HONOURS PROJECTS OPTIONS 2009

Updated September 19th 2008

SCHOOL OF POPULATION HEALTH

BACHELOR OF HEALTH SCIENCE AND COMBINED DEGREES
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HS 1. Surveillance of health impacts from urban emissions

**Supervisor(s) and Research Group:** Dr Angus COOK, Dr Angus Cook. Environmental Determinants of Chronic Disease/ Ecology & Health, School of Population Health

**Length of project:** Year long

**Background:**
This project will link in with an established research project on health outcomes of urban vehicle emissions currently being conducted through The Cooperative Research Centre for Asthma and Airways.

**Outline:**
The ultimate aim of this project is to involve general practitioners in identification of community cardio-respiratory disease from urban emissions in Perth. The surveillance system developed in this project and the information obtained will be directly applicable to urban corridors in other metropolitan centres in Australia. This project involves use of cutting-edge mapping methods to explore how patterns of asthma change in relation to air pollutant levels in Perth. The use of spatial tools and models in an emerging area in population health and the student will receive a thorough grounding in these important skills.

**Contact details:** angus.cook@uwa.edu.au at the School of Population Health
HS 2. Evaluating changes in health need in Western Australia

**Supervisor(s) and Research Group:** Dr Rachael Moorin, Australian Centre for Economic Research on Health

**Project length:** Year-long

**Background:**
The aim of this project is to examine changes in composite and disease-specific measures of burden of disease for Western Australia over time. The premature mortality rate has been advocated as the best single indicator of population health status, because of its powerful association with self-reported health measures and its relative independence from measures of health care utilisation. The evaluations of such measures are an important component of needs-based health service planning.

**Outline:**
This will involve the calculation of all-cause and disease-specific premature mortality rates and years of life lost at the level of postcode over 5 year periods from 1980 to 2004. In addition, changes in the rate of potentially avoidable mortality and potentially avoidable hospitalisations will also be evaluated. This project requires utilisation of morbidity and mortality data from the WA Data Linkage System and calculation of age and sex standardised premature mortality rates. The correlation of the premature mortality rates with measures of socio-economic status, area of residence (eg. metro, rural, remote) and measures of morbidity (eg hospital admission rates) will be examined.


Through this project the candidate will acquire skills at an introductory to intermediate level in the analysis of linked health data. The project is especially recommended to those with an aptitude for computing and quantitative research methods. It is expected that the candidate will draft, under supervision, a paper for publication in a scientific journal.

**Contact details:**
Dr Rachael Moorin
School of Population Health
Email: rachael.moorin@uwa.edu.au
Tel: 6488 1416
Fax: 6488 1188
HS 3. Implications for health care service provision associated with an ageing population:

**Supervisor(s) and Research Group:** Dr Rachael Moorin, Australian Centre for Economic Research on Health

**Project length:** Year-long

**Background:**
Over the last 30 years, a significant change in the age composition of the population has been observed in most developed countries. Specifically, the relative number of old persons (those aged 80 years and over) has steadily increased, and is expected to continue in the future. The main contributors to this increased ageing are decreased fertility and increased life expectancy made possible by improved living conditions and innovations in medicine. A report commissioned by the Federal Government in 2001 investigating population ageing and the economy estimated that Australia would experience significant demographic changes over the next few decades. The report projected that the population would reach around 25.4 million by 2051, representing a downward trend in population growth from around 1.2% per annum in 1999 to 0.1% per annum in 2051. Due to the reduced population growth the age composition of the Australian population has become steadily older. Between 1976 and 2001 the proportion of the population aged over 65 years rose from 9% (1.3 million) to 12% (2.3 million). It has been projected that by 2016, 16% of the population will be aged over 65 years, and that by 2051 this proportion will have risen to 25%. Since it has been estimated that the older population will more than double in the next thirty years it has been suggested that ageing (and the resultant rising per capita utilisation) may add to health-care costs the equivalent of 1.78% of national output ($11.6 billion in 2000 dollars) by 2031.

**Outline:**
There is considerable scope for a student to develop a research project under the umbrella of the ‘cost of ageing’ study. Examples of areas of research include evaluating changing patterns of utilisation and/or cost over time in the hospital sector or primary health care sector. The project will make use of WA’s unique data linkage system.

Through this project the candidate will acquire skills at an introductory to intermediate level in the analysis of linked health data. The project is especially recommended to those with an aptitude for computing and quantitative research methods. It is expected that the candidate will draft, under supervision, a paper for publication in a scientific journal.

**Contact details:**
Dr Rachael Moorin
School of Population Health
Email: rachael.moorin@uwa.edu.au
Tel: 6488 1416
Fax: 6488 1188
HS 4. Variation in CT scanning protocols across WA teaching hospitals

Supervisor(s) and Research Group: Dr Rachael Moorin, Australian Centre for Economic Research on Health

Project length: Year-long

Background:
Medical applications of ionising radiation are accepted as essential tools for protecting and improving health. However, they also represent a significant source of radiation exposure to the population. Since 1972 CT scanning has made enormous clinical and technical advances. As a result of these advances the clinical indications for CT were extended. This has resulted in a considerable increase in both the number of examinations performed and the average scanned patient volume per examination. Research studies have estimated a two to seven-fold increase in the number of CT examinations performed in the last decade.

