Epidemiology in the age of the internet

AEA Annual Scientific Meeting 2014
Australasian Epidemiologist

The Australasian Epidemiologist is a publication of the Australasian Epidemiological Association (AEA) that is distributed free to all members of the AEA. It is published three to four times per year. Contributions appearing in the Australasian Epidemiologist do not necessarily reflect the views of the AEA or the Editors. Articles are intended to inform members of the most recent epidemiological research being done in Australasia and to stimulate thought, discussion and comment, particularly with respect to the relationship between epidemiology and public health practice and policy. Contributions should be sent to the Editors.

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Information for authors
We will consider written contributions that do not essentially duplicate already published material and are not being simultaneously considered for publication elsewhere.

Categories of publication
Original articles for peer review
Reports of original research findings including studies of statistical or methodological issues. (Please note: these articles are not required to be congruent with the theme of the Round Table).

Round Table
Forum for dissemination without peer review of research findings, discussion and debate around current topics. Articles may be by original research, ethical issues, opinions and perspectives, personal experiences, new methodologies, a review of the literature or a discussion of policy and its impact on research and public health practice. Contributions in this category must be consistent with the theme of a forthcoming Round Table.

Dialogue
Letters to the Editors in response to previous articles or letters.

Teaching epidemiology
Discussion of teaching matters, practice and policy.

Book reviews and course reviews

Contribution length (maximum)

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Conference welcome

A warm welcome to Auckland, the largest city in Aotearoa and home to the largest Polynesian community in the world. This is the first time the AEA annual scientific meeting has been held in Auckland and we wish you an enjoyable occasion.

The conference theme – “Australasian Epidemiological Association Annual Scientific Meeting” – is very timely as the internet has transformed our lives over the last two decades, including the way we work. Epidemiology has many natural synergies with the internet which have already been integrated into the work of epidemiologists, and there is still huge potential for the internet to further develop and transform how we practice.

The 2014 scientific meeting in Auckland is an opportunity to hear from international researchers at the cutting edge of using the internet and its related technologies, about harnessing this exciting new potential to integrate and analyse large data sets, collect new data and manage studies.

The format this year is different from previous meetings. We have organised a three day meeting (instead of the usual two days plus a day of workshops).

Wednesday, October 8th

Our first day is held jointly with the New Zealand Population Health Congress.

The first invited speaker is Kirk Smith, Professor of Global Environmental Health at the University of California, Berkeley, an environmental epidemiologist and expert on the consequences and control of indoor air pollution. He will speak on “Population Health and the Afterlife and, through the example of climate change, explore why humans worry about the future.”

Dr Jeffrey Wigand, a former senior tobacco company executive who became an internationally known ‘whistle-blower’ on ‘Big Tobacco’, will speak on the “Science of Cigarettes”.

Professor Shiriki Kumanyika, from the University of Pennsylvania’s Perelman School of Medicine in Philadelphia, and President-elect of the American Public Health Association, will speak on “Using Evidence to improve Population Health”, illustrated by recent initiatives to prevent obesity in the United States.

Between these plenary lectures there will be ten master classes (which take the place of workshops) on topical public health issues, given by leaders in their fields. The morning master classes are:

- A history of life and death in New Zealand
- Accelerating progress on reducing obesogenic environments
- Strategies to reduce alcohol-related harm
- Understanding economic inequalities in health
- Building healthy, sustainable homes, communities and cities

The afternoon master classes are:

- Smoke Free 2025
- Climate CHANGE – transforming threats into opportunities and science into action
- Managing fresh water resources for public health and sustainability
- Who’s working with big health data in New Zealand and Australia? A show and tell
- Decolonising epidemiology - reclaiming numbers

Thursday, October 9th

The AEA annual scientific meeting formally starts on Thursday with a Powhiri (traditional Māori welcome).

The keynote speaker is Professor Frank Sullivan from the University of Toronto, who holds the Gordon F. Cheesbrough Research Chair and is director of UTOPIAN, a practice-based research network. Previously, he was the Director of the University of Dundee’s Health Informatics Centre, which developed secure and confidential deterministic record linkage techniques for health records, now used by the Wellcome Trust-funded Scottish Health Informatics Programme. His talk, entitled “Bespoke Linkage and Big Data”, will describe the development of deterministic record linkage in Scotland, including recent methods of enabling large scale data integration whilst ensuring security and confidentiality.

It is a special privilege that the Ian Prior Oration will be delivered by Emeritus Professor Robert Beaglehole of the University of Auckland, who during 2004 – 2007 directed the World Health Organisation’s Department of Chronic Disease and Health Promotion. His close links with Ian Prior over many years make him uniquely placed to give the oration, entitled “Epidemiology and Politics: lessons from Ian Prior’s battles.”
Friday, October 10th

The plenary sessions on Friday showcase the novel research being carried out in veterinary epidemiology and the link between animal and human health.

The keynote speaker is Professor Nigel French, who is Director of the Infectious Disease Research Centre and Head of the Molecular Epidemiology at Massey University, New Zealand. He specialises in the application of microbiology, molecular biology, genomics and epidemiology to inform public health decision making. He will talk on “Controlling Zoonoses: the increasing role played by Molecular and Genomic Epidemiology”.

Dr Joanna McKenzie, from the Institute of Veterinary, Animal and Biomedical Sciences at Massey University, leads the academic program for developing veterinary epidemiology in South Asia and will talk on “Strengthening Epidemiological Capacity within a One Health Framework”.

The final plenary session features a panel, chaired by Prof John Matthews from the University of Melbourne, the members of which will deliver a range of perspectives on the important topic of “Privacy, data access and the public good: the future of big data and epidemiological research”.

Concurrent sessions

Over Thursday and Friday there are 20 concurrent sessions, many of which begin with scene-setting presentations by leading researchers in the field, including:

- Social and digital media in epidemiology
- Advances in record linkage (3 sessions)
- Biostatistics
- Quantitative methods (2 sessions)
- Epidemiology and cost-effectiveness
- Recruitment to epidemiological studies
- Oral health
- Infectious disease
- Injury
- Cancer
- Cardiovascular disease
- Indigenous health
- Maternal and infant health
- Addictive substances
- Mental health.

I would like to thank the members of the Conference Organising Committee for what has been a true team effort, and the experienced practical support from Rachel Cook and Rachael Speedy of Conference Innovators (the meeting organiser).

While in Auckland there are many sights that can be reached from the city centre, including access to the Waitemata Harbour and wonderful views from the volcanic cones. The Auckland Museum is a cultural landmark with the greatest Polynesian collection in the world. If you plan to stay longer, day trips out of Auckland will take you to the islands of the Hauraki Gulf (including Rangitoto and Waiheke), or to the Waitakere Ranges with kauri forests and spectacular west-coast beaches. Longer trips will allow you to enjoy the Bay of Islands, Coromandel Peninsular or Rotorua.

Warm Pacific greetings to AEA 2014.
Robert Scragg, Meeting Convenor
Anthony LaMontagne, AEA President
On behalf of the organising committee

Meeting Organising Committee

Kristie Carter (NZ President, AEA Council)
Alistair Woodward (Scientific Programme)
Rod Jackson (Sponsorship)
Mark Elwood
Roger Marshall
Nicki Jackson
Shanthi Ameratunga
Boyd Swinburn
Cliona Ni Mhurchu
Simon Thornley
Keynote and invited speakers

Professor Robert Beaglehole

Robert Beaglehole was Professor of Community Health at the University of Auckland until 2003. Between 2004 and 2007 he directed the World Health Organisation’s Department of Chronic Disease and Health Promotion. He is now an Emeritus Professor of the University of Auckland and is engaged in public health issues in New Zealand and globally.

Professor Tony Blakely

Tony Blakely is an epidemiologist at the University of Otago, Wellington, New Zealand. His portfolio of research includes the New Zealand Census-Mortality Study (NZCMS) and CancerTrends linking the national censuses with mortality and cancer data to allow monitoring and research on ethnic and socioeconomic inequalities. Tony also directs the Health Inequalities Research Programme and the HRC-funded Burden of Disease Epidemiology. Equity and Cost Effectiveness Programme to assess the health impact and cost effectiveness and equity impacts of preventative and cancer control interventions.

Professor Nigel French

Nigel French is Professor of Food Safety and Veterinary Public Health at Massey University, New Zealand. He is Director of the Infectious Disease Research Centre (www.idrc.ac.nz) and Head of the Molecular Epidemiology and Public Health laboratory in the Hopkirk Research Institute (http://mepilab.massey.ac.nz/). Prior to joining Massey University in 2004, Nigel held a number of academic positions at the University of Bristol and, between 1996 and 2004, at the University of Liverpool, where he was Professor of Veterinary Epidemiology. He graduated as a veterinary surgeon from the University of Bristol in 1987, and in 1993 he was awarded a PhD (Bristol) and a Master's degree in epidemiology (University of London, London School of Hygiene and Tropical Medicine), funded by a Wellcome Trust Research Training Fellowship in Clinical Epidemiology. Nigel specialises in the application of microbiology, molecular biology, genomics and epidemiology to inform public health decision-making, particularly for the control of zoonotic diseases. He has carried out a number of large-scale research programs in both New Zealand and the United Kingdom on food safety and water quality and worked on improving our understanding of the epidemiology and control of pathogens such as Campylobacter spp., Salmonella spp, E. coli O157, Cryptosporidium spp. and Giardia spp. He has published over 200 peer-reviewed papers, many in the area of food safety and public health. Nigel is a member of New Zealand Institute for Advanced Studies, a Principal Investigator in the Allan Wilson Centre for Molecular Ecology and Evolution and a Fellow of Food Standards Australia New Zealand.

Professor Cord Heuer

Cord Heuer is professor of veterinary epidemiology and infectious diseases at the Epicentre Massey’s Institute of Veterinary, Animal and Biomedical Sciences. His research interest is developing strategies and tools to prevent infectious diseases in animals and their transmission to humans. He leads a number of research projects about leptospirosis, paratuberculosis, bovine viral diarrhoea, mastitis, and endometritis. Another field of interest is animal health economics, with applications to improving herd fertility and cow’s productive life.”
**Professor Rachel Huxley**

Rachel Huxley is the Chair of Epidemiology, Head of the Research and Research Training Committee, and Director of the Queensland Clinical Trials and Biostatistics Centre (QCTBC), within the School of Population Health, University of Queensland, all positions which she has occupied since July 2013. She obtained her doctorate in epidemiology and public health from Oxford University, then completing her postdoctoral training in Oxford and then at the George Institute for Global Health, University of Sydney. In 2009, Dr Huxley moved to the University of Minnesota where she became a co-investigator on the Atherosclerosis Risk in Communities Study and the Multi-Ethnic Study of Atherosclerosis. Her research is primarily focused on the determination and quantification of major and modifiable risk factors for chronic disease and how these associations may differ between women and men and across diverse ethnic groups. She has published more than 130 research articles in the past decade, co-written several book chapters and is regularly invited to speak at national and international conferences.

**Professor Shiriki Kumanyika**

Shiriki Kumanyika is Professor of Epidemiology in Biostatistics and Epidemiology and in Pediatrics (Nutrition Section) in the Perelman School of Medicine at the University of Pennsylvania in Philadelphia, USA. She holds advanced degrees in social work, nutrition, and public health. Shiriki’s research focuses on identifying effective population-based strategies to reduce nutrition-related chronic disease risks and health inequalities. She is President-elect of the American Public Health Association and will assume the office of President in mid-November 2014. A major theme in her current research is improving equity in food marketing environments in African-American communities. In 2002, she founded the African-American Collaborative Obesity Research Network (AACORN) (www.aacorn.org), a national network that seeks to improve the quantity, quality, and effective translation of research on weight issues in African-American communities. Shiriki has a long history of providing policy guidance on public health nutrition issues to health agencies and organisations in the USA and abroad. She was Vice Chair of the US Health Secretary’s Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020 from 2008 – 2011, and has been a nutrition advisor to the World Health Organisation Department of Nutrition and Human Development for more than ten years. She has received numerous honors for her research contributions and is an elected member of the Institute of Medicine of the US National Academy of Sciences.

**Professor Thomas Lumley**

Thomas Lumley is Professor of Biostatistics at the University of Auckland, and Affiliate Professor at the University of Washington, Seattle, where he spent 15 years. He has a long-standing collaboration with the Cardiovascular Health Research Unit in Seattle, and is an investigator in the Cardiovascular Health Study, a large cohort of older Americans. In recent years, this has led to involvement in large-scale genetic epidemiology, both SNP-based and sequence-based, on the Analysis Committee of the CHARGE (Cohorts for Heart and Aging Research in Genomic Epidemiology) Consortium.

**Associate Professor Roger Marshall**

Roger Marshall is an Associate Professor of Biostatistics and Epidemiology at the School of Population Health, Auckland University. After undergraduate and master’s degrees in mathematics from Southampton University, and completing a PhD in rainfall statistics in 1976, he taught mathematics at the University of the West Indies. Subsequently, he took up research positions at Leeds University. One of these, in cancer research, led to an interest in medical statistics and in 1986 took a position at Auckland University, where he has remained as a lecturer in biostatistics. He has published on many topics including: misclassification bias, spatial disease patterns, case-crossover designs, methods for prognostic and diagnostic classification, statistical graphics and data mining.
Keynote and invited speakers

**Professor Joanna McKenzie**

Joanna McKenzie is Senior Lecturer in One Health Epidemiology and International Development in IVABS at Massey University, leading the academic program for a One Health Epidemiology project in South Asia funded by the European Union. After graduating as a veterinarian from Massey University, Joanna went on to develop a career in epidemiology, completing a Master's of Preventive Veterinary Medicine from University of California, Davis and a PhD with the EpiCentre at Massey University. Joanna has a broad spectrum of experience, beginning with clinical practice in New Zealand and the United Kingdom, supporting smallholder animal production with Volunteer Service Abroad in Indonesia, managing disease surveillance and epidemiology studies in the Ministry of Agriculture and Fisheries, then moving onto a research and teaching career at Massey University. In the past 12 years, she has worked extensively in Asia and the Pacific, strengthening biosecurity systems in Samoa and advising on strategies to develop government veterinary epidemiology services and avian influenza surveillance in South and Southeast Asia. Most recently, Joanna contributed to the One Health Master's degree in epidemiology in South Asia, and led the in-country implementation of multi-sectoral epidemiology projects in a One Health Epidemiology Capacity Building Program in South Asia funded through the World Bank.

**Professor Gita Mishra**

Gita Mishra is the Head of Epidemiology and Biostatistics Division, School of Population Health, University of Queensland, Australia. She is also the Director of the Australian Longitudinal Study of Women's Health (ALSWH), the nation's flagship cohort study of women's health. She first joined ALSWH as a research academic at its outset in 1996, having just completed her PhD in Statistics at the University of Auckland. Her research interests include understanding the social, biological, and behavioural pathways to health inequality, and adapting and developing statistical methodology relevant to longitudinal and life course data. After a decade of research with the Medical Research Council in the UK, Professor Mishra has more than 200 peer-reviewed publications and is internationally recognised for her research on a life course approach to women's health. In 2012, she was awarded an Australian Research Council Future Fellowship.

**Professor Miriam Rosin**

Miriam Rosin is a Professor at the University of British Columbia and at Simon Fraser University, and is Founding Director of the British Columbia Oral Cancer Prevention Program. She is a leading researcher and scientist on oral cancer prevention, control, and treatment. Her work includes the establishment of screening and referral networks for dental health professionals, the development of clinical models for the risk assessment and management of oral disease and cancers, and the creation of new research models to study human papillomavirus virus infection. She is principal investigator on a unique Oral Cancer Prediction Longitudinal Study that is following approximately 600 patients with oral dysplasia over time to develop and validate indicators of risk of progression for such lesions. Miriam has led cancer research projects in the Philippines, India, Egypt and Russia, as well as Canada and is a strong advocate for international collaboration on cancer control. She is currently involved in an international study with investigators at the University of Heidelberg to better define the role human papillomavirus infection plays in progression of oral dysplasia.
Keynote and invited speakers

Professor Linda Slack-Smith

Linda Slack-Smith is a Professor in Oral Epidemiology and Director of Research in the School of Dentistry at the University of Western Australia. She is currently President-elect for the Australasian Epidemiological Association and President-elect for the International Association for Dental Research (ANZ). Her research interests are in public health and epidemiology where she has primarily focused on oral health, child health, Indigenous health, dental service use in marginalised group. She works to build capacity by supporting early researchers and working closely with communities. She has completed work as chief investigator on a NHMRC Indigenous Capacity Building Grant and is now a chief investigator on a Centre for Research Excellence in Primary Oral Health Care.

Professor Kirk Smith

Kirk Smith is Professor of Global Environmental Health at the University of California, Berkeley. He has contributed to the Global Energy Assessment, the US National Research Council’s Board on Atmospheric Science and Climate, the Executive Committee for the World Health Organisation’s Air Quality Guidelines, and the International Comparative Risk Assessment. He was a Convening Lead Author for Climate and Health for the 5th Assessment of the IPCC. In 1997 he was elected a member of the US National Academy of Sciences. His research addresses the relationships among environmental quality, health, resource use, climate, development, and policy in developing countries. Recent work includes:

- Studies of the health effects of air pollution exposures in developing countries, particularly health effects in women and children from indoor air pollution due to household fuels
- Development of smart, cheap, portable electronic monitors for exposure assessment
- Implications for policy of the potential to achieve co-benefits (health and climate) from pollution control in developing countries

Professor Frank Sullivan

Frank Sullivan is an Academic General Medical Practitioner with an interest in linking health data for research since 1984. After graduating from the University of Glasgow he combined clinical training in Scotland and service general practice in Blantyre with a PhD in Health Services Research. He is currently the Gordon F. Cheesbrough Research Chair at North York General Hospital in the University of Toronto. Until February 2014 he was the director of the University of Dundee’s Health Informatics Centre, which developed secure and confidential deterministic record linkage techniques for health records. Record linkage methods developed in Dundee contributed to the successful Wellcome Trust-funded Scottish Health Informatics Programme and are now part of the UK-wide Farr Institute. He is a principal investigator on twelve studies including two large EU funded informatics projects: Translational Research and Patient Safety in Europe (TRANSFoRm) and Electronic Health Records for Research (EHR4CR). He was a member of the UK Office for Strategic Co-ordination of Health Research (OSCHR) E-Health Records Board 2007 – 9 and is currently a member of Scotland’s Privacy Advisory Committee. He was elected a Fellow of the Royal Society of Edinburgh in 2011.

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AEA Annual Scientific Meeting Auckland, New Zealand, 2014
**Keynote and invited speakers**

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**Professor W. Murray Thomson**

W. Murray Thomson is Professor of Dental Epidemiology and Public Health at the University of Otago. He is an experienced, productive and award-winning researcher who has made substantial contributions to knowledge in dentistry and public health in the areas of dental epidemiology, health services research and the oral health of older people. His life course work in the renowned Dunedin Study has been complemented by his pivotal role in the development, testing and field use of a number of important self-report measures which are in wide use internationally. Murray is one of the few dental scientists anywhere to have been honoured with two separate Distinguished Scientist Awards from the International Association for Dental Research (the 2010 H. Trendley Dean Memorial Award, for meritorious research in epidemiology and public health; and the 2014 Geriatric Oral Research Award), and he is the first NZ-based scientist to have been honoured by the IADR. In 2010, he received the Sir John Walsh Research Award (for research over an extended period by a member of the University of Otago Faculty of Dentistry). In 2009, he was awarded the Alan Docking Award for distinguished research in dentistry by the Australia-New Zealand Division of the IADR.

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**Professor Robyn Whittaker**

Robyn Whittaker is the Programme Leader of Health Informatics & Technology research at the National Institute for Health Innovation (NIHI) at the University of Auckland. The team at NIHI covers a broad range of expertise in health technology, mobile health, health informatics, health information standards, health knowledge management and evaluation of health IT initiatives. Robyn’s research interests are particularly in mobile health and digital health – using ICT to deliver health information and services to the population. Her research has included text messaging, video messaging, internet and tablet/smartphone apps in topics such as smoking cessation, prevention of depression, cognitive behavioural therapy, weight management, alcohol brief intervention, health information for pregnant women/young families, cardiac rehabilitation and self-management support for people with diabetes.

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**Professor Jeff Wigand**

Dr Wigand is former vice president of research and development at US tobacco company Brown & Williamson. He rose to international prominence when he became known as a ‘whistleblower’ on big tobacco after appearing on 60 Minutes in 1996 and revealing tobacco company decisions to manipulate tobacco blends to increase the amount of addictive nicotine in cigarettes.

He has received public recognition and numerous awards for his actions in revealing tobacco company research and marketing practices and he continues his efforts to reduce teen tobacco use through the non-profit organisation he formed, Smoke-Free Kids, Inc. He was also portrayed by Russell Crowe in the 1999 film, The Insider, which told the story of his whistleblowing.
General information

Meeting venue
Aotea Centre, 50 Mayoral Drive, Auckland 1010, New Zealand

Meeting Organisers
Conference Innovators
PO Box 28 084, Remuera, Auckland 1541, New Zealand
E: rachel@conference.co.nz
W: www.conference.co.nz
T: +64 9 525 2464
F: +64 9 525 2465

Accommodation
Delegates who have booked accommodation with their meeting registration are located in three properties:

Rendezvous Grand Hotel
71 Mayoral Drive, Auckland T: +64 9 366 3000

Crowne Plaza Hotel
128 Albert Street, Auckland T: +64 9 302 1111

Rydges Hotel
59 Federal Street, Auckland T: +64 9 375 5900

Please ensure that accounts are settled in full prior to your departure from the hotel.

