



THE UNIVERSITY OF
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AUSTRALIA**

School of Population & Global Health

Research projects 2024

Topics for MPH 24 point
Dissertations



Research Projects 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 24-point dissertation. This can lead to enrolment in a Master of Philosophy (MPhil) or Doctor of Philosophy (PhD).

As a 24-point MPH dissertation research student with us, you will develop, under supervision, a paper for publication in an academic 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.

If you are interested in one of these projects, please contact the person named below the title. If you would like to undertake a project not listed here (e.g., one where the supervisor is within a different School or not based at UWA) you will still require a supervisor within SPGH. Please contact the Dissertation Coordinator to discuss.

Want to know more?

If you're interested in a MPH 24 point dissertation contact our Dissertation Coordinator: Dani Barrington – dani.barrington@uwa.edu.au

Research Areas at SPGH

The Busselton Health Study

The Busselton Health study is a series of internationally recognised cross-sectional and longitudinal population health studies carried out on the population of Busselton, WA which aims to provide a better understanding and management of disease and illness.

Research activities undertaken as part of the Busselton Health Study are diverse and encompass a wide range of health conditions and measures.

These have included cardiovascular disease, respiratory disease, diabetes and endocrine disorders, gastrointestinal, kidney and liver diseases, cancer, obesity, sleep disorders, cognition and genetic epidemiology.

Extensive information on demography, lifestyle and behaviour have also been collected at each of the surveys along with blood samples for biochemical measures and genetic studies.

Epidemiological data analysis driven projects are available for Masters students. Please contact *A/Prof Kevin Murray* (kevin.murray@uwa.edu.au) for details.

Cardiovascular Disease Epidemiology

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Research in this area aims to reduce the burden of cardiovascular disease through research into trends and determinants of acute events, treatment, management and outcomes.

Child and Adolescent Development and Health

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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.

Environment and Health

Enquire

Research in this area 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.

Genetic Epidemiology

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Research in this area aims to identify the genetic and environmental determinants of common human diseases, and explore ways of using this information to improve human health.

Global Health

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As public health researchers, we are interested not only in the health of Australia's domestic population, but also the health of communities across our region and around the world. We work with partners in neighbouring countries to support primary research on the impact of health programs, local policies, and new interventions or health strategies; and we work with global institutions, such as the World Health Organisation, to undertake cross-country analyses of secondary data on child and maternal health, nutrition, and health systems functioning.

Health Services Research

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The 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.

Neuropsychiatric Epidemiology

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The Neuropsychiatric Epidemiology Research Unit (NERU) focuses on psychiatric epidemiology, taking a cross-disciplinary approach to the study of psychotic disorders including schizophrenia and other severe mental illness.

The Raine Study

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The Raine Study is the oldest pre-birth longitudinal study in the world, and one of the world's largest successful ongoing prospective cohorts of pregnancy, childhood, adolescence and adulthood. Established in 1989, the Raine Study has been running for over 30 years, studying the same group of 2,900 pregnant women, their 2,868 children who were born into the study between 1989 and 1992, grandparents of the original babies and now their own offspring. It has conducted 17 follow-ups resulting in an output of over 600 scientific publications.

Vulnerable Groups

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Research in this area aims to improve health and social outcomes and reduce the disease burden among some of society's most at-risk populations.

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

A/Prof Tom Briffa

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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.

Process evaluation of the Healing Right Way trial

A/Prof Judith Katzenellenbogen

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Background: This project is part of a process evaluation of the NH&MRC-funded randomised control trial (RCT) entitled 'Enhancing rehabilitation for Aboriginal Australians after brain injury: Healing Right Way' (HRW). This project is focused on providing culturally secure rehabilitation services for Aboriginal patients with acquired brain injury. HRW uses a randomised cluster step-wedge design of a complex intervention (consisting of culturally secure training (CST), and the introduction of an Aboriginal Brain Injury Coordinator (ABIC) role) in four metropolitan and four regional Western Australian hospitals.

We have designed and implemented a mixed methods process evaluation which is being undertaken both prospectively and retrospectively, enhancing the conduct and interpretation of the parent study.

Outline: To determine processes, barriers and facilitators that have influenced the implementation of the trial and ongoing partnerships with stakeholders during the first two years of the RHW.

Methodology: Qualitative study using data collected prospectively as part of the process evaluation.

Data collected includes minutes of meetings, interviews with project staff, surveys with participants of cultural security training in hospitals, review of communication with project partners.

Project Specific Requirements:

Knowledge of evaluation frameworks, qualitative methods.

Project Length: 24-point MPH.

Coronial inquiries and circumstances of death among people with Rheumatic Heart Disease (RHD)

Dr Emma Haynes
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A/Prof Judith Katzenellenbogen
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Background: RHD is a serious condition involving damage and dysfunction of one or more heart valves following acute rheumatic fever (ARF). ARF peaks in the 5 to 14-year age group and premature death is common among people with severe RHD. The significant and disproportionate burden of ARF and RHD is driven by indirect causes of the disease, including the ongoing effects of colonisation, socio-economic inequities, inadequate housing, living conditions, and sub-optimal access to effective and culturally responsive health care.

Deaths in custody is a major issue for Aboriginal people, as is access to care for complex diseases both in custody as well as the community. Coronial inquiries are over-represented in the death records of people with RHD. More information is needed about the detailed circumstances so that appropriate steps can be put in place to mitigate preventable deaths.

Outline: To explore the reasons for coronial inquiries and circumstances of death among people with RHD who die in an RHD cohort aged under 55. Such information can be used to guide care and reduce preventable deaths.

Methodology: Mixed methods but predominantly qualitative.

Sources of data:

1. Existing data set of death in people with RHD.
2. Public records of coronial inquiries.
3. Interview with key professional informants (such as legal, RHD control program).

Methods of analysis:

1. Simple frequencies/proportions of deaths with coronial inquiries on the death record.
2. Review of legal documents to explore reasons for the coronial inquiry.
3. Thematic analysis of court records and interview data regarding circumstances related to care.

Additional - select 3 case studies for detailed analysis (from all sources) selected to explore nature of care (purposive sampling).

Project Specific Requirements:

- Interest and knowledge of Aboriginal health.
- Qualitative methods.

Developing contemporary algorithms for monitoring myocardial infarction in Australia

Dr Lee Nedkoff

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Background: Measuring population trends in myocardial infarction (MI) incidence and hospitalisation rates has been an important historical indicator of the effectiveness of coronary disease prevention. However, the use of new diagnostic biomarkers since the 2000s has impacted epidemiological monitoring of temporal trends in MI.

Outline: The study will quantify the impact of changes in cardiac biomarkers on trends in MI and test the feasibility of linking cardiac biomarker data to population-level hospitalisation data for ongoing monitoring of MI in Australia.

Methodology: A linked dataset containing hospital, emergency department, mortality and pathology data for all coronary heart disease presentations in Western Australia since 2000 is available. Classification of MI and each coronary heart disease subtype will be made according to ICD-coding and cardiac biomarkers, and rates and trends compared across each classification group.

Project Specific Requirements:

Knowledge of evaluation frameworks, qualitative methods.

Project Length: 24-point MPH.

The epidemiology and experience of rheumatic heart disease

(End RHD in Australia: Study of

Epidemiology – ERASE project)

A/Prof Judith Katzenellenbogen

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Background: Acute rheumatic fever (ARF) and rheumatic heart disease (RHD) persist as significant sources of health burden among Indigenous Australians. End RHD in Australia: Study of Epidemiology (ERASE) Project aims determine the baseline burden of ARF/RHD in Australia and to develop further insights into the progression and outcomes of the disease as a basis for improved monitoring. Other areas of investigation include health system costs, hospital service utilisation, medication adherence and factors affecting the management of these conditions in primary care.

Outline: A number of potential projects associated with the ERASE project are available for students, including epidemiological analyses and analyses related to health systems. Translation of findings will occur through the End RHD Coalition as well as dissemination of results to communities.

Methodology: The project uses a multi-jurisdictional linked database from multiple sources (hospital, primary health care, deaths, RHD register) as well as qualitative data on primary care systems to support RHD management. Midwives data is currently being linked in as well. An appropriate methodology will be developed depending on the research question, available data and the level of skill/interest

of the student.