A survey of all CT facilities conducted by the Australian Radiation Protection and Nuclear Safety Agency in 1996 found that Australia recorded just over 1 million examinations per year (60 examinations per 1000 people) which was three times the rate of the UK and New Zealand and similar to the rate in the US. Most worrying was the finding that the mean dose per examination from CT in Australia was between 50% and 69% higher than that found by studies in other countries. Once the number of examinations was factored in, the mean effective dose per capita in Australia was found to be approximately five times greater than New Zealand and seven times greater than the UK. A limitation of this sole Australian study was that the response rate was only 55%. To extrapolate figures for the whole of Australia, the authors assumed that the results for non-responders would be similar to responders. Thus, definitive information regarding the use of CT in Australia remains unavailable.

Some countries have attempted to control radiation dose resulting from medical imaging via regulations restricting the radiation dose permitted for each type of examination. However, to date Australia has not been able to implement such regulations despite the potential for dose reductions of up to 30%.

Outline:
This honours project will involve collecting data pertaining to both current and historical CT imaging protocols via in-depth structured interviews from CT providers at four teaching hospitals in Perth to:

- Evaluate the variation in CT scanning protocols across providers
- Compare differences in radiation exposure arising from different protocols

Contact details:
Dr Rachael Moorin
School of Population Health
Email: rachael.moorin@uwa.edu.au
Tel: 6488 1416
Fax: 6488 1188
HS 5. Framing effects in surveys about attitudes toward privacy protection

**Supervisor(s) and Research Group:** Professor D’Arcy Holman, Centre for Health Services Research and UWA School of Population Health

**Project length:** Year-long

**Background:**
Controversy concerning data protection legislation, disease registries and informed consent have raised fears that epidemiological research will become increasingly impracticable and that as a consequence the public’s health will suffer. The concerns of privacy advocates have been fuelled by advances in information technology, especially in the finance, retail and service industries. Health research has been swept up in a blunt policy response, and legislators have struggled to find ways to make exceptions for public-interest health research.

Survey information is being used and called for in an effort to ascertain the community’s ‘true’ attitude towards use of confidential health data in medical research, including when the data have been anonymised (e.g., the WA Data Linkage System) and when patient names are essential and consent is impracticable. However, it is likely that framing effects will occur in such surveys, whereby the results will be highly dependent on how the questions are asked and what background information is provided.

**Outline:**
The project will involve a survey instrument on attitudes towards privacy and medical research that was used by the Office of Federal Privacy Commissioner. The Office has given Prof Holman permission to use the instrument. The candidate will be responsible for devising two variations of the instrument, one which provides background to respondents and frames question in a way that highlights privacy concerns; the other providing background and framing that highlights the importance to the community of medical research.

Funding is available to commission the School’s Survey Research Centre to implement the surveys by computer-assisted telephone interview. Respondents will be randomly assigned to the three different instruments: (i) the original; (ii) the privacy-highlighted variation; and (iii) the research-highlighted variation.
The candidate will be responsible for analysing the data from the survey. Differences in response patterns will be compared across the three instrument variations to determine the extent of framing effects on the apparent level of support for research and for privacy controls. The results are likely to lead to important recommendations on the way that privacy surveys are conducted and interpreted in the future.

The topic will require a strong literature review. It is expected that the candidate will draft, under supervision, a paper for publication in a scientific journal.

Contact details:
Make an appointment to see Professor Holman at the UWA School of Population Health with his secretary, Margaret Mathews
School of Population Health
Email: margaret.mathews@uwa.edu.au
Tel: 6488 1318
Fax: 6488 1188
HS 6. Trends in the ‘Community Waiting List’: A Study of Real Waiting Times for Elective Surgery in the Western Australian Public and Private Health Sectors

Supervisor(s) and Research Group: Professor D’Arcy Holman, Centre for Health Services Research and UWA School of Population Health

Length of project: Year-long

Background:
Waiting lists for elective surgery such as hip replacements are a highly political issue and they receive considerable attention in the media with claims and counter-claims concerning how many patients are waiting for surgery. It is well known that waiting lists are easily manipulated in either direction by both service providers and health administrators.

In April 1993, a unique community health survey was performed with 1,535 adults aged 18 years or more who were resident in the North Metropolitan Health Region of Perth. The participants were randomly selected, except that those aged 60 or more years were purposely over-sampled. Among many other areas of inquiry, the survey collected information about the proportion of respondents who were waiting to receive health services including surgical services. They were also asked about the degree of inconvenience and pain that was being caused by the condition that was awaiting surgical intervention. The significance of this population-based approach to the measurement of the prevalence of waiting for surgery is that it cannot be manipulated by providers or health administrators, it adopts a community and patient perspective and distinguishes between patients who are waiting in a state of discomfort and those for whom the length of the wait is of less importance for their quality of life.

Outline:
The study will repeat the 1993 community survey using exactly the same methods, but the survey will be restricted to the topic of waiting for health services. In this way it will be possible to draw a set of comparisons between the status of waiting for surgery in the community at the present time with that in 1993. It will thus be possible to assess objectively and independently if the real ‘waiting list’ has become greater or less since the early 1990s, and also whether the prevalence of patients in distress has gone up or down. It will also be possible to compare the trends in waiting times between the public and private sectors. As a secondary objective, it will also be possible to compare waiting times for a number of other health services, in particular, allied health services such as speech pathology and physiotherapy.

