



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**

School of Population & Global Health

Research projects 2019

Topics for Honours and MPH Projects
and Dissertations



Research projects now available in the School of Population & Global Health (SPGH)

As a world-class research university, UWA offers research opportunities of the highest calibre. You will work closely with an expert supervisor on a specific research topic to produce a manuscript of significant academic scholarship.

Your initial research training can include completion of an Honours or a postgraduate coursework Master of Public Health (MPH) with a 12 point or 24 point dissertation. This can lead to enrolment in a Master of Philosophy (MPhil) or Doctor of Philosophy (PhD).

As an honours or 24 point dissertation research student with us, you will develop, under supervision, a paper for publication in a scientific journal - this is the first step in your research career!

How does research training at SPGH work?

You will work with an academic researcher to investigate an important and topical area of public health. Responsible, conscientious students, who meet the eligibility criteria, with well-developed interpersonal and written communication skills are sought for these projects.

Although some projects use linked data and require a high degree of analytical aptitude, there are many other projects that require different skills. Given the scope of projects available, a great project can be found to match your own interests and skills.

Want to know more?

If you're interested in an Honours / MPH 12 point project or MPH 24 point dissertation

Contact our Honours & Dissertation Coordinator by email - karen.martin@uwa.edu.au

Research Areas & Centres at SPGH

Our research strengths include a strong evidence-based approach to services and health program evaluation. We have a proven record of achievement in preventative, clinical and occupational epidemiology and have been instrumental in setting world standards in population health databases through record linkage.

Cardiovascular Disease Epidemiology

Aims to reduce the burden of cardiovascular disease through research into trends and determinants of acute events, treatment, management and outcomes.

Centre for Health Services Research

Is a leader in its field through its work with linked medical and health data and the evaluation of health services, patient safety, surgical care and pharmaco-epidemiology.

Child & Adolescent Development and Health

Early influences on child and adolescent health significantly impact on health and development outcomes throughout life. Our research draws on the skills and experience of our teams' multi-disciplinary backgrounds to engage with stakeholders and deliver high quality research with real world policy and practice implications.

Global Environment and Health

Investigates the relationships between ecosystems, environmental and occupational agents and health, at local and global scales, in order to determine ways that we can improve global human health. We research disease outcomes resulting from occupational and environmental exposures, such as mining hazards, asbestos, air pollution, heat, noise and water. We are also investigating the positive impact of green and blue spaces on health, and a developing area of interest is health promotion in relation to global and environmental health

Health and Labour Economics

To improve resource allocation and decision making in the health sector through systematic evaluation and assessment, with an economic perspective.

The Raine Study - <https://www.rainestudy.org.au/>

The Western Australian Pregnancy Cohort (Raine) Study is one of the world's largest successful prospective cohorts of pregnancy, childhood, adolescence and now early adulthood. These families have provided environmental, developmental and health information over the past 28 years offering a unique and valuable resource covering a wide range of health areas.

Vulnerable Groups

Aims to improve health and social outcomes and reduce the disease burden among some of society's most at-risk populations.

Western Australian Centre for Rural Health -<http://www.wacrh.uwa.edu.au/>

The Western Australian Centre for Rural Health (WACRH) aims to improve rural, remote and Aboriginal health through research, education, student support and community service activities. WACRH operates with funding from the Commonwealth Department of Health and support from the University of Western Australia but also works closely with numerous health organisations, on a local and national level.

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Projects under Cardiovascular Research Epidemiology

State-of-the-Art Cardiovascular Disease (CVD) Research

A/Prof Tom Briffa

Background: CVD is costly and prevalent worldwide. Monitoring and reporting trends is a national priority health area and is a driver of health policy aimed at improving healthcare delivery and outcomes

Outline: Various projects in specific areas are offered. These will involve examining the trends and models of care in CVD prevention, treatment and management and may consider clinical epidemiology, health outcomes, pharmacotherapy, prevention, cost-effectiveness and community engagement.

A range of topic areas include:

- Atherothrombotic disease across the vascular territories
- Busselton Health Study
- Monitoring coronary artery disease
- Management of CVD in the Indigenous population
- Diabetes and CVD
- Peripheral arterial disease
- Risk Factor Prevalence Study
- Coronary artery revascularisation
- Chronic kidney disease and CVD

Methodology: The cardiovascular research group uses clinical data collected from cohorts in Western Australia together with person linked administrative data from hospitals and registers to examine influences, trends and epidemiology of CVD health outcomes.

Project Length:

Honours/12 or 24 point MPH

Developing reliable algorithms for monitoring coronary heart disease in Australia

Dr Lee Nedkoff

Background: Coronary heart disease in Australia is very common and kills more people than any other disease. A number of factors including changing diagnostic criteria means that current methods for monitoring and measuring the trends in coronary heart disease are becoming out of date.

There are a number of potential projects available under this topic encompassing validation of heart attack coding in hospital data, developing algorithms to reliably monitor coronary heart disease over time, and translation of findings into national data through our collaboration with the Australian Institute of Health and Welfare.

Outline: Develop new models for national monitoring of heart attack and coronary heart disease in Australia.

Methodology: The project will use a linked database from multiple sources.

Project Length: 24 point MPH

Best use of Clopidogrel in acute coronary syndrome patients

Dr Frank Sanfilippo

Background: Following coronary stent procedures, patients are put on dual antiplatelet therapy (aspirin and clopidogrel). However, doctors still don't know the optimal length of time for this treatment due to competing risks of bleeding versus the risk of a further heart attack.

Outline: The project will use linked datasets and clinical hospital data to investigate across 3 main areas:

- (i) how long to continue dual antiplatelet therapy
- (ii) rates of acute coronary syndrome admission following cessation of clopidogrel, and
- (iii) rates of admission for bleeding while on versus off clopidogrel.

Methodology: The project will use linked datasets and clinical hospital data.

Project Length: 24 point MPH

Use of statins in coronary heart disease patients

Dr Frank Sanfilippo

Background: Statins are frequently used drugs in coronary heart disease (CHD) patients to prevent heart attacks.

Outline: This project will investigate a number of important areas of statin utilisation including identifying age- and sex-specific risk thresholds for use of statins and determining levels of risk in patients who cease statins. There are also opportunities to investigate a broader range of secondary prevention medications in this patient group.

Methodology: The project will use linked administrative datasets including hospital morbidity/mortality and PBS data.

Project Length: 24 point MPH

Projects with the Centre for Health Services Research

Are survival rates different for young & older patients with colorectal cancer (CRC)?

Dr Nita Sodhi-Berry; Prof David Preen

Background: CRC typically affects older adults with an average age at incident diagnosis of 70 years. However, the CRC incidence among adolescents and young adults in Australia has significantly increased over the past two decades. Some research suggests that young-onset CRC may represent a more aggressive underlying disease process compared with later-onset CRC, with younger patients exhibiting more advanced disease at diagnosis and poorer prognosis. However, empirical evidence in this area is currently inconclusive.

Outline: This study will use population-based linked WA Cancer Registry and mortality data to examine any significant differences in:

- 1) tumour characteristic and diagnosis and
- 2) survival rates for adolescents and young adults aged 15-39 years with CRC compared with later-onset CRC (≥ 40 years).

Methodology: The student will undertake a literature review and perform quantitative data analyses suited to the scope of the project.

Project Specific Requirements:

A fundamental knowledge of biostatistics along with a working knowledge of a statistical software package like SAS, STATA or SPSS.

Project Length:

Honours/12 or 24 point MPH

What is the burden of mental & physical health disorders in cancer survivors?

Dr Nita Sodhi-Berry; Prof David Preen

Background: Therapeutic advancements allowing early cancer detection and treatment have enhanced survival. However, cancer survivors are known to deal with a variety of mental health and chronic physical health conditions over the course of their lifespan.

Outline: This study will ascertain the burden of a variety of chronic physical (e.g. cardiovascular and pulmonary) and mental disorders in cancer survivors relative to the general population and identify the determinants and trends over time since diagnosis. The study will be enabled by comprehensive linked hospital, death and cancer registry data on cancer patients in WA. The findings will have public health policy and translational implications with respect to identifying opportunities for adequate diagnosis and management of these chronic disorders and provision of support services to vulnerable groups identified through this study.

Methodology: The student will undertake a literature review and perform quantitative data analyses suited to the scope of the project.