Examples:

- Analysis of concurrent ARF/RHD and obstetric/pregnancy hospitalisations.
- Missed opportunities in the diagnosis of ARF in hospital (review administrative records of ARF/RHD diagnosed patients to identify whether ARF had not been diagnosed in previous emergency department and hospital encounters.
- Collection and analysis of ARF/RHD paediatric cardiology out-patient data over 20 years.
- Descriptive study of PHC data of patients diagnosed with ARF/RHD in NT.
- Development/evaluation of resources for dissemination of findings to Aboriginal communities (mixed methods).
- Qualitative studies of aspects of the management and experiences of ARF/RHD.
- Development of a standardized set of recommended data items that facilitate comparability of RHD-related information in pregnant women from varied sources and for various purposes (Delphi method).

Project Specific Requirements:

- For linked data analysis, competence in SAS; R or SPSS or preparedness to learn quickly.
- For evaluation and mixed methods research, preparedness to learn qualitative methods.

Describing infant outcomes among mothers diagnosed with Rheumatic Heart Disease

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Dr Mohammed Junaid
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Background: Rheumatic Heart Disease (RHD) is the chronic heart damage arising from Acute Rheumatic Fever, caused by an autoimmune response to Group A Streptococcus infection. The burden of RHD is higher for women and risk of which escalates in pregnancy where the increased cardiac demands can unmask undiagnosed RHD, particularly in the 3rd trimester and immediately post-partum. While maternal outcomes have been documented, little is known about the immediate infant outcomes. The proposed study will examine perinatal outcomes among a cohort of mothers diagnosed with RHD in pregnancy using linked population datasets made available as part of the ERASE project.

Outline:

- To describe perinatal characteristics of infants born to mothers with Rheumatic Heart Disease.
- To investigate demographic, reproductive and maternal medical/surgical history factors as determinants of infant outcomes.

Methodology: The End RHD in Australia: Study of Epidemiology (ERASE) project has assembled a data base of linked hospital, RHD register and Emergency Department from five States. The proposed study will use the midwives' registries in addition to ERASE

project data base to describe and explain outcomes for infants of mothers with RHD in multiple Australian jurisdictions.

Study cohort will be constituted by mothers with RHD as identified from RHD register and hospital records while the comparison cohort will be mothers with a current or previous diagnosis of Acute Rheumatic Fever alone. The linked Midwives registry data will be used to describe infant outcomes that include gestational age, birth weight, intrauterine growth restriction, Apgar score, fetal distress and mode of delivery adopted at birth. The infant outcomes will be further stratified by demographic and preceding antenatal factors (smoking and pre-existing conditions), parity, plurality, RHD severity, and history of surgery (catherisations, and cardiac valve replacements), and use of bicillin (BPG) medication.

Project Specific Requirements: This is a linked data project, there is no field work component. Completion of Introduction to Linked Data Analysis and Biostatistics II is preferred. Clinical background advantageous but not essential.

Project Length: 2 semesters MPH Dissertation (half-time)

Development of an electronic phenotype for investigating chronic coronary disease

Dr Lee Nedkoff
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Background: Coronary heart disease is a progressive and long-term condition resulting from atherosclerosis in the coronary arteries. It is the leading cause of death in Australia, resulting in 17,731 deaths in 2019, and costing the Australian health system \$2.4 billion in 2018-19. Many patients live with the chronic form of the disease, **chronic coronary disease (CCD)**, for many decades, requiring long-term drug therapy and multiple diagnostic and interventional coronary procedures.

We don't know the true prevalence of CCD in Australia. While there are strong methodological approaches for measuring incidence and hospitalisations for acute coronary syndromes (ACS, comprising myocardial infarction (MI) and unstable angina), there is no evidence-based method for identifying CCD patients at a whole-population level in Australia. Without accurate prevalence estimates, there are limited data to inform health policy and service design regarding the effectiveness of secondary prevention therapies.

Outline: This study aims to bring together a broad scope of multi-jurisdictional Australian linked health data to develop a method for identifying people with chronic coronary disease (known as an electronic phenotype) and to investigate the burden and management of people with this disease.

Methodology: The study will use linked hospitalisation, emergency department, mortality, PBS and MBS data from multiple jurisdictions in Australia. Machine learning techniques will be used to develop the electronic phenotype; health service utilisation and medication adherence will be measured in the patient cohort.

Project Specific Requirements:

Requires some experience with using linked data and/or statistical software packages, eg, SAS, STATA.

Project Length: 2 Semesters MPH Dissertation (half time).

Identifying the clinical risk factors for Rheumatic Heart Disease diagnosis in pre-school aged children

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Background: Rheumatic Heart Disease (RHD) is the chronic heart damage arising from Acute Rheumatic Fever, caused by an autoimmune response to Group A Streptococcus infection. The End RHD in Australia: Study of Epidemiology (ERASE) project reported RHD prevalence of 2648 per 100,000 people among <55-year-old Indigenous Australians living in the Northern Territory (NT). Here, 91% of prevalent RHD cases are in Indigenous people aged 15 years and older, but RHD has also been diagnosed in pre-school children. The proposed study will compare the clinical profiles of a 'pre-school' cohort to a 'school-aged' cohort in order to identify clinical risk factors associated with young age RHD onset.

Outline: What are the socio-demographic and clinical profiles of 'pre-school' vs 'school-aged' children diagnosed with RHD?

How do the health care contacts differ between these two age groups of children?

Methodology: The ERASE project has assembled a data base of linked hospital, RHD register and Emergency Department records from five States.

The proposed study will use the ERASE project data base to describe and identify risk factors for 'pre-school' RHD onset (relative to 'adolescent' onset) in multiple Australian

jurisdictions.

Cohorts of children with an ARF and/or RHD diagnosis ages <6 years (pre-school) and 6 -14 years (school-aged) will be identified from RHD register and hospital records.

A more detailed analysis will be undertaken of the NT patients, using PHC data from clinics covering 50% of the population.

Project Specific Requirements: This is a linked data project, there is no field work component. Completion of Analysis of Linked Health Data and Biostatistics I and proficiency in SAS and/ or R programming is preferred. Clinical background advantageous.

Pharmacoepidemiology studies using the 10% PBS sample

A/Prof Frank Sanfilippo

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Background: We have applied to obtain a 10% sample of data from the Pharmaceutical Benefits Scheme (PBS) with linkage to deaths. The dataset will provide a longitudinal source of records for medicines dispensed in Australian pharmacies from 2012 onwards. This will allow various analyses on use of medicines in Australia.

Outline: To investigate the use of specific groups of medicines in a 10% random sample of patients receiving medicines through the PBS in Australia.

Methodology: The PBS data contains information on medicines dispensed from Australian pharmacies, including hospital pharmacies that are registered with the PBS (ie. all private and some public hospitals). Variables include age, sex, name and strength of the drug, quantity dispensed, ATC code, PBS item code, date of supply, date prescribed, beneficiary status (concession card, general beneficiary) and date of death. The dataset will be supplied on approval by the Department of Human Services. It consists of linked data of PBS records and matching death record from a random 10% sample of people in Australia. Various analyses can be completed using these data, with specific examples including: (i) use of psycho- active medicines in the elderly; (ii) use of low dose vs high dose statins by patient characteristics; (iii) patterns of medication use before and during the COVID-19 period (eg. supply of hydroxychloroquine); (iv) use of medicines in the very old; (v) adherence

of specific drug groups (eg. anti-retroviral drugs, statins, beta blockers, antiplatelet agents).

Analysis will require identifying the specific drug groups of interest, applying multivariable regression methods, estimating medication adherence using the proportion of days covered (PDC) method, describing patient characteristics, and simple univariate and bivariate statistics. There is potential to publish the findings in a suitable journal.

Project Specific Requirements:

Knowledge of medicines and therapeutics would be an advantage, although an interest in this area would be sufficient, with additional training provided. Analysis will require use of multivariable regression methods. The data are linked and some knowledge or understanding of how to handle these data would be useful.

Western Australian Heart Valves Study (WAVES)

A/Prof Tom Briffa

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A/Prof Frank Sanfilippo

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Graham Hillis, Primeo Ng, Tom Gilbert, Royal Perth Hospital Clinical Trials Team.

Background: To establish the WAVES registry and inform clinical practice on the treatment of valvular heart disease, improve patient outcomes, and design future trials which have global health implications.