Catering
All catering during the meeting sessions will be located in the Owens and Lower NZI foyers.
Pre-booked meeting dinner tickets will be issued at registration.
For delegates who provided dietary details during registration, special meals will be available in the catering area within the Owens Foyer. Venue staff will be available to assist.

Dress
The dress code throughout the conference, including the Welcome Reception and Meeting Dinner, is smart casual.

Insurance
Registration fees do not include personal travel or health insurance of any kind. The Organising Committee and Conference Innovators do not take any responsibility for any delegate failing to take adequate insurance cover.

Internet Access
Wireless internet is available at no cost to visitors of the Aotea Centre and is designed for web browsing and checking web-based email. It is not designed for accessing VPN’s or downloading large files.

Medical Emergency
In case of an emergency, please contact any member of the Aotea Centre or meeting staff at the Registration Desk.

Mobile Phones
As a courtesy to speakers and other delegates, please ensure your mobile phone is turned off or is on silent mode during all sessions and social functions.

Name Badges
Please wear your name badge when attending all meeting sessions including social functions.

Parking
The Civic car park is a multi-story car park located under Aotea Square (adjacent to the Aotea Centre) with 828 car parks over three levels. Access to the Civic car park is at Greys Avenue and Mayoral Drive. The maximum daily rate is $17 per vehicle.

Early-bird Parking is available for $13 per day should you arrive before 8.30am and depart by 7:00pm. Rates are current as at the time of printing.

Poster Sessions
Poster sessions will take place during Lunch on Thursday 9 October (12:30–1:30pm) and Friday 10 October (12:30–1:30pm).

If you are presenting a poster you are required to prepare your display prior to 9:30am of the day you have been allocated. Poster presenters are required to be stationed with their poster for the duration of the session to discuss with delegates.

Poster presentations must be taken down at the end of the meeting. The meeting organisers will not be responsible for posters left behind at the end of the conference.

Presenter Information
Upon arrival at the meeting, or at least two hours prior to their scheduled presentation, presenters should meet the audio-visual technician in the Speakers Preparation Room to load their presentation. Please check with the Registration Desk staff if you require further assistance.

Smoking
The Aotea Centre is a non-smoking venue.
**General information**

## Registration information

### Registration desk

The Registration Desk will be located in the Owens Foyer during the meeting and will be open at the following times:

- **Wednesday 8 October**: 7:30am – 7:30pm
- **Thursday 9 October**: 7:30am – 6:00pm
- **Friday 10 October**: 7:30am – 5:30pm

### Registration entitlements

#### Full and student registration

- All meeting sessions and Master Classes on Wednesday 8 October to Friday 10 October
- Combined AEA ASM and Congress Welcome Reception
- Day catering

#### Day registration

- All meeting sessions and/or Master Classes on day of attendance
- Day catering

---

**Aotea Centre**
# Meeting program at a glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wednesday, 8 October 2014</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:30am–7:30pm</td>
<td>Registration</td>
<td>Owens Foyer</td>
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<tr>
<td>8:30am–9:30am</td>
<td>Plenary Session 1</td>
<td>Epidemiology, population health and the afterlife</td>
</tr>
<tr>
<td>9:30–10:00am</td>
<td>Morning tea</td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>10:00–11:50am</td>
<td>Master classes 1</td>
<td>A history of life and death in New Zealand</td>
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<td>Accelerating progress on reducing obesogenic environments</td>
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<td>Strategies to reduce alcohol-related harm</td>
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<td>Understanding economic inequalities in health</td>
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<td>Building healthy, sustainable homes, communities and cities</td>
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<tr>
<td>12:00–12:45pm</td>
<td>Plenary Session 2</td>
<td>The science of cigarettes</td>
</tr>
<tr>
<td>12:45pm–1:40pm</td>
<td>Lunch</td>
<td>Owens Foyer and Lower NZI Foyer</td>
</tr>
<tr>
<td>1:40pm–3:30pm</td>
<td>Master classes 2</td>
<td>Smoke Free 2025</td>
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<tr>
<td></td>
<td></td>
<td>Climate CHANGE: transforming threats into opportunities and science into action</td>
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<td>Managing fresh water resources for public health and sustainability</td>
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<td></td>
<td>Who’s working with big health data in New Zealand and Australia: a show and tell</td>
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<td>Kindly sponsored by ProCARE</td>
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<tr>
<td></td>
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<td>Decolonising epidemiology - reclaiming numbers</td>
</tr>
<tr>
<td>3:30pm–4:00pm</td>
<td>Afternoon tea</td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>4:00pm–5:00pm</td>
<td>Plenary Session 3</td>
<td>Using evidence to improve population health: some lessons from the obesity epidemic</td>
</tr>
<tr>
<td>5:15pm–7:15pm</td>
<td>Combined Congress and AEA Welcome Reception</td>
<td>Owens Foyer and Lower NZI Foyer</td>
</tr>
<tr>
<td><strong>Thursday, 9 October 2014</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:30am–7:30pm</td>
<td>Registration</td>
<td>Owens Foyer</td>
</tr>
<tr>
<td>9:00am–9:30am</td>
<td>Powhiri and Meeting Welcome</td>
<td>Lower NZI</td>
</tr>
</tbody>
</table>
### Meeting program at a glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30am–10:30am</td>
<td>Plenary Session 4</td>
<td>Bespoke linkage and Big data in the age of the internet</td>
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<td>Lower NZI</td>
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<tr>
<td>10:30am–11:00am</td>
<td>Morning tea</td>
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<td></td>
<td></td>
<td>Owens Foyer and Lower NZI Foyer</td>
</tr>
<tr>
<td>11:00am–12:30pm</td>
<td>Concurrent Session 1</td>
<td>Oral health</td>
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<td>Biostatistics</td>
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<td>Injury</td>
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<td>Cardiovascular disease</td>
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<td>Maternal / infant health</td>
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<tr>
<td>12:30–1:30pm</td>
<td>Lunch and posters</td>
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<td></td>
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<td>Owens Foyer and Lower NZI Foyer</td>
</tr>
<tr>
<td>12:30pm–1:30pm</td>
<td>Early-career Workshop</td>
<td>Is publication bias present in the beneficial effects of statins in the primary prevention of cardiovascular disease?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accounting for exposure misclassification introduced into linked population databases</td>
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<tr>
<td>1:30pm–3:00pm</td>
<td>Concurrent Session 2</td>
<td>Advances in record linkage 1</td>
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<td>Quantitative methods 1</td>
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<td>Addictive substances</td>
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<td>Non-communicable disease</td>
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<td>Recruitment to epidemiological studies</td>
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<tr>
<td>3:00–3:35pm</td>
<td>Afternoon tea</td>
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<td></td>
<td></td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>3:30pm–4:30pm</td>
<td>Ian Prior Oration</td>
<td>Epidemiology and politics: lessons from Ian Prior’s battles</td>
</tr>
<tr>
<td>7:00pm – 12:00am</td>
<td>Conference Dinner</td>
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<tr>
<td>7:30am–9:00am</td>
<td>Early Career Breakfast</td>
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<tr>
<td>7:30am–5:30pm</td>
<td>Registration</td>
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</tr>
<tr>
<td>9:00am–10:30am</td>
<td>Plenary Session 5</td>
<td>Controlling Zoonoses: the Increasing Role Played by Molecular and Genomic Epidemiology</td>
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<td>Strengthening epidemiological capacity within a One Health framework</td>
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<tr>
<td>10:30am–11:00am</td>
<td>Morning tea</td>
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<tr>
<td>11:00am–12:30pm</td>
<td>Concurrent Session 3</td>
<td>Advances in record linkage 2</td>
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<td>Quantitative methods 2</td>
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<td>Infectious disease</td>
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<td>Social and digital media in epidemiology 1</td>
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<td>Mental health</td>
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<td>12:30pm–1:30pm</td>
<td>Lunch and posters</td>
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<td>Owens Foyer and Lower NZI Foyer</td>
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<td>Time</td>
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<tr>
<td>12:30pm–1:30pm</td>
<td>AEA Annual General Meeting</td>
<td>Lower NZI</td>
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<tr>
<td>1:30pm–3:00pm</td>
<td>Concurrent Session 4</td>
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<td></td>
<td>Advances in record linkage 3</td>
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<td></td>
<td>Epidemiology and cost-effect modelling</td>
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<td></td>
<td>Cancer</td>
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<td></td>
<td>Social and digital media in epidemiology 2</td>
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<td></td>
<td>Indigenous health</td>
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<tr>
<td>3:00pm–3:30pm</td>
<td>Afternoon Tea</td>
<td>Owens Foyer and</td>
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<td></td>
<td>Lower NZI Foyer</td>
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<tr>
<td>3:30pm–5:00pm</td>
<td>Panel session</td>
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<td></td>
<td>Privacy, data access and the public good: the future of big data and epidemiological research</td>
<td>Lower NZI</td>
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<tr>
<td>5:00pm</td>
<td>Close of Annual Scientific Meeting</td>
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</tbody>
</table>

### Social program

**Combined AEA ASM and NZ Population Health Congress Welcome Reception**

- **Date:** Wednesday 8 October
- **Time:** 5:15pm–7:15pm
- **Location:** Owens Foyer, the Aotea Centre
- **Dress:** Smart casual
- **Tickets:** One ticket is included in each full registration; additional tickets can be purchased ($48 per person) from the registration desk.

**Meeting Dinner**

- **Date:** Thursday 9th October
- **Time:** 7:00pm–12:00am
- **Venue:** Air New Zealand Foyer, Aotea Centre
- **Dress:** Smart casual
- **Tickets:** If you have already purchased tickets for the Meeting Dinner, you will have received these at the time of registering. Additional tickets are available for purchase, $100 per person. Please see the Registration Desk for more details.

**Breakfast Session**

**Early Career Breakfast**

- **Venue:** Upper NZI Room 1
- **Time:** 7:30am–8:30am
- **Cost:** $28
- **Tickets:** If you have already purchased a ticket for this breakfast, you will have received this at the time of registering. Additional tickets are available for purchase, $28 per person. Please see the Registration Desk for more details.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30am–7:30pm</td>
<td>Registration</td>
<td>Owens Foyer</td>
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<tr>
<td>8:30am–9:30am</td>
<td>Plenary Session 1</td>
<td>Lower NZI</td>
<td>Invited Speaker: Kirk Smith</td>
</tr>
<tr>
<td>9:30am–10:00am</td>
<td>Morning tea</td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>10:00am–11:50am</td>
<td>Master classes 1</td>
<td></td>
<td>Alistair Woodward, Tony Blakely, Richard Taylor</td>
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<tr>
<td></td>
<td>A history of life and death in New Zealand</td>
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<td></td>
<td>Accelerating progress on reducing obesogenic environments</td>
<td></td>
<td>Boyd Swinburn, Shiriki Kumanyika, Cliona Ni Mhurchu, Stefanie Vandevijvere</td>
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<tr>
<td></td>
<td>Understanding economic inequalities in health</td>
<td></td>
<td>Kristie Carter, Tim Hazeldine, Rebecca Bently, Emma Baker</td>
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<td></td>
<td>Strategies to reduce alcohol-related harm</td>
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<td>Kypros Kypri, Jennie Connor, Tim McCreanor, Derek Bell</td>
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<tr>
<td></td>
<td>Building healthy, sustainable homes, communities and cities</td>
<td></td>
<td>Philippa Howden-Chapman, Michael Baker, Karen Witten</td>
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<tr>
<td>12:00pm–1:40pm</td>
<td>Plenary Session 2</td>
<td></td>
<td>Invited Speaker: Jeffrey Wigand</td>
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<tr>
<td>12:45pm–1:40pm</td>
<td>Lunch</td>
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<tr>
<td>1:40pm–3:30pm</td>
<td>Master classes 2</td>
<td></td>
<td>Richard Edwards, Jeffrey Wigand, Robert Beaglehole, Janet Hoek, Tony Blakely, Nick Wilson</td>
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<td></td>
<td>Smoke Free 2025</td>
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<tr>
<td></td>
<td>Climate CHANGE: transforming threats into opportunities and science into action</td>
<td></td>
<td>Kirk Smith, Alex Macmillan, Alistair Woodward, Rhys Jones</td>
</tr>
<tr>
<td></td>
<td>Managing fresh water resources for public health and sustainability</td>
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<td>Nicholas Jones, Gary Taylor, Garth Harmsworth, Stephen Daysh, David Allen</td>
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</table>
## PROGRAM: Thursday, 9 October 2014

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<tr>
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<th>Location</th>
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<tbody>
<tr>
<td>9:00am–9:30am</td>
<td>Powhiri and Meeting Welcome</td>
<td>Lower NZI Foyer</td>
<td>Rod Jackson</td>
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<tr>
<td>9:30am–10:30am</td>
<td>Plenary Session 4</td>
<td>Lower NZI Foyer</td>
<td>Invited Speaker: Shiriki Kumanyika</td>
</tr>
<tr>
<td>10:30am–11:00am</td>
<td>Morning Tea</td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>11:00am–11:30am</td>
<td>Concurrent session 1a: Oral health</td>
<td>Owens Foyer and Lower NZI Foyer</td>
<td>Invited speaker: Linda Slack-Smith</td>
</tr>
<tr>
<td>11:30am</td>
<td>From basic science to public health: British Columbia’s system-wide approach to oral cancer</td>
<td>Owens Foyer and Lower NZI Foyer</td>
<td>Invited Speaker: Miriam Rosen</td>
</tr>
<tr>
<td>11:45am</td>
<td>Oral epidemiology – a window on the life course</td>
<td>Owens Foyer and Lower NZI Foyer</td>
<td>Invited Speaker: W. Murray Thomson</td>
</tr>
<tr>
<td>12:00pm</td>
<td>Is poor oral health a risk marker for incident cardiovascular disease hospitalisation and all-cause mortality? Findings from a record linkage study</td>
<td>Owens Foyer and Lower NZI Foyer</td>
<td>Grace Joshy</td>
</tr>
<tr>
<td>12:15pm</td>
<td>Investigating the impact of a new fast food development on residents’ eating behaviours using a natural experiment study design</td>
<td>Owens Foyer and Lower NZI Foyer</td>
<td>Lukar Thornton</td>
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### PROGRAM: Thursday, 9 October 2014

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<tr>
<td>11:00am–12:30pm</td>
<td><strong>Concurrent session 1b: Biostatistics</strong></td>
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<tr>
<td>11:00am</td>
<td>Discovering high risk factor combinations in epidemiology: the use of partitioning methods and visualisation by scaled rectangle diagrams</td>
<td></td>
<td>Invited speaker: Roger Marshall</td>
</tr>
<tr>
<td>11:15am</td>
<td>A comparison of sensitivity-specificity imputation, direct imputation and fully Bayesian analysis to adjust for misclassification of smoking status in estimating the association between smoking and lung cancer</td>
<td></td>
<td>Marine Corbin</td>
</tr>
<tr>
<td>11:30am</td>
<td>Assessing the impact of vaccination programs: an evaluation of statistical approaches using rotavirus in Australia as a case study</td>
<td></td>
<td>Nicole Mealing</td>
</tr>
<tr>
<td>11:45am</td>
<td>Designing a randomised trial to inform policy on the benefits and harms of patient choice of treatment: How many patients do I need?</td>
<td></td>
<td>Robin Turner</td>
</tr>
<tr>
<td>12:00pm</td>
<td>Statistical approaches used to assess equitable access to food outlets: a systematic review</td>
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<td>Karen Lamb</td>
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<tr>
<td>12:15pm</td>
<td>A privacy-preserving method for encoding geospatial locations to enable distance comparison without revealing locations</td>
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<td>James Farrow</td>
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<tr>
<td>11:00am–12:30pm</td>
<td><strong>Concurrent session 1c: Injury</strong></td>
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<tr>
<td>11:00am</td>
<td>Results from a randomised controlled trial of a home injury prevention intervention</td>
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<td>Nevil Pierse</td>
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<tr>
<td>11:15am</td>
<td>Risk of injury among young New Zealanders with disability and long-term conditions with functional limitations</td>
<td></td>
<td>Shanthi Ameratunga</td>
</tr>
<tr>
<td>11:30am</td>
<td>Economically inactive, unemployed and employed suicides in Australia by age and sex over a ten-year period: what was the impact of the 2007 economic recession?</td>
<td></td>
<td>Anthony D LaMontagne</td>
</tr>
<tr>
<td>11:45am</td>
<td>Prevalence and predictors of post-traumatic stress among 2,220 injured New Zealanders: findings among hospitalised and non-hospitalised subgroups</td>
<td></td>
<td>Gabrielle Davie</td>
</tr>
<tr>
<td>12:00pm</td>
<td>Persistent problems and predictors of recovery one year following mild traumatic brain injury</td>
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<td>Alice Theadom</td>
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<tr>
<td>12:15pm</td>
<td>Role of conspicuity in bicycle crashes involving a motor vehicle</td>
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<td>Sandar Tin Tin</td>
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<tr>
<td>11:00am–12:30pm</td>
<td><strong>Concurrent session 1d: Cardiovascular disease</strong></td>
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<tr>
<td>11:00am–11:30am</td>
<td>Sex differences in the relationships between cardiovascular risk factors and outcomes: do they exist and do they matter?</td>
<td></td>
<td>Invited speaker: Rachel Huxley</td>
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<tr>
<td>11:30am</td>
<td>Ambulatory blood pressure adds little to Framingham Risk Score for the primary prevention of cardiovascular disease in older men: secondary analysis of observational study data</td>
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<td>Katy Bell</td>
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<tr>
<td>Time</td>
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<tr>
<td>11:45am</td>
<td>28-day and one-year case fatality after an acute coronary syndrome in New Zealand: a national data linkage study</td>
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<td>Corina Grey</td>
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<tr>
<td>11:45am</td>
<td>Developing a new CVD prediction system based on New Zealand primary care data</td>
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<td>Romana Pylypchuk</td>
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<tr>
<td>12:15pm</td>
<td>Sun exposure, mortality and cardiovascular disease among women in Sweden</td>
<td></td>
<td>Robert Scragg</td>
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<tr>
<td>11:00am–12:30pm</td>
<td><strong>Concurrent session 1e: Maternal / infant health</strong></td>
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<tr>
<td>11:00am</td>
<td>Adverse outcomes associated with postpartum haemorrhage</td>
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<td>Jane Ford</td>
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<tr>
<td>11:15am</td>
<td>Understanding variation in hospital induction practices</td>
<td></td>
<td>Judy Trevena</td>
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<tr>
<td>11:30am</td>
<td>Exploring adverse outcomes associated with age of blood in a maternity population</td>
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<td>Jillian Patterson</td>
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<td>11:45am</td>
<td>Atypical hyperplasia: risk and risk factors for subsequent breast cancer</td>
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<td>Elizabeth Buckley</td>
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<tr>
<td>12:00pm</td>
<td>Children’s diets in the first two years of life: findings from an Australian birth cohort study</td>
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<td>Lauren Carpenter</td>
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<tr>
<td>12:15pm</td>
<td>Are women birthing in New South Wales hospitals satisfied with their care?</td>
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<td>Jane Ford</td>
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<tr>
<td>12:30–1:30pm</td>
<td>Lunch and posters</td>
<td>Owens Foyer and Lower NZI</td>
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<tr>
<td>12:30–1:00pm</td>
<td><strong>Early Career Researcher Workshops</strong></td>
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<td>12:30–1:00pm</td>
<td>Is publication bias present in the beneficial effects of statins in the primary prevention of cardiovascular disease?</td>
<td>Lower NZI</td>
<td>Simon Thornley, Discussant: Thomas Lumley</td>
</tr>
<tr>
<td>1:00–1:30pm</td>
<td>Accounting for exposure misclassification introduced into linked population databases</td>
<td>Lower NZI</td>
<td>Annette Regan, Discussant: Annette Dobson</td>
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<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 2a: Advances in record linkage 1</strong></td>
<td></td>
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<tr>
<td>1:30pm</td>
<td>The NGLMS: Experiences using graph databases and algorithms to store, manipulate and query linked data</td>
<td></td>
<td>James Farrow</td>
</tr>
<tr>
<td>1:45pm</td>
<td>Proton pump inhibitors and increased risk of interstitial nephritis: a record linkage study using routinely collected data from New Zealand</td>
<td></td>
<td>Mei-Ling Blank</td>
</tr>
<tr>
<td>2:00pm</td>
<td>National differences and time trends of tuberculosis in West Africa</td>
<td></td>
<td>Abdulai Agbor Yansaneh</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Using data linkage to improve the quality of Aboriginal infant and child mortality statistics: a tale of two Australian states</td>
<td></td>
<td>Carrington Shepherd</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Estimating the likely true rheumatic fever incidence in New Zealand</td>
<td></td>
<td>Jane Oliver</td>
</tr>
<tr>
<td>2:45pm</td>
<td>Antidepressant medication use in Australian adults: results from a large-scale linkage study using administrative pharmaceutical data</td>
<td></td>
<td>Ellie Paige</td>
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## PROGRAM: Thursday, 9 October 2014