Contact details: Professor D’Arcy Holman
To make an appointment to see Professor Holman, please contact his administrative secretary, Margaret Mathews, on 6488 1318 or by email margaret.mathews@uwa.edu.au.
HS 7. The Impact of Early vs Late Elective Colectomy for Inflammatory Bowel Disease: A Data Linkage Study

Supervisor(s) and Research Group: Professor D’Arcy Holman, Centre for Health Services Research and UWA School of Population Health

Length of project: Year-long

Background:
Ulcerative colitis and Crohn’s Disease (“Inflammatory Bowel Disease”) are serious conditions that may cause considerable morbidity, disability, increase the risk of cancers of the bowel and can be sometimes fatal. Those affected are often faced with the difficult decision as to whether or not to opt for a colectomy (total removal of the large intestine) as a prophylactic form of treatment to avoid more serious complications. This surgical treatment itself causes considerable morbidity and affects the quality of life and thus there is a trade-off to be considered as to which of two challenging courses of action is to be taken.

Researchers at the Oxford University Unit of Health Services Epidemiology have used data linkage to uncover evidence that in England and Wales a choice to elect for a colectomy early in the course of the disease may have important benefits, and yet very often the decision to proceed with a colectomy is delayed apparently to the longer-term survival disadvantage of the patient.

Outline:
The study will use linked health data in Western Australia to compare survival outcomes between patients with inflammatory bowel disease who have an early elective colectomy, a late elective colectomy, an emergency colectomy and no colectomy. To the extent possible, severity of illness will be taken into account using prior bed-days as a surrogate measure. Comorbidity and sociodemographic confounders will be more readily controlled. The study will generally follow the approach taken in Oxford and will thus be only the second study of its type to appear in the international literature. In addition to this important contribution to worldwide knowledge of the topic, the research will be of particular value in informing patients and clinicians in Western Australia concerning the prognosis of the disease under different colectomy scenarios.

Through this project the candidate will acquire skills at an introductory to intermediate level in the analysis of linked health data. The project is especially recommended to those with an aptitude for computing and quantitative research methods.

Contact details: Professor D’Arcy Holman
To make an appointment to see Professor Holman, please contact his administrative secretary, Margaret Mathews, on 6488 1318 or by email margaret.mathews@uwa.edu.au.
HS 8. Genetic epidemiology of complex human diseases

Supervisor(s) and research group:
The Laboratory for Genetic Epidemiology comprises a young and dynamic multi-disciplinary team of genetic statisticians, genetic epidemiologists, mathematicians, epidemiologists, bioinformaticists, molecular biologists, and social scientists committed to developing ways of investigating the determinants of complex human disease and exploring ways of using genetic information to improve human health. We are tightly integrated with multiple basic science, public health, and clinical research groups in Australia, the US and the UK. A number of national networks and key enabling facilities are run from our group.

Supervision offered by Laboratory for Genetic Epidemiology academic staff (Prof Lyle Palmer, Dr Steve Wiltshire, Dr Pam McCaskie, Dr Kylie Hewitt, Dr Kim Carter, Dr Angeline Loh, Dr Becky Webster) and various SPH and clinical co-supervisors (see below).

Length of project: Year-long

Background:
Genetic epidemiology and genomics are revolutionizing public health, clinical medicine, and drug discovery. The generation of new genetic knowledge and its integration into research projects in industry and academia are exponentially increasing trends. In Australia and internationally, there is a large-scale reorientation of population health and epidemiological research towards the genetic epidemiology. Genetic Epidemiology is one of eight strategic priority areas identified by the Senate of the University of Western Australia.

Outline:
A series of honours projects working in specific disease-focused areas are offered for 2008, with co-supervision by Prof Palmer and other academic staff in the Laboratory for Genetic Epidemiology at the Western Australian Institute for Medical Research (www.genepi.org.au) and other academics in the Schools of Population Health and/or Medicine & Pharmacology at UWA. These honours projects will involve an investigation into the genetic basis of a complex human disease. Topics covered may include: clinical epidemiology, genetic epidemiology and gene discovery; pharmacogenetics; the ethical, legal and social background to genetic research; community engagement; and the use of genetic information in a public-health context.

Projects: Representative sample given below. Other projects are possible; please contact Prof Palmer for details. Opportunities for research exist in a broad range of areas, including:

- Breast and prostate cancer pharmacogenetics
- Cardiovascular disease (in collaboration with the WA Cardiovascular Disease Consortium)
- Diabetes and obesity
- Eye disease (in collaboration with Lion’s Eye Institute)
- Early life predictors of adult disease
- The Joondalup Family Health Study (www.jfhs.org.au)
- Melanoma (as part of the Scott Kirkbride Melanoma Research Centre)
- Mesothelioma (as part of the National Research Centre for Asbestos Related Disease)
- Respiratory disease (in collaboration with the Busselton Health Study)
- Sleep apnea (in collaboration with the WA Sleep Disorders Research Institute)
- Meta-analysis
- Gene-environment interaction
- Bioethical and legal issues relevant to genetic research
- Medical anthropology and community engagement

Likely Outcomes:
A publication in the peer reviewed scientific literature.
A research contribution to UWA’s current initiatives in genetic epidemiology.

Contact details:
Professor Lyle J Palmer
Western Australian Institute for Medical Research (Nedlands Campus)
Ground Floor, B Block
QE-II Medical Centre
Hospital Avenue, Nedlands, WA, 6009
AUSTRALIA

Email: lyle@cyllene.uwa.edu.au;
Phone: 9346 1061
Fax: 9346 1818.
HS 9. Weight loss and health outcomes following obesity surgery

**Supervisor(s) and Research Group:** Dr David Preen; Centre for Health Services Research, UWA School of Population Health.