Outline: Research Objective 1: Create a historical registry of all patients and outcome measures after surgical heart valve replacement and/or repair in one of the three tertiary public hospitals in Western Australia (WA) between 1 January 2010 and 31 December 2020 (retrospective cohort).

Research Objective 2: Create a new registry of all patients and outcome measures after surgical heart valve replacement and/or repair in one of the three tertiary public hospitals in WA from 1 January 2021 onwards with prospective periodic follow-up.

Methodology: A combination of data sources including local and national retrospective and prospective clinical/surgical quality registries, patient-reported measures, and routinely collected hospital morbidity and mortality collections.

Project Specific Requirements:

Requires knowledge and competency with common data analytical software and in statistical regression.

Project Length: Negotiable.

Understanding trends and patterns of medicine utilisation to manage cardiovascular disease

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Background: Cardiovascular disease (CVD) is a leading cause of morbidity and mortality worldwide. In Australia, it accounts for 27% of deaths every year and around 1.2 million Australians have one or more heart or vascular conditions. One of the means of preventing and treating CVD is using evidence-based pharmacotherapies. These drug groups include blood pressure lowering drugs, lipid lowering drugs, and vasodilators, and they account for around one third of all Pharmaceutical Benefits Scheme (PBS) prescriptions in Australia. While there is some data available on supply trends of CVD medicines in Australia, there is limited research investigating other aspects of pharmacological management. In particular, most studies concentrate on trends in various measures for individual drug groups, with limited data on patterns in people taking multiple drugs. Little is known about the use of nitrates (a subgroup of the vasodilator category) and the patterns of use in combination with other CVD drug groups. Nitrates are an anti-anginal drug and some are highly specific for the management of coronary artery disease-related chest pain. Therefore, they could potentially be used to identify the portion of this patient group who are not hospitalised

for their condition. However, we have limited data on patterns of use of this drug group, of different nitrates, and of how they are used in combination with other CVD drugs.

Outline: The primary aim of this project is to examine trends in the dispensing of PBS-listed CVD pharmacotherapies, stratified by age, sex and state. Specifically, the aims are to:

1. Examine the dispensing trends of major CVD drug groups, including vasodilators, beta blockers, calcium channel blockers, agents acting on the renin-angiotensin system, and lipid modifying agents.
2. Determine the prevalence and incidence of use of these drug groups.
3. Determine the co-prescribing patterns for people using the CVD medications of interest

Methodology: This study will utilise the PBS 10% sample dataset to examine trends and patterns in government-subsidised CVD pharmacotherapy use from 2005 to 2022. This dataset contains information on medicines dispensed from Australian pharmacies. Variables include age, sex, name and strength of the drug, quantity dispensed, PBS item code, supply date, prescribed date, beneficiary status and year of death. Various analyses can be conducted using this dataset to understand trends and patterns in dispensing of CVD pharmacotherapies.

Project Specific Requirements:

Knowledge of medicines and therapeutics would be an advantage, although an interest in this area would be sufficient, with additional training provided. Analysis will require use of multivariable regression methods and some knowledge or understanding of working with linked data.

Acute Coronary Syndromes and Stroke

Dr Lee Nedkoff,

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Keira Robinson

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Background: Acute coronary syndromes (ACS) occur when there is a reduction in blood supply to the heart, and include ST-segment elevation myocardial infarction (STEMI), non-STEMI and unstable angina. In 2020, 56,700 Australians aged 25 and over suffered an acute coronary event. Stroke is a known complication following ACS and is associated with increased morbidity and mortality. There were around 39,500 new and recurrent stroke events in Australia in 2020. Currently, age-specific incidence of stroke and long-term cardiovascular outcomes following hospital admission for ACS is unclear. A more accurate understanding of stroke risk in the ACS population is needed to inform health policies pertaining to stroke prevention strategies.

Outline: This study aims to describe the age-specific risk of stroke in people admitted to hospital with ACS. This may include estimation of:

1. age-specific stroke incidence and recurrence rates in the ACS population, stratified by sex
2. short, medium, and long-term risk of stroke in the ACS population
3. the population attributable risk of stroke due to ACS.

Methodology: A linked dataset containing hospital, emergency department, and mortality data for all cardiovascular disease presentations in Western Australia since 1985 is available. A retrospective cohort of ACS

patients will be constructed based on International Classification of Diseases (ICD) coding, and relevant statistical and regression analyses will be undertaken.

Project Specific Requirements:

This is a linked data project. Requires some experience using SAS, STATA or R programming, and completion of Epidemiology and/or Biostatistics units.

Project Length: 2 semesters MPH or Honours dissertation (half-time)

Physical activity interventions targeting dog owners

Dr Hayley Christian

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Background: Almost half of all Australian households own a dog. Dog walking has been shown to be a potentially viable strategy for increasing the number of people (adults and children) who meet national physical activity recommendations.

Outline: This project will involve intervention research to examine the potential of dog walking and active play to improve physical activity levels, health and wellbeing. The project is likely to have significant implications for physical activity promotion and will involve working closely with key stakeholders, 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.

Children's Physical Activity, Health and Development

Dr Hayley Christian

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Background: This research forms part of the PLAYCE program of research – Places Spaces & Environments for Children's Physical Activity. PLAYCE examines 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: at home, around the neighbourhood and whilst attending early childhood education and care (ECEC). This research will provide information on how best to create healthy home, neighbourhood and ECEC environments.

Outline: The project involves qualitative research with children, parents, staff and key stakeholders in the ECEC setting, as well as quantitative research measuring young children's movement behaviours (physical activity, sedentary time and sleep), overweight/obesity, development and the influence of the ECEC physical, policy and social environment. There is scope to evaluate the impact of policy and practice-based interventions to improve children's movement behaviours at ECEC.

Students have the option to work on the PLAYCE cohort study which details patterns of movement behaviours and the effect movement behaviours have on weight status and socio-emotional, cognitive, and motor development across childhood (2-9 years).

Methodology: Literature Review; Quantitative/qualitative research.

Project Specific Requirements:

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

Interventions to reduce energy drink intake in children and adolescents

Dr Siobhan Hickling

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Dr Gina Trapp (TKI)

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Background: Energy drinks have catapulted to popularity among young people. Whilst they are marketed to improve the body's performance, they pose a significant health risk due to the high levels of caffeine, sugar, sodium and herbal stimulants they contain. Their consumption has been linked to heart palpitations, hypertension, cardiac arrest and even sudden death in individuals with underlying heart conditions.

Children and adolescents are at an even greater risk of experiencing adverse health effects from energy drinks due to their smaller body size and lower tolerance to caffeine. Despite growing community concern and evidence of health risks, Australian governments have not enforced age-specific restrictions on the purchasing of energy drinks. Thus, there is a critical need to identify other ways to minimise harm in young people.

Outline: Interested students are invited to undertake research projects aimed at reducing and preventing energy drink intake in children and adolescents.

Potential research topics include:

- Development of a parent-based intervention to reduce energy drink intake in children and adolescents.
- Development of a child-focused intervention to reduce and prevent energy drink intake.
- Investigating parent, teacher and school principal's knowledge, attitudes, perceptions and experiences related to children's energy drink intake.

Project Specific Requirements:

Excellent interpersonal, written and oral communication skills.

Parent engagement in the Play Active Program

Dr Hayley Christian

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Background: Daily physical activity is critical during the early years of life for facilitating children's health and development. Only one in three Australian children aged 2 to 5 achieve the recommended level of three hours of daily physical activity. Early childhood education and care (ECEC) services are a key setting to intervene to increase physical activity.

Outline: The student will be part of a multi-jurisdictional NHMRC funded project (Play Active) and have the opportunity to work with eight partner agencies.

The project will use qualitative research to identify barriers and enablers for improving parent-child, and parent-educator engagement around children's physical activity.

This will involve exploring, identifying and better understanding the factors that strengthen the educator-parent engagement process to boost children's physical activity in the home and ECEC environment.

Methodology: Literature review; Qualitative.