Project Specific Requirements:

A fundamental knowledge of biostatistics along with a working knowledge of a statistical software package like SAS, STATA or SPSS.

Project Length:

Honours/12 or 24 point MPH

Exploring the Mental Health and Emotional Wellbeing of Reception Prisoners

Prof David Preen

Background: People who go to prison experience social disadvantage, mental illness and trauma at far higher rates than the general community. To investigate mental illness and emotional wellbeing in this group further 719 adults were recruited and interviewed within one week of entering prison. They were asked a range of questions on topics that included mental health, life stressors, drug and alcohol use, and unmet needs.

Outline: The project aims to describe and quantify the nature and extent of mental disorders including alcohol and substance misuse disorders amongst WA reception prisoners, as well as their met and unmet needs. A main project aim is to provide high quality data that will assist in the planning and provision of mental health services to mentally disordered offenders both within the criminal justice system and in the community.

Methodology: Cross-sectional survey data collected within one week of reception into prison.

Project Specific Requirements:

Reasonable knowledge of biostatistics

Project Length:

Honours/12 or 24 point MPH

Association between maternal discharge readiness in a kangaroo mother care ward in South Africa and neonatal outcomes

Ms Tina Lavin ; Prof David Preen

Background: Kangaroo mother care is routinely practiced with premature and low birth weight infants in many low- and middle-income countries (LMICs). When practising continuous kangaroo mother care the naked infant is placed skin-to-skin in an upright position between the mother's breasts with the baby facing the mother 24 hours per day. Research has identified it as a life-saving intervention reducing the risk of mortality by 40% in LMICs as well as reduced time to full feeds, increased breast-feeding rates, better weight gain, reduced risk of infections, decreased need for incubator care and reduced length of hospital stay. Despite these benefits continuous kangaroo mother care can be challenging for the mother and often mothers are discharged home after just a few days in hospital, to socially challenging situations which make continuous kangaroo mother care difficult. There is little published research around the readiness for discharge home of mothers who are admitted to kangaroo mother care wards in LMICs and the neonatal outcomes after discharge home.

Outline: This study will use structured face-to-face interviews with 350 mothers to investigate their readiness for discharge home (data collection will be completed July 2018). Sociodemographic and clinical data will also be collected as well as follow-up data for the mothers and infants until 6 weeks post-discharge (hospital re-admission, failure to thrive, other adverse

outcomes). This study will use statistical analysis techniques to meet these specific objectives:

- To measure the level of discharge home readiness for mothers in a continuous kangaroo mother care ward.
- To explore the clinical and sociodemographic factors that may influence mothers' readiness for discharge home, such as rural/urban location, length of hospital stay, discharge weight and birth weight (and others).
- To assess if level of discharge readiness is a predictor for adverse outcomes in the first 42 days after discharge, such as failure to thrive, hospital re-admission etc.

This study will allow for a better understanding of the socio-demographic and clinical factors that influence readiness for discharge home and outcomes for these infants 6 weeks post-discharge.

Methodology: Quantitative

Project Specific Requirements:

- Excellent proficiency in English.
- Basic statistical skills (good score in Biostatistics I or equivalent).

Project Length: Honours/24 point MPH

Projects under Child and Adolescent Health

The PLAYCE Study: Play Spaces & Environments for children's physical activity & health

Dr Hayley Christian

Background:

There is growing interest in environmental interventions targeted at increasing children's physical activity because of their potential reach and impact on the health and well-being of future generations. In the last decade there has been a 20% increase in the number of 0-4 year olds in WA with 63% of WA 2-3 year olds attending some type of child care. The child care setting is where children spend a considerable amount of time. It is an important setting where children should have the opportunity to be physically active and engage in unstructured physical play to facilitate their health and development.

Outline:

The PLAYCE (Places Spaces & Environments for Children's Physical Activity) research program investigates the influence of the physical, social and policy environment on young children's physical activity, sedentary behaviour, eating behaviour, weight status, sun exposure and development across different behaviour settings (childcare, home and the neighbourhood).

PLAYCE aims to provide information on how best to create healthy environments for young children and families to enable them to lead healthy and fulfilling lives.

PLAYCE research projects available include:

- activity patterns of young children in their home and neighbourhood;

- qualitative research with children, parents and childcare staff;
- interventions to improve physical activity levels and health of children attending childcare.
- others available.

Methodology: Literature review; Qualitative; Quantitative survey; Intervention research; Evaluation of existing programs.

Project Specific Requirements:

- Ability to conduct quantitative/qualitative research.
- Excellent writing skills.
- Statistical analysis (SPSS and/or SAS).
- Ability to work as part of a team.
- Good interpersonal communication skills.

Project Length:

Honours/12 or 24 point MPH

Benefits of family dog ownership for child health & development

Dr Hayley Christian

Background: Physical inactivity and rising levels of overweight/obesity in children are a major public health concern. Dog ownership is associated with higher levels of physical activity in adults but few studies have examined the physical, social and emotional health benefits associated with dog ownership in children.

Outline: This investigates associations between dog ownership, physical activity, sedentary behaviour, overweight/obesity and developmental outcomes in children. The influence of socio-demographic, social and physical environment factors will be considered. Existing data from the 'Play Spaces and Environments for Children's Physical Activity' (PLAYCE) study is available to analyse for young children (2-5 years). There is scope to collect new data for older age groups of children as well as qualitative research with parents and children.

Methodology: Qualitative; Quantitative community based survey; Intervention research.

Project Specific Requirements:

- Ability to conduct quantitative/qualitative research.
- Excellent writing skills.
- Statistical analysis (SPSS and/or SAS).
- Ability to work as part of a team.
- Good interpersonal communication skills.

Project Length:

Honours/12 or 24 point MPH

Physical activity interventions targeting dog owners

Dr Hayley Christian

Background: There is growing awareness about the importance of dog ownership to physical human health. Almost half of all Australian households own a dog. Dog owners do more walking and are more physically active compared with non-owners. Importantly, dog walking has been shown to be a potentially viable strategy for increasing the proportion of the community who are sufficiently active for health benefit.

Outline: This project will involve intervention research to examine the potential of dog walking to contribute to owners' overall levels of physical activity and increase the proportion of people who meet the recommended level of physical activity. The project is likely to have significant implications for health promotion policy and will involve working closely with industry partners, nationally and internationally.

Methodology: Qualitative; Quantitative community based survey; Intervention research.

Project Specific Requirements:

- Ability to conduct quantitative/qualitative research.
- Excellent writing skills.
- Statistical analysis (SPSS and/or SAS).
- Ability to work as part of a team.
- Good interpersonal communication skills.

Project Length:

Honours/12 or 24 point MPH

Influence of the built environment on child health & development

Dr Hayley Christian

Background: Developmental delays in children have significant health, social and economic consequences for later life. There are inequalities in the proportion of children developmentally at risk. The project will examine the influence of the neighbourhood and home physical environment on child health and development.

Outline: The main aim of this research is to identify aspects of the built environment that are important for child health and development. This research will use data from the Australian Early Development Census (AEDC) and/or Middle Years Development Index to examine the neighbourhood attributes (e.g. access to child education and health services) associated with child health and development outcomes. It will provide evidence to determine what is a child-friendly environment in the context of neighbourhood and what are optimal levels of built environment features for child health and development?

Methodology: Quantitative: Data Linkage; Community based survey; Cohort study. One or more methods will be used depending on length of the project.

Project Specific Requirements:

- Ability to conduct quantitative/qualitative research.
- Excellent writing skills,
- Statistical analysis (SPSS and/or SAS)
- Ability to work as part of a team,
- Good interpersonal communication skills.

Project Length:

Honours/12 or 24 point MPH

How does contact with nature facilitate young children's health & development?

Dr Hayley Christian

Background: Contact with nature (plants and animals) is associated with children developing a sense of identity, autonomy, psychological resilience, self-regulation, gross motor skills and learning healthy behaviours. The pathways through which contact with nature facilitates child health and development has received some research attention in older children. Research on the effect of nature contact on young children's health and development is needed.

Outline: This project will involve collaboration with industry partner Nature Play WA (NPWA). The project will evaluate the impact of NPWA's education program aimed at providing early childhood education and care staff with the knowledge and skills to create nature play spaces within the childcare setting. A follow-up survey of early childhood education and care staff will be undertaken to ask them about changes to their childcare centre (e.g. changes to the outdoor physical environment, program content, care and teaching practices). Data has been collected as part of the 'Play Spaces and Environments for Children's Physical Activity (PLAYCE) study.

