

# MENZIES RESEARCH INSTITUTE TASMANIA

## HONOURS, MASTERS & PHD RESEARCH PROJECTS 2014



# UNIVERSITY OF TASMANIA

The Menzies Research Institute Tasmania conducts innovative, world-class research to improve human health and well-being.

Menzies is the medical research institute of the University of Tasmania, works in close collaboration with the UTAS School of Medicine and Faculty of Health Science, and is a member of the Association of Australian Medical Research Institutes and Research Australia.

## YOUR FUTURE IN MEDICAL RESEARCH AWAITS YOU

Menzies Research Institute Tasmania (Menzies) is home to a wealth of talent, experience, resource and networks. We have an outstanding reputation, both within Australia and internationally, for excellence in postgraduate research training and in producing renowned researchers.

Research at Menzies is organised around five themes that focus on the major diseases affecting the Tasmanian community. Menzies five research themes are:

**Public Health & Primary Care**  
**Neurodegenerative Disease/Brain Injury**  
**Cardio-Metabolic Health & Diseases**  
**Musculoskeletal Health & Diseases**  
**Cancer, Genetics & Immunology.**

A number of Honours, Masters and PhD project opportunities are available in the five research themes in 2014.

The first step in applying to undertake Honours, Masters or a PhD at Menzies is securing agreement for Supervision.

Following is a list of Menzies research academic staff who currently have capacity to supervise new Honours, Masters or PhD candidates in 2014 and each academic's research area is listed also. In the following pages, you will find a summary of projects currently open to candidates.

Once a Supervisor has been identified from the list below, the prospective candidate should email them with a copy of their Resume and a statement outlining their interest in undertaking study in the particular research area.

Candidates are strongly advised to review the research projects available when preparing this statement.

Prospective candidates should also copy in the following staff members when contacting a potential Supervisor:

**Kristy.Sanderson@utas.edu.au**

**Tracey.Dickson@utas.edu.au**

Extensive information on the Menzies Research Institute Tasmania can be found at: [www.menzies.utas.edu.au](http://www.menzies.utas.edu.au)

## **SUPERVISOR: DR FAY JOHNSTON**

Research Area: Environmental Epidemiology

(Public Health & Primary Care)

Email: Fay.Johnston@utas.edu.au Phone: +61 (0)408266652

Dr Fay Johnston is a Public Health Physician, GP and Senior Research Fellow at the Menzies Research Institute Tasmania. Her background includes primary health care (rural and Aboriginal health), communicable diseases control, and public health policy. She uses a range of statistical approaches to understand the public health impacts of environmental hazards such as bushfires, extreme heat events and outdoor air pollution from biomass combustion. Her research is interdisciplinary and applied, and she has strong collaborations with scientists in the fields of fire ecology, GIS and remote sensing.

## **PROJECTS**

### **BUSHFIRE SMOKE AND PLANNED BURNS**

Australian land management agencies are increasingly using smaller planned burns set under controlled conditions to reduce the risk from wildfires. A common side effect is the short term exposure of communities to frequent episodes of air pollution. The problem is that the trade-off between protecting communities from dangerous bushfires and exposing them to the health risks associated with smoke exposure from management burns, has not been well characterised. Land managers and public health authorities require this information to develop guidelines for burning operations. A range of projects suitable for honours or PhD are available with opportunities to focus on clinical research, statistical modeling of population level data, public health policy or a combination of these. The research will be co-supervised by collaborators from Monash University. Projects are appropriate for candidates with backgrounds in clinical medicine, cardio-respiratory physiology, public health, epidemiology, biostatistics or other health related disciplines.

#### **1. How is Cardiovascular, hematological and respiratory function affected by exposure to landscape fire smoke? (Honours or PhD)**

This prospective panel study will be conducted in rural Victoria in collaboration with Monash University during the annual autumn planned burning program of 2014. It will explore the association between exposure to outdoor smoke and a range of sensitive clinical health measures in a group of adult volunteers. These will include daily symptoms, medication use and health service utilization, lung function, lung inflammation (exhaled nitric oxide), blood pressure and endothelial function (using finger plethysmography), heart rate variability and markers of cardiac ischaemia using 24 hour electrocardiography; and blood markers of inflammation and coagulation.

#### **2. Understanding population level impacts of landscape fire smoke (PhD)**

This project will be part of a newly funded ARC Linkage Project. Our team of collaborators from Canada, Victoria and NSW has specific expertise in fire ecology, fire smoke modeling, epidemiology, land management, environment protection and public health practice. We will use regulatory air quality monitoring, mobile smoke monitoring, remote sensing and atmospheric modeling, to determine how different types of landscape fire regimes affect community exposures to smoke. We will use spatial datasets of ambulance and emergency calls to map how the intensity and duration of smoke exposure influences important health outcomes and which population groups are at greatest risk. New practical approaches to determining smoke exposures for public health management will be developed and evaluated. It will be particularly appropriate for a student familiar with R including spatial analysis in R or ARC GIS.

#### **3. Community perceptions of the health impacts of planned burning (honours)**

How do community members perceive the tradeoffs between planned burning and the risks of and unplanned fire? How do they perceive any risks to their health? This qualitative study will recruit people in a rural Victorian community affected by planned burning to participate in focus groups and semi-structured interviews.

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### **WINTER WOOD-SMOKE, HEAT AND GOLD IN TASMANIA**

Many regional centres in Tasmania experience extremely poor air quality during winter months from excessive emissions of smoke from wood heaters. This source of air pollution has been clearly associated with mortality rates, cardiovascular diseases and adverse respiratory health outcomes including the exacerbation of asthma, the incidence of otitis media, and lower respiratory tract infections and represents an important public health problem in Tasmania.

#### **4. Heat, air pollution and ambulance callouts (honours)**

Are ambulance services under greater pressure during episodes of severe air pollution or heat? This project is an epidemiological analysis of environmental and health data from Hobart. The aim is to determine the association between ambulance call outs for acute cardio-respiratory health problems and a range of environmental exposures including temperature, pollen, and air pollution from vegetation fires and wood heaters.

#### **5. The firebox study (honours)**

Reducing emissions from wood heaters can be achieved through improved operation but this requires the users to be educated and motivated to change their behaviour. Emissions from individual wood heaters can also be influenced by altering the combustion process using an internal fire box product. The utility of such products as a public health intervention is uncertain. This project will investigate the influence of a community wide intervention on outdoor wood smoke during winter and assess the impact of daily pollution concentrations on the daily incidence of a range of primary health care outcomes.