease using latent variable models and longitudinal models to identify predictors and disease trajectories from birth with a focus on asthma across multiple birth cohorts. The candidate will collaborate with the DCHS and STELAR study teams and will supervise, plan, design, manage, and implement research and data analysis of a highly complex nature. Postdoctoral Research Fellows should have a PhD in statistics, data science, machine learning or a related field. Candidates should have a high level of expertise in one or more of the following areas: quantitative research methods, dimensionality reduction techniques, Bayesian data analysis, multilevel modelling, latent variable modelling and/or longitudinal analyses of cohort data. In addition, candidates should have strong data management skills and a high degree of proficiency with one or more statistical software packages (e.g., SAS, Stata, R, MPLUS, PLINK). Candidates should also have experience preparing oral and written reports of research findings. Candidates will have the opportunity to spend time in the UK with the STELAR team for training and as part of this collaborative research. The successful candidate will take an active part in academic activities in the DCHS including presentations, statistical support to investigators and contributing to or producing study manuscripts.

#### Research and other Duties:

- To apply statistical theories and methods to analyse large, complex datasets
- To analyse and interpret data and to report conclusions from analyses in presentations and scientific publication
- Opportunity to develop methodology in latent variable modelling, longitudinal modelling and missing data
- To prepare material for presentation in oral and poster formats and present findings to colleagues and at conferences
- To draft publications and prepare them for submission to refereed journals
- To submit publications to refereed journals
- To contribute to developing and writing new research grants
- To promote the reputation of the DCHS study, the MRC unit and this collaboration
- To provide advice and statistical support to staff and students, including PhD students
- To develop contacts and research collaborations to further support or expand this research
- To undertake appropriate administration tasks

- To undertake any necessary training and/or development
- Any other duties commensurate with the grade of the post as directed by line manager / supervisor

#### Conditions of Award:

##### General

- postdoctoral research fellowships are only available to individuals who have achieved the doctoral degree within the past 5 years
- applicants may not previously have held full-time permanent professional or academic posts;
- no benefits or allowances are included in the value of the fellowship.
- the successful incumbent will be required to comply with the University's approved policies, procedures and practices for the postdoctoral sector.
- Knowledge of research methods and statistical procedures.
- A strong understanding and proven experience of analysing large datasets.
- Familiar with at least one statistical package (e.g. R/SPLUS, SAS, STATA, MPLUS, PLINK).
- Experience of longitudinal data analysis.
- Experience with feature selection and shrinkage methods.
- Knowledge of non-linear models (such as decision trees, random forests, Bayesian networks).
- Demonstrable good project management and organisational skills.
- Experience within a research environment and publication in relevant and refereed journals.

##### Specific

- PhD in statistics, data science, machine learning or a related field.
- Strong quantitative skills and experience and knowledge of statistics.
- Ability to demonstrate initiative and work independently.
- Willing to progress and acquire new skills and responsibilities.
- Ability to present information effectively at meetings and write project reports.
- Ability to communicate effectively with collaborators both internally and externally.
- Have excellent written and spoken English as well as presentation skills.
- Demonstrate the ability to work to deadlines within an agreed framework.
- Ability to develop and apply new concepts.
- Creative approach to problem-solving.
- Excellent verbal communication skills and the ability to deal with a wide range of people.
- Excellent written communication skills and the ability to write clearly and succinctly for publication.
- Ability to direct the work of a small research team and motivate others to produce a high standard of work.
- Ability to organise own work with minimal supervision.
- Ability to prioritise own work in response to deadlines.
- Willingness to work as part of a team and to be open-minded and cooperative.
- Willingness to undertake any necessary training for the role.
- Discipline and regard for confidentiality and security at all times.
- Willingness to travel both within the United Kingdom and abroad to conduct research and attend conferences.

##### Value and tenure

- The value of the fellowship is R450,000-550,000 per annum (non taxed) based on previous research experience.
- The full value of the Fellowship must be declared.
- The fellowship is compliant with the SARS policies/rules and is therefore exempt from taxation.
- The fellowship is tenable for one year and where renewal for a second and third year is possible, such renewal will be considered on evidence of satisfactory academic progress and availability of funds.

##### Application requirements: All applications should include:

- a Cover Letter including expertise, research interests and experience
- CV including a list of publications/scholarly output
- Please submit all required documentation to: [Tiffany.Burd@uct.ac.za](mailto:Tiffany.Burd@uct.ac.za)
- **Closing date for applications is December 31 2018, with the expected start date of the fellowship between January and June 2019.**

##### Selection Process

Selection and recruitment of applicants will be done by a committee authorized by the Department to select such candidates. In all cases, such selection must take account of the University's approved policies and procedures. *Eligible and complete applications will be considered by the UCT Co-PI (Prof Heather Zar) and the unit Project Manager (Tiffany Burd).* **The University of Cape Town reserves the right to:** disqualify ineligible, incomplete and/or inappropriate applications / change the conditions of award or to make no awards at all.