Methodology: Literature review; Qualitative; Quantitative survey; Intervention research; Evaluation of existing programs.

Project Specific Requirements:

- Ability to conduct quantitative/ qualitative research.
- Excellent writing skills.
- Statistical analysis (SPSS and/or SAS).
- Ability to work as part of a team.
- Good interpersonal communication skills.

Project Length:

Honours/12 or 24 point MPH

Physical activity, sport and recreation research with the Department of Local Government, Sport and Cultural Industries

Dr Hayley Christian

These projects are in collaboration with the WA Department of Local Government, Sport and Cultural Industries.

Background:

Project 1 - Strategies for encouraging physical activity in children through targeting those not currently enrolled in sporting clubs but who would like to participate.

Project 2 - Reasons for participating in sport and recreation evolve and change, as do barriers to participation, and people are likely over the course of their lives, to be involved in a range of activities and challenges.

Project 3 - What role do informal social networks play as barriers and or motivators for physical activity behaviour? How do these informal social networks function across different life stages (e.g. new parent, retiree etc)?

Outline:

Project 1 - What intervention strategies would encourage children's participation in physical activity, with a focus on fundamental movement skills?

Project 2 - What are the factors associated with participation in sport and recreation at various life stages?

Project 3 - Understanding the role of informal social networks in facilitating accessible low-cost physical activity options.

Methodology: Qualitative; Quantitative community based survey; Intervention research.

Project Specific Requirements:

- Ability to conduct quantitative/ qualitative research.
- Excellent writing skills.
- Statistical analysis (SPSS and/or SAS).
- Ability to work as part of a team.
- Good interpersonal communication skills.

Project Length:

Honours/12 or 24 point MPH

Testing the capacity of an online tool to promote safe sun behaviours in teenagers

Dr Hayley Christian

Background: In this project, we will test a newly developed online tool, designed for an with adolescents, on its capacity to actively engage the target audience in an entertaining and age-appropriate way to deliver rigorously vetted health information around optimal sun protection and exposure.

Outline: The aim of this project is to test a prototype online tool that aims to improve the knowledge and behaviours that young adolescents have around safe sun protection and exposure practices for vitamin D.

Research objective - Obtain end-user responses ('process', including; engagement, functionality, aesthetics and information quality) and pilot test the capacity of the developed online tool to improve the sunhealth knowledge and behaviours in an independent cohort of young adolescents (aged 12-13, from Perth Modern School).

Methodology:

In this project, we will test the capacity for a prototype online tool, to improve the knowledge and behaviours of young adolescents around safe sun practices for optimal health. In a pilot study, we will test end-user responses ('process': engagement, functionality, aesthetics and information quality) to using the online tool, as well as its capacity to improve their safe sun knowledge and behaviours.

Specific methodological approaches undertaken:

1. Assess responses to questionnaires administered to pilot study participants on 'process' outcomes related to using the developed online tool;
2. Assess the knowledge gain related to sunhealth of pilot study participants in response to using the online tool, comparing with baseline answers to a standardised multiple-choice test; and,
3. Measure the skin type, sun sensitivity and normal sun exposure patterns of participants as well as sun exposure

behaviours before and after using the online tool (questionnaires, polysulfone badges and skin-casts).

Project Specific Requirements:

The student will help the research team to:

- Provide information and obtain informed consent from participants (and their parents);
- Supervise young adolescents when completing the process questionnaire, multiple choice knowledge test and other questionnaires;
- Monitor the sun exposure behaviours of participants;
- Collate and record all data and feedback from participants;
- Perform statistical and other data analysis, using analyses such as student's t tests, one-way ANOVA and simple correlations on programs like Prism GraphPad and Microsoft Excel; and,
- Prepare a manuscript that describes study findings in a publication.

At the end of this project, the student will have the ability to:

- Manage datasets;
- Perform data analysis in Prism Graphpad and Microsoft Excel;
- Effectively communicate through scientific writing and oral presentations; and,
- Think critically.
- Essential skills for this project include excellent written and oral communication, very good organisation, motivation and dedication.

Police and Working with Children checks, which will be funded by the study.

Project Length: 24 point MPH

Projects under Global Environment and Health

Health effects of air pollution

Prof Jane Heyworth

Background: Air pollution (AP) patterns have changed as technological advances and pollution controls have led to reductions in concentrations of pollutants such as lead and sulfur dioxide (SO₂). However, urbanisation with its associated increase in motor vehicles, industrial processes and energy requirements are overtaking the advances made in AP control over the past two decades. The AP health burden is substantial; there is evidence from Europe that ~50% of adult mortality resulting from AP is attributable to traffic emissions. Significant sources of AP in the Perth metropolitan area are motor vehicles and domestic wood heaters (25% of households have wood heaters). The overall aim of this study is to investigate the long-term effects of air pollution, specifically PM₁₀, PM_{2.5}, NO₂, CO and ozone, on human health in a cohort of older men in Perth.

Outline: Does exposure to air pollution at the concentration observed in Perth lead to health effects.

Methodology: Quantitative methods. AP exposure metrics have been developed and linked each participant in the Health in Men Study (HIMS), a cohort of 12,201 men aged 65 years and above. These men were recruited in 1996 and were followed up to 2012. Using cox proportional hazard regression models, the hazard ratios and 95% confidence intervals for the impact of different pollutants and a range of health outcomes will be estimated.

Project Specific Requirements:

Completion of Biostatistics II or equivalent.

Project Length: 24 point MPH

Health risk assessment of artisanal brick kilns in low- and middle-income countries: Opportunities for disease prevention with 'improved' kiln technologies

Prof Jane Heyworth

Background:

The artisanal brick kiln industry is an important but poorly characterized industrial sector. Brick workers are among the most marginalized of unskilled workers and the industry is in need of urgent environmental, occupational health and safety and labour regulation. There are over 300,000 highly polluting brick kilns throughout low- and middle-income countries, emitting over 890 million tonnes of CO₂ each year as well as high levels of PM_{2.5}, sulphur dioxide, carbon monoxide and black carbon. These emissions are responsible for serious negative impacts on human health in workers and residents of surrounding areas. Key issues faced by workers in this industry are child and bonded labour, unsafe and unhealthy working conditions and sub-standard living conditions on the kiln sites. This project will describe the global artisanal brick industry and the associated risks to human health, and estimate the potential reduction in health risks with the implementation of 'improved' kilns that have been developed to reduce adverse environmental emissions.

The recent Nepal earthquakes provide the opportunity to conduct a case-study of brick kiln reconstruction in Kathmandu valley, as all existing brick kilns (approx 200) were extensively damaged.

Outline:

1. Describe the artisanal brick kiln industry from a global perspective;
- 2a. Identify the hazards associated with artisanal brick kilns and the associated health and environmental outcomes for particular levels of exposure;
- 2b. Identify the exposed population and the potential for prevention;
3. Investigate the changes in hazards and exposure levels with the implementation of 'improved' kiln technologies; and
4. Investigate the implementation of 'improved' kiln technologies in the Kathmandu Valley since the Nepal earthquake of April 25, 2015.

Methodology:

The project will require you to:

- develop, prepare and submit a research proposal;
- review the literature on artisanal brick kilns in low-middle income countries;
- conduct a qualitative health risk assessments based on analysis of the available literature;
- obtain and compile available information on brick kiln reconstruction in the Kathmandu valley since April 2015;
- prepare manuscripts for publication.

Project Specific Requirements:

Well-developed literature searching and reviewing skills.

Project Length: 24 point MPH

Smoke from domestic wood heaters in the Perth region

Prof Jane Heyworth

Background: Research has linked air pollution to lung and heart disease as well as many other health problems. However, air pollution is inherently complex and more investigation is needed to better understand the role that poor air quality plays on health and disease. Sources of air pollution in the Perth metropolitan area are varied and emissions may arise from both point and fugitive sources, predominantly from burning of fossil fuels, such as motor vehicle emissions, power generation, other industrial combustions, residential wood fires and bush fires. Smoke emissions from domestic wood fires have been previously identified as one of the principal sources of particulate matter (PM) in the Perth region.