Project Specific Requirements:

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

What do parents, children and industry think about the current state of 'Kids' meals in cafes & restaurants

Dr Siobhan Hickling

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Dr Gina Trapp (TKI)

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Background: Going out to eat was once viewed as an occasional treat, but it is now a common behaviour in many Australian households and accounts for around a third of all food spending. It has been suggested that restaurant tables are turning into the “new generation” of the dinner table where families connect, highlighting the importance of healthy meals to be served within these establishments. However, children’s menus or ‘kids’ meals’ (usually targeted at those under 12 years), are noted for their absence of healthy offerings like salads, whole-grain products, and fruit-based desserts. Our Food & Nutrition Team recently completed an audit of ‘Kid’s Meals’ in Perth, WA. Typical fare included foods like chicken nuggets and chips, burger and chips and fish and chips, with sugar-sweetened beverages often bundled in as the default drink option.

Outline: The aim of this student project is to investigate parents’, children and food business owners’ attitudes and experiences related to ‘Kid’s Meals’ and the barriers and facilitators related to improving the nutritional quality of ‘Kid’s Meals’.

A mixed-method design could be employed with quantitative (i.e. surveys) and qualitative (i.e. interviews/focus groups) elements.

Project Specific Requirements:

- Excellent interpersonal, written and oral communication skills.
- Working with Children Check.
- Undergraduate degree in nutrition, public health, health promotion or related field

Within-store interventions to increase healthy food purchasing

Dr Siobhan Hickling
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Dr Gina Trapp (TKI)
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Background: The daily diets we consume are influenced by the environments in which we live, work and play. While many Australians understand the need to eat a healthy diet, all too often the healthy choice is not the easiest choice. One of the ways we can try to address this issue is by looking at ways we can nudge people towards healthier choices in public settings, such as hospitals and sport and recreation settings. This includes making small changes that improve the availability and promotion of water and healthy food options instead of sugary drinks and junk food.

Outline: We are looking for interested students to carry out a series of ‘nudge’ experiments within food outlets located in public settings. A ‘nudge’ is a small change that alters people’s behaviours without forbidding any options. For example, displaying water for sale at eye level within a canteen and limiting the promotion of sugar-sweetened beverages by putting them out of sight, such as under a counter.

Evaluation of sales; attendance data and customer exit surveys will be used to assess how the changes have impacted the food outlet and people’s behaviour (e.g. retail profits, healthy food and drink purchasing, resources required, and acceptability among the community).

Project Specific Requirements:

- Excellent interpersonal, written and oral communication skills.

Understanding and improving the mental health of young people

Professor Ashleigh Lin
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Background: Ashleigh is open to supervision on a range of projects in the youth mental health space, using qualitative and quantitative methodologies.

Outline: Ashleigh's research program focuses on understanding and improving the mental health of young people. She has a strong focus on LGBTQA+ and trans youth mental health, and other marginalised groups. Ashleigh is open to discussing new project ideas with potential students and encourages people to approach her.

Methodology:

Some of Ashleigh's projects include:

- Using the Raine data to understand the onset of mental illness in youth;
- A cohort study of trans young people attending the Gender Diversity Service at Perth Children's Hospital;
- Evaluation of the Luminos Project, a residential service for young people with experiences of suicidal thoughts and behaviours;
- Clinical trials of cannabidiol (CBD) to reduce symptoms across mental illnesses.

Other data is available for analysis from studies of LGBTQA+ youth mental health.

Ashleigh uses mixed methods, thus will consider qualitative and quantitative studies.

Project Specific Requirements:

Depends on the project selected.

Project Length: Depends on the student and the project selected.

The Genetic Epidemiology Group

The Genetic Epidemiology Group (GEG) is home to a highly skilled team of genetic epidemiologists, statisticians, and epidemiologists who are committed to identifying the genetic, epigenetic and environmental determinants of common human diseases, and exploring ways of using such information to improve human health.

The GEG team undertake research into a wide spectrum of human trait and disease areas, as well as methodological research into the techniques required to conduct successful projects. We work closely with clinical and academic collaborators locally, nationally and internationally.

Research topics include:

- Breast cancer.
- Melanoma.
- Mesothelioma.
- Cardiovascular disease.
- Sleep disorders.
- Burns and scarring.
- Autism.
- Lipidomics.
- Statistical research methods.

Projects with a genetic focus will use statistical methods of genetic and genomic analysis, utilizing bioinformatics and high throughput 'omics' technologies to unravel the genetic and environmental contributions to human disease.

Other projects involve high-level statistical analysis of "big data" from large data linkage projects or population-based databases that focus more on (non-genetic) clinical outcomes, integral to primary prevention as well as early detection of chronic human disease.

Projects are available for Masters level projects. Previous biostatistics training is preferred.

Interested students should contact *A/Prof Jennifer Stone* (jennifer.stone@uwa.edu.au) for details and to be put in touch with relevant GEG team members and project supervisors.

Global Health

There are many ways to get involved with global health research at SPGH. For examples of specific projects, you can see the opportunities below. If you have your own interests that aren't mentioned here, it may be possible to develop your own research project, using secondary data from global data repositories, or by undertaking a literature review or scoping review of existing evidence. Both Dr Dani Barrington (dani.barrington@uwa.edu.au) and A/Prof Tim Robertson (tim.roberton@uwa.edu.au) would be happy to speak with you about your ideas. Across the School, we have expertise to support global health research in water, sanitation and health (e.g. menstrual health, toilets, incontinence), child and maternal health, nutrition, health workforce analysis, and health systems strengthening.

Chronic kidney disease in Sri Lanka

Adjunct Prof Jane Heyworth

jane.heyworth@uwa.edu.au

in collaboration with Dr Tanuja Ariyananda (Lanka Rain Water Harvesting Forum) and Dr Gayan Bowatte (University of Peradeniya)

Background: There are approximately 70,000 estimated CKD/CKDu patients in 6 of the 9 provinces in Sri Lanka. Despite many studies conducted in this area, the risk factors for this disease are still uncertain (thus “u” in CKDu). According to studies carried out to date, CKDu may be a result of drinking water contamination.

In the Northern province, a preliminary survey conducted of CKDu patients in households with rainwater harvesting system installed in the northern province indicated that the patients “feel healthier” after drinking rain water and that their condition remain stable. However, further research is needed to confirm these findings and to identify differences in the constituents of harvested rainwater and other drinking water.

The Lanka Rain Water Harvesting Forum (LRWHF) has installed over 500 RWH systems in households Northern & Uva province.

Outline:

- Is drinking harvest rainwater associated with a reduced risk of CKD?
- Are the symptoms of CKDu improved among patients drinking rain water?
- What factors in drinking water sources might lead to differences in risk?
- What are other potential risk factors for CKDu?

Methodology: Establish/undertake a case control study of CKD in Sri Lanka.

1. Identify methods for selecting cases and control.
2. Develop survey instruments for assessing exposure to water and other risk factors.
3. Monitor water quality of different water sources (RW, RO, well).

Project Specific Requirements:

Good performance in epidemiology and biostatistics units.

Developing an mHealth intervention to promote antenatal health and immunisation

Dr Julie Saunders

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Adjunct Prof Jane Heyworth

jane.heyworth@uwa.edu.au

Background: mHealth initiatives are becoming more prominent in low- and middle-income countries as a means of engaging residents in public health activities. The Kaski District Public Health Office (DPHO), located in Pokhara, Nepal wish to develop more effective ways of delivering health reminders around antenatal care and vaccinations to persons living in rural Nepal. Mobile phones are commonly used in Nepal, thus mHealth initiatives may be an efficient method of reaching families living in rural areas. DPHO and Kanchan Nepal, our partner organization, will provide advice on the local context, including antenatal care and immunisation schedules.

Outline: To develop a culturally relevant mHealth intervention to convey specific health messages to rural Nepalese women.

Specific objectives are to:

- Review the literature on the use of mHealth interventions for health messaging.
- Determine the messages that might be most effectively conveyed by this approach.
- Develop culturally appropriate and engaging messages with input from the local community.
- Pilot and evaluate the health messages for the app among the local community.

Methodology: The student will work with

DPHO and Kanchan Nepal to determine the schedule for delivery of health messages and seek their input into the appropriate style of message. The project may include interviews with staff of the DPHO and community health posts as well as focus groups with rural community members. The student will prepare a project plan for the mHealth intervention that includes recruitment, access, messages and ongoing or longer-term evaluation.

Project Specific Requirements:

Completion of PUBH4401 and PUBH4403 (or their equivalent) with a Distinction or High Distinction grade.