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 2b: Quantitative methods 1</strong></td>
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<tr>
<td>1:30pm–2:00pm</td>
<td>Familiar questions, different context: estimation and testing in large-scale genetic association studies</td>
<td></td>
<td>Invited Speaker: Thomas Lumley</td>
</tr>
<tr>
<td>2:00pm</td>
<td>Lifestyle factors and risk of colorectal cancer for people with germline mutations in DNA mismatch repair genes</td>
<td></td>
<td>Aung Ko Win</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Determining the methodological approach for the Australian Burden of Disease Study 2011</td>
<td></td>
<td>Lynelle Moon</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Medicare data for cancer follow-up studies</td>
<td></td>
<td>Bridie Thompson</td>
</tr>
<tr>
<td>2:45pm</td>
<td>Effects of interpretive front-of-pack nutrition labels on food purchases: STARLIGHT randomised controlled trial</td>
<td></td>
<td>Cliona Ni Mhurchu</td>
</tr>
<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 2c: Addictive substances</strong></td>
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<tr>
<td>1:30pm</td>
<td>Kava use and risk of car crash injury: a population-based case control study in Fiji</td>
<td></td>
<td>Iris Wainiqolo</td>
</tr>
<tr>
<td>1:45pm</td>
<td>Acculturation and prevalence of smoking in Asian migrants in western countries: a systematic review and meta-analysis</td>
<td></td>
<td>Shuyu Guo</td>
</tr>
<tr>
<td>2:00pm</td>
<td>The association between quitting smoking and weight gain: a systematic review and meta-analysis of prospective cohort studies</td>
<td></td>
<td>Jing Tian</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Effects of study design and allocation on self-reported drinking behaviour: randomised trial</td>
<td></td>
<td>Kypros Kypri</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Marijuana use and injury events: findings from the New Zealand Blood Donors Health Study</td>
<td></td>
<td>Shanthi Ameratunga</td>
</tr>
<tr>
<td>2:45pm</td>
<td>Idle youth by all things enslaved: media, consumerism and tobacco</td>
<td></td>
<td>Rob McGee</td>
</tr>
<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 2d: Non-communicable disease</strong></td>
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<tr>
<td>1:30pm</td>
<td>Towards global benchmarking of food environments and policies to reduce obesity and diet-related non-communicable diseases: design and methods for nationwide surveys</td>
<td></td>
<td>Stefanie Vandevijvere</td>
</tr>
<tr>
<td>1:45pm</td>
<td>Hospitalisation costs associated with above-normal body mass index: a data linkage study</td>
<td></td>
<td>Rosemary Korda</td>
</tr>
<tr>
<td>2:00pm</td>
<td>National survey of risk factors for non-communicable disease in Vietnam and prevalence estimates and an assessment of their validity</td>
<td></td>
<td>Tan Bui</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Trajectories of urban and non-urban residence and BMI from childhood to adulthood</td>
<td></td>
<td>Kira Patterson</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Partnering and parenting transitions in Australian men and women: associations with changes in weight, diet and physical activity</td>
<td></td>
<td>Alison Venn</td>
</tr>
<tr>
<td>2:45pm</td>
<td>Does heavy exercise cause atrial fibrillation? Six year follow-up of participants in the Taupo Cycle Challenge</td>
<td></td>
<td>Alistair Woodward</td>
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## PROGRAM: Friday, 10 October 2014

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<tr>
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<tbody>
<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 2e: Recruitment to Epidemiological Studies</strong></td>
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<tr>
<td>1:30pm–2:00pm</td>
<td>Recruitment via the Internet and social networking sites: the 1989 – 95 cohort of the Australian Longitudinal Study on Women's Health</td>
<td>Invited Speaker: Gita Mishra</td>
<td></td>
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<tr>
<td>2:00pm</td>
<td>The ups and downs of recruiting in the 21st century</td>
<td>Jennifer Powers</td>
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<tr>
<td>2:15pm</td>
<td>Achieving high response rates</td>
<td>Brian Cox</td>
<td></td>
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<tr>
<td>2:30pm</td>
<td>Recruitment and retention strategies in the community-onset Staphylococcus aureus longitudinal cohort study</td>
<td>Catherine Bennett</td>
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<tr>
<td>2:45pm</td>
<td>Latency to participate and intervention response in a randomised alcohol behaviour change trial</td>
<td>Steven Bowe</td>
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<tr>
<td>3:00–3:30pm</td>
<td><strong>Afternoon tea</strong></td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>3:30–4:30pm</td>
<td><strong>Ian Prior Oration</strong></td>
<td>Lower NZI</td>
<td>Chair: Robert Scragg</td>
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<td></td>
<td>Epidemiology and politics: lessons from Ian Prior's battles</td>
<td></td>
<td>Robert Beaglehole</td>
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<tr>
<td>7:00pm–12:00am</td>
<td><strong>Meeting Dinner</strong></td>
<td>Air NZ Foyer</td>
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### Friday, 10 October 2014

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<tr>
<td>7:30–9:00am</td>
<td><strong>Early Career Breakfast</strong></td>
<td>Lower NZI</td>
<td>Rachel Huxley, Chris Bullen and Andrea Mannetje</td>
</tr>
<tr>
<td>7:30am–5:30pm</td>
<td><strong>Registration</strong></td>
<td>Owens Foyer</td>
<td>Chair: Michael Baker</td>
</tr>
<tr>
<td>9:00–10:30am</td>
<td><strong>Plenary session 5</strong></td>
<td>Lower NZI</td>
<td>Nigel French</td>
</tr>
<tr>
<td>9:00–9:45am</td>
<td>Controlling zoonoses: the increasing role played by molecular and genomic epidemiology</td>
<td>Joanna McKenzie</td>
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<tr>
<td>9:45am – 10:30am</td>
<td>Strengthening epidemiological capacity within a One Health framework</td>
<td>Joanna McKenzie</td>
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<tr>
<td>10:30–11:00am</td>
<td><strong>Morning tea</strong></td>
<td>Owens Foyer and Lower NZI Foyer</td>
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</tr>
<tr>
<td>11:00–12:30pm</td>
<td><strong>Concurrent session 3a: Advances in record linkage 2</strong></td>
<td></td>
<td>Invited Speaker: Frank Sullivan</td>
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<tr>
<td>11:00am–11:30am</td>
<td>Advances in record linkage</td>
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<td>Kindly sponsored by</td>
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<tr>
<td>11:30am</td>
<td>Initiation and maintenance of cardiovascular medications following cardiovascular risk assessment in a large primary care cohort</td>
<td>Suneela Mehta</td>
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<tr>
<td>11:45am</td>
<td>The impact of processes on care on hospitalisation among people with diabetes: a record linkage study</td>
<td>Elizabeth Cornino</td>
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<tr>
<td>12:00pm</td>
<td>Exploring the data collection process for a regional trauma registry in New Zealand</td>
<td>Bridget Kool</td>
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<tr>
<td>12:15pm</td>
<td>Risk factors for death due to pandemic influenza A (H1N1) 2009 in New Zealand: a linked administrative data study</td>
<td>James Harris</td>
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<td><strong>11:00am–12:30pm</strong></td>
<td><strong>Concurrent session 3b: Quantitative methods 2</strong></td>
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<tr>
<td>11:00am</td>
<td>Measuring residential aged care in New Zealand: methodological challenges in using available data</td>
<td>Joanna Broad</td>
<td></td>
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<tr>
<td>11:15am</td>
<td>Measurement error in Cancer Council Victoria’s FFQ and correction for its effect on estimates of diet-disease association using recovery biomarkers</td>
<td>Michael Fahey</td>
<td></td>
</tr>
<tr>
<td>11:30am</td>
<td>Weekly cholecalciferol supplementation results in significant reductions in infection risk among the vitamin D deficient: results from the CIPRIS trial</td>
<td>Steve Simpson, Jr.</td>
<td></td>
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<tr>
<td>11:45am</td>
<td>Development and impact of redistribution methods for the Australian Burden of Disease Study</td>
<td>Melissa Goodwin</td>
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<tr>
<td>12:00pm</td>
<td>Death in the digital age: a comparison of cross-jurisdiction utility of an electronic coronial data retrieval system</td>
<td>Rebecca Lilley</td>
<td></td>
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<tr>
<td>12:15pm</td>
<td>Supporting lower salt food choices for people with CVD: randomised controlled trial of the SaltSwitch smartphone app</td>
<td>Helen Eyles</td>
<td></td>
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<tr>
<td><strong>11:00am–12:30pm</strong></td>
<td><strong>Concurrent session 3c: Infectious disease</strong></td>
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<tr>
<td>11:00am–11:30am</td>
<td>The public health and economic impact of leptospirosis in New Zealand</td>
<td>Invited Speaker: Cord Heuer</td>
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<tr>
<td>11:30am</td>
<td>Geographic divergence of bovine and human Shiga toxin-producing Escherichia coli O157:H7 genotypes in New Zealand</td>
<td>Patricia Jaros</td>
<td></td>
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<tr>
<td>11:45am</td>
<td>One Health: building relationships between human and animal health professionals through epidemiology</td>
<td>Invited Speaker: Joanna McKenzie</td>
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<tr>
<td>12:00pm</td>
<td>Healthcare usage and loss of productivity due to infectious gastroenteritis: Australia, 2008 – 2009</td>
<td>Yingxi Chen</td>
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<tr>
<td>12:15pm</td>
<td>Choosing optimal controls for a rheumatic fever case-control study in New Zealand</td>
<td>Michael Baker</td>
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<tr>
<td><strong>11:00am–12:30pm</strong></td>
<td><strong>Concurrent session 3d: Social and digital media in epidemiology 1</strong></td>
<td></td>
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<tr>
<td>11:00am–11:30am</td>
<td>Social and digital media</td>
<td>Invited Speaker: Robyn Whittaker</td>
<td></td>
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<tr>
<td>11:30am</td>
<td>The use of mobile phone technology to improve data collection for vaccine safety monitoring</td>
<td>Annette Regan</td>
<td></td>
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<tr>
<td>11:45am</td>
<td>Google Flu Trends and the media: is Google Flu Trends set to take over from traditional influenza surveillance methods, or is the effect of media influence too great?</td>
<td>Monique Chilver</td>
<td></td>
</tr>
<tr>
<td>12:00pm</td>
<td>‘Healthy mobile check-ins’ study: using GIS in smartphones to track use of urban environment by survivors of endometrial cancer</td>
<td>Julie-Anne Carroll</td>
<td></td>
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<tr>
<td>12:15pm</td>
<td>Presenting the new General Record of Incidence of Mortality (GRIM) Books</td>
<td>Jeanette Tyas</td>
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<tr>
<td>11:00am–12:30pm</td>
<td><strong>Concurrent session 3e: Mental health</strong></td>
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<tr>
<td>11:00am</td>
<td>How does recent serious mental illness impact on colorectal cancer survival?</td>
<td></td>
<td>Ruth Cunningham</td>
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<tr>
<td>11:15am</td>
<td>Does wealth buffer the deleterious mental health effects of acquiring a disability in adulthood?</td>
<td></td>
<td>Rebecca Bentley</td>
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<tr>
<td>11:30am</td>
<td>Mental health, physical health, work and retirement in men and women: a prospective study of 21,608 Australians aged 55 to 69 years</td>
<td></td>
<td>Kha Vo</td>
</tr>
<tr>
<td>11:45am</td>
<td>Healthy lifestyles are associated with a reduced incidence of depression in young adults: the Childhood Determinants of Adult Health Study</td>
<td></td>
<td>Seana Gall</td>
</tr>
<tr>
<td>12:00pm</td>
<td>Untangling the relationship between food insecurity and mental health</td>
<td></td>
<td>Kristie Carter</td>
</tr>
<tr>
<td>12:15pm</td>
<td>Sickness absence and psychosocial job quality: an analysis from a longitudinal survey of working Australians, 2005–12</td>
<td></td>
<td>Anthony LaMontagne</td>
</tr>
<tr>
<td>12:30–1:30pm</td>
<td><strong>Lunch and posters</strong></td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>12:30–1:30pm</td>
<td><strong>AEA Annual General Meeting</strong></td>
<td>Lower NZI</td>
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<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 4a: Advances in record linkage 3</strong></td>
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<tr>
<td>1:30pm</td>
<td>Cosmetic breast augmentation surgery and subsequent breastmilk feeding</td>
<td></td>
<td>Christine Roberts</td>
</tr>
<tr>
<td>1:45pm</td>
<td>The role of maternal education in the trajectory of malnutrition in children aged &lt;5 years in Bangladesh, 1996–2011</td>
<td></td>
<td>MD Tanvir Hasan</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Elevated iron stores in pregnancy and risk of gestational diabetes</td>
<td></td>
<td>Amina Khambalia</td>
</tr>
<tr>
<td>2:30pm</td>
<td>Methodological considerations for Indigenous Burden of Disease estimates for Australia</td>
<td></td>
<td>Michelle Gourley</td>
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<tr>
<td>2:45pm</td>
<td>Sociodemographic predictors of stillbirth and neonatal death in New Zealand: findings from linkage of national maternity and perinatal mortality data</td>
<td></td>
<td>Lynn Sadler</td>
</tr>
<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 4b: Epidemiology and cost-effect modelling</strong></td>
<td></td>
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<tr>
<td>1:30pm–2:00pm</td>
<td>What can epidemiologists offer to – and learn from – disease and cost-effectiveness modelling? Lots!</td>
<td></td>
<td>Invited speaker: Tony Blakely</td>
</tr>
<tr>
<td>2:00pm</td>
<td>A cost-utility analysis of regularly raising tobacco taxation to help achieve the New Zealand government’s smoke-free nation goal</td>
<td></td>
<td>Nick Wilson</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Validation of a synthetic population for use in micro-simulation</td>
<td></td>
<td>Josh Knight</td>
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<tr>
<td>2:30pm</td>
<td>Economic evaluation of a school intervention to reduce the risk of rheumatic fever</td>
<td></td>
<td>Richard Milne</td>
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<tr>
<td>2:45pm</td>
<td>Efficient use of clinical analytics in implementing best patient care</td>
<td></td>
<td>Efty Stavrou</td>
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<td>1:30–3:00pm</td>
<td><strong>Concurrent session 4c: Cancer</strong></td>
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<tr>
<td>1:30pm</td>
<td>Counting unknown primary cancers in burden of disease analysis</td>
<td></td>
<td>Melissa Goodwin</td>
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<tr>
<td>1:45pm</td>
<td>Obesity and advanced breast cancer in rural and urban Australia: a data linkage study</td>
<td></td>
<td>Janni Leung</td>
</tr>
<tr>
<td>2:00pm</td>
<td>Socioeconomic and geographic disparities: measuring concordance with treatment guidelines and time to treatment for people with lung cancer</td>
<td></td>
<td>Kalinda Griffiths</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Screen-detected ductal carcinoma in-situ as a risk factor for subsequent invasive breast cancer</td>
<td></td>
<td>Elizabeth Buckley</td>
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<tr>
<td>2:30pm</td>
<td>Association between mammographic density and breast cancer risk by mode of detection</td>
<td></td>
<td>Kavitha Krishnan</td>
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<td>2:45pm</td>
<td>Cancer risk in people with type 1 and type 2 diabetes in Australia: 1997–2007</td>
<td></td>
<td>Jessica Harding</td>
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<tr>
<td>1:30–3:00pm</td>
<td><strong>Concurrent session 4d: Social and digital media in epidemiology 2</strong></td>
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<tr>
<td>1:30pm</td>
<td>Validation of a designer Australian Smartphone app to replace written weighed food records in nutrition research</td>
<td></td>
<td>Margaret Allman-Farinelli</td>
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<tr>
<td>1:45pm</td>
<td>Wearable cameras enhance the accuracy of 24-hour dietary recalls: a validation study using doubly labelled water</td>
<td></td>
<td>Luke Gemming</td>
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<td>2:00pm</td>
<td>Reality check ahead: validation of a virtual supermarket to measure food purchase behaviour</td>
<td></td>
<td>Wilma Waterlander</td>
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<td>2:15pm</td>
<td>Obtaining participants for an online epidemiological study</td>
<td></td>
<td>Juliet Anderson</td>
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<tr>
<td>2:30pm</td>
<td>Enriching interview data with administrative health data and area-based measures: the “prospective outcomes of injury study” example</td>
<td></td>
<td>Gabrielle Davie</td>
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<td>2:45pm</td>
<td>Development and evaluation of a mHealth cardiac rehabilitation system</td>
<td></td>
<td>Jonathan Rawstorn</td>
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<td>1:30–3:00pm</td>
<td><strong>Concurrent session 4e: Indigenous health</strong></td>
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<tr>
<td>1:30pm</td>
<td>Dialysis outcomes of older Indigenous and non-Indigenous Australians and New Zealanders</td>
<td></td>
<td>Charlotte McKercher</td>
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<tr>
<td>1:45pm</td>
<td>Estimating the relative contribution of risk factors and social determinants to the health gap between Indigenous and non-Indigenous Australians</td>
<td></td>
<td>Michael McGrath</td>
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<td>2:00pm</td>
<td>Hepatitis B immunity: a comparison of national prisoner and population serosurveys</td>
<td></td>
<td>Heather Gidding</td>
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<td>2:15pm</td>
<td>Māori health profiles</td>
<td></td>
<td>Shirley Simmonds</td>
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<td>2:30pm</td>
<td>Reliability of electronic cemetery records in ascertaining vital status in historical cohorts</td>
<td></td>
<td>Stella Gwini</td>
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<td>2:45pm</td>
<td>The role of alcohol in four-wheel motor vehicle crashes in Fiji</td>
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<td>Josephine Herman</td>
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<tr>
<td>3:00pm–3:30pm</td>
<td>Afternoon tea</td>
<td>Owens Foyer and Lower NZI Foyer</td>
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<tr>
<td>3:30pm–5:00pm</td>
<td>Panel discussion</td>
<td>Lower NZI</td>
<td>Chair: John Matthews&lt;br&gt;Privacy, data access and the public good: the future of big data and epidemiological research&lt;br&gt;Louisa Jorm&lt;br&gt;Lianne Parkin&lt;br&gt;Frank Sullivan&lt;br&gt;Graeme Osborne (Australian Government Representative)</td>
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<tr>
<td>5:00pm</td>
<td>Close of Annual Scientific Meeting</td>
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<td><strong>Posters</strong></td>
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<td>A Western Australia retrospective birth cohort medical record linkage study: an epidemiological investigation with special focus on occupational exposures to endocrine disrupter chemicals</td>
<td>Adeleh Shirangi</td>
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<td>The effectiveness of antenatal influenza vaccination in preventing influenza infection in newborns</td>
<td>Annette Regan</td>
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<td>Lifestyle factors and risk of endometrial cancer for women with germline mutations in DNA mismatch repair genes</td>
<td>Aung Ko Win</td>
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<td>Comparison of different pathways to the diagnosis of melanoma</td>
<td>Stella Kim</td>
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<td>Differences in cancer survival between New Zealand and Australia: Implications for improvement in New Zealand’s cancer care</td>
<td>Phyu Sin Aye</td>
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<td>Managing suspected cancer in primary care in New Zealand: an international study</td>
<td>Han Win Htun</td>
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<td>Stroke prevention on an international scale: the Stroke RiskometerTM app</td>
<td>Suzanne Barker-Collo</td>
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<td>Development and pilot-testing of an evidence-based weight loss mobile telephone app</td>
<td>Kylie Ball</td>
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<td>Online dietary assessment for research: The Automated Self-Administered 24-hour Dietary Recall System for Australia (ASA24-Aus)</td>
<td>Sarah A McNaughton</td>
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<td>Feasibility, acceptability and potential effectiveness of a mobile health (mHealth) weight management programme for New Zealand adults</td>
<td>Wilma E Waterlander</td>
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<td>Developing the evidence for a national salt reduction program for India</td>
<td>Claire Johnson</td>
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<td>Diet quality is not associated with obesity risk in mid-age women in the Australian Longitudinal Study on Women’s Health</td>
<td>Haya Aljadani</td>
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<td>Recent trends in age and sex-specific heart disease mortality in Australia</td>
<td>Melanie Nichols</td>
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<td>Health-related quality of life of care-givers of stroke patients in Vietnam</td>
<td>Phan T Kim Hoang</td>
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<td>Sun exposure behaviours and cardiovascular lifestyle risk factors among women in Sweden</td>
<td>Robert Scragg</td>
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<td>Sun exposure, vitamin D status and acculturation in East Asian Australians</td>
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<td>Shuyu Guo</td>
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<td>Is self-reported sun exposure a reliable measure of sun exposure?</td>
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<td>Fiona Bruinsma</td>
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<td>MRSA in the community: transmission analyses from the community-onset Staphylococcus aureus household cohort (COSAHC) Study, Australia</td>
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<td>Catherine M Bennett</td>
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<td>Hospital presentations for food allergy in New Zealand children</td>
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<td>Colleen McMilin</td>
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<td>Cost-utility analysis of four population-level interventions to reduce health loss from dietary salt intake</td>
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<td>Hospital costs for stroke patients admitted to a stroke unit in Ho Chi Minh City, Vietnam</td>
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<td>GP databases reveal inappropriate prescribing of oral anti-thrombotics for patients with atrial fibrillation</td>
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<td>Predictors of disability among a cohort of 2,856 injured New Zealanders</td>
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<td>Risk factors associated with intentional and unintentional poisoning: findings from the New Zealand blood donors’ health study</td>
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<td>Roshini Peiris-John</td>
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<td>Risky driving and driver injuries: missed opportunities for prevention</td>
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<td>Shanthi Ameratunga</td>
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<td>What influences the association between previous and future crashes among cyclists?</td>
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<td>Sandar Tin Tin</td>
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<td>The use of ‘standard drinks’ to measure alcohol consumption in developing world</td>
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<td>Tan Bui</td>
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<td>Mortality inequalities in Australia, 2009 – 2011</td>
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<td>Jeanette Tyas</td>
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<td>Income mobility in New Zealand: a descriptive analysis</td>
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<td>Kristie Carter</td>
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<td>The impact of roads on health-related quality of life of residents in Auckland, New Zealand</td>
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<td>Vikram Nichani</td>
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<td>The sexual literacy of the student population of the University of Tasmania: results of the RUSSL Study</td>
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<td>Steve Simpson, Jr.</td>
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<td>Diverticular disease as a chronic condition</td>
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<td>Joanna B Broad</td>
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<td>Epidemiological response capacity in the Western Pacific Region: need for a regional solution</td>
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<td>Shoaib Hassan</td>
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<td>A community-based prospective cohort study of exclusive breastfeeding in central Nepal</td>
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<td>Rajendra Karkee</td>
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<td>Description and comparison of anatomic distribution of basal cell and squamous cell carcinoma</td>
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<td>Padmini Subramaniam</td>
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- We represent Auckland’s most diverse network of GPs and general practice teams
- We are dedicated to superior clinical performance, ranking first and second in the recent CVDRA and Smoking – brief advice national health targets PHO performance results

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Epidemiologists use Stata to bring meaning to their data.
Abstracts for oral presentations
Wednesday, 8 October

Plenary Session 1
8:30am–9:30am
Lower NZI

Epidemiology, population health and the afterlife

Kirk Smith
School of Public Health, University of California, Berkeley, Berkeley, United States of America

Climate change poses challenges to decision-making because actions today have their most severe consequences in generations that follow rather than in our own. Using perspectives from the moral philosopher, Samuel Scheffler, and the social historian, Steven Pinker, Professor Smith will explore how the shift of human values needed to make difficult and expensive decisions today to protect the future may actually fit existing trends and values in society. Scheffler’s “Afterlife Conjecture” is that believable threats to even an indefinite human future would profoundly affect today’s values; i.e. we in a real sense care more for the future than the present. Some future climate scenarios would place humanity in a world very much altered from today, i.e. threaten Scheffler’s Afterlife and thus today’s values. Pinker documents the worldwide reduction in the rates of violence over human history that is still spreading in contrast to common perception. Climate change will harm many groups not able to protect themselves – arguably violence by one group on another that could be ameliorated by extending Pinker’s trend of violence reduction across time as well as geography. Insights of philosophers and historians as well as climate scientists and epidemiologists may be essential to learn how to change values in time to avoid the worst impacts from climate change.