**Project length:** Year-long

**Background:**
Surgical procedures such as gastric bypass, laparoscopic sleeve gastrectomy and laparoscopic gastric banding are becoming an increasingly popular option for the treatment of obesity, especially in those people for which lifestyle interventions have failed to reduce body fat to ‘safe’ levels. It is a commonly held belief that insufficient attention is paid to the screening of potentially unsuitable patients for these procedures, such as those with compulsive eating disorders or reduced satiety. Consequently, it is not uncommon for patients to experience post-operative complications such as digestive complications due to blockage or temporary occlusion of the alimentary canal. Further, some individuals often continue to gain weight after this form of surgery.

If bariatric surgery is to become the favoured model of care for morbidly obese patients, who have exhausted all other weight loss options, more research is needed to determine the associated benefits and risks of such procedures.

**Outline:**
Students will have a choice of a number of discrete studies prospectively investigating the impact of different forms of obesity surgery on a variety of health outcomes. Some of the options available include:

- A comparison of different bariatric surgery procedures in terms body composition changes, post-operative complications and quality of life.
- The impact of bariatric surgery on hormonal regulation, blood pressure and blood biochemistry.
- The effect of bariatric surgery and subsequent weight loss on libido and sexual health.

Students will be required to work with both academic and clinical personnel to investigate an important (and topical) area of health care. However, it will require a reasonable level of commitment, and as such we are seeking responsible, conscientious students with well-developed interpersonal and written communication skills for these projects. It would also be an advantage for students to have a second major in anatomy and human biology, human movement, nutrition, physiology, pharmacology, pathology, biochemistry, microbiology or related area.

**Contact details:**
Dr David Preen
School of Population Health
Email: david.preen@uwa.edu.au
Tel: 6488 1307
Fax: 6488 1188
HS 10. The reasons and implications for regional differences in colonoscopy in Western Australia

Supervisor(s) and Research Group: Dr David Preen; Centre for Health Services Research, UWA School of Population Health.

Project length: Year long

Background:
Colonoscopy is used to investigate gastrointestinal symptoms. In Western Australia, colonoscopy is one of the most commonly performed invasive procedures in hospital. Anecdotal observation suggests that colonoscopy is commonly used for screening, especially in more affluent metropolitan areas and may result in lower mortality from colorectal cancer. Earlier work showed that the use of colonoscopy in rural Western Australians was less than their metropolitan counterparts. This trend of lower procedure rates in rural Western Australia for specialised interventional procedures has also been previously shown for cataract surgery, prostate surgery and treatment of kidney stones.

Outline:
The aim of this project will be to use linked hospital admission data to determine regional differences in colonoscopy in Western Australia between 1991 and 2002. The student will be expected to be highly computer literate and be comfortable manipulating and analysing large data sets. A student choosing the year long option will need to explore the regional differences in greater depth and to try and identify factors that may account for these differences, including variation in the availability of trained specialists in different localities and how this affects the rate of colonoscopy.

Contact details:
Dr David Preen
School of Population Health
Email: david.preen@uwa.edu.au
Tel: 6488-1307
Fax: 6488-1188
HS 11. Topics in health economics

There is the opportunity to undertake honours in the area of health economics. Please make an appointment to see Dr Liz Geelhoed to discuss potential projects in this area.

Contact details:
Liz Geelhoed
School of Population Health
Email: Elizabeth.Geelhoed@uwa.edu.au
Tel: 6488 7129
Fax: 6488 1188
HS 12. Research projects related to Type 1 Diabetes, Type 2 Diabetes and Obesity in Children.

Supervisor(s) and Research Group:
Assoc Prof Tim W. Jones, Department of Diabetes and Endocrinology, PMH
Dr Elizabeth Davis, Department of Diabetes and Endocrinology, PMH
Assoc Prof Max K. Bulsara, School of Population Health, UWA

Length of project: One semester or year-long

Background:
Juvenile Diabetes is a major child health problem in Western countries. Princess Margaret Hospital is the only referral centre for Diabetes in the state and hence every child with diabetes has to be treated at PMH. They have a unique longitudinal data base which was initiated in 1992 and have a 99% ascertainment rate.

Obesity is becoming a major health issue for children and adolescents. PMH has a large research interest in this area, focusing on medical and psychosocial complications of obesity, contributing family factors, and potential interventions.

Outline:
There are several projects including investigating the problems associated with exercise and hypoglycaemia in Type 1 diabetes, as well as investigating factors related to type 2 diabetes. A number of projects are available related to obesity in primary school children. Details of each project will be given to potential students.

Contact details:
Assoc Prof Tim W. Jones, tim.jones@health.wa.gov.au
Dr Elizabeth Davis, elizabeth.davis@health.wa.gov.au
Assoc Prof Max K. Bulsara, max.bulsara@uwa.edu.au
HS 13. Evaluating legislation and the medical community to investigate Legionnaires’ Disease

Supervisor(s) and Research Group: Ms Jessica Gorman, Dr Angus Cook, Professor Phil Weinstein; Ecology and Health

Length of project: Full year

Background:
Legionellosis is a collection of infections that emerged in the second half of the 20th century, and are caused by *Legionella pneumophila*, *Legionella longbeachae* and related Legionella bacteria. The severity of legionellosis varies from mild febrile illness (Pontiac fever) to a potentially fatal form of pneumonia (Legionnaires’ disease). Worldwide, *Legionella pneumophila* is the main bacterium responsible for reported cases.

