

Advertisement for the MRFF PhD Scholarship with Decision Analytics, Sax Institute

PhD Opportunity

An exciting opportunity exists to undertake an interdisciplinary PhD with the Decision Analytics team at The Sax Institute. We are looking for the ideal candidate, interested in learning how to apply system dynamics modelling (and/or agent based modelling) to inform national strategies for reducing child and adolescent overweight and obesity, through integration of existing research evidence, expert knowledge, and data (primary and secondary). This PhD scholarship is offered as a joint project between Decision Analytics, Sax Institute, The Australian Prevention Partnership Centre and the University of Sydney. The candidate will be enrolled through the University of Sydney, and will be located at the Sax Institute (Sydney, Australia) as part of the Decision Analytics technical lab.

Background

The Australian Government, through the Medical Research Future Fund, has invested \$10 million to support The Australian Prevention Partnership Centre in delivering innovative preventive health research, with one of the key elements being to tackle childhood obesity, nutrition and physical activity. An approved program of work under this Fund, being led by Decision Analytics is:

'Harnessing big data and dynamic simulation modelling to tackle child and adolescent overweight and obesity and associated healthcare expenditure in Australia.'

Child and adolescent overweight and obesity is a significant public health challenge in Australia, with the prevalence estimated to be approximately 25%; a figure that obscures the emergence of a substantial socio-economic gradient as well as the emergence of severe obesity. Obesity in very early childhood not only contributes healthcare costs that are 1.6 times that of healthy weight children, but overweight and obesity carried through to adulthood contributes significantly to Australia's burden of chronic disease including cardiovascular disease, type 2 diabetes, musculoskeletal conditions/back pain and some cancers. These conditions have significant social and economic impacts and have been estimated to cost the Australian health system over \$21 billion annually. With potential inter-generational effects of overweight and obesity^{4,5} and its sequelae perpetuating a reinforcing cycle of morbidity, there are significant financial, individual and social imperatives for tackling the complex problem of child and adolescent overweight and obesity.

Dynamic simulation modelling methods are particularly suited to supporting decision-making for complex problems and where the outcomes of interventions are unlikely to be realised in the short term. The past 10 years has seen significant technological and methodological advancements that are improving the accessibility, transparency, and robustness of these dynamic modelling tools, not least of which have been advancements in data science (data analytics and data engineering). Software developments are improving the accessibility of modelling methods among broader, multidisciplinary, non-modelling audiences facilitating the implementation of participatory model building approaches and improving transparency and knowledge mobilisation. Sophisticated multi-method modelling approaches (i.e. combining system dynamics modelling, agent-based modelling, and discrete event simulation), are being implemented by Decision Analytics and national and international partners, which combine the benefits of the individual methods and can deliver to policy makers powerful decision support tools that span the continuum from primary and secondary prevention to service delivery scenarios.

More recently, the synergistic relationship between big data and dynamic modelling is being realized. Big data collected from sensor-enabled wearable devices and mobile phones for example, are being used to gain further detailed insights into health behaviours, offering significant value to the parameterisation of dynamic models, while conversely dynamic modelling is offering a bridge between big data and evidence-informed decision making.

The proposed work aims to expand on the existing, participatory applications of dynamic simulation modelling in ACT and NSW, and importantly build capacity and infrastructure for embedding an interactive, and auto updating national decision support tool within the Commonwealth Department of Health to inform investment decisions to reduce child and adolescent overweight and obesity, its chronic disease sequelae, healthcare expenditure and health system burden.

Eligibility criteria

Applicants should have a Bachelor's degree with Honours or a Master's Degree in either a health / public health related discipline with biostatistics experience and an interest in building expertise in dynamic simulation modelling, or in a computer or data science related discipline with an interest in health. Experience/background in R statistical package is desirable. Experience with modelling applications in public health desirable, but not essential.

Strong written and verbal communication skills as well as good time management skills are essential. The ability to think critically and analytically, and the capacity and motivation for self-directed learning are also essential. Applicants must be Australian citizens, Australian permanent residents or New Zealand citizens. Applicants must be available to commence full-time candidature by end of June 2018.

Amount Awarded

The scholarship stipend is \$35,000 in 2018 (tax exempt) and may be renewed for up to three years, subject to satisfactory progress. If the student is successful in obtaining an external scholarship, the stipend will be reduced to \$10,000 per annum and act as a 'top up' payment to the external scholarship funding.

Application Guide

Your application should include the following. 1) Curriculum vitae; 2) Copy of an academic transcript; 3) Proof of citizenship or permanent residency; 3) Names and contact details of at least two referees; 4) A sample of your written work (this may include an assignment from an undergraduate program, a thesis chapter, dissertation or a published or unpublished paper on which you were the primary author); 5) A single page 'Statement of Purpose', which should outline your reasons for pursuing an advanced degree in general and this project in particular, and your ultimate career goals. For further information, contact Dr Jo-An Atkinson Jo-An.Atkinson@saxinstitute.org.au (0467 522 766) or Dr Ante Prodan Ante.Prodan@saxinstitute.org.au (0437 093 748).

Closing Date

Friday 1st June 2018