Outline: This project will examine data pertaining to emissions from wood heaters within the Perth region. The main aim will be to test the reliability of outputs from models that are used to measure exposure to ambient air pollution as a result of wood heaters.

Approaches to enable testing model outputs include:

- reviewing data inputs used to develop estimates of ambient air pollution as a result of wood heaters;
- collecting additional data where there are gaps in the knowledge around how wood heaters are used as a source of heating within Perth;
- comparing modelled estimates of air pollutants directly against observed data from monitoring stations and/or independent data sources, i.e. validation data;

- assessing the sensitivity of modelled outputs to modifying the assumptions on data inputs to models, e.g. can we assume the level of wood heater usage is homogenous across Perth.

Methodology:

The project will require you to:

- become familiar with the Health in Men and Air Quality Study (HIMAQs) and liaise with HIMAQs investigators;
- review emissions inventory data for the Perth region on the uses of wood as a primary or secondary source of residential heating;
- collect additional data and/or develop a better method to estimate of wood heater usage in the Perth Region. This may involve contacting organisations that have relevant information, e.g. the Australian Bureau of Statistics. This part of the project may lead to designing and implementing a small survey. There may also be scope to test the use of personal monitors to measure individual exposure levels. Personal monitors are an emerging technology and have potential to add a lot of value to this research area.
- analyse data, compile results, and assist with preparing manuscripts for publication.

Project Specific Requirements:

Good statistical knowledge and skills.

Project Length: Honours/24 point MPH

Indoor & outdoor air pollution & exacerbations of Chronic Obstructive Pulmonary Disease

Dr Peter Franklin

Background: Chronic Obstructive Pulmonary Disorder (COPD) is a major cause of morbidity and mortality in Australia.

Total hospital admissions for COPD for both men and women in the over 55y age group have increased significantly over the last decade. Ambient air pollution (AP) is considered a potentially important trigger for COPD exacerbation. However, people spend most of their time indoors and this is particularly so for the elderly and those with pre-existing illness. Therefore, for patient groups such as those with COPD, who are likely to be in an older age group, indoors is probably the most important environment for exposure to air pollutants. Despite this there are very little data on the role of indoor AP on ongoing symptoms in COPD. The aim of this study is to investigate the role of both indoor, specifically unflued gas heaters (UFGH), and outdoor AP on COPD exacerbations.

Outline: COPD patients will be recruited from hospitals and study databases. A housing questionnaire will be administered and home address recorded. Outdoor AP exposure will be determined using an existing land-use regression model for the Perth metropolitan region. Exposure to indoor AP from UFGH will be determined from the questionnaire. Hospitalisation for COPD exacerbation and other clinical data will be collected using data linkage.

Methodology:

The project will require you to:

- review literature on air pollution and COPD;

- develop, prepare and submit a research proposal and application for ethics approval;
- collect questionnaire data from COPD patients;
- organise data-linkage; and
- analyse data, compile results, and prepare manuscripts for publication.

Project Specific Requirements:

Good statistical knowledge and skills.

Project Length: 24 point MPH

Modelling 20 years of noise in WA mines: have noise levels reduced?

Dr Peter Franklin; Prof Jane Heyworth

Background: Prolonged exposure to high levels of noise can result in permanent and irreversible damage to hearing (noise induced hearing loss – NIHL). Noise exposure is prevalent in mining and is a generic hazard, to a greater or lesser extent, to all operations within mining. The mining industry has long been known to have one of the highest rates of occupational NIHL. A 2004 SafeWork Australia report used compensation claims (1998/99 to 2001/02 data) for NIHL to determine incidence of claims for different industries. Mining had the highest incidence of deafness claims (343/100,000 employees in 2001/02). In Western Australia (WA) there is a regulatory requirement for specific action to be taken when people are exposed to either an average noise level of more than 85 dB(A) for an eight-hour working day (LAeq,8h) or a peak noise level in excess of 140 dB(lin). The WA Department of Mines, Industry Regulation and Safety (DMIRS) have a guideline for the management of noise in

WA mining operations. Despite this, noise measurements above the exposure standard were recorded for 93% of underground production employees, 73% of surface production employees, and 68% of ore treatment employees in mines between 1996 and 2009.

Outline: The aim of this study is to investigate noise levels in WA mines between 1996 and 2016 to determine; 1) the main contributing factors to elevated level and 2) if there have been reductions in noise over that 20 year period

Methodology: Noise data has been collected by DMIRS since 1996. We will initially model the determinants of exceedance of the full-shift workplace noise exposure limit (LAeq,8h≥85 dBA) using logistic regression analyses. Models will include the type of mine, place of collection (eg surface or underground), and activities conducted during collection. Trends over time will then be calculated

Project Specific Requirements:

Statistical competency (ideally biostats II)

Project Length:

Honours/12 or 24 point MPH

Health effects of mining exposures?

Dr Nita Sodhi-Berry; Dr Peter Franklin

Background: Mining activities are associated with exposure to harmful dusts and gases. Studies on mining cohorts have advanced scientific knowledge on causal relationships between these exposures and chronic respiratory diseases (e.g. pneumoconiosis and lung cancer). This has influenced regulatory changes over the past decades with improved respiratory health outcomes. However, ongoing assessment is required to determine if these changes are sufficient in protecting miners' health.

The WA miners' cohort includes over 150,000 miners who worked and lived in WA between 1996 and 2012. Their occupational histories have been decoded to assign quantitative exposure metrics for diesel and silica, two of the most common mining exposures. The cohort has been linked with administrative health records allowing assessment of various health outcomes. The overall aim of this study is to investigate the short- and long-term health effects of modern-day mining exposures, specifically silica and diesel.

Outline: Are current mining emission regulations sufficient to preserve miners' health?

This project offers potential students the opportunity to choose from a variety of health outcomes (e.g. cancer, pulmonary, cardiovascular, renal, etc.). The scope of a project will be tailored to suit the candidate's goals. Candidates will gain hands-on experience of applying core epidemiological concepts and understand how epidemiological evidence is generated and used to inform policy and planning

of occupational health standards and guidelines.

Methodology: Students will undertake a comprehensive literature review on their chosen research question and develop a research proposal, followed by quantitative analyses of large linked datasets including the cohort's occupational and health histories. Analyses will include generation of disease frequencies, general population comparisons, time trends, estimation of risks and dose-response relationships, etc. Scientific manuscripts for peer-reviewed publication will be prepared.

Project Specific Requirements:

Good literature reviewing skills. Good statistical knowledge, e.g. Biostatistics II essential.

Project Length: 12 or 24 point MPH

Asbestos exposure and cancers

Dr Nita Sodhi-Berry; Dr Peter Franklin

Background: Asbestos causes over half of all work-related cancer deaths globally and is the leading occupational cause of lung cancer and mesothelioma. It also causes laryngeal and ovarian cancer. However, there is limited epidemiological evidence on its role in the causation of other cancers. Moreover, while the risk of mesothelioma is known to substantially differ by the type of asbestos exposure, there is little understanding if this is true for other cancers.

Cohorts of workers exposed to blue asbestos and/or mixed asbestos, including over 3000 people, have been established and followed up for over 25 years. Their work histories have been used to assign

cumulative asbestos exposure metrics for each individual. These cohorts will be used to investigate potential causal relationships with these cancers and ascertain any differences by the type of asbestos they were exposed to.

Outline: Does asbestos cause a particular cancer? Does cancer risk differ by the type of asbestos exposure?

The breadth of this project allows multiple students to work on different research questions, the scope of which will be tailored to suit the candidates' goals. Candidates will gain an in-depth experience of a core epidemiological concept of causal attribution.

Methodology: Students will undertake a comprehensive literature review and develop a research proposal, followed by statistical analyses suitable for the scope of the project (e.g. cancer incidence, compare rates, time trends, estimate risks and dose-response relationships, etc.) and prepare scientific manuscripts for publication.

Project Specific Requirements:

Good literature reviewing skills. Good statistical knowledge, e.g. Biostatistics II required.

Project Length: 12 or 24 point MPH

Comparison of occupational exposure assessment tools for asbestos

Dr Nita Sodhi-Berry; Dr Peter Franklin

Background: Accurate exposure assessment is important for epidemiological studies. Various methods are used to ascertain exposures in occupational studies. These include expert judgement on a case-by-case basis, job exposure matrices (JEMs) and self-reported exposures. Each has its own pros and cons.