In contrast, in Australia, *Legionella pneumophila* (LP) and *Legionella longbeachae* (LL) together are the main causes of Legionnaires’ disease, each bacterium being responsible for approximately half the reported cases. However, data from the Australian Communicable Disease Intelligence shows a wide geographical variation in the distribution of LP and LL across Australia. LP is more prominent in the Eastern States (New South Wales, Queensland and Victoria), while in Western Australia and South Australia LL is more commonly identified. Differences in environment determinants, testing procedures and reporting legislation are all postulated as the cause of the variability in serotypes.

Outline:
The project covers five Australian states. The project will involve an extensive analysis of the testing patterns of medical practitioners for Legionnaire’s Disease when presented with community acquired pneumonia. This will determine what, if any, differences in prevalence rates within Australia can be attributed to the prevalence for testing for LD. This will also be accompanied by reviewing the legislation associated with testing for Legionella and reporting LD, as well as the regulations for the maintenance and regulation of water cooling towers and the regulations for potting mixes manufacturers.

There is considerable scope for a student to develop the project. It involves acquiring knowledge of infectious diseases, qualitative and quantitative data collection and analysis, as well as developing skills in questionnaire design, legislative requirements for infectious diseases and producing public health recommendations. The project is run in conjunction with the WA Dept of Health.

Contact details:
Ms Jessica Gorman
School of Population Health
Email: jgorman@meddent.uwa.edu.au
Phone: 6488 1276
HS 14. State-of-the-Art Cardiovascular Research

Supervisor(s) and Research Group:

The Cardiovascular Research Group comprises a dynamic multi-disciplinary team of epidemiologists, biostatisticians, and health practitioners committed to examining trends and models of care in cardiovascular disease prevention, treatment and management. We have a long and distinguished history covering the WHO MONICA Project, Busselton Health Study and many other studies involving local, national and international partners.

Supervision is offered by Cardiovascular Research Group personnel (Prof Matthew Knuiman, Dr Tom Briffa, Dr Frank Sanfilippo, Dr Siobhan Hickling, and various SPH and clinical co-supervisors).

Length of project: Yearlong

Background:
Cardiovascular disease is prevalent and costly worldwide. Monitoring and reporting trends in cardiovascular disease is a national priority health area and is a driver of health policy and investment aimed at improving its healthcare delivery and outcomes.

Outline:
Various honours projects working in specific disease-focused areas are offered for 2009, with supervision by the members of the Cardiovascular Research Group at the School of Population Health and other academics in the Schools of Population Health, and Medicine & Pharmacology at UWA. These honours projects will involve an investigation into the trends and models of care in cardiovascular disease prevention, treatment and management. Topics covered may include: clinical epidemiology, health outcomes, pharmacotherapy, prevention; the broader determinants of health; cost-effectiveness and community engagement.

Projects: Representative sample given below. Other projects are possible; please contact Dr Briffa for details. Opportunities for research exist in a broad range of areas, including:

- Monitoring coronary artery disease in the modern era
- Busselton Health Study
- Management of coronary heart disease in the Indigenous population
- Ischaemic heart disease
- Peripheral arterial disease
- Health in Men Study
- Risk Factor Prevalence Study
- Coronary artery revascularisation studies
- Atherothrombotic disease across the vascular territories
- Chronic kidney disease progression and cardiovascular diseases

Contact details: Dr Tom Briffa on 6488 1292 or email Tom.Briffa@uwa.edu.au
**HS 15. Research projects related to marine safety**

**Supervisor(s) and Research Group:** Dr Terri Pikora, Marine Safety Research

**Length of project:** a range of year long projects

**Background:** Along with other Australian states, recreational boating in Western Australia (WA) is a popular leisure time activity with more than 85,000 vessels registered in WA. While interest in marine safety research has gained momentum in recent years, our knowledge related to factors that may influence boating-related fatalities and incidents remains limited. It has been suggested that the cost of boating fatalities and serious boating-related injury across Australia is in excess of $370 million each year. (O’Connor, 2004) In addition, it has been estimated that more harm is caused by boating-related incidents than rail and air crashes combined, resulting in marine incidents being second only to road-related crashes as a cause of transport injury in Australia. The marine safety program of research was established to assist in the development and evaluation of marine safety policy and education programs within Western Australia but also has the potential to influence at the national level.

**Outline:**
There are a range of projects that would be suitable for a student who is seeking a challenge in a new area of research. These projects include:

1. A range of safety issues and areas can be explored through the secondary analysis of data that has been collected from recreational boaters over the past four years. These can include issues related to protective behaviours among boaters undertaking different types of activities (such as fishing) and different locations used for boating (such as protected waters). Previous student projects using these data have included factors related to alcohol use among recreational boaters and the influence of education upon recreational boater behaviour.

2. Recent evidence suggests that a large number of recreational boaters do not use a marine radio to log on and off when they are going out boating. This project would utilise self-completed data collected from recreational boaters across a range of locations in the state to determine log on and off patterns among recreational boaters; explore why boaters do not log on; compare the characteristics of boater who do and do not log on; to identify groups where to focus educational programs; and to explore possible strategies to encourage logging on and off.

3. There is the potential to utilise data collected from people who participate in high-risk water activities, including Personal Watercraft (PWC) riders, kite surfers, and water skiers. This data will be collected over summer 2008/09 using an online survey in a pilot study. Using this data, this project will explore and describe the risks and protective factors (including safety and training practices) among water users. Using an ecological approach, conceptual frameworks will be developed to explore hypothesised potential risk factors for injuries among the different recreational water users. This project has funding from
Healthway and is being undertaken in collaboration with Dr Rebecca Braham from the School of Sport Science, Exercise and Health.