Plenary Session 3
4:00pm–5:00pm
Lower NZI

Food futures and global health

Shiriki Kumanyika
Perelman School of Medicine, University of Pennsylvania, Philadelphia, United States of America.

Issue
The obesity epidemic has created a demand for timely, relevant evidence to guide far-reaching and often controversial policy actions.

Main points
Experience with the obesity epidemic is an ongoing case study of how to resolve a complex population health problem. Many key lessons resulting from this experience relate to generating, evaluating and translating evidence to support changes in environments and policies that affect eating and physical activity. A 2010 US Institute of Medicine report on evidence to inform obesity prevention concluded that most of the published evidence then available and judged to be of high quality by the standards of evidence-based medicine was of very limited use for guiding effective interventions. Furthermore, the evidence reviewed was found to foster the perception that obesity prevention was a bad investment. This analysis of evidence issues led to the development of a framework, called “LEAD”, for Locate evidence, Evaluate evidence, and Assemble evidence to inform Decisions.

Lessons learned from the development and subsequent use of LEAD and similar evidence-based public health approaches include the need to:

1) Recognise that obesity prevention requires actions in the real world which are inherently characterised by less certainty than actions taken under controlled circumstances, and that perfect evidence is unlikely to appear;

2) Balance the tensions between relevance and rigor and between objectivity and advocacy when designing and conducting research;

3) Adopt a systematic approach for making the best possible of use the evidence that is available;
4) Pose user-oriented rather than researcher-oriented questions, where the 'users' are decision-makers, and search for evidence that is appropriate to answering these questions;

5) Take full advantage of the traditions of producing knowledge in a range of disciplines, and triangulate these different types of evidence;

6) Use appropriate standards to evaluate each type of evidence;

7) Take a systems perspective by thinking about how various policies and programs are connected; and

8) Be transparent about what you have done.

Conclusions
The effective use of evidence to inform solutions to population health problems involves challenging the framing of these problems as primarily clinical, combined with effective advocacy for utilisation of a suite of evidence-based public health concepts and tools.

Implications
The methodological stress associated with addressing the obesity epidemic is forcing new learning and drawing attention to the limitations of evidence based medicine paradigms when applied to population health. The ultimate result may be to transform our field.
From Bespoke linkage to Big data in the age of the internet

Frank Sullivan
Department of Family & Community Medicine and Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

The information superhighway in health data has seemed more like an obstacle course until recently. Developments in technology and methodology are now creating opportunities to extract, link and analyse large quantities of data quickly from a range of diverse sources. The development of deterministic record linkage methods in Scotland since the 1970s will be described, including the early uses of linked data for drug safety research, quality improvement and patient engagement in diabetes. Although linkage on a project-by-project basis was considered satisfactory for many years it was slow and cumbersome. Big data brings challenges and opportunities of volume, velocity and variety internationally. The sensitive nature of person-specific health data adds a further dimension of difficulty to its use for epidemiological purposes. Recent methods of obtaining consent for use of data and enabling large-scale data integration whilst ensuring security and confidentiality in the UK-wide Farr Institute and in European collaborations will be described and discussed.

Perinatal influences on dental outcomes: Is dental epidemiology still cutting its teeth?

Linda Slack-Smith
School of Dentistry, The University of Western Australia, Perth, Australia

One of the most significant gains in public health (water fluoridation) is a classic example of the outcome of dental epidemiology. However, dentistry, both as a profession and an area of research, has suffered from operating in silos. Some may say dental research lags behind other areas of research. Recently there have been substantial gains in dental epidemiology, with increasing use of improved research methods, improved use of biostatistics, population-level data and data linkage. One area where we know relatively little is the impact of perinatal influences on dental outcomes. Despite substantial research on perinatal influences on health outcomes this is only recently gaining traction in dental research. This talk will consider current knowledge on perinatal influences on oral health, including my work and that of others, and what we need to do to untangle relevant causal pathways.

From basic science to public health: British Columbia’s system-wide approach to oral cancer

Miriam Rosin
British Columbia Cancer Prevention Program, BC Cancer Agency, Vancouver Canada

Oral cancer is an important global health issue, but is often neglected as compared to other cancers. Generally, global strategies to address oral cancer are inadequate: there is low awareness among health professionals and the public; the disease suffers low prioritisation by governments and health systems; and there are often dramatic inequities in care, vast infrastructure and human resources deficits, and a high degree of system fragmentation. Given that oral health lies outside the general medical system in most countries, system fragmentation is a particularly complex barrier for this disease. As a result, this cancer is often detected late, with poor treatment success and high rates of morbidity and mortality.

Studies show that complex health problems require a complex approach that addresses prevention all the way to care, involving a great many organizations and actors. Over
In the past decade, the British Columbia Oral Cancer Prevention Program has been developing such a ‘systems approach’ to engage multiple institutions and organizations, intervening via myriad approaches at multiple levels to prevent and better control this disease. Enabled by an NIH-funded longitudinal study, our team has streamlined the referral pathway from community dental practices through a centralised oral biopsy service to specialised referral centres, and has engaged in action-oriented research (including technology development) that can be quickly applied and scaled-up for practical use. This systems approach to oral cancer intervention may be a useful model that might be applied to other contexts to improve prevention and control programs for this important, neglected disease.

Oral epidemiology – a window on the life course

W. Murray Thomson
Sir John Walsh Research Institute, School of Dentistry, University of Otago, Dunedin, New Zealand

The life course can be thought of as our journey from gestation through childhood, adolescence, early and middle adulthood, and finally to old age and eventual death. Life course epidemiology seeks to understand the links between exposures and chronic conditions while considering aspects of the former, such as their timing, duration and intensity. Poor oral health is arguably the most prevalent chronic condition among adults, and it is an ideal focus for the life-course approach. Dental caries (‘tooth decay’), periodontitis (‘gum disease’) and associated tooth loss are chronic, cumulative conditions which are responsible for a considerable amount of human suffering. The profound health inequalities which exist in New Zealand are most readily apparent when oral ill-health is considered. This presentation will use data from national surveys and longstanding cohort studies to highlight the challenge of poor oral health among adult New Zealanders. Three particular points will be emphasised: 1) dental caries is a lifelong disease; 2) inequalities in incremental tooth loss continue to widen with age; and 3) increases in tooth retention among older people have brought a whole new set of challenges.

Is poor oral health a risk marker for incident cardiovascular disease hospitalisation and all-cause mortality? Findings from a record linkage study

Grace Joshy1, Rosemary Korda1, Manish Arora2, John Chalmers3, Emily Banks1,4
1 National Centre for Epidemiology and Population Health, Australian National University, Canberra, Australia
2 The University of Sydney, Sydney, Australia
3 The George Institute for Global Health, University of Sydney, Sydney, Australia
4 The Sax Institute, Sydney, Australia

Objective
To investigate the relationship between oral health (tooth loss and self-rated health of teeth and gums) and hospitalisation for ischaemic heart disease (IHD), heart failure, stroke and peripheral vascular disease (PVD) and all-cause mortality.

Methods
Prospective population-based Australian study of men and women aged ≥45 years joining the 45 and Up Study between 2006 and 2009. Questionnaire data were probabilistically linked with data on hospitalisations and deaths up to 31 December 2011. There were 170,862 participants, excluding those with a self-reported history of cancer and a history of cardiovascular disease (CVD) at baseline. Cox proportional-hazards models examined the relationship of oral health indicators and first hospitalisation since baseline for cardiovascular disease and all-cause mortality, adjusting for confounders.

Results
There were 3,488, 424, 1,592, and 481 incident hospitalisations for IHD, heart failure, stroke and PVD respectively, and 3,188 deaths, during a median follow-up of 3.9 years. IHD, heart failure, PVD and all-cause mortality risk increased significantly with increasing tooth-loss ($p_{\text{trend}}<0.05$ for all comparisons, except stroke). Compared with those reporting ≥20 teeth left, risks were higher for IHD (hazard ratio (HR): 1.13 (95% CI: 1.00–1.27)), heart failure (HR: 1.52 (95% CI: 1.14–2.05)), PVD (HR: 1.93 (95% CI: 1.45–2.58)), stroke (1.10 (95% CI: 0.93–1.30)) and all-cause mortality (HR: 1.36 (95% CI: 1.21–1.52)) in those with no teeth left. The risk of IHD, PVD and all-cause mortality were significantly higher with worsening self-rated health of teeth and gums ($p_{\text{trend}}<0.05$ for these outcomes, but not heart failure or stroke).

Conclusions
Tooth loss, and to a lesser extent self-rated oral health, are markers for increased risk of IHD PVD, all-cause mortality and some additional cardiovascular outcomes.
Investigating the impact of a new fast food development on residents’ eating behaviours using a natural experiment study design

Lukar E Thornton, Kylie Ball, Jennifer McCann, David A Crawford
Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences, Deakin University, Burwood, Australia.

Aims and objectives
A common basis for opposition to the development of new fast food outlets is the claim of negative health impacts; however, causal evidence remains scarce. This study aims to assess the impact of a new fast food (McDonald’s) development on the eating behaviours and perceptions of local residents using a natural experiment design.

Methods
The site for this study was Tecoma, Australia, a small town on the outer fringe of Melbourne. Prior to the new store, the nearest McDonald’s outlet was approximately 8km away. Baseline data was collected in December 2012 on eating behaviours and perceptions of the local environment among 242 Tecoma residents and 183 residents from a nearby control site (Monbulk). Three month post-development data is funded to be collected in July 2014 and will form the basis for the results to be presented.

Results
At baseline, around 80% of residents from both sites reported that they had not eaten McDonald’s products during the last month; even higher proportions reported not eating other fast foods (e.g. approximately 90% for KFC and Hungry Jack’s). Residents from both towns reported that they believed that their town did not have a lot of rubbish/litter, had only moderate levels of traffic, and was an attractive place to live.

Conclusions
Natural experiments have been proposed as a priority area for food environment research. Evidence generated from this controlled study will be used to assess the causal impact of a new fast food restaurant development on the eating behaviours and perceptions of local residents.

Concurrent session 1B: Biostatistics
11:00am–12:30pm
Invited speaker: Roger Marshall

Discovering high risk factor combinations in epidemiology: the use of partitioning methods and visualisation by scaled rectangle diagrams

Roger Marshall
Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, New Zealand

This presentation will give a brief overview of ways of analysing data to identify high (or low) risk combinations of risk factors in epidemiology by methods which search for Boolean combinations. These include classification trees, search partition analysis, logic regression and data-mining methods. It will discuss some limitations of these methods. Ways to simplify risk combinations will be discussed, and how to visualise combinations using two and three-dimensional scaled rectangle diagrams.

A comparison of sensitivity-specificity imputation, direct imputation and fully Bayesian analysis to adjust for misclassification of smoking status in estimating the association between smoking and lung cancer

Marine Corbin1,2, Stephen Haslett3, Neil Pearce1,4, Milena Maule2, Sander Greenland5
1 Centre for Public Health Research, Massey University, Wellington, New Zealand
2 Cancer Epidemiology Unit, University of Turin, Turin, Italy
3 Institute of Fundamental Sciences, Massey University, Palmerston North, New Zealand
4 Faculty of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, London, United Kingdom
5 School of Public Health, University of California, Los Angeles, United States
Background
Measurement error is an important source of bias in epidemiological studies.

Methods
We consider two approaches to sensitivity analysis: imputation based on specifying the sensitivity and specificity of the measured exposure (SS) and direct imputation (DI) of the ‘true’ exposure using a regression model for the predictive values. We apply these approaches in a case-control study of lung cancer where the main exposure, the smoking status, has been misclassified. Each approach is carried out using both fixed-parameter bias analysis (FBA) and probabilistic bias analyses implemented as Monte-Carlo sensitivity analysis (MCSA).

Results
The ‘true’ odds ratio (OR) of lung cancer for ever-smokers vs. never-smokers adjusted for sex in the original dataset was OR=8.18 (95% CI: 5.86–11.43); after misclassification it decreased to OR=3.08 (95% CI: 2.40–3.96). After SS and DI, the OR was always closer to the true OR than the OR estimated with the misclassified smoking status. For both FBA and MCSA, the intervals obtained after SS and DI were larger than the confidence interval obtained with the misclassified smoking status. When the misclassification parameters were misspecified, the FBA intervals often omitted the true OR whereas our MCSA intervals always included the true OR.

Conclusions
The relative performance of SS and DI depends on the amount and quality of prior information available; both can be performed and compared to assess sensitivity to the choice. FBA may tend to underestimate total uncertainty, and hence we recommended MCSA when a risk assessment must be made that accounts for all sources of uncertainty.

Assessing the impact of vaccination programs: an evaluation of statistical approaches using rotavirus in Australia as a case study

Nicole Mealing, Andrew Hayen, Anthony T Newall
School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia

Aims and objectives
Vaccine programs are generally highly successful in controlling infectious disease at a population level. However, evaluation of the impact of these programs can be complicated by factors such as the limitations of routine surveillance systems and lack of routine testing to confirm diagnosis, as well as natural fluctuations in disease rates over time. This work explores statistical methods for evaluating the epidemiological impact of vaccine programs using rotavirus in Australia as a case study.

Methods
A review of the statistical methods for vaccine program impact was undertaken and their strengths and limitations assessed. We apply the different statistical approaches identified in the literature to assess the rotavirus vaccine program impact in Australia.

Results
In Australia, rotavirus disease has declined following the introduction of vaccination, as demonstrated through declines in incidence of notifiable diseases, positive laboratory testing and hospital presentations. However, most studies evaluating the impact have compared the mean pre-vaccine rates (e.g. mean annual hospitalisation rates) from several years to each individual year post-vaccine introduction. No study accounted for underlying trends in pre-vaccination data. Time-series methods and analyses of surveillance data sets both individually and collectively strengthen the case for causation with observed declines in rates of rotavirus disease.

Conclusions
This work provides a detailed evaluation of the statistical methods that assess the impact of vaccination programs, demonstrated using rotavirus in Australia. This will allow for more accurate estimations of program impact to be calculated, helping to inform the cost-effectiveness of these programs, as well as future assessments of vaccination programs internationally.
Designing a randomised trial to inform policy on the benefits and harms of patient choice of treatment: How many patients do I need?

Robin M Turner¹, Stephen Walter¹, Petra Macaskill³, Kirsten McCaffery³, Les Irwig³.

¹ School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia
² Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Canada
³ Screening and Test Evaluation Program, School of Public Health, University of Sydney, Sydney, Australia

Aims and objectives
With the increased use of shared decision making, it is increasingly important to provide evidence for the impact that patient treatment choice has on outcomes. Two-stage randomised trials, incorporating participant choice, offer the opportunity to determine the effects of choice, which is not estimable in standard trials. We developed methods for designing these trials to be adequately powered.

Methods
The design provides unbiased estimates of: the treatment effect; the selection effect (difference between outcomes for participants who prefer one treatment compared to the other); and the preference effect (interaction between participant’s preferences for treatment and the treatment actually received, i.e. the effect of choice). We have developed methods for determining the required sample sizes for estimating these effects.

Results
In general, approximately twice as many participants are needed to have equivalent power for detecting both treatment and selection/preference effects compared to a trial of the treatment effect alone. This can be reduced if the treatment effect is of less interest. We have demonstrated these methods using a hypothetical primary screening trial comparing human papillomavirus DNA testing versus cervical screening. This example would require 520 participants to have 80% power to detect moderate sized preference and selection effects and a small to moderate treatment effect.

Conclusions
With the growing interest in understanding treatment choices and use of decision aids, well-designed and adequately powered two-stage randomised trial designs offer the opportunity to determine the effect of preference and to provide evidence for policymakers about patient choice.

Statistical approaches used to assess equitable access to food outlets: a systematic review

Karen Lamb, Lukar Thornton, Ester Cerin, Kylie Ball
Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences, Faculty of Health, Deakin University, Burwood Australia

Aims and objectives
To review the literature on equitable access to food outlets, such as supermarkets and fast-food outlets, and to identify the statistical methods employed. Our key focus was to examine the robustness of approaches used to tackle the data (e.g. whether these respected the type of outcome data considered) and to assess whether spatial autocorrelation was considered.

Methods
Searches were conducted in health science databases, including Medline and PsychINFO, for articles published from January 2000 to March 2014. Eligible studies included an objective outcome measure of the neighbourhood food environment, mapped using geographic information system (GIS) software, and a measure of neighbourhood-level socioeconomic status. Neighbourhoods had to have been defined using small area measures such as census blocks or postcode districts.

Results
Fifty-five papers were included. Outlet accessibility was typically defined as either the distance to the nearest outlet from the neighbourhood geographic or population-weighted centroid, or as the number of food outlets within a neighbourhood (or pre-specified buffer), some adjusting for population or area size. Statistical analysis techniques adopted included one-way analysis of variance, correlation, and Poisson or negative binomial regression. Although the studies frequently featured geographically contiguous areas, few considered or adjusted for spatial autocorrelation in the analysis.

Conclusions
With advances in GIS software, it is possible to consider sophisticated measures of neighbourhood outlet accessibility. However, the approaches to statistical analysis often appear less well-considered. Care should be taken to consider the spatial nature of the data and the possibility of correlated residuals which could affect the results obtained.
A privacy-preserving method for encoding geospatial locations to enable distance comparison without revealing locations

James Farrow\textsuperscript{1,2}

\textsuperscript{1} SANT DataLink, Adelaide, Australia
\textsuperscript{2} Farrow Norris, Sydney, Australia

The aim of this method is to encode information in such a way that the result no longer contains explicit location information which may be mined, but which still allows comparison to ascertain distance separation.

A new method for encoding location is presented to do this. Encodings have the property that two records may be compared to ascertain their separation distance up to a configurable resolution threshold without revealing the location of either. This is not an encryption method and no explicit location data is encoded. Data may be encoded to arbitrary precision by trading against the size of the resulting encoded hash. The privacy implications of this method are discussed, as well as some conclusions able to be drawn about the privacy implications of any method which provides comparison/similarity data at a record level.

The method may be generalised to non-spatial data with an arbitrary number of comparison fields.

An analysis of a set of test points shows that nearly all hash-computed distances are within 10\% of the true result and 70\% of distances lie within 5\% of the true result. The algorithm is highly configurable in terms of both the maximum separation distance computable and the desired size of the result in encoded strings.