An asbestos job exposure matrix (the AsbJEM) has been developed to estimate cumulative asbestos exposure for Australian jobs. It has been validated by examining dose-response relationships with mesothelioma and asbestosis, both diseases exclusively attributable to asbestos exposure. However, exposure estimates from the AsbJEM have not yet been compared with those from another tool. The overall aim of this study will be compare the validity of exposure assignment through a matrix vs. expert opinion. The difference in risk for asbestos-related diseases will be quantified for a subset of over 300 Wittenoom miners with exposure estimates derived from both tools.

Outline: This study will compare two exposure assessment tools (AsbJEM vs. expert assessments) to assess if risk estimates for asbestos-related diseases, such as mesothelioma, lung cancer and asbestosis, are similar.

Methodology: Using the data on over 300 Wittenoom miners, the student will understand the differences in the calculation of exposure through the two methods. She/he will undertake a comprehensive

literature review and prepare a research proposal, perform statistical analyses to calculate incidence rates and compare these, and prepare a scientific manuscript for publication.

Project Specific Requirements:

Good literature reviewing skills. Good statistical knowledge.

Project Length: 12 point MPH

Post-Wittenoom occupational asbestos exposures: Do they matter?

Dr Nita Sodhi-Berry; Dr Peter Franklin

Background: Workers from the Wittenoom mine and residents of the Wittenoom township have had the highest incidence rate of mesothelioma and lung cancer in the world from their exposure to high levels of blue asbestos (crocidolite). Exposure levels of both Wittenoom workers and ex-residents have been estimated through their employment records and residency, respectively. In epidemiological studies, only their Wittenoom exposures have been considered. However, some people had asbestos exposure after leaving Wittenoom.

We have full work histories for over 1300 Wittenoom miners and 1100 Wittenoom residents, and their post-Wittenoom exposures have been quantified through the Australian asbestos job exposure matrix, the AsbJEM.

Outline: The aim of this project is to estimate post-Wittenoom exposures in the Wittenoom cohorts to determine if these can make a significant contribution to the overall asbestos exposure.

Methodology: Using the data on Wittenoom workers and residents who had additional occupational exposure outside of Wittenoom, the student will understand the differences in the calculation of exposures through the two assessment tools. She/he will undertake a comprehensive literature review and prepare a research proposal, perform statistical analyses to calculate *incidence* rates and compare these, and prepare a scientific manuscript for publication.

Project Specific Requirements:

Good literature reviewing skills. Good statistical knowledge.

Project Length: 12 or 24 point MPH

Quantitative assessment of occupational exposures in WA mines

Dr Peter Franklin

Background: Assigning quantitative and accurate exposure levels is key for deriving valid inferences from occupational epidemiological studies. Quantitative exposure assessment enables epidemiologists to express risks of a disease per unit of exposure and inform acceptable thresholds in the workplace. Accurate estimation of health risks arising from hazard exposure in the workplace require valid exposure quantification. Measurement data along with information on how, why, when and where they measurements were collected is needed for this.

Levels of exposure to potentially hazardous dusts and chemicals in WA mines have been monitored by the mining industry and

collated on an electronic database since 1986. This data will be modelled to describe the levels, determinants and variability of exposure to dusts, including specific carcinogens, and other hazards in the mining industry.

Outline: To estimate quantitative levels of exposure to various contaminants (e.g. respirable dust, CO, NO_x, nickel, lead, arsenic, etc) for various jobs in the contemporary mining industry.

Methodology: The student will undertake a review the literature on a specific mining exposure (e.g. asbestos), gain familiarity with the mining exposures database and prepare a research proposal, followed by statistical analyses and preparation of a scientific manuscript for publication. Statistical analyses will include modelling of exposure measurements, describing time trends, identifying determinants of exposure and assigning quantitative exposure levels to individual miners.

Project Specific Requirements:

Good statistical knowledge and skills, e.g. Biostatistics II essential.

Project Length: 24 point MPH

What is the impact of vegetation on air quality?

Prof Jane Heyworth; Ania Stasinska; Dr Natasha Pauli (School of Agriculture and Environment UWA)

Background: There is emerging evidence that green space is associated with health and wellbeing. Some of the mechanisms by which this might occur include: increased physical activity, reduced stress, improving air quality and reducing urban heat effects. Vegetation may be both beneficial and harmful for air quality as trees can filter out particulates in air, but some may also produce volatile organic compounds or pollens. In order to plan greening in urban areas to improve health more in-depth knowledge is needed regarding the specific settings and greening characteristics that will maximize benefits.

Ref: Zupanci, et al (2015), The Impact Of Green Space On Heat And Air Pollution In urban Communities.

Outline: To understand the relationship between green space and air pollution in Australian urban environments.

Methodology: Literature review.

Project Specific Requirements:

Good analytical and writing skills

Project Length:

Honours/12 or 24 point MPH

Does proximity to urban green and blue space affect respiratory health?

Ania Stasinska; Prof Jane Heyworth; Wilma Zijlema (ISGlobal)

Background: Urban green and blue space (for example parks, street trees, lakes and urban gardens) have the potential to improve population health by promoting physical activity and neighbourhood social cohesion, improving air quality and reducing noise and urban heat island effects.

A variety of health benefits related to green and/or blue space have been reported including reductions in all-cause mortality, cardiovascular mortality, weight status, mental health issues, as well improved perceived general health and pregnancy outcomes.

There are some indications for a relationship between green space and respiratory mortality and hence we would like to investigate the long-term and causal effects of green space on respiratory morbidity to strengthen the evidence base.

Estimates of both blue and green space exposure have been determined (for green space using Normalized Different Vegetation Index (NDVI), Urban Monitor (<http://urbanmonitor-beta.landgate.wa.gov.au/project.php>) and the Public Open Space tool (<http://urbanmonitor-beta.landgate.wa.gov.au/project.php>)). These have been linked to each participant in the Health in Men Study (HIMS), a cohort of 12,203 Perth men aged 65 and above enrolled in 1996 and followed up until 2012.

Outline: The overall aim of this study is to investigate if residential proximity to green space affects respiratory health outcomes in a cohort of older men in Perth.

Methodology: Quantitative methods. Cox proportional hazards regression will be used to examine the relationship between green space estimates and respiratory health outcomes including hospital admission and mortality, adjusting for confounders such as traffic, urban density, industry and other land uses which may influence health.

Project Specific Requirements:

Completion of Biostatistics II or familiarity with survival analysis techniques.

Project Length:

Honours/12 or 24 point MPH

Health and well-being impacts of interactions with green space: Does perception of biodiversity influence outcomes?

Prof Jane Heyworth; Dr Natasha Pauli (School of Agriculture & Environment UWA)

Background: Perth is within a global biodiversity hotspot, with a high proportion of endemic species coupled with a dramatic reduction in total area covered in native vegetation. There exists a broad body of literature detailing the links between green space and impacts on physical and mental health and wellbeing. However, there is a relative lack of information on how the biodiversity of green spaces is a) perceived by the general public and b) is linked with health and well-being.

Emerging research has shown some potential correlations between access to areas with higher biodiversity, respiratory health and allergic conditions.

However, the degree to which people's perception of biodiversity influences their use and opinion of green spaces with varying levels of native biodiversity has been little explored in the Australian context.

This research project will use a mixed methods approach to explore perceptions of a cross-section of the community to a spectrum of green spaces that could be used for recreation, highlighting the likely impacts on wellbeing and physical activity.

Ref: Sandifer, et al (2015) *Ecosystem Services* 12: 1-15.

Outline: To understand variation in the perception of biodiversity; and to assess whether people's views on biodiversity are linked with differential impacts on health and well-being.

Methodology: Literature review, questionnaires, focus groups, qualitative and/or quantitative data analysis.

Project Specific Requirements:

Good analytical and writing skills. Ability and willingness to interact with members of the public and/or key external stakeholders.

Project Length:

Honours/24 point MPH

An economic evaluation of the intervention to improve mental health & wellbeing for children with hearing loss

Dr Ian Li

Background: In addition to evidence demonstrating the efficacy or effectiveness of health-based interventions, evidence on the cost aspects are required to inform policy-makers and practitioners on the economic impact of funding decisions. This study will draw on effectiveness outcomes from the Belong project, which will trial interventions for children in mainstream schools targeted at supporting their mental health and well-being, and cost data to evaluate the cost-effectiveness of the interventions.