4. There is the opportunity to explore issues related to willingness to pay and cost utility to investigate where boaters draw the line in terms of the costs related to boating. This would involve exploring a range of different issues as they change (such as increases in the cost of fuel; infrastructure costs related to moorings; the availability of moorings). Focus groups among boaters will assist in developing a range of scenarios that will then be tested among different boater groups. This project would be jointly supervised by Dr Rachael Moorin (Director of the Australian Centre for Economic Research on Health) and will be conducted in collaboration with Marine Safety personnel at the Department for Planning and Infrastructure.

5. There are possibilities to explore other areas of injury research. If you are interested in such a project please contact me so that we can discuss further.

Contact details:
Dr Terri Pikora
School of Population Health
Email: terri.pikora@uwa.edu.au
Tel: 6488 7057
**HS 16. Discoveries that make a difference (WACHA)**

**Supervisor(s) and Research Group:** Professor Osvaldo Almeida, The Western Australian Centre for Health and Ageing (WACHA)

**Length of project:** 1 year

**Background:**
How individuals age will continue to be greatly impacted by the health research being conducted today. While living well and exercising is important, many people are also *counting on research* to find new and better ways to treat, diagnose, prevent, and cure a number of diseases and disorders that present themselves as a person ages. The researchers at WACHA are helping to find new approaches to prevent, diagnose and cure disease to improve the quality of life and health of our elders. This type of research will make a difference to the lives of older people, helping them live longer, healthier and stronger.

WACHA is one of the most productive health and ageing research centres in Australia. We are partnered with the WA Institute for Medical Research and the University of Western Australia and supported by the WA Department of Health. Our researchers collaborate extensively both nationally and internationally, giving our students an opportunity to share ideas with the world’s scientific leaders.

WACHA is committed to research training and has an extensive mentor training program that fosters scientific rigor and innovation. Our research covers the spectrum of health care for older adults. WACHA’s researchers have made a number of ‘firsts’ they include:

**‘Firsts’ at WACHA:**

- The first to demonstrated that smoking is not a protective factor (as was commonly believed), but a risk factor for dementia.
- The first to develop a culturally sensitive dementia assessing tool for remote and rural Indigenous communities.
- The first to provide evidence of the benefit of memory clinics in reducing stress for older people with dementia and their caregivers, leading to the adoption of state run memory clinics in Victoria and Western Australia.
- The first to conduct the largest study of residential care residents in Australia, that showed that vitamin D supplementation reduced residents rates of falls by 30%

WACHA is recognised for its innovation and commitment to scientific rigor and wishes to attract some of the brightest and best students in a variety of disciplines.

WACHA also conducts research in the following areas:

- Alzheimer's disease and Dementia
- Depression
- Education and the Environment
- Epidemiology & Population Health
- Exercise
Below, we have outlined some of the projects that will be available to Honours students in 2009. If you have other novel research ideas that you wish to explore contact us at wacha@uwa.edu.au to arrange a meeting.

Outline:

1. **HEALTHY MENTAL AGEING**: As people age they are more likely to suffer with effects of poor mental health. WACHA has shown that this is not inevitable and a lot can be done to prevent mental health problems and promote mental well being in older people. Two of the areas that you may wish to be involved are below.

2. **DEPRESSION** is a common and disabling illness, affecting 5-15% of adults older than 60 years at any one point in time. WACHA has demonstrated that lifestyle interacts with genetic factors to affect the risk of depression. Genetic and biochemical markers of cardiovascular disease, inflammation, cell death and glucose metabolism have already been shown to be important. We have been using this new knowledge to develop new approaches to manage depression in later life with the aim of decreasing the prevalence and incidence of depression amongst older Australians. We are currently running 3 projects in this area and have 2 new projects set up to start in 2009.

3. **DELAYING COGNITIVE DECLINE**: Cognitive function declines with increasing age, and as the World’s population ages cognitive impairment will affect an ever larger number of people in the community and will the major source of disability in Australia. WACHA has been running a series of projects designed to delay cognitive decline in later life. These projects have been investigating the role of hormones, antioxidants, vitamins, smoking, alcohol and medication use, physical activity, inflammation, cardiovascular disease, and mental activity on the rate of brain changes and cognitive decline in older people over time. The results of our studies to date have shown that some of our interventions can indeed decrease the rate of cognitive decline amongst older adults, and further investigations are currently under way.

4. **QUALITY OF LIFE IN PEOPLE WITH DEMENTIA**: WACHA is participating in several ground breaking projects to understand and enhance the quality life of people with dementia in community and residential settings. Two ongoing projects are underway to investigate the association of quality of life with cognition, and to examine the effect of an
educational intervention to improve the quality of life of people with dementia living in residential care. Studentships and Honors projects, are envisaged collecting, managing and organising portions of data from these ongoing studies. Supervision by both medical specialists and neuropsychology staff is possible, making these programs suitable for students form a range of disciplines.

5. NEUROIMAGING AND STRUCTURAL BRAIN DISEASE: WACHA has a strong track record in use of neuroimaging to understand the pathogenesis of cognitive decline in various settings, such as people with heart failure. WACHA also has an interest in CT perfusion imaging and is establishing collaborations to develop mathematical models to facilitate automated processing of CT perfusion maps. Several projects are being offered in processing and analysing imaging data from these various cohorts.