Lives Saved Tool (LiST) for modelling child and maternal health outcomes in low- and middle-income countries

A/Prof Tim Robertson

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Background: The Lives Saved Tool (LiST) is a mathematical modelling tool for estimating changes in child and maternal health. It is widely used by Ministries of Health and global organisations, such as the World Health Organisation, UNICEF, and the World Bank, to model the impact of programs on child, neonatal, and maternal mortality, and birth outcomes such as preterm and small for gestational age. Countries use LiST to help prioritise interventions, evaluate health programs, and develop their national health strategies.

Outline: Research projects involving LiST typically aim to estimate the number of lives saved by increasing the coverage of basic health interventions in low- and middle-income countries. Using LiST, we can answer questions such as: What reduction in child mortality can be attributed to a country's health strategy? Which interventions were responsible for saving the most lives? How many maternal deaths could be prevented over the next 10 years by scaling-up coverage of basic obstetric interventions?

If you are interested in child and maternal health in a specific country, or have a specific analysis question in mind, we can likely develop a research proposal that matches your interests.

Methodology: Most LiST analyses involve secondary data from large-scale household surveys, such as DHS or MICS. We put this data into LiST, enter additional parameters for a scale-up scenario, and use LiST to generate results that will be useful for policy makers.

Project Specific Requirements: Anyone who is interested in child and maternal health is welcome to use LiST. Although it is a mathematical modelling tool, it does not require advanced quantitative skills. Most students will be able to start using LiST after only a few hours.

Migration widows: The impact of the international migration of workers on those who stay behind

Dr Julie Saunders

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Adjunct Prof Jane Heyworth

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Background: Nepal has a long history of labour migration, with an estimated 3.5 million Nepalese working abroad (Simkhada et al. 2017). Labour migrants from Nepal are predominantly males; 15% of all economically active males (aged 15 years and older) compared with 2% of Nepali females (Maharajan, Bauer, Kner, 2012). The majority of these males are from agricultural backgrounds.

Despite research into the health risks for those who migrate for work, there is little research on the health and wellbeing impacts for those who stay behind. However, an understanding of the contextualised impact on women and families left behind is important.

Outline: To estimate the extent of social, health and gender impacts of the international migration of male workers from Nepal on the women and families left behind. Specific objectives are to:

- Develop a questionnaire based upon the results of recent qualitative research.
- Pilot the questionnaire with 100 women in the Central (Kathmandu) and Western (Pokhara) Development Regions in Nepal.
- Undertake a reliability study with a sub sample of this population.

- Estimate and compare the prevalence of key impacts among those left behind with those whose partner has not migrated for work.

Methodology: We have undertaken qualitative research with women whose partners have migrated for work and the current study will build upon those findings to develop a questionnaire.

A quantitative survey of 100 women who have a child aged under 5 will be undertaken. The sample will be stratified on the basis of whether a partner has migrated for work in the past 12 months. A sub-sample of 50 women will participate in a test-retest reliability study completing the questionnaire on two separate occasions, two to three weeks apart.

The student will be supported by a local research assistant to recruit the sample and administer the questionnaire. The student will analyse and interpret the data and write up these findings. The student will prepare a report the findings to be provided to the NGOs, prepare a video of the key messages of this research and a conference abstract.

The student will analyse the transcribed interviews, undertake thematic analyses, and interpret and write up these findings. The student will prepare a report the findings to be provided to the NGOs, prepare a video of the key messages of this research and a conference abstract.

Project Specific Requirements:

Completion of PUBH4401 and PUBH4403 (or their equivalent) with a Distinction or High Distinction grade.

Why do drinking water projects using desalination technology keep failing?

Dr Dani Barrington

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Dr Mat Francis (Moerk Water)

Background: In an effort to provide clean drinking water to vulnerable populations whose only available water source is salty, small scale desalination units have been installed by aid agencies, governments and well-meaning individuals around the world. This is particularly true in Pacific Island Countries (PICs) where freshwater is severely lacking due to shifting climate patterns. However, many desalination units have stopped working in PICs shortly after installation, not only failing to achieve their aim of sustainable freshwater provision, but also leaving communities to deal with defunct units and the associated solid waste.

Outline: In communities where desalination is key to providing clean drinking water, what is necessary to be able to do so in a sustainable manner?

Methodology: Interviews and/or systematic document review.

Project Specific Requirements: Nil.

Project Length: Any.

Understanding water, sanitation and hygiene failures in sub-Saharan Africa

Dr Dani Barrington

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Dr Becky Sindall

Esther Shaylor (UNICEF)

Background: Water, sanitation and hygiene (WASH) endeavours regularly fail. Sometimes this means that programmes do not achieve their stated aims; other times these failures are setbacks that can be rectified with sufficient reflection and action. In the worst cases, the purported ‘beneficiaries’ of WASH projects are harmed- sometimes even killed- through the unintended consequences borne of admirable intentions. The WASH failures team have conducted 97 interviews with WASH professionals in Malawi, South Africa, Tanzania and Zimbabwe to understand why they believe these failures keep happening and what can be done to avoid them in future.

Outline: The interview transcripts detail examples and modalities of failure, as well as ways of discussing challenges throughout programmes, based on the lived experiences of WASH professionals in four countries. The student will work with the supervisor to develop an analytical framework to delve further into the interviews, possibly through investigating internal weaknesses and external threats to WASH programming, probably focusing on a single country. This is an opportunity to engage with real data that is being made available open access so that the WASH sector can reflect on and improve their practice.

Methodology: Qualitative data analysis of existing interview transcripts.

Project Specific Requirements: Nil.

Project Length: Any.

An Examination of National, State and Clinic Incidence of Ovarian Hyperstimulation Syndrome (OHSS) and Contributory Factors in Females undergoing In Vitro Fertilisation

Prof David Preen

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Background: Ovarian Hyperstimulation Syndrome (OHSS) can occur during the management of infertility with an in vitro fertilisation (IVF) cycle. Ovarian stimulation protocols aim to produce many oocytes in one cycle. However, occasionally OHSS, an iatrogenic consequence of these protocols, occurs and can be fatal. Prevention of OHSS is critical to providing safe medically assisted reproduction (MAR) and several risk factors are employed to control its development, however, none are capable of independently predicting OHSS. Moreover, there is a dearth of information examining OHSS incidence and risk factors collectively, across several geographical locations, incorporating several states and clinics.

WA health has a mandate to monitor adverse OHSS events from assisted reproductive technology (ART) across the state and identify when a healthcare clinic does not respond appropriately to such an event and, more importantly, when these events are in excess of the national average. There is a significant gap in our knowledge of national, state and local clinic OHSS incidence, and the major contributory predictive factors to adverse outcomes. Statistical modelling could provide key insights for the deployment of national

standards for OHSS monitoring, clinical quality and safety in MAR.

Outline: The proposed research project aims to investigate OHSS events across state and ART clinics to assist in the development of national monitoring targets. Furthermore, it is an objective to analyse major contributory factors to OHSS, with the aim of providing real-world data for policy decisions on risk mitigation strategies for the management of OHSS.

This project is supported by the WA Department of Health Patient Safety and Clinical Quality Directorate and will provide the opportunity to work closely with senior clinical, policy and evaluation personnel from this area.

Methodology: This project is supported by the WA Department of Health Patient Safety and Clinical Quality Directorate and will provide the opportunity to work closely with senior clinical, policy and evaluation personnel from this area.

- i) Literature review of OHSS, OHSS adverse event reporting and monitoring, and national and international best practices.
- ii) Extract, compile and link OHSS events and clinical indicators from all states using data sources:
 - HMDS data collections for H01039 Disease since 2001.
 - State Reproductive Technology Registers since 2001.
 - ANZARD OHSS and cycle data since 2001.

- iii) Analyse clinical indicators of OHSS, including, but not limited to, female age, BMI, history of PCOS, AMH, basal estradiol, gonadotropin dose/regime, follicle count, rapid rise in estradiol, fresh/frozen embryo transfer, comorbidities etc. for significant differences between OHSS outcome groups.
- iv) Compare and analyse state and clinic OHSS incidence and outcomes to the national average with consideration for risk-adjustment.
- v) Model clinical indicators and locations for predictive discrimination of OHSS outcomes using receiver operation characteristic (ROC) curves, and calculate measurement intervals at which predictive accuracy at its highest.