The approach is suitable for releasing geospatial information where individual locations must not be readily identifiable but where records may need to be compared to obtain their distance from one another or from other geospatial features.

Concurrent session 1C: Injury
11:00am–12:30pm

Results from a randomised controlled trial of a home injury prevention intervention

Nevil Pierse
Department of Public Health, University of Otago, Wellington, New Zealand

Aims and objectives
Despite the considerable injury burden due to falls in the home amongst the general population, few effective safety interventions have been identified. We tested the safety benefits of home modifications such as handrails for steps and stairs, grab rails for bathrooms, outside lighting, edging for outside steps and slip-resistant surfacing for outside surfaces such as decks.

Methods
Using a single-blinded cluster randomised controlled trial, we analysed rates of medically treated home falls. Consenting households were randomly assigned by electronic coin toss to be modified immediately (the treatment group) or following a three-year wait (the control group). The primary outcome measure was a count of medically treated falls derived from administrative data on insurance claims. Rates of fall injuries per person year were analysed using a negative binomial generalised linear model with generalised estimating equations to account for clustering at the household level.

Results
Of 842 households recruited, 436 were randomly assigned to the treatment group and 406 were assigned to the control group, constituting 950 and 898 individual occupants, respectively. An intention-to-treat analysis was carried out. Injury rates per day exposed to the modified homes compared to the unmodified homes showed a reduction in the rate of home fall injuries of 26\% (95\% CI: 6\%–42\%).

Conclusions
This is the first randomised controlled trial to examine home modification as a means to reduce injury in the general population. The results show the potential important benefits to population safety of relatively low-cost home repairs and safety features.
**Risk of injury among young New Zealanders with disability and long-term conditions with functional limitations**

Roshini Peiris-John1, Haya Al-Ani1, Terryann Clark2, Terry Fleming1, Janie Sheridan3, Lee Arier Chi-Lu4, Shanthi Ameratunga1

1 Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, Auckland, New Zealand
2 School of Nursing, The University of Auckland, Auckland, New Zealand
3 Department of Paediatrics, Child and Youth Health, School of Medicine, The University of Auckland, Auckland, New Zealand
4 School of Pharmacy, The University of Auckland, Auckland, New Zealand

**Aims and objectives**

To investigate the risk of injury and healthcare access for injury among adolescents with disability or long-term conditions with functional limitations.

**Methods**

The participants in the Youth’12 survey comprised a nationally representative sample of 8,500 secondary school students in New Zealand. Students provided a broad range of data including sociodemographic and health information, and details on hospitalisations for injury and problems accessing healthcare for injury. Logistic regression tests were used to investigate associations between the presence of disability and long-term conditions, injury risk and problems seeking healthcare for injury.

**Results**

Almost one-in-six students (n=1,268, 14.9%) reported a disability (n=623, 7.3%) or long-term condition (n=506, 6.0%) or both (n=139, 1.6%). Students with disabilities and long-term conditions with functional limitations were more likely to seek treatment for an injury from road traffic crashes (OR=1.54 (95% CI: 1.11–2.14)), falls (OR=1.29 (95% CI: 1.07–1.56)), near drowning (OR=2.71 (95% CI: 1.50–4.87)), assault (OR=2.20 (95% CI: 1.54–3.14)) and attempted self-harm (OR=4.36 (95% CI: 3.09–6.17)) and more likely to report experiencing problems accessing healthcare for injury (OR=1.55 (95% CI: 1.29–1.85)) compared to students who reported no disability or long-term condition.

**Conclusions**

Compared with their peers, New Zealand adolescents with disability or long-term conditions with functional limitations attending mainstream schools are at increased risk of many types of intentional and unintentional injury, and also experience greater difficulty accessing healthcare for injury when needed. The systemic factors underlying the risks experienced by this vulnerable group require particular attention of healthcare providers, public health workers and policymakers.

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**Economically inactive, unemployed and employed suicides in Australia by age and sex over a ten-year period: what was the impact of the 2007 economic recession?**

Allison Milner1, Stephen Morrell2, Anthony D LaMontagne3

1 Melbourne School of Population and Global Health, University of Melbourne, Parkville, Australia.
2 School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia.
3 School of Health and Social Development, Deakin University, Melbourne, Australia.

**Aims and objectives**

Suicide is higher among economically inactive and unemployed persons than employed persons. This paper investigated differences in this relationship by sex and age over the period 2001 to 2010 in Australia. It also examined changes in suicide among employed, unemployed and economically inactive persons during the recession of 2007–09.

**Methods**

Suicide data from the National Coroners Information System (NCIS) were utilised for this retrospective study. Negative binomial and Poisson regression was used to estimate the association between suicide and employment status and to investigate differences in suicide rates over the period of the recession (2007–09) compared to the year before the recession (2006).

**Results**

Results suggest that economically inactive/unemployed males had a suicide rate ratio (RR) of 4.62 (95% CI: 4.10–5.19; p<0.001) compared to employed males (RR=1.00), while economically inactive/unemployed females had a suicide RR of 8.44 compared to employed females (95% CI: 7.38–9.67; p<0.001) during 2001–2010. There was a statistically significant increase in suicide among both employed (7% rise in 2007, p=0.003) and economically inactive/unemployed males during the GFC (22% in 2008, p<0.001). There was also a significant increase in suicide among economically inactive/unemployed females (12% in 2007, p=0.03; 19% in 2008, p=0.001) but not among employed females.
Prevalence and predictors of post-traumatic stress among 2,220 injured New Zealanders: findings among hospitalised and non-hospitalised subgroups

Shanthi Ameratunga\textsuperscript{1,2}, Ari Samaranayaka\textsuperscript{1}, Suzanne Wilson\textsuperscript{1}, Gabrielle Davie\textsuperscript{1}, Rebecca Lilley\textsuperscript{1}, Emma Wyeth\textsuperscript{1}, Jesse Kokaua\textsuperscript{1}, Sarah Derrett\textsuperscript{1}

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\textsuperscript{3} College of Health, Massey University, Palmerston North, New Zealand

\textbf{Aims and objectives}

Given the relative lack of previous research attention, this study compared the prevalence and predictors of post-traumatic stress disorder (PTSD) among people whose injuries did and did not result in hospitalisation.

\textbf{Methods}

Participants aged 18–64 years comprised the Prospective Outcomes of Injury Study cohort recruited from the New Zealand government’s no-fault injury compensation insurance register and followed to 12 months (n=2,220). Multivariable Poisson regression models examined the prevalence and predictors of PTSD at 12 months (as determined by an Impact of Events Scale score\textgreater;27) among participants who were hospitalised following their injury and those who were not.

\textbf{Results}

Among hospitalised and non-hospitalised participants, 12\% and 18\%, respectively screened positive for PTSD at 12 months, with only weak evidence of a difference (p=0.24). Multivariable models found perceived threat to life at the time of injury and poor expectations of recovery predicted PTSD in both groups, but injury severity was not a predictor in either. Other predictors in the hospitalised group comprised female gender, pre-injury depressive symptoms, expectations of financial security, and not having enough time to discuss or make decisions in healthcare encounters. Among those not hospitalised, higher drinking levels and smoking pre-injury and assault as the mechanism of injury were predictive.

\textbf{Conclusions}

While PTSD at 12 months is relatively common in both hospitalised and non-hospitalised injury survivors, the predictors are somewhat different, indicating the need for holistic appraisals of individual and service-level risk factors in the acute phase and beyond.

Persistent problems and predictors of recovery one year following mild traumatic brain injury

Alice Theadom\textsuperscript{1}, Suzanne Barker-Collo\textsuperscript{1}, Nicola Starkey\textsuperscript{1}, Kelly Jones\textsuperscript{1}, Varsha Parag\textsuperscript{1}, Shanthi Ameratunga\textsuperscript{1,2}, Kathryn McPherson\textsuperscript{1}, Anthony Dowell\textsuperscript{1}, Valery Feigin\textsuperscript{1} on behalf of the BIONIC Research Group

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\textsuperscript{3} The School of Population Health, The University of Auckland, Auckland, New Zealand

\textbf{Aims and objectives}

Whilst the consequences of moderate and severe traumatic brain injury (TBI) have been widely studied, less is known about how adults are affected by mild TBI in the longer term, particularly from an Australasian perspective. This study aimed to determine if people experience any ongoing effects following mild TBI at one year following injury and to identify the predictors of recovery.

\textbf{Methods}

Longitudinal study of 341 adults (\textgreater;16 years) who were classified as experiencing a mild TBI within a population-based incidence sample in New Zealand. Participants completed a follow-up assessment at 12 months post-injury on cognitive functioning, post-concussion symptoms, mood, physical functioning and quality of life. Predictors of outcomes were identified through regression modelling.

\textbf{Results}

Nearly half of adults continued to experience four or more post-concussion symptoms one year following injury (48.5\%) and/or reported below-average quality of life (47.4\% below the New Zealand mean on the Medical Outcomes Study SF36 questionnaire). A number of participants had moderate or severe anxiety (29.3\%), depression (12.1\%), global cognitive impairment (10.9\%) and poor physical functioning (10.4\%). Prior TBI, female gender, living alone, and being of non-European ethnicity were significant predictors of increased severity and frequency of post-concussion symptoms one year post mild TBI (r=0.22, p<0.01).
Conclusions
A high proportion of people with mild TBI experience post-concussion symptoms and reduced quality of life at one year post-injury

Role of conspicuity in bicycle crashes involving a motor vehicle
Sandar Tin Tin1, Alistair Woodward1, Shanthi Ameratunga1,2
1 Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, Auckland, New Zealand
2 Injury Prevention Research Unit, Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand

Aims and objectives
This study investigated the role of physical vs. attention conspicuity in preventing bicycle crashes involving a motor vehicle.

Methods
The Taupo Bicycle Study is a prospective cohort study involving 2,590 adult cyclists who were recruited from the Lake Taupo Cycle Challenge in 2006 and followed over a median period of 6.4 years through linkage to insurance claims, hospital discharges, mortality records and police reports. A composite measure of physical conspicuity was created using latent class analysis based on the use of fluorescent colours, lights and reflective materials, and the main colour of top, helmet and bike frame. Attention conspicuity was assessed based on regional differences in travel patterns and the amount of riding in a bunch. Cox regression modelling for repeated events was performed with multivariable adjustments to assess the association between conspicuity and incidence of bicycle crashes involving a motor vehicle.

Results
During a median follow-up period of 6.4 years, 162 participants experienced 187 bicycle crashes involving a motor vehicle. The crash risk was not predicted by the four latent classes identified and the amount of bunch riding but was higher in Auckland, the region with the lowest level of bicycle use relative to car use. In subgroup analyses, compared to other latent classes, the most physically conspicuous group had a higher risk in Auckland but a lower risk in other regions.

Conclusions
Conspicuity aids may not be effective in preventing bicycle-motor vehicle crashes in New Zealand, particularly in Auckland, where attention conspicuity is low.

Concurrent session 1D: Cardiovascular disease
11:00am–12:30pm
Invited speaker: Rachel Huxley

Sex differences in the relationships between cardiovascular risk factors and outcomes: do they exist and do they matter?
Rachel R Huxley1,2, Sanne AE Peters1,4, Mark Woodward2,4
1 School of Population Health, University of Queensland, Brisbane, Australia
2 The George Institute for Global Health, University of Sydney, Sydney, Australia
3 Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht, The Netherlands
4 The George Institute for Global Health, Nuffield Department of Population Health, University of Oxford, Oxford, UK

Sex differences can be identified throughout the entire life course of cardiovascular disease (CVD). However, despite the significant anatomical, physiological and behavioural differences between men and women, it is commonly assumed in medicine that the effects of risk factors on disease outcomes are the same in women as in men. However, there is increasing evidence to indicate that this is an unreliable premise and that there are significant and clinically meaningful sex differences in the relationships between established risk factors and CVD. The reliable determination of whether sex differences in risk factor–disease associations exist is important, not solely to better understand the aetiology of CVD, but also from a population and public health vantage. Convincing evidence of whether sex differences exist in the effect of the most prevalent and modifiable risk factors, including elevated blood pressure, cigarette smoking, diabetes mellitus, excess weight and raised cholesterol, is necessary since these risk factors are among the leading causes of CVD. Moreover, just as possible racial differences in the relationships between risk factors and diseases are considered when tailoring specific interventions for different communities, so could
information on important sex differences be used to provide an added impetus for targeted interventions aimed at the treatment and management of these risk factors in both sexes.

Ambulatory blood pressure adds little to Framingham Risk Score for the primary prevention of cardiovascular disease in older men: secondary analysis of observational study data

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1 Centre for Research into Evidence Based Practice (CREBP), Bond University, Gold Coast, Queensland, Australia
2 Screening and Diagnostic Test Evaluation Program (STEP), School of Public Health, University of Sydney, Sydney, New South Wales, Australia
3 Department of Medical Sciences, Uppsala University Hospital, Uppsala, Sweden
4 School of Public Health and Community Medicine, The University of New South Wales, Sydney, New South Wales, Australia
5 George Institute for International Health, Royal Prince Alfred Hospital, University of Sydney, Sydney, Australia

Aims and objectives
To determine the incremental value of ambulatory BP in predicting cardiovascular risk when the Framingham Risk Score is known.

Methods
We included 780 men without cardiovascular disease from the Uppsala Longitudinal Study of Adult Men, all aged approximately 70 years at baseline. We first screened ambulatory systolic blood pressure (ASBP) parameters for their incremental value by adding them to a model with ten-year Framingham Risk Score (FRS). For the best ASBP parameter we estimated hazard ratios and changes in discrimination, calibration and reclassification. We also estimated the difference in the number of men started on treatment and in the number of men protected against a cardiovascular event.

Results
Mean daytime ASBP had the highest incremental value; adding other parameters did not yield further improvements. While ASBP was an independent risk factor for cardiovascular disease, addition to FRS led to only small increases to the overall model fit, discrimination (a 1% increase in the area under the ROC curve), calibration and reclassification. We estimated that for every 10,000 men screened with ASBP, 141 fewer would commence a new BP lowering treatment (95% CI: 58–224 less treated), but this would result in seven fewer cardiovascular events prevented over the subsequent ten years (95% CI: 21 fewer events prevented – 7 more events prevented).

Conclusions
In addition to a standard cardiovascular risk assessment it is not clear that the addition of ambulatory BP measurement provides incremental value. The clinical role of ambulatory BP requires ongoing careful consideration.

Twenty-eight day and one-year case fatality after an acute coronary syndrome in New Zealand: a national data linkage study

Corina Grey1, Rod Jackson1, Susan Wells1, Daniel Exeter1, Andrew Kerr1,2
1 Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, Auckland, New Zealand
2 Middlemore Hospital, Auckland, New Zealand

Aims and objectives
To determine 28-day and one-year case fatality in all patients hospitalised with acute coronary syndromes (ACS) in New Zealand and identify factors associated with mortality.

Methods
Using linkage of national hospitalisation and mortality datasets, all New Zealand residents admitted to hospital with an ACS from 1 January 2007 to 31 December 2009 were followed for up to one year. All-cause mortality was used to calculate short and long-term case fatality. Clinical and sociodemographic factors associated with mortality were identified using Cox proportional-hazards regression.

Results
Over the three-year study period, 42,920 patients were admitted to hospital with an ACS. Increasing age and Māori or Pacific ethnicity were factors strongly associated with both short and long-term mortality. Compared to New Zealand European/Other patients, Māori and Pacific patients were 1.5 times more likely to die within 28 days and twice as likely to die within one year. Residents of more deprived areas, as defined by the NZDep06 score, were approximately 20% more likely than other patients to die within 28 days, but differences between 29 and 365 days were not statistically significant.
Conclusions
Although increasing age was the major determinant of case fatality, ethnicity and deprivation were also important factors. Further research is needed to explore the reasons behind these disparities and effective strategies to address them.

Developing a new CVD prediction system based on New Zealand primary care data

Romana Pylypchuk, Rodney Jackson, Roger Marshall, Susan Wells
School of Population Health, Section of Epidemiology and Biostatistics, The University of Auckland, Auckland, New Zealand

Aims and objectives
To describe the development of a new cardiovascular disease (CVD) risk prediction system based on New Zealand data and to present preliminary models for estimating five-year CVD risk.

Methods
Data from a prospective open cohort of primary care patients was used. The population for the prediction model was defined as non-diabetic men and women aged 30–74, free of CVD or atrial fibrillation. Predictors were selected based on subject knowledge and availability in the dataset. Cox models were built and model assumptions tested. Multivariable fractional polynomials analyses were performed to detect non-linearity and interactions. Performance of models was tested using established discrimination and calibration methods. Also, scaled rectangle diagrams were used to explore how predicted risk and actual occurrence of CVD coincide. All analyses were stratified by sex.

Results
The study population included 76,408 women and 98,804 men. 3,501 first CVD events occurred during follow-up (mean: 2.95 years). Preliminary models included all predictors initially defined, except for family history of CVD and lipid-lowering treatment status at baseline. For men, a cubic transformation of BMI and quadratic transformation of TC/HDL were applied; for women, a cubic transformation of TC/HDL was applied. Preliminary models had consistently superior calibration compared with New Zealand-Adjusted Framingham score, although they underestimated observed risk in some of the high-risk deciles. Improvement in discrimination was small.

Conclusions
In addition to standard predictors, SES, ethnicity, blood pressure-lowering treatment socioeconomic status and eGFR contribute significantly to CVD risk prediction. Preliminary models have considerably improved calibration but only slightly better discrimination than current Framingham-based risk scores.

Sun exposure, mortality and cardiovascular disease among women in Sweden

Robert Scragg1, Alistair Stewart1, Sven Sandin2, Marie Löf2, Hans-Olov Adami2, Elisabete Weiderpass2,3
1 Section of Epidemiology and Biostatistics, The University of Auckland, Auckland, New Zealand
2 Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden
3 Department of Community Medicine, University of Tromsø, Tromsø, Norway

Aims and objectives
Cohort studies show that low vitamin D levels predict cardiovascular disease (CVD). This study aimed to assess whether behavioural patterns of sun exposure, the main determinant of vitamin D status, also predict CVD.

Methods
Data come from approximately 40,000 women aged 30–50 years enrolled in a Swedish cohort study, interviewed in 1991–92 and followed up to 2012 for mortality and CVD hospitalisation. For each of the second through fourth decades of life (ages 10–39 years), women were asked: annual number of sunburns; annual number of weeks vacationing at a beach; and times per month using a solarium. They were ranked based on their exposure over the three decades, corrected for number of years if aged 30–39 years.

Results
Sunburn frequency was inversely associated with all-cause mortality (hazard ratio (HR)=0.70 (95% CI: 0.57–0.84) and thrombotic CVD (thrombosis, myocardial and cerebral infarction: HR=0.67 (95% CI: 0.51–0.88)) for women with >2 sunburns per year compared with none, adjusting for covariates. A similar pattern was seen for beach holidays: all-cause mortality HR=0.87 (95% CI: 0.73–1.03); thrombotic CVD HR=0.73 (95% CI: 0.56–0.95) for >2.5 weeks per year compared with none. In contrast, solarium exposure was not related to all-cause mortality, although associated with increased CVD hospitalisation.

Conclusions
These findings suggest that solar exposure (sunburn, beach holidays) which includes UVB and increases vitamin D levels, reduces risk of mortality and thrombosis. The opposite findings for solarium exposure may be explained by its UVA exposure which typically does not synthesise vitamin D.
Concurrent session 1E: Maternal / infant health
11:00am–12:30pm

Adverse outcomes associated with postpartum haemorrhage

Jane B Ford, Jillian Patterson, Jonathan Morris, Christine Roberts
Kolling Institute, University of Sydney, Sydney, Australia

Aims and objectives
While rates of postpartum haemorrhage (PPH) have continued to rise, it is not clear if the association with transfusion and other morbidities has changed over time. This study explores adverse maternal outcomes of postpartum haemorrhage stratified by mode of delivery.

Methods
Linked birth and hospital data were used to examine ICD-10AM coded PPH and outcomes in maternal singleton birth admission records, 2003–11 in hospitals in New South Wales, Australia (N=818,965 pregnancies). Logistic regression models were developed separately for vaginal and caesarean births, and for transfusion and a validated maternal morbidity composite indicator (excluding transfusion). Adjusted odds ratios (aOR) for yearly change. Adjustment included maternal (e.g. age, country of birth) and pregnancy factors (e.g. parity, interventions, pregnancy complications).

Results
Overall there was a significant increase in PPH rates, from 6.1% (n=5,158) in 2003 to 8.3% in 2011 (n=7,866) (p<0.0001). Having accounted for maternal and pregnancy factors, there was a slight increase in transfusions for vaginal births (aOR 1.02 (95% CI: 1.00–1.03; p<0.01)); however there was no significant trend amongst caesarean births (aOR 0.99 (95% CI: 0.97–1.01; p=0.30)). There was no significant change in morbidity among women with a PPH delivering vaginally (aOR for yearly change 0.97 (95% CI: 0.94–1.00; p=0.36)), and a slight decrease amongst women delivered by caesarean section (aOR 0.96 (95% CI: 0.92–0.99; p<0.01)).

Conclusions
It is encouraging that there have been no large increases in morbidity or transfusion associated with increasing haemorrhage rates.