6. LICIT DRUGS FOR OLDER PEOPLE: WACHA has successfully completed work to understand the health effects of licit drug use on older people. Current work builds on this foundation to examine the effects of polypharmacy in large cohorts and initiate intervention trials to examine the effect of reducing drug burden in older people. Honours projects are being offered in each of these areas.

7. PREVENTING FRAILTY: At WACHA we are exploring the concepts of frailty and are using some of our studies of large groups of older people to test different measures of frailty. We propose to find the major factors that increase the risk of frailty and those that help prevent it. We hope to find a simple score that will be useful in routine clinical practice and work out what interventions we can use on this targeted group of individuals.

Contact details:

Address: 48 Murray Street
Ainslie House, Level 6
Royal Perth Hospital, Perth, WA 6000
Telephone: 9224 2993 | Email: wacha@uwa.edu.au | Website: www.wacha.org.au
HS 17. Topics in Health Promotion

Supervisor(s) and Research Group: Dr Colleen Fisher

There is the opportunity to undertake honours in the area of health promotion, particularly in the areas of prevention and early intervention in family and domestic violence.

Please make an appointment to see Dr Colleen Fisher to discuss potential projects in this area.

Contact details:
Colleen Fisher
School of Population Health
Email: Colleen.Fisher@uwa.edu.au
Tel: 6488 2193
Fax: 6488 1188
HS 18. Cost and access as barriers to physical activity participation among children

Supervisor(s) and Research Group Dr Lisa Wood, Centre for the Built Environment and Health

Length of project: year-long project

Background:
Childhood obesity and levels of physical inactivity are major public health issues. Among adults, the affordability of recreational facility fees has been cited as an obstacle to physical activity by low income people. While many Australian children are involved in sport and recreational activities, access to, and the cost of these activities, are plausible barriers to participation for children from families who are socio-economically disadvantaged. Statistics from the welfare sector indicate that many families currently struggle to afford basic expenses relating to food, transport and housing; all of which are recognized in the literature as underlying social determinants of health. For disadvantaged families, the cost of sport/recreational team membership, equipment or lessons is potentially prohibitive, particularly in families with several children. Little is known from a physical activity perspective about the relative cost of sport and recreational options for children, or extent to which sporting and community organisations provide reduced fee options for disadvantaged families is also unknown. Such information would help to inform both physical activity interventions and policies to promote equity of access.

Outline:
This project will investigate the availability and participation costs of sport and recreational programs, clubs and activities targeting children in the Perth metropolitan area. The project will provide the student with the opportunity to develop and undertake a brief survey of sport and recreational organizations, followed by data analysis. The analysis will include investigation of differences in access and cost by sport and recreational type and where applicable, by location (including level of area disadvantage as determined by ABS data). WA data relating to physical activity levels of children can be used by the student to assist with the interpretation and application of findings. There is some scope for the student to develop project details to suit their research interests and skills and the project will also entail a review of relevant literature. The research is relevant to health promotion efforts to identify and address barriers to healthy behaviour and has equity and policy implications for recreation and sporting organisations and clubs in WA. In addition to the honours thesis, the student will have an opportunity to be involved as an author in the development of a journal paper relating to the research findings.

Contact details:
Lisa Wood
School of Population Health
Email: lisa.wood@uwa.edu.au
Tel: 6488 7809
HS 19. Exploring the Quality of Neighbourhood Environments for Older Adults

Supervisor(s) and Research Group: Ms Andrea Nathan, Dr Dick Saarloos, Dr Lisa Wood; Centre for the Built Environment and Health

Length of project: Year-long

Background:
There are numerous physical and mental health benefits to physical activity across the life-course, but for older adults benefits also include delaying the onset of functional decline and remaining independent, and reducing the risk of falls and fracturing bones. Yet participation in sufficient physical activity declines with age, and this is of concern given that Australia’s population is ageing. There is growing evidence supporting the notion that the built environment influences health in adults and more recent research has focussed on older adults. In addition to the presence of attributes in the environment that support physical activity, the quality of these attributes is also important, thus assessing the quality of neighbourhood environments for older adults specifically is important in planning and designing neighbourhoods that support independence and increase quality of life for older adults.

Outline:
The aim of this project will be to conduct an environmental audit to obtain data on the quality and support of neighbourhood environments for walking in older adults. The project will involve a review of relevant literature, adapting a reliable environmental audit tool for use in an Australian context, and engaging in field work to systematically assess neighbourhood environments surrounding a determined number of retirement villages in Perth. The project will also entail data analysis relating to the environmental audit findings. In addition to the honours thesis, the student will have the opportunity to develop and submit a journal paper relating to the research findings.

This project will provide a student with a mix of valuable research skills and experiences that are relevant to many areas of health that are potentially impacted by the built environments in which we live, work and play.

Contact details:
Ms Andrea Nathan
School of Population Health
Email: anathan@meddent.uwa.edu.au
Tel: 6488 8737
Fax: 6488 1199
HS 20. Exposure of children to ambient advertising and marketing – implications for health promotion

Supervisor(s) and Research Group: Dr Lisa Wood, Sarah French; Centre for the Built Environment and Health

Background:
Ambient media refers to the type of advertising messages we are exposed to in the course of day to day life – be it billboards, toilet door ads, petrol pumps signage or the imagery on food packaging. Although the entire community is regularly exposed to such forms of advertising, children and adolescents are potentially more receptive and vulnerable to the messages and norms portrayed. The tobacco marketing of the past is a good case in point, with evidence linking young people’s exposure to tobacco advertising to distorted perceptions of smoking prevalence, sanitised views of tobacco related harm, and also to smoking experimentation and uptake. In the present day, advertising for unhealthy foods and alcohol abound in both traditional (i.e. TV, radio and press) and ambient media. In addition, new forms of targeted advertising and marketing are continually being developed by commercial companies, and ambient media and convenience advertising are buzz concepts in this regard. Social marketing campaigns targeting children and adolescents in relation to health issues such as smoking, nutrition or alcohol use need to have an understanding of the type of messages and images with which they compete. Moreover, they can learn from the methods being used by commercial companies to reach this target group.