Project Specific Requirements:

- Ability to conduct quantitative/qualitative research.
- Statistical analysis (R, STATA, SPSS and/or SAS).
- Statistical modelling – manual, stepwise, machine learning.
- Knowledgebase in Clinical Reproductive Medicine/Science.
- Excellent interpersonal, written and oral communication skills.

Project Length:

24 semesters MPH Dissertation (half-time).

Measuring 10-year post-injury health outcomes in an acquired brain injury cohort (ABI-REStART)

Prof David Preen

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Background: Acquired brain injury (ABI) is one of the leading causes of death and disability in Australia. Defined as any injury to brain after birth, ABI can be traumatic, caused by external head injuries, or non-traumatic (e.g., stroke, hypoxia, neoplasm).

Brightwater Care Group has been a main provider of post-acute neurorehabilitation and disability support services in WA since 1991, with the aim to support individuals to *meaningfully restart* their lives after brain injury. ABI-REStART is a retrospective whole-population cohort study of all adults aged 18-65 years who received post-acute brain injury services through Brightwater from inception on 15 March 1991 to 31 December 2020 (n=1,011).

Outline: The ABI-REStART study is a series of longitudinal studies which aim to:

i) measure the health and social needs of the ABI-REStART cohort over distinct phases of brain injury recovery (10-year pre-injury, acute, post-acute and 10-year follow-up), and
ii) identify predictors of short- and long-term outcomes to directly inform evidence-based service models.

A number of student projects are available to examine the *post-injury health outcomes* of the cohort, including the:

- Incidence and predictors of hospital readmissions for ABI.
- Incidence and predictors of new/subsequent ABI diagnoses.

- Patterns and predictors of hospitalisations and emergency department presentations (diagnosis, procedures).

Methodology: This study is a retrospective cohort study utilising internal electronic medical records (EMR) data from Brightwater and linked health data from the WA Data Linkage System. Specific data sources and key variables include:

- Brightwater data (post-acute)
- Admission and discharges.
- Demographics (age, gender, Indigenous, SEIFA IRSD, ASGS Remoteness Area).
- Clinical (diagnoses, cause of injury, time since injury, observations, medications, medical and allied health consultation notes, medical correspondence and referrals).
- Rehabilitation outcome measures (FIM+FAM, MPAI-4, GAS, QoLIBRI).
- Linked health data (pre-injury, acute and follow-up).
- Hospital Morbidity Data Collection.
- Emergency Department Data Collection.
- WA Mortality Register.

We are particularly interested in using our post-acute Brightwater data to predict long-term outcomes after discharge, and to identify modifiable factors that can be targeted through post-acute rehabilitation to enhance long-term health outcomes for people with ABI.

The project is supported by Brightwater Research Centre and will provide the opportunity to work closely with senior research and clinical personnel in the neurorehabilitation field.

Project Specific Requirements:

Analysis will need to be conducted using Stata. Knowledge or willingness to learn multi-level modelling techniques is required.

Project Length: 24-point MPH.

The utilisation and safety of prescription drugs of dependence in pregnancy

Dr Erin Kelty

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Background: Prescription drugs of dependence are a class of medicines with a high potential for misuse, abuse and dependence. However, they are often indicated for the treatment of conditions such as severe pain, attention deficit hyperactivity disorder (ADHD), opioid dependence, and severe anxiety.

The use of these medications during pregnancy has potential to cause harm to the developing fetus. However, ceasing treatment can also be risky, but very little evidence exists to guide the treatment of pregnant women using drugs of dependence.

Outline: The overarching aim of this study is to examine the extent and safety of the use of these medications during pregnancy, to help patients and doctors make informed treatment decisions.

Within this study, there are a number of small projects which look at the use of specific medications (e.g. methadone, methylphenidate, oxycodone) in terms of usage in pregnancy, maternal outcomes, neonatal outcomes and child health outcomes.

Methodology: This study is a retrospective cohort study. It utilises linked health data, including medication, hospital, emergency department, mortality and congenital anomalies datasets for women treated with pharmaceutical drugs of dependence and their exposed children.

Project Specific Requirements:

Analysis will need to be carried out using Stata.

Effectiveness of high-sensitivity troponin in the investigation and management of chest pain in the emergency department

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A/Prof Tom Briffa

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A/Prof Frank Sanfilippo

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Background: To determine the impact of switching from non-high sensitivity to high sensitivity Troponin assays on (i) resource utilisation and clinical management, (ii) 30-day and 1-year clinical outcomes, and (iii) cost-effectiveness in a single public tertiary hospital in Metropolitan Perth.

Outline: Research Objective 1 (RO1):

Compare overall and sex-specific 30-day and 1-year outcomes for each of death, heart attack, stroke, heart failure, or the combination of cardiovascular events, for pre (non-high sensitivity Troponin) and post (high sensitivity Troponin) period patients;

Research Objective 2: Evaluate overall and sex-specific cost-effectiveness of non-high sensitivity Troponin versus high sensitivity Troponin testing at 1 year in the emergency department setting for patients who present with suspected heart attack.

Methodology: A combination of data sources involving a local and national retrospective cohort.

Project Specific Requirements:

Requires knowledge and competency with common data analytical software and in statistical regression.

Project Length: Negotiable.

Linking for Life: Enhancing pathways to well-being for all Australians

Prof David Preen

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Dr Rebecca Glauert

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Background: The Linking for Life Project will identify pathways to wellbeing and better social outcomes across the life- course for high-risk/vulnerable individuals and their families to streamline service provision, improve outcomes and identify cost-efficiencies across government agencies. The work will expand cross- sectoral data linkage capability, enhancing research capacity to generate evidence- based policy to improve integrated service delivery across government.

The project involves the analysis of longitudinal, whole-population, genealogically linked data, across seven government departments in order determine pathways (across individual, family, community and system levels) that reduce vulnerability to adverse outcomes including social disadvantage, child abuse and neglect, mental illness, poor educational attainment, justice system involvement, and restricted access to public services.

Outline: Research questions in this project are categorised under three intersecting domains:

1) Resilience and overcoming disadvantage;

2) Families and Intergenerational Effects; and
3) Aboriginal Wellbeing, with the primary aims of the current program being to:

1. Determine pathways that reduce vulnerability to adverse outcomes and restricted access to public services;

2. Identify critical transition points to target prevention and intervention strategies across government sectors; and

3. Identify factors associated with resilience in disadvantaged groups to improve intergenerational outcomes.

Methodology: The sub-projects developed under this program of work will utilise up to 40 years of whole-population, genealogically linked data, across seven government departments including the WA Dept. of Communities, Dept. of Justice, WA Police, Dept. of Education, Dept. of Health, Mental Health Commission and the Commonwealth Dept. of Education and Training.

Statistical analysis and multivariate modelling of these data will be undertaken using SPSS, Stata or SAS to address the above-mentioned research aims.

Project Specific Requirements:

- Knowledge of epidemiology and biostatistics.
- Completion of PUBH5785 Analysis of Linked Health Data or equivalent prior experience,
- Experience with writing statistical syntax to complete data analyses.

Project Length: 24-point MPH.

Survey of High Impact Psychosis (SHIP) projects

The SHIP survey took place in 2010 and is one of the largest and most comprehensive face-to-face assessments of psychotic disorders undertaken in Australia and internationally. Its main aim was to collect prevalence and profile data on a representative Australian sample of men and women with psychotic illness in contact with public mental health treatment services and NGOs.

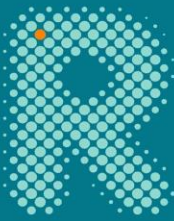
Over 1500 data items were collected from 1825 participants covering, among others: education, housing, employment, income; psychopathology; cognition; functioning and quality of life; service utilisation; medication use; and physical health (including fasting blood tests). Students interested in undertaking epidemiological projects using the SHIP data should contact *Assist/Prof Anna Waterreus* - anna.waterreus@uwa.edu.au

The Raine Study

The Raine Study has a unique multigenerational and multidisciplinary data holding from pre-birth to middle age across 4 generations. Data is available from 14 different research areas across physical health, mental health, lifestyle and genetics as well as biological resources and cohort methods. Our data repository is added to with every new follow-up study, growing in value with time and usage. What we have learned so far has changed health outcomes, delivered economic and social benefits on a global basis, and helped enhance understand of disease and wellbeing across generations.