Understanding variation in hospital induction practices

Judy Trevena1, Jillian Patterson1, Tanya Nippita2, Jane Ford1, Judy Simpson3, Jonathan Morris1, Christine Roberts1
1 Perinatal Research, Kolling Institute, University of Sydney, Sydney, Australia
2 Department of Obstetrics and Gynaecology, Royal North Shore Hospital, Sydney, Australia
3 School of Public Health, University of Sydney, Sydney, Australia

Aims and objectives
Induction is the process of starting labour artificially, rather than waiting until it starts naturally. Variation in induction rates between hospitals may reflect different patient mix, or differences in clinical practice. We assessed variation in induction rates among hospitals to identify clinically defined groups of women for whom induction rates have the potential to be reduced.

Methods
This is a population-based, record linkage study of 175,444 deliveries in 72 public and private hospitals in New South Wales, in 2010–11. Deliveries were categorised into ten risk-groups based on clinical factors of parity, plurality, previous caesarean, foetal presentation and gestational age. Multilevel logistic regression was used to examine variation in hospital induction rates within these induction groups, adjusted for differences in maternal age, ethnicity, smoking, diabetes, hypertension and type of maternity care.

Results
The overall induction rate was 26.6%, ranging from 9.8% to 41.3% across hospitals. The majority of inductions were performed for women at 39–40 weeks gestation with a single cephalic pregnancy. Rates of inductions in these women varied widely across hospitals, from 4.2 to 48.7% for first-time mothers and from 5.5 to 63.5% for women who had previously given birth. We also report hospital induction rates for different clinically relevant groups of women after accounting for case-mix, and identify opportunities for further investigation.

Conclusions
Understanding the extent of hospital heterogeneity in induction practice and implementing evidence-based practices may result in improved maternity care. We have identified population groups who are potential targets for reducing practice variation and induction of labour.
Exploring adverse outcomes associated with age of blood in a maternity population

Jillian A Patterson1, David O Irving2, Christine L Roberts1, Jane B Ford1

1 Clinical and Population Perinatal Health Research, Kolling Institute, University of Sydney, Sydney, Australia
2 Research and Development, Australian Red Cross Blood Service, Alexandria, Australia

Aims and objectives
Blood transfusion occurs in 1.4% of pregnancies. Blood can be transfused up until 42 days after collection, however there has been a suggestion that older blood is associated with higher rates of adverse outcomes. This study looked at adverse outcomes associated with older blood given during a birth admission.

Methods
Women receiving 1–4 packs of blood during a birth admission between July 2006 and December 2010 were identified from routinely collected hospital and birth data linked with blood pack information from blood banks and the Red Cross Blood Service. Generalised propensity score methods were used to determine the effect of increased age of blood transfused and adverse outcome rates (severe maternal morbidity and readmission), accounting for the different propensity of receiving older blood depending on location, blood type and timing of the transfusion. Median age and inter-quartile ranges (IQR) are reported.

Results
Transfusion information was available for 2,990 pregnancies. The median age of blood transfused was 20 days (IQR: 14–27). Overall the rate of severe maternal morbidity was 3.7% (N=111), and the rate of readmission was 14.4% (N=430). The median age of blood was similar between those with and without severe morbidity (21 [IQR: 14–28] vs. 22 [IQR: 15–30]), or readmissions (22 [IQR: 15–30] vs. 22 [IQR: 15–30] days). After adjusting for propensity to receive older blood, there was no significant difference in adverse outcomes.

Conclusions
Although transfused women experience more subsequent morbidity than the general maternity population (3.7% vs. 0.5%), among transfused women there is no increased risk of morbidity after receiving older blood.

Atypical hyperplasia: risk and risk factors for subsequent breast cancer

Elizabeth Buckley1, Thomas Sullivan1, Gelareh Farshid2, Janet Hiller3 and David Roder1

1 School of Population Health, University of South Australia, Adelaide, Australia
2 SA Health, Adelaide, Australia
3 Faculty of Health, Arts and Design, School of Health Sciences, Swinburne University of Technology, Hawthorne, Australia

Aims and Objectives
Atypical ductal hyperplasia (ADH) and atypical lobular hyperplasia (ALH) are risk factors for breast cancer in women. Few sources of population data are available regarding the risk of breast cancer following ADH and ALH. This study aims to estimate the risk of breast cancer in South Australian women after screen-detected ADH or ALH.

Methods
By retrospective cohort design, the relative risk of breast cancer in women with a history of screen-detected ADH and ALH separately was estimated overall, by age, and time since diagnosis. All women participating in screening between 1989 and December 2010 in South Australia were included for analysis. Follow-up of women, from first screening to breast cancer, was censored if breast cancer was not diagnosed before December 2010 or if they died of causes other than breast cancer. Evaluation of potential predictors, including family history and hormonal therapy was also undertaken.

Results
Unadjusted incidence of breast cancer in women with no ADH or ALH, ADH, or ALH was 3.6, 6.7 & 10.2 per 1,000 person-years, respectively. After adjustment, breast cancer risk was increased 2.8 (95% CI: 1.7 –4.6) and 4.0-fold (95% CI: 2.0 – 8.9) following screen-detected ADH or ALH, respectively. Evaluation of breast cancer risk by time and age since diagnosis indicates different risk profiles for both lesions.

Conclusions
Population-based data indicate that ADH and ALH should not be considered to have similar behaviours and risks. Further, women who participate in breast screening may benefit from surveillance programs tailored to the individual risks of these lesions.
Children’s diets in the first two years of life: findings from an Australian Birth Cohort Study

Lauren Carpenter, Emily Amezdroz, Elise O’Callaghan, Shae Johnson, Elizabeth Waters
The Jack Brockhoff Child Health and Wellbeing Program, School of Population and Global Health, University of Melbourne, Parkville, Australia

Aims and objectives
The dramatic changes in an infant’s diet in the first two years of life have not been reported comprehensively in the literature, despite the known importance of diet over this time. The aim of this research was to describe children’s diets and the timing and type of foods and beverages being introduced over the first two years of life.

Methods
Parent-reported dietary data (n=481) was collected (four time points) as part of a birth cohort study of infants aged between one and 20 months. Breast and formula feeding habits were surveyed at all four time points. A 46 item food and beverage frequency questionnaire (FFQ) was completed at three time points for children aged 6 months.

Results
The proportion of children being breastfed declined steadily with age from 81.5% at 1–3 months-old to 13.0% at 18–20 months-old. Infants commenced solids at an average age of 5.2 (SD: 1.3) months. The proportion of infants consuming fresh fruit and vegetables at least once a day increased between 6–8 months of age (fruit: 26.7%, veg: 50.9%) and 12–14 months (fruit: 57.8%, veg: 68.1%), but did not increase further at 18–20 months (fruit: 58.7%, veg: 65.2%). The proportion of children consuming fruit juice (FJ) and soft drink (SD) increased between 6–8 months of age (FJ: 14.5%, SD: 0.0%) and 18–20 months (FJ: 59.0%, SD: 18.4%).

Conclusions
The frequency of fruit and vegetable consumption in this group of infants is lower than the National recommendations. The introduction of ‘extra’ foods, not core to a healthy diet at such a young age is concerning, particularly that of sugar-sweetened beverages.

Are women birthing in New South Wales hospitals satisfied with their care?

Jane Ford, Diane Hindmarsh, Kim Browne K, Angela Todd
Clinical and Population Perinatal Health Research, Kolling Institute, University of Sydney, Sydney, Australia

Aims and objectives
Dedicated surveys of maternity patient satisfaction have not been undertaken in New South Wales. The aim of this study was to use overnight hospital patient surveys to investigate the effects of parity and hospital location on maternal satisfaction with hospital care at the time of birth.

Methods
NSW Ministry of Health conducted surveys of overnight hospital inpatients, including maternity patients, 2007–11. Questionnaires were mailed to a sample of patients approximately three months following their receipt of care. A stratified random sample was selected from all facilities offering services during the selected timeframe.

Results
5,367 maternity patients completed overnight patient surveys. Three-quarters of women were satisfied with in-hospital care. Compared with women who had previously given birth, first-time mothers were more likely to recommend their birth hospital to friends and family (61% vs. 56%), less likely to have experienced differing messages from staff (45% vs. 59%), and less likely to feel they had received sufficient information about feeding (59% vs. 65%) and caring for their babies (52% vs. 65%). While metropolitan women were more likely to rate their birth hospital positively (76% vs. 71%) than their rural counterparts, rural women tended to rate the care they received (68% vs. 63%), and doctors (71% vs. 61%) and nurses (74% vs. 70%) more highly than metropolitan women.

Conclusions
The overall picture of maternity care satisfaction in NSW is a positive one. Further resources could be dedicated to ensuring consistency and amount of information provided, particularly to first-time mothers.

Early career researcher workshops
12:30–1:30pm
Lower NZI

12:30–1:00pm
Discussant: Thomas Lumley

Is publication bias present in the reported beneficial effects of statins for the primary prevention of cardiovascular disease?
Simon Thornley
Section of Epidemiology and Biostatistics, The University of Auckland, Auckland, New Zealand

Aims and objectives
To determine if publication bias exists in meta-analyses which address the effect of statins for the primary prevention of cardiovascular disease, since some meta-analyses support their use, while others do not.

Methods
We searched the literature for highly cited meta-analyses on the use of statin treatment to prevent cardiovascular disease in high risk patients, using Google scholar and Medline (October 2013). Both total mortality and cardiovascular or coronary heart disease were included as outcomes of interest. We used a test by Ioannidis and Trikalinos for an excess of significant findings to assess evidence for publication bias in each meta-analysis and in a combined ‘meta-meta-analysis’. Evidence for a significant difference between expected and observed counts of positive trials of each meta-analysis was examined.

Results
Of the three meta-analyses selected, two supported the use of statins. In all three studies and in a ‘meta-meta-analysis’ the number of reported positive trials exceeded the expected, suggesting publication bias. For all-cause mortality, the difference was significant at the 10% level (4 positive compared to 1.8 expected; p=0.08), but not for cardiovascular disease end points (9 positive compared to 6.4 expected; p=0.17).

Conclusion
The summary measures of effect in meta-analyses of the use of statins in the primary prevention of cardiovascular disease are likely to be inflated by publication bias.

Accounting for exposure misclassification introduced into linked population databases

Annette Regan
School of Pathology and Laboratory Medicine, University of Western Australia, Perth, Australia

Aims and objectives
In Australia, no adult register of vaccinations currently exists. As a result, population-based research which evaluates the impact of vaccinations must rely on provider reporting of administered immunisations. Dependency on provider report introduces misclassification of the exposure variable, since it is unlikely that all vaccinated individuals will be reported. It is the aim of this workshop to discuss statistical methods available for accounting for such misclassification in large, linked population-based databases.

Methods
The example provided is a large population-based cohort of pregnant women established in Western Australia in 2012 for the purposes of evaluating health outcomes of maternal influenza vaccination in young infants. Based on comparison data available in Western Australia, the provider report system detects approximately 50% of maternal vaccinations in Western Australia. Although the sensitivity of provider report is low (49%), the specificity is high (100%).

Results
Misclassification of vaccination status in this cohort will underestimate the true effect of maternal immunisation on influenza infection in infants. Such bias negatively impacts our ability to accurately interpret study findings and make policy decisions. Bayesian models and Markov chain Monte Carlo methods have been used to account for this misclassification; however, alternative approaches are available.

Conclusions
The goal of this workshop is to review analytical methods for accounting for misclassification of exposure variables and how these methods can be applied to linked population-based data.
Traditional linkage systems predominantly store records in a relational form focusing on assigning group/cluster identifiers to records and do not retain pairwise data.

The new approach used by SANT DataLink uses graph theory and graph-based data structures (in the sense of nodes connected by edges) to retain underlying pairwise comparison data. The system and a quality review process around this representation are described, as well as the experience and advantages of using graph theory and algorithms in practice.

Further advantages of a graph-based approach are briefly described: on-demand (just-in-time) quality review; the ability to perform further clerical review on previously linked data sets; the ability to perform concurrent review on multiple projects; the ability to entirely remove datasets from the master linkage graph post hoc; the ability to maintain ‘open’ datasets and update and relink individual records; the ability to use different clustering/group algorithms to extract groupings with different properties from a single graph (cf. a flat master file approach where only one description of the linkage clusters is maintained); and the ability to store extra comparison/relational information in the graph such as genealogies, genetic similarity information, tribal/kinship structures or feedback from end-users regarding link quality.

A graph-based approach enables dynamic and extensible present and future functionality where data extractions may be tailored to suit differing research needs.

Proton pump inhibitors and increased risk of interstitial nephritis: a record linkage study using routinely collected data from New Zealand

Mei-Ling Blank, Lianne Parkin, Charlotte Paul, Peter Herbison
Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand

Aims and objectives
To estimate the relative and absolute risks of interstitial nephritis resulting in hospitalisation or death in users of the proton pump inhibitors (PPIs) omeprazole, pantoprazole, and lansoprazole.

Methods
We conducted a population-based nested case-control study using routinely collected national health and drug-dispensing data from New Zealand, linked using National Health Index numbers. The study cohort included 572,661 patients without a history of interstitial nephritis or other renal diseases who started a new episode of PPI use between 2005 and 2009. Cases had a first diagnosis after cohort entry of interstitial nephritis confirmed by hospital discharge letter or death record (definite: n=46), or discharge letter or death record only (probable: n=26). Ten controls, matched by birth year and sex, were randomly selected for each case from the study cohort.

Results
In the case-control analysis based on definite cases and their controls, the unadjusted matched odds ratio comparing current use of PPIs to past use was 5.16 (95% CI: 2.21–12.05). The estimate was similar when all cases (definite and probable) and their corresponding controls were analysed, and when potential confounders were added to the models. The crude incidence rates per 100,000 person-years were 11.98 (95% CI: 9.11–15.47) and 1.68 (95% CI: 0.91–2.86) for current and past use, respectively.

Conclusions
Current use of a PPI was associated with a significantly increased risk of interstitial nephritis, relative to past use. The absolute risks were very low, but substantially higher in older users.

National differences and time trends of tuberculosis in West Africa

Abdulai Agbor Yansaneh
Department of Epidemiology and Biostatistics, Faculty of Medical and Health Sciences, The University of Auckland, Auckland, New Zealand

Aims and objectives
Tuberculosis remains an important cause of mortality and morbidity in West Africa, largely due to years of healthcare neglect. This talk, therefore, aims to investigate national differences and time trends of tuberculosis (TB) in West Africa between 1990 and 2012.

Methods
Data were extracted from various electronic sources including the World Health Organization, the Global Burden of Disease project, and other sources. Other reports were accessed through the University of Auckland library. Data were analysed with STATA 12; national differences and time trends investigated using descriptive statistics.

Results
In 2012, West African TB incidence (all forms) was estimated at 395,000 cases, and a prevalence (all forms) of 617,000. In the same year, mortality from TB (excluding TB cases with Human Immunodeficiency Virus (TB-HIV)) was reported at 61,000, and mortality in TB patients with HIV was 29,000. In 2010, West Africa lost 3.7 million Disability-Adjusted Life Years due to TB. The burden of tuberculosis per capita falls most heavily on Sierra Leone, followed by Mauritania and Liberia. Between 1990 and 2012, Sierra Leone’s TB frequency
was the highest in West Africa and in some instances quadrupled the regional average. Although the rise in TB frequency has halted in Sierra Leone, Mauritania rates continue to show an upward trend with no indication that they will start to level off soon. When TB trends were investigated by colonial histories, Francophone West Africa appeared to have a marginal advantage in multidrug-resistant TB case detection and management, possibly due to better laboratory capacity infrastructure than the Anglophone and Portuguese former colonies. There appears to be no colonial differences in other TB indicators investigated in this study.

Nevertheless, TB trends have decreased by half from their 1990 levels, in line with the Millennium Development Goals in Niger, Guinea, and in four of the five countries described here as Low TB Frequency Countries (LTBFC). Across West Africa, TB mortality is higher in males than in females, but in Nigeria more deaths were reported in women than in men. Throughout the region, the quality and reliability of these findings are compromised by the lack of Vital Registration systems, the high frequency of underreporting, and common misdiagnosis.

Conclusions
Acknowledging the issues with data quality, it is evident nevertheless that TB rates remain very high in many countries in West Africa and the impact is greater in men than in women. The key implication from this study is that TB will likely remain a significant health problem in West Africa beyond the 2050 Millennium Development Goals target.

Using data linkage to improve the quality of Aboriginal infant and child mortality statistics: a tale of two Australian states

Carrington Shepherd1, Jane Freemantle1,2, Rebecca Ritte2
1 Telethon Kids Institute, The University of Western Australia, Perth, Australia
2 Centre for Health and Society and Onemda VicHealth Koori Health Unit, Melbourne School of Population and Global Health, University of Melbourne, Parkville, Australia

Aims and objectives
To use population data linkage to improve the quality of Aboriginal infant and child mortality statistics in Victoria and Western Australia.

Methods
Information collected by Midwives notification systems in Victoria and Western Australia on all births in recent decades were linked with other administrative datasets, using probabilistic matching on demographic items, with clerical reviews. Information on Aboriginal status across all sources was combined for each individual to provide a more accurate ascertainment of status. A range of statistical techniques were used to assess mortality rate trends over time and underlying causes of death in Aboriginal populations.

Results
Using information on Aboriginal status from multiple sources significantly increases the ascertainment of Aboriginal births (by up to 189%), particularly in metropolitan areas. While this approach also increases the estimate of Aboriginal deaths, it generally reduces the estimate of disparities between Aboriginal and non-Aboriginal mortality rates and changes the profile of causes of death in Aboriginal infant and children.

Conclusions
The quality of information on mortality in Aboriginal populations will be improved by using population data linkage. Such linkages will enable a more accurate ascertainment of Aboriginal status. Collaborative efforts to improve the process of collecting, recording and identifying Aboriginal people in administrative data sources require continued investment.

Estimating the likely true rheumatic fever incidence in New Zealand

Jane Oliver, Nevi Pierse, Michael Baker
Department of Public Health, University of Otago, Wellington, New Zealand.

Aims and objectives
Rheumatic fever (RF) is an important public health problem in New Zealand. There are three sources of RF surveillance data, all with major limitations that prevent New Zealand generating accurate epidemiological information. We aimed to estimate the underlying RF incidence using multiple surveillance data sources.

Methods
National RF hospitalisation and notification data were obtained, covering 1988–2011 and 1997–2011, respectively. Data were also supplied from four regional registers. Coded patient identifiers were used to calculate the proportion of individuals who could be matched between datasets. Capture-recapture analyses were used to calculate the likely number of true RF cases for the period 1997–2011. A range of scenarios were used to correct for likely dataset incompleteness. The estimated sensitivity of each data source was calculated.
Results
Patients who were male, Māori or Pacific Islander, aged 5–15 years old and met the Jones Criteria, were most likely to be matched between national datasets. All registers appeared incomplete. An average of 113 new initial cases occurred annually. Sensitivity was estimated at 80% for the hospitalisation dataset and 60% for the notification dataset.

Conclusions
None of the national RF surveillance systems are complete or accurate. There is a clear need to develop a high-quality RF surveillance system, such as a national register. A national register could link important data to provide effective, comprehensive national surveillance to support strategy-focused and control-focused activities, helping reduce the incidence and impact of this disease. It is important to remind clinicians that RF cases do occur outside the well-characterised high-risk groups.

Antidepressant medication use in Australian adults: results from a large-scale linkage study using administrative pharmaceutical data

Ellie Paige1, Rosmary Korda1, Anna Kemp2, Bryan Rodgers3, Emily Banks1
1 National Centre for Epidemiology and Population Health, The Australian National University, Canberra, Australia
2 School of Population Health, The University of Western Australia, Crawley, Australia
3 Australian Demographic and Social Research Institute, The Australian National University, Canberra, Australia

Aims and objectives
To investigate the association between sociodemographic and health factors and antidepressant medication use.

Methods
The study population consisted of participants from the 45 and Up Study, a cohort study of 267,000 men and women aged 45 years or older living in New South Wales, Australia, who were concession card holders and had pharmaceutical claims data (provided by the Department of Human Services, Australia) linked to their Study records (n=111,705). Current antidepressant medication use was defined as two or more consecutive dispensings of an antidepressant medication in the six months before completion of the baseline questionnaire. Multinomial logistic regression was used to analyse the association of sociodemographic factors, and mental and physical health factors, in current antidepressant users compared to non-users.

Results
Eleven percent of the study population were current antidepressant users. More females (14%) used antidepressants than males (8%), and the proportion of people using antidepressants decreased with increasing age. After adjusting for sex, age and sociodemographic factors, poorer health (moderate-severe physical impairment; fair-poor self-rated health; moderate-very high psychological distress; doctor-diagnosed depression; antipsychotic use; and dispensing of ≥5 other medications) were strongly associated with antidepressant medication use. Females, younger people, those born in Australia/New Zealand and those with a lower income were also more likely to currently use antidepressants.

Conclusions
Through the use of large-scale linked data we found that people with poorer physical and mental health were the most likely to be current antidepressant users. Sociodemographic factors were also associated with antidepressant use, which may broadly reflect varying patterns of depression in the population.