Outline:
The proposed project entails the use of both qualitative and quantitative research methods to explore young people’s exposure to ambient advertising and marketing in their day to day lives. There is scope for the student to develop project details to suit their research interests and skills. It is envisioned however that the project could involve an ‘environmental audit’ of ambient media within a fixed radius of selected schools, as well as at recreational and entertainment venues frequented by young people (such as cinemas and fast-food outlets). Such an audit would entail recording and analyzing both the types of media messages (e.g. food, alcohol, entertainment) and mediums (e.g. toilet doors, shop awnings) to which young people are exposed. There would also be a literature review component, and an expectation that the student would consider some of the implications of current ambient media practices for health promotion.

Contact details:
Lisa Wood
School of Population Health
Email: lisa.wood@uwa.edu.au
Tel: 6488 87809
Fax: 6488 1188
HS 21. HS1 Air pollution exposure of Perth commuters

**Supervisor(s) and Research Group:** Dr Jane Heyworth OEE group and Dr Andrea Hinwood, Centre for Ecosystem Management ECU

**Background:**
Daily commutes may be an important source of the overall inhalation of air pollutants for the Perth population. The distribution of air pollution within the street network and across transport modes is not known in Perth; however evidence collected elsewhere shows differing exposures across different transport modes and differing concentrations near roads than away from the roads for some pollutants.

**Outline:**
The aim of the proposed study is to generate preliminary data to describe the variability of pollutant concentration across space, time and transportation modes on three commute routes in Perth and resulting inhalation dose. We will collect measurements of personal pollution concentrations for nitrogen oxides, BTEX and manganese as well of energy expenditure on participants recruited via Travelsmart programs existing in Universities, Local Government and also selected workplaces. The data will be gathered such that comparisons of exposure and inhalation may be made between travel modes and commute time.

**Contact details:**
Dr Jane Heyworth
Email: jane.heyworth@uwa.edu.au
Ph: 61-8-6488 7370
Fax: 61-8-6488 1188.
HS 22. Asbestos exposure in residential areas of Perth

**Supervisor(s) and Research Group:** Dr Jane Heyworth and Alison Reid OEE group
Also Mr John Howell, Environmental Health Directorate, Department of Health and
Professor Peter Howat, Director, Centre for Behavioural Research in Cancer Control, Curtin
University

**Background:**
The health effects of asbestos are well known and the impact on persons exposed
occupationally has been very apparent in Western Australia. However, it is expected that we
will now see the wave of asbestos related diseases that are associated with lower level
residential exposure. Asbestos was used extensively in as a building material in residential
areas of Perth and the Department of Health plans to undertake a health risk assessment of
residential exposure to asbestos in Perth.

**Outline:**
The aim of the proposed study is to gather data on the presence and distribution of asbestos
materials in a residential area (most likely the City of Stirling). This will enable the Health
Department to estimate the level of exposure across the community. The student would
undertake an observational study in which they would document and map the presence of
asbestos, its uses, its state of repair where it is located such as buried, loose on surface or
loose in foot traffic area. The observational work would be complemented by incorporating
information from a number of other sources including databases, literature, commercial
information and interviews with key players.

**Contact details:**
Dr Jane Heyworth
Email: jane.heyworth@uwa.edu.au
Ph: 61-8-6488 7370
Fax: 61-8-6488 1188.

Alison Reid
Occupational Respiratory Epidemiology
Telephone: +61 8 6488 7091
Facsimile: +61 8 6488 1611
Email: alison.reid@uwa.edu.au
HS 23. Recommended foam densities for pressure management and postural support cushions, based on client weight.

**Supervisor(s) and Research Group:** The Centre for Cerebral Palsy. Marie Blackmore, Senior Research Therapist & Lorraine Johnson, Senior Occupational Therapist

**Length of project:** 1 year

**Background:** Many clients with cerebral palsy and other neurological conditions spend the majority of their day seated on cushions in wheelchairs. Providing good postural support while reducing the risk of pressure areas, is crucial for client safety, comfort and functional independence. Client weight has often been used as a way of predicting pressure management properties of the different foams used in seating fabrication. This had become more relevant over the last ten years with the increasing size and age of the general population which has been reflected in our client base, prompting the development of a range of larger size wheelchairs.

**Outline:** This project aims to develop best practice guidelines outlining the most suitable foam (in terms of pressure management) for different weight ranges of clients. The process will involve different weights being placed on foam cushion blocks and pressure readings taken over a period of time (up to 2 hours). A range of Dunlop foams will be used (the most commonly used foam) and possible combinations of foams and overlays. Guidelines will then be established for foam that manages pressure most effectively, for each weight range.

**Contact details:**

1. Marie Blackmore – (08) 9443 0395; marie.blackmore@tccp.com.au
2. Lorraine Johnson – (08) 9443 0207; lorraine.johnson@tccp.com.au