Outline: This study will involve collection and sourcing of cost data around implementation of the intervention, as well as estimation and analysis of Quality Adjusted Life Year data based on responses to the CHU9D instrument from the study's participants. These data will be analysed in order to estimate the incremental cost-effectiveness ratio from implementing the intervention, and the development of recommendations for policy and practice.

Methodology: Quantitative

Project Specific Requirements:

Essential -

- Excellent proficiency in English
- Basic statistical skills (good score in Biostatistics I or equivalent)

Desirable- Knowledge in health economics and economic evaluation techniques (completion of Health Systems and Economics and/or Economic Evaluation of Healthcare)

Project Length: Honours/24 point MPH

An economic evaluation of the new WHO guidelines for the number of routine antenatal care visits in South Africa

Dr Ian Li; Ms Tina Lavin

Background: In 2001, the WHO reduced the recommended number of routine antenatal care visits during pregnancy, based on results from a multi-country, randomised controlled trial (n=22000) that found having fewer visits did not increase adverse perinatal and obstetric outcomes. As such, South Africa and many other lower-income countries reduced their visits over the next 2-5 years. However, new research has emerged that has shown that reducing the number of routine visits increases stillbirths. Hence, in 2016, the WHO revised their guidelines to reflect these new findings and South Africa up-scaled the number of routine antenatal care visits in April 2017. This is expected to reduce stillbirths and increase the detection of hypertension.

Outline: As South Africa is one of the first countries to adopt the new WHO guidelines the intervention is being heavily evaluated. This study will involve the analysis of cost data around implementation of increased antenatal care visits in four circumscribed catchment areas across South Africa

(1 urban, 2 pre-urban; and 1 rural sub-districts). This study will also include the development of recommendations for policy and practice.

Methodology: Quantitative

Project Specific Requirements:

Essential -

- Excellent report writing skills and proficiency in English.

- Basic statistical skills (a good score in Biostatistics I or equivalent)

Desirable-

Knowledge in health economics and economic evaluation techniques (completion of Health Systems and Economics and/or Economic Evaluation of Healthcare)

Project Length: Honours/ 24 point MPH

The Raine Study

Background: The Raine Study is a longitudinal pregnancy birth cohort and a rich resource for the study of genetic, phenotypic, behavioural, environment and social factors that affect health and development. 2,900 pregnant women were recruited between 1989 and 1991 and their offspring formed the Raine Study Gen2 cohort. Information was collected on the pregnant mother and subsequently both parents and the child. The Gen2 cohort participants have been assessed at birth, and at 1, 2, 3, 5, 8, 10, 14, 20, 22, 27 and 28 years of age. Today the Raine Study has data on four generations of participants – Gen0 (grandparents of the main cohort), Gen1 (their parents), Gen2 and Gen3 (their children). Information available includes questionnaire data (demographic, developmental, psychological), clinical assessment information (anthropometry, DXA, physical fitness), genetics (GWAS, EXOME, EWAS) and biological sample analysis.

Information collected over the last 29 years has been utilised to obtain an understanding of how events during

pregnancy, childhood, adolescence and adulthood affect health and development.

The Raine Study information can be used to examine complex causal pathways associated with health and social outcomes. Information has been prospectively collected 12 times over the life course of the Gen2 participants and provides a unique opportunity to examine longitudinal data to answer important research questions.

A range of research opportunities are available for utilising the Raine Study Dataset. Data is available on research areas including genetics; cardiometabolic; respiratory, immunology and inflammation; hormonal and reproduction; musculoskeletal; psychological; senses; bio; perinatal; built environment and social environment; and education and work. Detailed information on questionnaires and data collections are available on the Raine Study website rainestudy.org.au.

Enquiries: Aggie Bouckley - aggie.bouckley@uwa.edu.au

Projects under Vulnerable Groups

Reducing health inequalities among vulnerable/disadvantaged populations

A/Prof Lisa Wood; Dr Karen Martin

Background: Huge inequalities in physical, mental and social health continue to exist between the most advantaged and disadvantaged population groups in Australia. Socially determined barriers (such as where you live, grow and work) can impede the effectiveness of public health and other interventions with more disadvantaged population groups (e.g. at-risk young-people, homeless people, refugees and prison populations). Previous projects in this field include evaluating health interventions; assessing the impact of broader public policies on health related behaviours or outcomes; investigating relationships between PTSD, loneliness and connectedness in adolescent refugees; and socio-economic differences in the density of alcohol and tobacco retail outlets.

Outline: There is scope for a range of projects focusing on disadvantaged populations and/or addressing underlying policy, social, economic and geographic drivers of health and wellbeing disparities. Such projects could be linked to existing studies we are undertaking, or students could discuss their own ideas.

Methodology: Methodologies can include qualitative and/or quantitative research. There is specific interest in research that has strong policy and practice implications.

Project Length:

Honours/ 12 or 24 point MPH

The role of therapy dogs in contributing to positive mental health in educational settings

A/Prof Lisa Wood

Background:

There is a large body of international evidence supporting the benefits of companion animals at both the individual and community level. Animal assisted therapy is increasingly used in healthcare, aged care and counselling contexts, and the use of therapy dogs in educational settings is gaining popularity. Whilst more common in the USA and Canada, there are now range of schools and universities across Australia with a therapy or campus dog. Hypothesised benefits include improving students' mental health and reducing stress. Evidence to support the use of therapy dogs for positive mental health in educational settings in Australia is needed.

Outline: This project will look at the potential benefits, barriers and enablers of therapy dogs in educational settings (schools or universities) through a review of published evidence, and data collection.

Methodology: The data collection could take a number of forms depending on the student's preferences for qualitative or quantitative research methods. A survey of a sample of schools or universities with a therapy dog (in WA or nationally) to investigate the perceived benefits is one data collection option. The project could include in-depth interviews

Project Length: Honours

Reducing health inequalities for people experiencing homelessness

A/Prof Lisa Wood

Background: Housing is a recognised social determinant of health, and precarious housing and homelessness can cause and exacerbate health inequalities. Mental illness and chronic disease risk factors are more prevalent among people in homeless or unstable housing circumstances, and transient housing reduces the likelihood of preventative behaviours or early help-seeking, resulting in greater use of costly emergency and tertiary health services. Students have the opportunity to be involved in our growing program of internationally regarded research around homelessness and health, in collaboration with the Homeless Team and Royal Perth Hospital and Homeless Healthcare.

Outline: The overall aim of this research is to demonstrate the health, social and economic benefits of reducing homelessness, with a strong focus on evaluating the effectiveness of interventions being implemented in the health and homelessness sectors. There is scope for a number of student project options in 2019, and the specific research aims will depend on the project selected.

Methodology:

A mix of research methods are being used in our suite of homelessness and health research, including qualitative and quantitative research, and assessment of economic impact. We are particularly interested in research that has strong

policy and practice implications. Students interested in this area are encouraged to contact us to discuss possible projects. interested in research that has strong policy and practice implications. Students interested in this area are encouraged to contact us to discuss possible projects.

Project Length:

Honours/ 12 or 24 point MPH

No Pets Allowed? Social & health benefits of enabling pets to live with people vulnerable to social isolation

A/Prof Lisa Wood

Background: Research has demonstrated a raft of mental and physical health and social benefits of pet ownership, but for some people changes to their housing or life circumstances make it hard to keep a pet.

Outline: There is scope for three projects looking at current policy and practice across a number of areas relating to pets and vulnerable populations.

1. Retirement villages and aged care facilities often have a default 'no pets allowed' policy, however pets provide an important antidote to social isolation and can facilitate connectedness with other people.

2. Women and children escaping domestic violence situations – most shelters and refuges are communal and can't accommodate pets, and evidence indicates women can delay leaving a violent home environment for fear of the pet being harmed.

3. Homeless people face many challenges relating to pets. Most emergency or crisis accommodation facilities and rental properties do not allow pets which limits housing options and can delay being re-housed.

Methodology:

1. This project could include a survey of retirement and aged care facilities to assess current pet policies and/or qualitative research with people for whom ‘no pet’ rules are a barrier to downsizing or moving into a retirement village.
2. This project could include a review of services/ programs in Australia to address this issue e.g. desktop and literature review plus a survey or interviews with services regarding demand for the service, barriers and enablers to program effectiveness etc.
3. This project could include a review of policies relating to pets in places that provide accommodation for homeless people and/or interviews with a sample of services to investigate barriers to altering ‘no pet’ policies and/or interviews with organisations such as the Mercy Foundation that have advocated on behalf of homeless people with pets.