Concurrent session 2B: Quantitative methods 1
1:30–3:00pm
Invited speaker: Thomas Lumley

Familiar questions, different context: estimation and testing in large-scale genetic association studies

Thomas Lumley
Department of Statistics, The University of Auckland, Auckland, New Zealand

In a sense, genome-wide association studies (GWAS) in unrelated individuals present no new statistical challenges: the standard analyses use very simple regression models. The context, however, is different. There are very many exposure variables, large sample size, low risk of bias, and strong reasons to expect nearly all the exposures to be of negligible importance for any given outcome. In this new context, intuition about the performance of simple estimators and tests has often been incorrect. I will give some examples based on experience from the CHARGE Consortium GWAS and re-sequencing studies.
Lifestyle factors and risk of colorectal cancer for people with germline mutations in DNA mismatch repair genes

Aung Ko Win1, Seyedeh Ghazaleh Dashti1, Rowena Chau1, Driss Ait Ouakrim2, Daniel D Buchanan1,2, Mark Clendenning3, Christophe Rosty3,11, Ingrid M Winship3,4, Joanne P Young5,16, Graham G Giles1,2, Barbara Leggett6, Finlay A Macrae6, Dennis J Ahnen7, John A Baron8,10, John D Potter14,15,16, Graham Casey11, Steven Gallinger8, Robert W Haile17, Loïc Le Marchand9, Noralane M Lindor11, Polly A Newcomb14,15, Stephen N Thibodeau8,20, John L Hopper11,22, Mark A Jenkins1

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10. QIMR Berghofer Medical Research Institute, Royal Brisbane Hospital, Herston, Australia.
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15. School of Public Health, University of Washington, Seattle, United States of America.
16. Centre for Public Health Research, Massey University, Wellington, New Zealand.
17. Department of Preventive Medicine, Keck School of Medicine and Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, United States of America.
18. Lunenfeld Tanenbaum Research Institute, Mount Sinai Hospital, University of Toronto, Toronto, Canada.
19. Department of Medicine, Division of Oncology, Stanford Cancer Institute, Stanford University, Stanford, United States of America.

Aims and objectives

People with germline mutations in DNA mismatch repair (MMR) genes have a substantially higher risk of colorectal cancer; however, the modifiers of this risk are not well established. The aim of the study was to investigate associations between lifestyle factors and risk of colorectal cancer for MMR gene mutation carriers using the largest dataset to date.

Methods

This study comprised 1,724 carriers of a mutation in an MMR gene (624 MLH1, 831 MSH2, 164 MSH6 and 105 PMS2) from the Colon Cancer Family Registry. Using Cox proportional-hazards regression weighted to correct for ascertainment bias, we estimated hazard ratios (HRs) for associations between lifestyle factors and risk of colorectal cancer for carriers.

Results

During 75,339 person-years of observation, 720 carriers (42%) were diagnosed with colorectal cancer. A decreased risk of colorectal cancer was associated with use of multivitamin supplements (for 1–5 years: HR=0.65 (95% CI: 0.43–0.96); and for >5 years: HR=0.42 (95% CI: 0.25–0.86); and for >10 years: HR=0.26 (95% CI: 0.11–0.61)), aspirin (for 1–10 years: HR=0.48 (95% CI: 0.26–0.87); and for >10 years: HR=0.45 (95% CI: 0.25–0.80)) and Ibuprofen (for 1–5 years: HR=0.48 (95% CI: 0.26–0.87); and for >5 years: HR=0.42 (95% CI: 0.25–0.72); and for >10 years: HR=0.26 (95% CI: 0.11–0.61)), compared with never users. An increased risk of colorectal cancer was associated with consumption of beer (per 14 g/day: HR=1.09 (95% CI: 1.00–1.18)), and liquor (per 14 g/day: HR=1.19 (95% CI: 1.04–1.36)). There was no evidence of association with use of folic acid supplements, oral contraceptives or hormone replacement therapy.

Conclusions

Lifestyle factors are important modifiers of colorectal cancer risk for MMR gene mutation carriers.
Determining the methodological approach for the Australian Burden of Disease Study 2011

**Lynelle Moon, Karen Bishop, Melissa Goodwin, Miriam Lum On, Nick Mann**

**Australian Institute of Health and Welfare, Canberra, Australia**

**Aims and objectives**

AIHW has been funded to update the Australian burden of disease estimates for both the whole population and the Indigenous population using the Disability-Adjusted Life Year metric. The first phase of the project was to review the methodology used in previous studies and determine the appropriate approach for the new Australian study.

**Methods**

A detailed description of the steps involved in the estimation of burden of disease studies was developed, including analysis of the fatal and non-fatal burden as well as the attribution to various risk factors. This was followed by a detailed review of methods used in the 2010 Global Burden of Disease study (GBD 2010), and the previous Australian and recent New Zealand studies.

**Results**

The review of methods and subsequent discussion with expert advisors resulted in the decision to use the methodological framework of GBD 2010 as the basis of the Australian study, including using the GBD 2010 reference life table and disability weights, no discounting or age-weighting, and to use prevalence as the basis of the non-fatal component. However, a number of adaptations are being incorporated to better suit the Australian context, including a modified cause list, direct use of Australian data and Australian-specific redistribution of deaths.

**Conclusions**

GBD 2010 and other previous studies provide a good basis for the Australian study. However, to better suit a country study the methods have been adapted and extended and a system has been established that enables new developments and data to be incorporated.

Medicare data for cancer follow-up studies

**Bridie Thompson¹, Catherine Olsen¹, Padmini Subramaniam², Rachel Neale¹, David Whiteman¹ for the GSkin Study**

¹. Population Health, QIMR Berghofer Medical Research Institute, Brisbane, Australia
². School of Public Health and Social Work, Queensland University of Technology, Brisbane, Australia

**Aims and objectives**

To investigate the utility of Medicare data for conducting health research, specifically in skin cancer.

**Methods**

The GSkin cohort comprises a random sample of 43,794 Queensland adults aged 40 to 69 years at baseline in 2011. We obtained Medicare records through data linkage from the date of consent until 30 June 2012. We identified participants who had excisions of primary keratinocyte skin cancers (KC) (including basal cell carcinoma (BCC) and squamous cell carcinoma (SCC)) from Medical Benefit Scheme (MBS) item codes. These participants were then matched to records from the major pathology companies servicing Queensland to obtain detailed histological information.

**Results**

Of the 37,118 participants linked to the Medicare dataset, 2,821 participants had MBS item codes for 4,830 excisions of KC. Of these excisions, 97% had a corresponding MBS item for an anatomical pathology service within seven days. We were able to obtain pathology reports for 68% (3,282/4,830) of excisions from data linkages to the two major pathology laboratories. Preliminary review indicated that >95% of the available pathology reports confirmed the diagnosis of skin cancer.

**Conclusions**

Medicare data reliably identifies patients treated for skin cancer; however, the MBS item codes do not distinguish BCC from SCC. Concordance between Medicare item reporting for treatment of KC and confirmed diagnoses from pathology reports was high. Medicare item codes for skin cancer are a useful surrogate for large-scale epidemiological studies which do not require precise histological diagnoses.

Effects of interpretive front-of-pack nutrition labels on food purchases: STARLIGHT randomised controlled trial

**Ekaterina Volkova¹, Bruce Neal², Mike Rayner², Boyd Swinburn³, Helen Eyles¹, Yannan Jiang¹, Jo Michie¹, Cliona Ni Mhurchu¹**

¹. Population Health, QIMR Berghofer Medical Research Institute, Brisbane, Australia
³. Department of Exercise and Sport Science, University of Otago, Dunedin, New Zealand

**Aims and objectives**

To investigate the effect of interpretive front-of-pack nutrition labels on food purchases.
Aims and objectives

To assess the effects of two interpretive front-of-pack (FOP) nutrition labels compared with a standard non-interpretive numerical label, on the healthiness of consumer food purchases.

Methods

Design: Three-arm parallel RCT.
Setting: New Zealand retail outlets.
Intervention arms: 1) Traffic-light label; 2) Health Star Rating label.
Control arm: Nutrition Information Panel.
Delivery: Via a smartphone application.
Participants: 1,500 New Zealand adult smartphone owners, who are main household shoppers.
Baseline: One week.
Randomisation: 1:1:1 ratio, using computer-generated randomisation sequences.
Stratification factors: Ethnicity and self-reported interest in healthy eating.
Intervention: Four weeks. Food and beverage purchase data: till receipts; electronic grocery purchase lists recorded using the smartphone app.
Primary outcome: Mean Food Standards Australia New Zealand nutrient profiling score (NPS) for all food and beverage products purchased over the intervention period.
Secondary outcomes: 1) Saturated fat, total sugar, sodium and energy content of food purchases; 2) Food expenditure; 3) Labelling profile of food purchases (mean number of Health Star Rating stars and proportion of red, green and amber traffic lights); 4) NPS over time; 5) NPS of key food categories; 6) Mean NPS of the three NPS criterion food categories; 7) Purchases of unpackaged foods; 8) Self-reported nutrition knowledge; 9) Recorded use of assigned labelling system.
Ethical Approval: Granted by the University of Auckland Human Participant Ethics Committee on 26 May 2014 (ref. 011390).

Results

The most recent recruitment data will be presented (recruitment due to commence in July 2014).

Kava use and risk of car crash injury: a population-based case control study in Fiji

Iris Wainiqolo1, Berlin Kafoa2, Bridget Kool1, Elizabeth Robinson1, Josephine Herman1, Eddie McCaig2, Shanthi Ameratunga1

1 The University of Auckland, Auckland, New Zealand
2 Fiji National University, Suva, Fiji

Aims and objectives

While kava is a widely consumed beverage in Pacific settings, its contribution to road traffic crashes is unknown. We aimed to quantify the relationship between kava use and car crash injuries in Fiji.

Methods

A population-based case-control study conducted as a component of the Traffic-Related Injury in the Pacific (TRIP) project, collected data from drivers (or their proxies) of eligible case vehicles (n=140) involved in crashes, where at least one person died or was hospitalised. Controls (n=752) were a random sample of drivers of vehicles representative of driving time within the study region. The study (October 2005 – September 2006) used structured interviews to elicit data on putative risk and protective factors including kava use and potential confounding factors.

Results

Drinking kava in the previous 12 hours was reported by drivers of 23% of case vehicles and 7% of control vehicles. After adjustment for major confounders, consuming kava within 12 hours of driving was associated with a three-fold increase in the odds of crash involvement (OR 3.50 (95% CI: 1.47 – 8.31)) with an associated population attributable risk of 16%. There were no significant interactions observed between acute kava and acute alcohol consumption or between acute and usual kava use.

Conclusions

Driving under the influence of kava is an important contributor to serious injury-involved vehicle crashes in Fiji and should be an explicit target in road safety strategies in Pacific Island countries where kava use is common. Further studies are required to identify concentrations of kava and patterns of use that pose the greatest risk.
Acculturation and prevalence of smoking in Asian migrants in Western countries: a systematic review and meta-analysis

Shuyu Guo
National Centre for Epidemiology and Population Health, The Australian National University, Canberra, Australia

Aims and objectives
Western countries have made concerted efforts, with considerable success, to decrease the prevalence of smoking. In Asian countries, however, smoking prevalence remains high. Asian migrants are a rapidly growing population group in Western countries; it is not known whether smoking prevalence changes – and to what extent – following migration and as migrants become more acculturated to the host country.

Methods
We conducted a systematic review of the peer-reviewed literature published between 2000 and 2013 on smoking behaviours in Asian migrants living in the United States, Australia and Canada. We undertook a meta-analysis of the association between indicators of acculturation and smoking behaviour in Asian immigrants, stratified by sex.

Results
Data were available from 41 population-based cross-sectional studies. The prevalence of current smoking ranged from 11% to 39% in men and 0.6% to 17% in women. Amongst East Asian migrants, nearly half of ever-smokers had stopped smoking. In general, the prevalence of current smoking among men was lower, and the proportion that had stopped smoking higher, compared to the country of origin. Meta-analysis showed that, with increasing acculturation, the odds of being a current smoker decreased in men (summary OR=0.64 (95% CI: 0.55–0.74)) but increased in women (summary OR=1.78 (95% CI: 1.55–2.04)). Effect sizes were greater where multi-item scales were used to measure acculturation (for example, summary OR=0.48 (95% CI: 0.37–0.62 for men)).

Conclusions
Our results demonstrate the change in smoking behaviour that occurs in association with changing social norms and culture. The findings have implications for tobacco control in multicultural communities in Western countries as well as Asian countries.

The association between quitting smoking and weight gain: a systematic review and meta-analysis of prospective cohort studies

Jing Tian, Alison Venn, Petr Otahal, Seana Gall
Menzies Research Institute Tasmania, University of Tasmania, Hobart Australia

Aims and objectives
To quantify change in weight after smoking cessation in quitters compared with continuous smokers.

Methods
Design: Systematic review and meta-analysis.
Data sources: Medline, EMBASE, Web of Science, Scopus and CINAHL prior to May 2013. Reference lists of full text papers were scrutinised.
Eligibility criteria and selecting studies: Prospective cohort studies of adults were included if they recorded weight change from baseline (before smoking cessation) to follow-up at least 3 months after cessation in the general population. Two authors independently selected studies according to the inclusion criteria.
Analysis: Random-effect models were used to calculate pooled mean differences and relative risks.

Results
Thirty-seven population-based prospective cohort studies were identified, including 62,671 quitters and 353,885 continuous smokers. Follow-up length ranged from 1 to 16 years. The meta-analysis was performed for two indicators of weight change: weight (kg) and body mass index (BMI, kg/m²). Compared with continuing smoking, quitting smoking was significantly associated with absolute measures of weight gain (adjusted mean difference: 2.73 kg (95% CI: 1.73–3.73 kg) and BMI gain (adjusted mean difference: 0.68 kg/m² (95% CI: 0.46 kg/m² – 0.91 kg/m²). Meta-analyses using categorical classifications of weight gain supported the continuous findings. Study region and length of follow-up were found to be sources of heterogeneity in meta-regression analyses, such that North American quitters gained more than Asian quitters and studies with longer follow-up showed greater weight gain.

Conclusions
Smoking cessation is associated with a small amount of weight gain in the long-term in males and females.
Effects of study design and allocation on self-reported drinking behaviour: results from a randomised trial

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2 Department of Psychology, University of North Carolina, Chapel Hill, United States of America
3 Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, London, United Kingdom

Aims and objectives

What participants think about the nature of a study may affect subsequent behaviour and bias findings. We tested two hypotheses: 1) that participants who are told they are in an intervention trial would report lower alcohol consumption at follow-up than those told they are in a cohort study; and 2) that participants told they are in the intervention group in a trial would have lower alcohol consumption at follow-up than those told they are in the control group.

Methods

6,788 university students with hazardous drinking were invited to participate in a ‘Research project on student drinking’ and were randomised to three groups. Group A were informed that their drinking would be assessed at baseline and again in one month (as in a cohort study). Group B were told the study was an intervention trial and that they were in the control group. Group C were told the study was an intervention trial and that they were in the intervention group. All were assessed and received identical alcohol education material to read online. Whether they accessed the material and for how long were recorded unobtrusively. One month later alcohol intake was assessed again.

Results

In relation to hypothesis 1, there were non-significant differences between groups on the four pre-specified outcomes. In relation to hypothesis 2, there were non-significant differences though all four point estimates were in the hypothesised direction (i.e. C<B). Groups A and B similarly accessed the material (59% vs. 57%) while group C were more likely to access it (78%) and read it for longer.

Conclusions

There was no evidence to support hypothesis 1 but this may be due to weak experimental manipulation. Hypothesis 2 is rejected: knowledge of group allocation (control vs. intervention) does not, in itself, affect behaviour.

Marijuana use and injury events: findings from the New Zealand blood donors’ health study

Shanthi Ameratunga1, Roshini Peiris-John1, Papaarangi Reid2, Ariër Lee1, Janie Sheridan3

1 Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, Auckland, New Zealand
2 Te Kupenga Hauora Māori, School of Population Health The University of Auckland, Auckland, New Zealand
3 School of Pharmacy and Centre for Addiction Research, The University of Auckland, Auckland, New Zealand

Aims and objectives

To investigate the associations between marijuana use and the risk of fatal or hospitalised injury in a large cohort of adult New Zealanders.

Methods

At recruitment (1998–99), the 22,389 participants in the New Zealand Blood Donors Health Study completed a self-report survey on a range of personal, demographic and lifestyle questions, including substance use. Outcome data on injury admissions and death from recruitment to 31 December 2012 were collected prospectively through electronic record linkage of participants’ unique identifiers to the national mortality and hospital discharge databases. Cox proportional-hazards analysis was used to examine the associations between marijuana use and injury.

Results

Over 15% of participants of the cohort reported marijuana use at baseline. During a median follow-up period of 13.8 years, 3,369 incident injury cases (3,312 non-fatal and 57 fatal) occurred, the majority of which were unintentional injury events caused by falls (1,032 incident cases) and motor vehicles (740 incident cases). Compared to non-users, marijuana users were more likely to experience injuries that were self-inflicted (adjusted HR=1.81 (95% CI: 1.18–2.79)), caused by assault (adjusted HR=1.69 (95% CI: 1.09–2.62)), motor vehicle (adjusted HR=1.46 (95% CI: 1.13–1.88)), or due to cutting or piercing (adjusted HR=1.73 (95% CI: 1.23–2.43)). Relative to non-users, participants who used marijuana monthly or more frequently were at increased risk of most major types of injuries examined at follow-up.

Conclusions

The pathways and correlates of harm underlying the increased risks of injury (particularly self-harm and assault) associated with marijuana use, require public health attention.
Idle youth by all things enslaved: media, consumerism and tobacco

Rob McGee
Department of Preventive and Social Medicine, Dunedin School of Medicine, University of Otago, Dunedin, New Zealand

Aims and objectives
This research examines the relationship between aspects of adolescent culture and tobacco use. There are two broad aims: 1) to develop a model of adolescent consumer culture and media use; and 2) to examine the association between consumer culture and media use, and tobacco behaviours including cigarette smoking, intention to smoke, and perceptions of social norms around smoking.

Methods
The 2008 New Zealand In-depth survey collected an extensive set of information about the use of, and exposure to various media by a large sample of New Zealand young people (N=3,000+). These include movies, television, magazines and social media on the internet, as well as involvement in consumption culture. Outcome measures included cigarette smoking in the last 30 days, intention to smoke among those not currently smoking tobacco, and perception of social norms around smoking. We examine three structural equation models (SEM) for each of these outcomes.

Results
Measurement models indicated it was possible to combine different media variables and consumer spending behaviours into a reasonably robust measurement model. There were significant paths from media exposure and consumer behaviour to tobacco outcomes. The paths from media exposure appeared stronger than those from consumerism.

Conclusions
While these models rely on cross-sectional data, they should be considered as exploratory and hypothesis generating, pointing to further replication and extension to longitudinal study. Our findings suggest the importance of examining exposure to a broad variety of media in relation to youth smoking.

Towards global benchmarking of food environments and policies to reduce obesity and diet-related non-communicable diseases: design and methods for nationwide surveys

Stefanie Vandevijvere, Boyd Swinburn for INFORMAS
The University of Auckland, School of Population Health, Auckland, New Zealand

Aims and objectives
Unhealthy diets are heavily driven by unhealthy food environments. INFORMAS (International Network for Food and Obesity/non-communicable diseases [NCDs] Research, Monitoring and Action Support) aims to reduce obesity, NCDs and their related inequalities globally. As a first step towards global monitoring and benchmarking of food policies and environments, methods have been developed for comprehensive national surveys on the healthiness of food policies and environments.

Methods
A package of 11 sub-studies has been identified: 1) food composition, labelling and promotion on food packages; 2) food prices, shelf space and placement in different outlets; 3) food provision in schools/other settings and outdoor food promotion around schools/other settings; 4) density of and proximity to food outlets in communities; food promotion to children via 5) television, 6) magazines, 7) sport sponsorships, and 8) internet and social media; 9) analysis of the impact of trade and investment agreements on food environments; 10) government policies; and 11) industry actions. For the sub-studies on food prices, provision, promotion and retail, ‘environmental equity’ indicators have been developed to check progress towards reducing diet-related health inequalities. International ‘best practice benchmarks’ are being identified, against which to compare progress of countries on improving the healthiness of their food environments and policies.

Conclusions
This research is highly original due to the ‘upstream’ approach taken and its direct policy relevance. The detailed protocols will be offered to and adapted for countries of varying size and income to establish INFORMAS globally as a new monitoring initiative to reduce obesity and diet-related NCDs.
Hospitalisation costs associated with above-normal body mass index: a data linkage study

Rosemary Korda1, Grace Joshy1, Ellie Paige1, James RG Butler1, Louisa R Jorm1, Bette Liu4,5, Adrian Bauman6, Emily Banks1,5

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4 The Kirby Institute, University of New South Wales, Sydney, Australia
5 The Sax Institute, Sydney, Australia
6 School of Public Health, University of Sydney, Sydney, Australia

Aims and objectives

To quantify hospitalisation costs attributable to above-normal BMI.