The Raine Study has a proud record of supporting and investing in the next generation of researchers. Data is available for use at low- or no cost to UWA students and researchers, and a number of the Raine Study's Special Interest Group research leaders are based at UWA and its affiliates. Student and Early Career Researchers are encouraged to participate in the Raine Study's annual Symposium (scientific meeting), with prizes available for the best presentation in various categories. The Raine Study itself does not supervise Dissertation projects, but if you are interested in undertaking a study that makes use of their data, please contact the Dissertation Coordinator, Dr Dani Barrington – dani.barrington@uwa.edu.au, to discuss your project idea. She can help you identify whether there are suitable SPGH Coordinating Supervisors available.

For further information on the Raine Study, visit <https://rainestudy.org.au/information-for-researchers/>.



the
Raine
Study

One of us
could change
your life

rainestudy.org.au

A unique data holding from pre-birth to middle age
FREE or REDUCED FEES to UWA researchers



17
follow-ups

33
years

4
generations

2,900

pregnant women
recruited (Gen1)

2,868

children born into the
study (Gen2)

600+

offspring born to
Gen2 (Gen3)

30,000

pieces of data
per participant

30 million

pieces of genetic
information per participant

Data available across 14 Special Interest Group
research focus areas

PHYSICAL
HEALTH

MENTAL
HEALTH

LIFESTYLE

GENETICS

BIOLOGICAL RESOURCES & COHORT METHODS
DATA ACROSS ALL SIGS



Vulnerable Groups

Developing a school-built environment audit tool to improve bullying and mental health

Dr Julie Saunders

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Dr Jacinta Francis (TKI)

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Background: Peer bullying and aggression are key contributors to mental illness among children, contributing to loneliness, distress, and poor academic performance. Although a number of school-based prevention and intervention approaches to prevent bullying have been developed internationally, many of these cease to be effective after Year 9, with some programs inadvertently increasing bullying behaviour. New approaches to prevent bullying are needed. The proposed project is a sub-study of the larger Building Out Bullying Project that aims to generate policy-relevant evidence, system-level guidelines, and school-based interventions to improve the bullying behaviour and mental health of children attending primary and secondary school in Western Australia.

Outline: This project aims to develop and validate primary and secondary school audit tools to measure features of the school indoor and outdoor built environment associated with bullying behaviour and mental health.

Methodology: A school audit tool will be developed and informed by a review of existing audit tools used in schools, parks and child-care centres and a Delphi survey sent to stakeholders to confirm, add or delete priority audit items.

The audit tools will be assessed to determine and enhance their psychometric properties and once validated, used to scan Western Australian schools.

Project Specific Requirements:

- Completion of PUBH4401 and PUBH4403 (or their equivalent) with a Distinction or High Distinction grade.
- Working with Children Check.

Do neighbourhood cohesion and physical activity mediate the relationship between green space and mental health?

Dr Julie Saunders

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Dr Jacinta Francis (TKI)

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Background: Investigations into green space and mental health have gained momentum in recent decades, with numerous studies linking green space attributes to both mental illness and wellbeing. While more research is needed into the pathways between greenspace and mental health, greenspace has the potential to improve mental health by reducing stress, facilitating physical activity and fostering positive social ties. This project involves the secondary analyses of a longitudinal dataset. The How Areas in Brisbane Influence health and activity (HABITAT) study is a multi-level study of over 8,000 adult participants and 200 neighbourhoods.

Outline: This project explores the pathways between neighbourhood greenspace and mental health, specifically the potential mediators of social relations, physical activity, and stressful life events across four timepoints.

Specific objectives include:

- exploring the role of social ties, physical activity, and stressful life events on the relationship between the built environment and mental health;
- identifying key park attributes that influence mental health by different

sub-populations (i.e., age, gender, parents, grandparents, children living at home, and age of children living at home); and

- identifying thresholds for key park attributes that influence mental health for different sub-populations and socio-economic areas.

Methodology: HABITAT is one of the largest studies of its kind. Data will be sourced from five time-points (2009-2016). Independent variables include objective and subjective measures of greenspace, such as features within neighbourhood parks, park area, greenery in suburb and tree cover. Both positive mental health and mental illness have been captured using the Kessler 6, Warwick Edinburgh Mental Wellbeing Scale and Personal Mastery Scale. Mediating variables include measures of physical activity, neighbourhood cohesion and stressful life events.

Repeated measures of outcomes variables will be accommodated using mixed linear models for quantitative outcomes and logistic regression with GEE estimation for binary outcomes. Interactions will investigate if the effect of built environment factors on outcomes is modified by social ties, physical activity, socio-economic status, or demographic variables.

Project Specific Requirements:

Completion of PUBH4401 and PUBH4403 (or their equivalent) with a Distinction or High Distinction grade.

Epidemiology of Smoking, Oral Health or Dental, Smoking

Professor Linda Slack-Smith

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Dr Mohammed Junaid

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Craig Cumming

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Background: Smoking is a major health issue in our society and globally. There is still limited epidemiological data in terms of dental outcomes – largely because most access to data is limited. This is an important opportunity to add to the evidence base around smoking, oral health, dental services or dental hospital admissions.

Outline: There are a range of potential projects around smoking and oral health either quantitative, qualitative or translational/policy based. The aim would be to describe dental visit patterns or dental hospital admissions for particular dental diagnosis (such as dental injury, dental caries, craniofacial outcome) using existing data. Some of the data suitable for smoking outcomes.

Methodology: The project would use standard epidemiological approaches.

Project Specific Requirements:

Requires strong epidemiology and biostatistics skills for most projects.

Project Length: Normally two semesters part-time.

Investigating the health and social outcomes of children exposed to family and domestic violence

Dr Carol Orr

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Background: Despite the high prevalence of family and domestic violence (FDV), it is only in recent years that significant steps have been made to understand the impact of the exposure on children. Much of the existing research on the outcomes of children exposed to FDV is limited in its scope. Additionally, the tendency to focus on children whose mothers are involved in specialist FDV services only represent a subsection of those exposed in the wider community. Linked administrative data present an opportunity to address these issues by merging individual unit-records for the entire population from a variety of sources, enhancing the potential to identify the outcomes of children exposed to FDV at the population level.

Outline: A number of potential projects are available utilising our dataset, including epidemiological analyses of different health and social outcomes of children exposed to FDV.

Methodology: The project is a retrospective cohort study utilising linked administrative datasets including hospital and police data.

Project Specific Requirements:

- Good statistical knowledge and skills.
- Competent in SAS or equivalent.

Project Length: 24 point MPH.

Public health issues in formal and informal childcare for children, parents, grandparents and workplaces

Prof Linda Slack-Smith

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Members Equity and oral Health Group or collaborators

Background: Childcare plays a significant role in our society, allowing women to return to work or study and for many children to experience good quality care during an important stage of development. There are important issues around health of children (for example diet, physical injuries, immunisation, medication use, infectious diseases, general health), parents (managing work and family responsibilities, parent health) and childcare workers (health, turnover, experience of racism). In addition to formal childcare (centres and family day care), there is significant care provided by grandparents, which is unregulated and often places high demands on our older adults.

Outline: To explore one aspect of health in childcare.

Methodology: Options include systematic or realist reviews, qualitative research, quantitative research, policy exploration.

Project Specific Requirements:

- Working with Children Check.
- Basic knowledge of qualitative research approaches.
- Literature searching skills.
- Good communication skills.

Social inequities and health

Prof Linda Slack-Smith

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Various team members and collaborators.

Background: Quotes “The measure of a civilisation is how it treats its weakest members” and “The greatness of a nation can be judged by how it treats its weakest member” have both been attributed to Gandhi.

Our group is interested in many aspects of inequities and there are many potential

projects. The recent extraordinary experiences of the pandemic (COVID-19) has demonstrated the vulnerability of our society where people are marginalised. Inequities occur across the life-course from access to safe contraception to how we treat older adults. Potential projects also include oral health in primary care and role of inter-professional collaboration.

Outline: There are a range of potential projects to explore inequities and health (potentially with the influence COVID-19 or not) in different groups.