Project Length:

Honours/ 12 or 24 point MPH

Family & domestic violence: Impact on the WA Health system & associated costs

A/Prof Lisa Wood

Background: Family and domestic violence (FDV) is a major public health and societal concern. People who have experienced FDV have poorer health outcomes and premature mortality, and are more likely to experience housing instability. FDV also carries an enormous economic cost to society, and there is a need to build the economic argument for greater prevention and early intervention. Health related costs of FDV are difficult to determine, particularly as FDV is often not disclosed as the reason for attending hospital. With conservative estimates assessing the cost of \$51 million for women hospitalised in WA during 2009-2015.

Outline: A recent exploratory study by staff from King Edward Memorial Hospital (KEMH) sought to look further into the hospitalisation rates and associated costs of FDV; it found for example, that ED presentations were higher among those women who were impacted by FDV, and average length of inpatient stay was longer. There is scope for a student to be involved in a research project that builds upon the exploratory KEMH work. Very little research to date has been able to capture the mental health burden and trauma attributable to FDV, and these costs are likely to be pervasive.

Methodology: The details of the project would be co-developed in consultation with the student, UWA supervisor and staff from KEMH. This could include quantitative research methods (for example analysis of

existing hospital data from regional and/or Perth hospitals); a review of the different ways data is collected (or not collected on FDV) currently and scope to improve standardisation of this, and/or a desk-top review of how FDV is screened for, recorded in hospital records and addressed in other healthcare settings. There is also scope to look at the health impacts of FDV for highly vulnerable population groups; for example national data indicates that Aboriginal women are 35 times more likely to be hospitalised due to FDV related assaults than non-Aboriginal women. FDV is also a major cause of homelessness in women, which in turn can exacerbate other health issues.

Project Length: 12 or 24 point MPH

School environments that support the mental health of young people

Dr Karen Martin

Background: Trauma and adverse experiences from childhood neglect and abuse are not uncommon. Australian data indicate that 12–23% of children experience family and domestic violence (FDV) and this includes 5–10% being physically abused and 12% being neglected. Burgeoning evidence also highlights the neurodevelopmental impact that trauma has on the developing brain, which in itself can lead to ongoing dysfunctional behaviours or mental health issues.

Behavioural responses to single or repeated incidents of trauma are highly individual; they can be obvious (such as violence, self-harming) or more subtle (e.g. guarded, defensive, angry, inappropriate behaviour).

Due to the expectations and stressors in the school setting, these behaviours are often displayed in this environment. Trauma-informed practice involves responding to dysfunctional behaviours cognisant of the impact that adversity/and or trauma has on emotions and behaviour. Our honours and dissertation projects will build on a larger research program which aims to develop school environments that support disadvantaged young people.

Outline: This research explores how schools can generate environments that are supportive of children who have experienced adversity and/or trauma including those that support positive mental health and reduce aggressive and violent behaviour.

Methodology:

Some examples of available projects include:

1. A qualitative exploration of perceptions of facilitators and barriers to trauma-informed practice (Honours)
- 2) A quantitative examination of teacher and student perceived trauma-informed practice in the school setting and its relationship with student outcomes (suspension, mental health, academic, school connectedness and completion) (Honours, Masters 24 Point)

Project Specific Requirements:

A passion for assisting vulnerable populations is needed. May need a Working with Children Check.

Project Length:

Honours/12 or 24 point MPH

Evaluating a dental care facility in a community setting

Dr Julie Saunders; Prof Linda Slack-Smith; A/Prof Angela Durey

Background: For many people from marginalised groups, attending dental services and maintaining oral health is challenging however it can make a life changing difference. This project will involve a simple evaluation of a voluntary dental service located within a day centre. This project will investigate and evaluate a community-based voluntary dental care service. Using Nutbeam's work on evaluation and Davidson's work on models of care, this project involves an evaluation (this will have qualitative and quantitative aspects).

Outline:

- Describe dental care delivered in a particular community setting.
- Identify strengths and weaknesses of this service.

Methodology: Literature review, scan current practice, existing data, interviews, questionnaires .

Project Specific Requirements:

Confident working in a community setting. Skills in qualitative and /or quantitative evaluation. You do not need any dental background.

Project Length:

Honours/12 or 24 point MPH

Family and domestic violence research priority setting

Prof Colleen Fisher

Background: Family and domestic violence is an important public health issue internationally. In Australia, the ABS (2013) estimated that 1 in 4 Australian women over the age of 15 years had experienced at least one incident of physical or sexual and/or emotional abuse in her lifetime. Despite being constructed as a social and public health issue since the 1970s and the state in Australia formally responding to the issue since the 1980s, family and domestic violence became much more prominent on political and policy agendas following Rosie Batty being named Australian of the Year in 2015. Australia has a national plan to prevent family and domestic violence with a designated research arm – ANROWS. The research priorities through ANROWS are 'top down' with researchers submitting research grant applications against ANROWS priority areas. Academics from the School of Population & Global Health, Telethon Kids Institute, Anglicare WA and the WA Consumer and Community Health Research Network were keen to understand what the research priorities were for those with lived experience. To this end we undertook a family and domestic violence research priority setting process in late 2016. From this process a prioritised list of 10 research priorities for mainstream and 10 for Aboriginal women was developed.

See: - <http://involvingpeopleinresearch.org.au/find-out-more/our-resources/family-and-domestic-violence-priority-setting-partnership>

Outline: This project is placed in the burgeoning area of scholarship and practice related to the imperative of ensuring consumer and community involvement in research. The intended outcome from this project is the publication of a manuscript detailing the priority setting process and the analysis of the qualitative data that were collected during the process.

Methodology: In this project you will have the opportunity to analyse the open-ended qualitative data that was collected from the survey that formed part of the priority setting process and situate the analysis in the broader community involvement and responses to family and domestic violence literatures.

Project Specific Requirements:

An understanding of qualitative data analysis. Your qualitative data analysis skills will develop over the course of the project.

Project Length: Honours/24 point MPH

Disability and disaster management in the Pilbara

A/Prof Monica Moran; A/Prof Rohan Rasiah

Background: The Pilbara region of Western Australia is well known for the frequency and ferocity of its weather related natural disasters. While such events pose significant risks for all residents in the times before, during and after the crises, evidence from other similar geographic locations suggests that the risks for people with physical disability are likely to be elevated. A recent systematic review suggested that the voices and needs of people with disability are rarely considered in emergency planning, disaster management and post disaster recovery activities.

Outline: This study will involve a desktop audit of governance, policy and procedure documents of public and private agencies funded to support the lives of people with physical disability in the Pilbara region of Northern Western Australia. The audit will focus on identifying the specific strategies already in place to support and empower people with physical disability to prepare for, manage and recover from the impacts of weather related natural disasters. The results will be mapped against best practice recommendations both nationally and internationally. Based on outcomes of the audit and the mapping with best practices a set of specific recommendations will be generated for the Pilbara with strategies for disaster response and recovery that are tailored to meet the needs of people with disability.

Methodology:

The project will require you to:

- review literature related to disaster management and disability;
- become familiar with the range of service providers engaged with people with disability and involved in disaster management across the Pilbara;
- develop an audit tool and conduct a detailed review of service documentation related to disaster management contingencies for people with disability;
- develop, prepare and submit a research proposal and application for ethics approval; and
- analyse and synthesise data to generate best practice guidelines and prepare manuscript for publication.

Project Specific Requirements:

- Sound literature searching skills.
- Commitment to empowering people with disability.

Project Length: Honours/24 point MPH

The challenges of career development for health professionals in rural/remote locations

A/Prof Monica Moran; A/Prof Rohan Rasiah

Background: The health workforce in remote Western Australia is a particularly transient one and the turnover of health personnel has a significant negative impact on service provision for communities in remote areas. In addition the cost of a rapid turnover of health professionals introduces an additional financial burden on health services. Finally for health professionals themselves the upheaval of taking up and then leaving a position in a short period of time has many negative connotations.

Much has been written about the factors that impact on health professionals' reasons to stay or leave a remote position. Concerns regarding limited opportunities for career development in remote settings are frequently identified.