Examples of types of projects include:

- Contextual factors and smoking
- Projects related to the commercial determinants of health
- Barriers and enablers to people with mental health disorders in accessing health services?
- What have been the outcomes of COVID-19 on CALD communities accessing health and dental care?
- What do adults with CALD backgrounds consider effective ways of communicating public health messages to their communities? Who do they trust? What

- influence does age and gender have?
- How have CALD communities communicated about COVID-19?
- Health, diet or oral health in women and children in prison (with Dr Jocelyn Jones, Curtin University).
- Breastfeeding, birth and perinatal issues
- Diabetes care in older adults
- Physical activity in older adults
- Other groups may include the aged, those with disability, refugees and others.

Methodology: Qualitative or quantitative.

There are a range of potential projects investigating and addressing health inequities (oral health or otherwise) across the lifespan (including child or older adult) and in various groups: Aboriginal Australians, people with disability, people with mental health issues, young children, the aged, those in residential aged care refugee and migrant groups, rural Australians, homeless and those with co-morbidities.

Project Specific Requirements:

- Ability to work independently and under direction.
- Interest in inequities and social justice. Skills required will depend on the particular project.
- Working with Children Check (possibly).
- Basic knowledge of qualitative research approaches.
- Literature searching skills.
- Good communication and project management skills.

Social Media use and Mental Health

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Background: The potential impact of social media on mental health is gathering interest topically, in education and health. Literature indicates several benefits from online communication through social media, including reduced isolation for many people. This has been particularly evident during the Covid-19 pandemic. However, there is a body of research where social media use has been found to be negatively associated with mental well-being for adults, for adolescents, and cautionary views indicating use can result in increased isolation and negative social comparison. Therefore, it is important to further examine the relationships between social media and mental health.

Outline: This research will investigate the potential bi-directional relationships between mental health and social media. The study will use data from the children of the Raine study who are referred to as the second generation and are now adults. The data for this study will be from the questionnaire data collected at 28 years (Gen2_28).

Methodology: To investigate the potential bi-directional associations between variables measuring mental health and social media (internet socializing using smart phones and computers) use for young adults using Raine Study data from Gen2_28.

parenthood, technology use, health and physical activity, sleep, self-perception, body image and risk-taking behaviour.

If there is interest and scope within student project data from earlier Gen2 questionnaires can be included.

Cross sectional bi-directional analyses for each of Gen2_28 data will look at correlates of mental health outcomes with specific focus on social media use. Analyses required include descriptive statistics, cross tabulations, and linear models and generalized linear models to examine the relationships between mental health outcomes and social media use adjusting for demographics, and potential confounders such as lifestyle variables.

Project Specific Requirements:

- Good statistical knowledge and skills.

Project Length: MPH 24 point dissertation.

Covariates include – demographics,

Sugar

Prof Linda Slack-Smith

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Various team members and/or collaborators

Background: Sugar has long been associated with poor oral health and obesity, yet it remains a common part of our diet. There are a range of potential projects.

Examples may include qualitative interviews to investigate community perceptions and/or investigation of the role of the media or policy in promoting sugar despite evidence of its relationship to significant health problems.

There is potential to look at various groups - for example preschool, ageing etc. (Project could be systematic review, qualitative, quantitative or mixed methods).

Outline: Potential aims may include:

- a Literature Review or scoping review to determine the context in which sugar/oral health is portrayed in the media using quantitative and qualitative approaches (frequency of use, terminology used, contexts, related terms in text);
- determining community perceptions about the role of sugar in diet and meanings associated with it e.g., rewards in various groups such as parents/older adults/refugees etc (perceived risks, role in health);
- conducting a comparative analysis of similarities and differences between groups.

Methodology: There are options to undertake simple content analysis of news media or to undertake qualitative interviews depending on skills and preferences of students. News media would be extracted using Factiva or similar approach.

Project Specific Requirements:

- Working with Children Check (possibly).
- Basic knowledge of qualitative research approaches.
- Literature searching skills.
- Good communications skills.

Evaluation of a physical activity intervention for people experiencing homelessness

Dr Claire Boulange UWA.

Please note that Claire is employed on a professional contract, holds a PhD, has experience supervising Master's and PhD students, and she is willing to take on a supervision role in the project detailed below. If this is not possible, she is happy to discuss other options.

Dr Julie Saunders UWA

Background: This research is in collaboration with On My Feet (OMF), an Australian registered not for profit organisation providing free running and fitness training to individuals experiencing homelessness. OMF has developed a 12-week intervention program designed to empower participants to achieve self-sufficiency and independence through exercise, community support and education, as well as to improve their mental and physical health. This research project aims to assess the effectiveness of the program in realizing these goals and the impact it has on the lives of individuals experiencing homelessness.

Outline: To conduct the baseline, mid-study, and final assessments and collect quantitative data on health parameters, well-being, physical activity levels, nutrition and other relevant factors.

Methodology: Collect data at the beginning, midway, and end of the 12-week intervention program on the participants - people experiencing homelessness, aged 18 – 75, living in shelters or temporary or government-subsidized homes who have previously experienced homelessness and who have been with On My Feet for less than 3-months. The data will be collected via questionnaires, cardiovascular endurance

tests, and vital sign measurements. The data will then be analysed, and the findings reported.

Project Specific Requirements:

Interest in physical activity and physical activity assessment.

Ability to conduct quantitative research.

Excellent writing skills.

Experience with vulnerable populations.

Ability to work as part of a team.

Good interpersonal communication skills.

Project Length:

2 semesters MPH Dissertation (half time), 2 semesters Honours Dissertation (~half time)

Investigating the experience of loneliness among people experiencing homelessness and the impact of a physical activity program.

Dr Claire Boulange UWA.

Please note that Claire is employed on a professional contract, holds a PhD, has experience supervising Master's and PhD students, and she is willing to take on a supervision role in the project detailed below. If this is not possible, she is happy to discuss other options.

Dr Julie Saunders UWA

Background: This research is in collaboration with On My Feet (OMF), an Australian registered not for profit organisation providing free running and fitness training to individuals experiencing homelessness. OMF has developed a 12-week intervention program designed to empower participants to achieve self-sufficiency and independence through exercise, community support and education, as well as to improve their mental and physical health. This research project aims to assess the effectiveness of the program in realizing these goals and the impact it has on the lives of individuals experiencing homelessness.

Outline: To investigate the issue of loneliness among people experiencing homelessness and to examine the impact of the 12-week intervention program designed by OMF on this issue.

Methodology: Collect data on loneliness and social isolation at the beginning, midway, and end of the 12-week intervention program on the participants - people experiencing homelessness, aged 18 – 75, living in shelters or temporary or government-subsidized homes who have previously

experienced homelessness and who have been with On My Feet for less than 3-months. The data will be collected via questionnaires and focus groups.

Project Specific Requirements:

Strong interest in qualitative research.
Data analysis and qualitative research skills.
Excellent writing skills.
Experience with vulnerable populations.
Ability to work as part of a team.
Excellent interpersonal communication skills.

Project Length:

2 semesters MPH Dissertation (half time), 2 semesters Honours Dissertation (~half time)

Measuring the cost-effectiveness of a physical activity and education program for people experiencing homelessness.

Dr Claire Boulange UWA.

Please note that Claire is employed on a professional contract, holds a PhD, has experience supervising Master's and PhD students, and she is willing to take on a supervision role in the project detailed below. If this is not possible, she is happy to discuss other options.

Dr Julie Saunders UWA

Background: This research is in collaboration with On My Feet (OMF), an Australian registered not for profit organisation providing free running and fitness training to individuals experiencing homelessness. OMF has developed a 12-week intervention program designed to empower participants to achieve self-sufficiency and independence through exercise, community support and education, as well as to improve their mental and physical health. This research project aims to assess the effectiveness of the program in realizing these goals and the impact it has on the lives of individuals experiencing homelessness.

Outline: To conduct a Cost-Benefit Analysis

to compare the 12-week intervention program's costs to the potential economic benefits. This research will quantify the costs and benefits associated with the intervention and compare them to the costs and consequences of homelessness without the intervention.

Methodology: Collect cost data related to the program and estimate the economic consequences of homelessness, such as preventable diseases and chronic conditions. Perform a CBA, with sensitivity analysis, and prepare a report with recommendations.

Project Specific Requirements:

Foundations in health economics.
Strong analytical and quantitative skills.
Excellent writing skills.
Statistical analysis.
Experience with vulnerable populations.
Ability to work as part of a team.
Good interpersonal communication skills.

Project Length:

2 semesters MPH Dissertation (half time),
2 semesters Honours Dissertation (~half time)



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