Outline: This study will involve the generation, development, implementation and analysis of an on-line survey to health professionals across a large remote area of Western Australia. The survey will explore the perceived career development needs of these health professionals including needs for mandated continuous professional development, needs for education and training specifically related to remote practice contexts, and needs for advanced education to support career advancement. The results will be used to inform health services' managers and education providers regarding specific strategies to enhance the sustainability of the remote health workforce through the development

of a comprehensive postgraduate educational program.

Methodology:

This project will require you to:

- review the literature related to Australian health workforce in the context of rural/remote practice areas;
- generate and deploy an online survey for health professionals;
- develop, prepare and submit a research proposal and application for ethics approval;
- analyse data, compile results, and prepare manuscripts for publication.

Project Specific Requirements:

- Sound knowledge and skills in survey development.
- Interest in rural/remote health workforce and service delivery.

Project Length:

Honours/24 point MPH

Projects with the WA Department of Health (DOH)

Evaluation of effectiveness of Westplan Heatwave, a current heatwave management framework in WA

Prof Jane Heyworth in collaboration with Dr Alex Xiao (Epidemiology Branch, DOH)

Background: The Department of Health (WA) developed a response plan called Westplan Heatwave in 2012. A systematic assessment of the effectiveness of the plan is required. The findings from the project will be used to inform policy, and assist with the development of strategies to tackle the impact of heatwaves.

Further info: alex.xiao@health.wa.gov.au

Outline: The aims of this project are to:

- evaluate health service utilisations and demands in WA during heatwave days before and after the launch of the Westplan Heatwave.
- investigate potential dose-response relationships between health service demands in WA and heatwave intensities.
- identify which vulnerable groups in WA are most susceptible to extreme heat, and in need of targeted interventions.

Methodology: Quantitative methods using the Hospital Morbidity Data.

Project Specific Requirements:

We are looking for a candidate who is passionate about research; has basic knowledge in Population Health, Epidemiology, and Health Statistics; and is keen to learn programming in using statistical software such as SAS.

Project Length: 24 point MPH

Exploring the impact of a dual-mode population based health survey

Prof Jane Heyworth, Dr Julie Saunders in collaboration with Dr Sarah Joyce (Epidemiology Branch, DOH)

Background: The WA Department of Health relies on the population based Health and Wellbeing Surveillance System (HWSS) to monitor the health status of the WA population including prevalence of lifestyle risk factors (e.g. physical activity, alcohol consumption, diet) and chronic disease. The HWSS is currently conducted as a telephone survey but it is becoming increasingly difficult to reach younger adults through this method.

Outline: The aims of this project are to:

- estimate the effects of online mode on
 - a) prevalence estimates for selected risk factors and chronic conditions
 - (b) response and participation rates; and
 - (c) timeliness of completion for both the total population and relevant sub-populations;
- design, develop and conduct a follow-up online survey to evaluate participant satisfaction with the online delivery mode for consenting participants;
- identify any issues contributing to improved or reduced quality of data collection and the potential implications for future program delivery.

Methodology: Quantitative - a pilot study will be conducted whereby selected respondents for the HWSS are given the option to complete the survey online

and the relationship between mode of completion and health estimates will be investigated.

Project Specific Requirements:

Completion of Biostatistics I and Epidemiology I or equivalent.

Project Length:

Honours/12 or 24 point MPH

for improving the health of urban, rural and remote Western Australians and provision of health services statewide.

Methodology: A fundamental knowledge of biostatistics will be required as will a working knowledge of a statistical software package like SAS, STATA or SPSS.

Project Length: Honours/24 MPH

The Western Australian Burden of Disease Study

A/Prof Tom Briffa in collaboration with Dr Laura Miller (WA DOH)

Background: Burden of disease (BOD) is a modelling technique combining multiple data sources to count and compare the total fatal and non fatal health loss from diseases and injuries in a population. In 2016, The Australian Burden of Disease Study (ABDOS) 2011 provided updated estimates for over 200 diseases and injuries in Australia and for the Aboriginal and Torres Strait Islander population for 2011.

Outline: The Epidemiology Branch of the WA DOH is currently conducting a project to create detailed, up-to-date estimates of disease burden for WA; the WA Burden of Disease Study (WA BODS). The WA BODS is a collaboration between the WA DOH, the Australian Institute of Health and Welfare and various disease experts from academia. This project involves analysis of linked data to either improve aspects of disease models used in the ABODS or refine estimates for the WA state and regional context. The findings will have public health policy and translational implications with respect to identifying opportunities

Projects with the World Health Organisation (WHO)

Prof Colleen Fisher in collaboration with Dr Joshua Vogel (Department of Reproductive Health and Research, WHO)

Mistreatment of women during childbirth in facilities

Background: Every woman has the right to dignified, respectful care during childbirth. Recent evidence has demonstrated that globally many women experience mistreatment during labour and childbirth in health facilities, which can pose a significant barrier to women attending facilities for delivery and can contribute to poor birth experiences and adverse outcomes for women and newborns.

However there is no clear consensus on how mistreatment of women during childbirth in facilities is defined and measured.

WHO has conducted a mixed-methods study in four lower-income countries on mistreatment during childbirth. The qualitative dataset relates to perceptions, experiences and drivers of mistreatment, while the quantitative dataset relates to measurement of the prevalence of different forms of mistreatment. Potential candidates would have skills and interest in qualitative analysis and software, and/or quantitative analysis and software.

Outline: Available topics include:

- Analysis of qualitative data on perceptions, experiences, and drivers of mistreatment.
- Analysis of quantitative data on prevalence, risk factors and adverse outcomes associated with mistreatment.

Preterm birth

Background: Preterm birth (PTB) is a condition affecting over 1 in 10 newborns worldwide. The Department of Reproductive Health and Research (RHR) at the World Health Organization co-ordinates a number of knowledge synthesis and research activities related to PTB, particularly related to PTB epidemiology, interventional research and knowledge gaps for clinical practice in low-and middle-income countries.

Potential candidates would have skills in quantitative analysis methods and software, and/or systematic review methodology.

Outline: Available topics include:

- Epidemiological analyses on levels and trends in preterm birth globally.
- Systematic review/s and primary research on international definitions, thresholds and reporting standards for preterm birth.
- Development and testing of tools for improving global PTB monitoring and reporting.
- Developing innovative approaches to PTB estimation at population level.

Knowledge translation

Background: While there is a growing volume of evidence and clinical guidelines in maternal and perinatal health, there is still a large gap between evidence and clinical practice, particularly in low- and middle-income countries. While collaborative writing platforms (such as Wikipedia and WikiDoc) are popular resources for clinicians and students globally, they are often of variable quality, which may have adverse impacts on clinical care.

WHO is exploring innovative methods to more efficiently develop recommendations and disseminate them globally. This includes prioritization of clinical questions, development of rapid review techniques, and expanding the use of digital tools and platforms (such as the WHO Reproductive Health Library) to support implementation. Potential candidates would have skills/demonstrated interest in systematic reviews, guideline development and knowledge translation methods.

Outline: Available topics include:

- Appraising the quality and accuracy of maternal and perinatal health information on priority clinical topics available in public knowledge translation platforms; exploring the use of digital communities to improve information quality.
- Using qualitative and quantitative methods to develop and test digital tools for use at point-of-care.
- Adapting and applying rapid review methodologies to development of WHO recommendations. women and communities) in low- and middle-income countries.

Core outcome sets

Background: While much attention has been paid to standardising randomised trial methods, the collection and reporting of outcomes has been comparatively neglected. Systematic reviews have characterised inconsistencies in outcome reporting across trials of key interventions in maternal and newborn health, as well as other disease areas. The development and implementation of patient-centred core outcome sets can help to address these issues.

The CROWN initiative collates a number of ongoing core outcome set research projects in maternal and newborn health, however several clinical topics and interventions are in need of COS development. Core outcome sets have often not considered generalizability to clinical settings in low- and middle-income countries, nor adequately engaged with women and communities living in low-resource contexts. Potential candidates would have skills/interest in quantitative analysis and systematic reviews.

Outline: Available topics include:

- Use of systematic reviews and Delphi consensus methods to develop COS in priority clinical topics within maternal and newborn health.
- Conduct research on the generalizability of COS to low- and middle-income country settings, and engaging the perspective of stakeholders (particularly women and communities) in low- and middle-income countries.



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