Methods

Prospective Australian cohort study involving 267,153 people aged ≥45 years (the 45 and Up Study). Baseline survey data (2006–09) were linked to individual hospital and death records (to 2011, median follow-up 3.42 years) and to National Hospital Cost Data. Generalised gamma models were used to model the relationship between BMI (self-reported at baseline) and inpatient hospital costs by sex and age group (45–64, 65–79 and ≥80 years), adjusting for age, area, education, income, smoking, alcohol intake and private health insurance status, with costs estimated using the recycled predictions method. Population attributable fractions were calculated to estimate hospital costs associated with above-normal BMI.

Results

Preliminary results showed, in the 45–64 and 65–79 (but not >80) age groups, costs increased with increasing above-normal BMI. Compared to BMI 22.5–≤25kg/m², costs for those with BMI 25–<27.5kg/m² were around 10–20% higher, rising to almost 100% higher amongst those with BMI 40–50kg/m². The percentages of hospital costs in Australia in people aged 45–79 attributed to overweight and obesity were estimated to be 4% and 10% respectively, equating to a total of 3.2 billion dollars in 2011–12, around $1 in every $7 of hospital costs spent.

Conclusions

This study highlights the usefulness of age-specific incremental BMI data in modelling the relationship between BMI and hospitalisation costs. The estimated dose-response relationship suggests that even small downward shifts in the BMI profile of the population in the above-normal BMI range could result in considerable cost-savings to the health system.

National survey of risk factors for non-communicable disease in Vietnam: prevalence estimates and an assessment of their validity

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3 Medical Services Administration, Ministry of Health of the Socialist Republic of Vietnam, Ha Noi, Vietnam
4 Department of Medicine, Southern Clinical School, Monash University, Melbourne, Australia

Aims and objectives

To estimate the prevalence of non-communicable disease (NCD) risk factors at a provincial level in Vietnam and assess whether these data allow reliable inferences to be drawn regarding regional differences in risk factors and associations between them.

Methods

The survey involved 14,706 participants (53.5% females, participation proportion 64.1%) aged 25–64 years selected by multi-stage stratified cluster sampling from eight provinces, each representing one of the eight geographical regions of Vietnam. Measurements were made using WHO STEPS protocols. Data were analysed using complex survey methods.

Results

Differences by sex in mean years of schooling (males 8.54±0.22, females 7.36±0.20), proportions of current smokers (males 57.69%, females 1.74%), and binge drinkers (males 25.11%, females 0.63%), and regional differences in diet, reflected the geographical and socio-cultural characteristics of the country. Provinces with a higher proportion of urban population had greater mean levels of schooling (r=0.38), BMI (r=0.81), and lesser physical activity (r=–0.88). The associations between the summary estimates were generally plausible (e.g. physical activity and BMI, r=–0.77) but with some anomalous findings due to characterisation of smoking and hypertension by STEPS protocols.
Conclusions
This study provides an extensive description of the sex-specific and regional distribution of NCD risk factors in Vietnam and a fascinating account of some health-related consequences of industrialisation in its early stages. The STEPS protocols can be utilised to provide aggregate data for valid between-population comparisons, but with two important caveats identified.

Trajectories of urban and non-urban residence and BMI from childhood to adulthood

Kira Patterson, Seana Gall, Allison Venn, Petr Otahal, Leigh Blizzard and Verity Cleland
Menzies Research Institute Tasmania, University of Tasmania, Hobart, Australia

Aims and objectives
To investigate whether BMI in mid-adulthood was predicted by trajectories of residence across urban and non-urban areas from childhood to adulthood.

Methods
Participants were 9–15 year-olds in 1985 (n=6,559) who were followed up in 2004–06 (n=3,960, aged 26 to 36) and 2009–11 (n=2,665, aged 31 to 41). Area of residence was classified as urban or non-urban at baseline (postcode level) and follow-ups (census collection district level). Weight and height in 2009–11 were self-reported. Life course modelling was used to test if ‘accumulation of risk’ or ‘sensitive period’ models explained the association between area of residence and BMI by comparing the fit of a series of nested linear regression models with a fully saturated model.

Results
The effect of area of residence on mid-adulthood BMI was best described by the accumulation model and sensitive period model at ages 26–36. BMI at ages 31–41 years were higher for those living in non-urban areas during the sensitive period at ages 26–36 years (β=1.04kg/m², p<0.001). Further analyses suggested that the risk was greater for those exposed during the ages 26 to 30 rather than 31–36. BMI was also higher for those who had greater accumulated exposure to non-urban areas throughout the life-course (β=0.40kg/m² per time point in a non-urban area, p<0.001).

Conclusions
Living in a non-urban area was associated with higher BMI. The risk was greatest in those exposed to non-urban environments for longer and those exposed during young adulthood.

Partnering and parenting transitions in Australian men and women: associations with changes in weight, diet and physical activity

Alison Venn1, Seana Gall1, Terry Dwyer1, Kylie Smith1
1 Menzies Research Institute Tasmania, University of Tasmania, Hobart, Australia
2 Murdoch Children’s Research Institute, Melbourne, Australia

Aims and objectives
To investigate whether partnering and parenting transitions were associated with changes in weight and related behaviours over five years in a national cohort study of young Australian adults.

Methods
2,634 young Australians (mean age 31.7 (SD: 2.6); 45% male) completed questionnaires in 2004–6 and 2009–11 and reported marital and parental status, weight (kg), alcohol (g/week), and fruit and vegetable consumption (serves/day). Physical activity (PA) (min/week) was measured in a subset (n=1,260). Relative to those who remained single or childfree, regression analysis estimated associations of transitions with change in weight and behaviour at follow-up, adjusting for baseline weight or behaviour, age, education, follow-up time and other life transition.

Results
Becoming partnered had little effect on weight or related behaviours, though women who partnered gained, on average, 1.64 kg more than women who remained single. For women only, separation/divorce/widowhood was associated with increased alcohol consumption (β=16.1 (95% CI: 1.6, 3.1) and increased total PA (β=303.0 (95% CI: 98.9, 507.1). Transitions to parenthood, and having more children in the follow-up period, were consistently associated with significant reductions in leisure-time PA for both men (β=-88.0 (95% CI: -133.0, -43.4); β=-74.7, (95% CI: -126.0, -23.4), respectively) and women (β= -69.0 (95% CI: -99.7, -38.3); β= -50.4 (95% CI: -83.5, -17.4), but not with differences in total PA. Women having a first child gained, on average, 0.65kg more weight. Partnering and parenting transitions were not associated with significant changes in fruit and vegetable consumption.

Conclusions
Women appear to be more susceptible than men to weight and behaviour change following life-stage transitions though reduced leisure-time PA was associated with parenting transitions for both men and women.
Does heavy exercise cause atrial fibrillation? Six-year follow-up of participants in the Taupo Cycle Challenge

Alistair Woodward
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Aims and objectives
The incidence of atrial fibrillation (AF) is increased markedly among elite athletes. It is not clear whether lesser levels of physical activity in the general population increase risk of AF. We asked whether participation in the Taupo Cycle Challenge was associated with increased hospital admissions due to AF, and within the cohort, whether admissions for AF were related to frequency and intensity of cycling.

Methods
Participants in the 2006 Lake Taupo Cycle Challenge, New Zealand’s largest mass cycling event, were invited to complete an online questionnaire. Those who agreed (n=2,590, response rate=43.1%) were followed up by record linkage via the National Minimum Health Database from December 1 2006 until June 30 2013, to identify admissions to hospital due to AF.

Results
The age and gender standardised admission rate for AF was similar in the Taupo cohort (19.60 per 10,000 per year) and the national population over the same period (2006–11) (19.45 per 10,000 per year). Within the study cohort (men only), for every additional hour spent cycling per week the risk changed by 0.90 (95% CI: 0.79 –1.01). This result did not change appreciably after adjustment for age and height.

Conclusions
Hospital admission due to AF was not increased above the national rate in this group of non-elite cyclists, and within the group the rate of AF was not related to amount of cycling. The level of activity undertaken by this cohort of cyclists was, on average, not sufficient to increase the risk of AF.

Recruitment via the Internet and social networking sites: the 1989 –95 cohort of the Australian Longitudinal Study on Women’s Health

Gita Mishra
School of Population Health, University of Queensland, Brisbane, Australia

Since its baseline survey in 1996 of over 40,000 Australian women and follow-up surveys conducted approximately every three years, the Australian Longitudinal Study on Women’s Health (ALSWH) has become established as a leading national study. Until recently, the study comprised three cohorts of women born in 1921 – 26, 1946 – 51, and 1973 – 78. These women were randomly selected using the national health insurance database, which includes all permanent residents of Australia.

In this paper, we describe the establishment of the latest young ALSWH cohort of 17,070 women born in 1989 – 95 and recruited in 2012 – 13, that involved a new recruitment method via the internet and social networking sites. We discuss the resultant characteristics and representativeness of this cohort with respect to women of the same age in the Australian population. Where possible a comparison is also drawn with women of the same age range in 1996 by using baseline data from the 1973 – 78 cohort. We conclude with the implications for the future recruitment of young adults for population based longitudinal health studies.

The ups and downs of recruiting in the 21st century

Jennifer Powers, Deborah Loxton
Research Centre for Gender, Health and Ageing, University of Newcastle, Callaghan, Australia

Aims and objectives
To identify and evaluate different methods of recruiting young women to a national longitudinal study.

Methods
In 2012–13, 18–23 year old women were recruited to the fourth cohort of the Australian Longitudinal Study on Women’s Health (ALSWH). Five broad recruitment strategies (Facebook including Facebook advertising, Other web activities, Referral, Traditional media, Fashion promotion) were used. Facebook advertising was used to target specific groups of women. Respondents were asked to indicate which strategy led them to the online survey. Demographic characteristics of each recruitment group were compared to the Census. Multinomial logistic regression was used to compare demographic characteristics of each recruitment group with the reference group, Facebook.
Results
17,070 women enrolled; 70% indicated Facebook, 5% Other web activities, 7% Referral, 5% Traditional media, and 13% Fashion promotion. Census comparisons showed women recruited via Facebook had similar age, area and relationship distributions as women of the same age in the Census. Women in all groups had higher educational qualifications (e.g. 48% versus 31% university, certificate or diploma) and were more likely to be studying than women of the same age in the Census. Compared with Facebook, Other web activities, Referral and Fashion promotion attracted more women in their twenties. Fashion promotion attracted more urban women, and Facebook attracted a greater proportion of women with less than Year 12 qualifications.

Conclusions
In the face of increasing difficulties with recruiting the general public into research studies, online recruiting, and particularly Facebook including Facebook advertising, is an effective means of enrolling young women to a longitudinal study.

Achieving high response rates
Brian Cox, Mary J Sneyd
Hugh Adam Cancer Epidemiology Unit Department of Preventive and Social Medicine Dunedin School of Medicine, University of Otago, Dunedin, New Zealand

Background
Cooperation rates [eligible participants interviewed/(eligible interviewed + not eligible but able to be contacted)] rather than response rates [eligible participants interviewed/eligible interviewed + eligible non-participants + people of presumed but of unconfirmed eligibility] are often reported in publications. Cooperation rates are higher than response rates. It has been reported that cooperation rates in published population-based case-control studies declined by 3.33% per year in cases and 5.15% per year in controls from 1991 to 2003. Cooperation rates of 70% and response rates of 50% are now reported. Response rates are still often not, or misleadingly, reported. In an attempt to overcome these problems alternative referent groups have sometimes been chosen.

Aims and objectives
To describe methods that achieve high response rates.

Methods
The methods used by the Hugh Adam Cancer Epidemiology Unit for the approach to potential participants in epidemiological studies and the response rates achieved have been reviewed.

Recruitment and retention strategies in the community-onset Staphylococcus aureus longitudinal cohort study
Ekaterina Bogatyreva, Greg Wood, Paul DR Johnson, Catherine M Bennett
School of Health and Social Development, Deakin University, Burwood, Australia

Aims and objectives
Few studies have tackled the complicated task of examining community-onset Staphylococcus aureus (Staph) or methicillin-resistant S. aureus (MRSA) infections. We recruited for a longitudinal cohort study using novel approaches to identify infections in the community whilst protecting doctor-patient relationships and patient privacy.

Methods
Staph infections were identified among routine clinical results in a large private pathology service in Melbourne (2008–12). Eligibility was determined based on demographic information and purpose, location and timing of specimen collection. All MRSA infections were followed up, and a frequency matched subsample of methicillin-sensitive. A complex process was established to contact referring doctors for infection confirmation and consent, and to notify patients and households. All household members were invited to participate in the baseline study, and the longitudinal if shared households. Home visits included collecting skin and nose swabs, medical and exposure history. Retention strategies included flexible visiting hours, providing personal swab results, and specific engagement strategies.

Results
From 1,053 possible community-onset infections, 769 were confirmed as eligible and contacted by the study. 291 index cases and 446 household members agreed to participate. Shared households (204) were invited into the longitudinal
study and 189 (92.6%) participated in the follow-up. Of those, 160 households (85.1%) completed one year follow-up and 105 (55.6%) completed two, with 24 households censored.

Conclusions
A detailed recruitment and retention strategy is critical to maximise response factions and minimise attrition in longitudinal population studies.

Latency to participate and intervention response in a randomised alcohol behaviour change trial

Kypros Kypri, Steven Bowe
1 School of Medicine and Public Health, The University of Newcastle, Callaghan, Australia
2 Department of Statistics, Data Science and Epidemiology, Swinburne University of Technology, Hawthorn, Australia

Background
Participating in behaviour change trials is often subject to strong selection processes that affect the generalisability (external validity) of effect estimates. In many cases the selection procedures and proportions who consent are not reported or reported in insufficient detail to permit assessment of who the results can be generalised to.

Aims and objectives
The aim of this study was to test the hypothesis that individuals whose participation in a behaviour change trial is hardest to elicit are less likely to benefit from intervention.

Methods
We compare early respondents (who participated prior to a second reminder) versus late respondents (who participated after a second reminder) in two web-based alcohol intervention trials conducted with university students in Australia (the THRIVE trial) and New Zealand (the e-SBINZ trial). Intervention effect estimates specified in the primary trials were calculated separately for the early versus late respondents and compared.

Results
There were no differences in the effectiveness of the interventions as a function of how hard it was to elicit participation. In the e-SBINZ study, relative to controls, participants receiving intervention consumed less alcohol per typical drinking occasion (RR=0.93 (99.17% CI: 0.86–1.00; p=0.005)). This effect size remained (RR=0.92 (99.17% CI: 0.85–0.99; p=0.002)) after adjusting models for latency to participate and for an interaction between treatment group and latency to participate (p=0.545).

Discussion
We consider limitations and implications for the interpretation of intervention trial findings and important unanswered questions. All studies and results will be discussed.

Note: 99.17 confidence intervals are equivalent to 95% CI adjusted for multiple comparisons (n=6).

Ian Prior Oration: Robert Beaglehole
3:30–4:30pm
Lower NZI

Epidemiology and politics: lessons from Ian Prior’s battles

Robert Beaglehole
The University of Auckland, Auckland, New Zealand

Ian Prior was the founder of modern epidemiology in New Zealand. Ian made many contributions to public health through his engagement in a wide range of health and social issues: social epidemiology; social justice; protection of the environment; a nuclear-free world; and the arts. None of these achievements came easily. Ian battled on several fronts throughout his career: epidemiological issues; medical prejudice; political opposition; and health problems. He overcame all of these obstacles and his manifold contributions are unrivalled by succeeding cohorts of epidemiologists. Ian’s life provides many lessons for contemporary public health practitioners and in particular, the central role of epidemiology in improving the health of all segments of the population and the importance of the underlying determinants of health.
Controlling zoonoses; the increasing role played by molecular and genomic epidemiology

Nigel French
mEpiLab, OIE Collaborating Centre for Veterinary Epidemiology and Public Health, Massey University, Palmerston North, New Zealand

Despite major advances in food and water safety, animal husbandry and the development of vaccines and antimicrobials, communicable diseases continue to impose significant health and economic impacts worldwide. It is estimated that at least 300 new human pathogens have emerged over the last 60 years – the majority of these are zoonotic and the rate of crossover into humans appears to be increasing. This increase is attributed to changes in socioeconomic, environmental and ecological factors that are collectively altering the infectious disease landscape. Previously treatable pathogens are developing resistance to antibiotics, and changes in food consumption patterns (e.g. towards raw food), agricultural intensification, urbanisation and encroachment into wild spaces, climate change, and human population growth are all examples of escalating forces that are leading to the emergence and resurgence of zoonotic diseases.

Many agents of infectious diseases impact economies in multiple ways – for example through the cost of healthcare and loss of productivity, and the effect on export trade. In New Zealand, the rising number of Shiga toxin-producing Escherichia coli (STEC) infections, particularly in children, is higher than reported in similar developed countries, costing the economy an estimated NZ$15–20M per annum. This economic impact is compounded by the effect that cattle-associated pathogens (such as STEC O157) have on our export of red meat, particularly to the United States of America and Europe, where increasingly stringent and costly testing requirements impose a significant burden on New Zealand producers and threaten market access.

Advances in our understanding of microbial genetics, evolutionary biology and modelling, coupled with the increasing availability of pathogen genome sequence data and accompanying ‘metadata’ (e.g. host epidemiological and demographic data and pathogen phenotypic data), are set to transform epidemiology and public health, and make major contributions to the control of zoonoses. A major challenge is the integration of models of evolutionary ancestry and the transmission of infectious disease to understand and model how pathogens are transmitted. This includes refining our approaches to identifying the reservoirs and pathways for food and waterborne zoonoses, and identifying host and geographical transition events. In this talk I will outline how recent advances in molecular epidemiology, whole-genome sequencing and our understanding of pathogen evolution are improving public health, and highlight some of the challenges facing the emerging fields of phylodynamics and genomic epidemiology.

Strengthening epidemiological capacity within a One Health framework for managing emerging and endemic zoonotic diseases

Joanna McKenzie
International Development Group in collaboration with EpiCentre, IVABS, Massey University, Palmerston North, New Zealand

Massey University is recognised as a leading international partner for the development of individual and institutional capacity to detect and manage emerging and endemic zoonotic diseases using a collaborative One Health approach. We have just completed a four-year programme to strengthen epidemiological capacity in human and animal epidemiology in South Asia funded by the European Union through the Avian and Human Influenza Trust Fund, administered by the World Bank. The seven participating countries were: Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. In addition, we have recently completed delivering a One Health Master’s degree programme for doctors and veterinarians in Mongolia and China and are now beginning a three-year One Health community capacity building programme in four of the seven South Asian countries: Afghanistan, Bangladesh, Bhutan, and Nepal.

The core principle to our approach is combining formal education with applied training and then the application of new knowledge and skills within government sector institutions in the participating countries; i.e. ‘education into action’. Formal education provides motivation and rewards for individuals through tangible and recognisable academic output, and at the same time builds knowledge, relationships, confidence, self-belief, and an understanding of the One Health concept amongst the postgraduate group. Subsequent applied training reinforces the academic learning through
Applying theoretical knowledge and operationalising the One Health approach in field-based collaborative investigation projects (CIPs). This strengthens institutional capacity, collaboration between institutions and sectors, project management capability, reinforces epidemiological understanding and generates useful information about priority zoonotic diseases nationally and regionally.

Building relationships between professionals in the human, domestic animal and wildlife health sectors underpins the One Health approach by generating mutual understanding, respect and trust as the basis for improved communication, sharing disease information and sharing responsibility for managing zoonotic diseases through integrated programmes. Relationships are built on shared experiences; studying together and implementing collaborative field-based projects provide the opportunity to build enduring relationships at the same time as developing epidemiological skills.

In addition to formal education and applied training we have identified the following key factors to be critical to the success of this ‘education to action’ approach to build capacity in a One Health framework;

1 Mobile and web-based tools are a critical element to facilitating collaboration and delivery of formal and applied training to a large group of people whilst they remain in their workplace in different organisations and geographic locations.

2 Building the applied training programme around CIPs provides a real-world focus for collaboration between the key government institutions from the different health sectors and between government and non-government organisations. In addition to building further epidemiological capacity and producing valuable information, it contributes to building a regional network of people from multiple sectors and multiple countries who were involved in the same programme.

3 A sustainable One Health approach involves institutionalisation of One Health within government. Formalising financial and operational agreements with senior decision makers in the key government health institutions to support the CIPs and to support the establishment of One Health Hubs as government-led functional networks of people involved with One Health in each country, contributed significantly to gaining the support of the decision makers for the collaborative approach.

In this presentation we will describe in more detail the key components of the One Health programmes, challenges and critical success factors.

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**Concurrent session 3A: Advances in record linkage 2**

11:00am–12:30pm

Invited speaker: Frank Sullivan

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**Advances in record linkage**

Frank Sullivan

Department of Family & Community Medicine and Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

Deterministic record linkage methods used in the Farr Institute @ Scotland (a collaboration between six Scottish Universities and NHS National Services Scotland) which were briefly described in the plenary ‘From Bespoke linkage to Big data in the age of the internet’ will be described in greater detail. The roles of safe havens, trusted third parties and proportionate governance in a range of use cases will be considered. The reasons for creating a register of people interested in participating in health research and who agree to allow researchers to use the coded data in their various electronic medical records to check whether they might be suitable for health research studies will also be presented.

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**Initiation and maintenance of cardiovascular medications following cardiovascular risk assessment in a large primary care cohort**

Suneela Mehta1, Sue Wells1, Corina Grey1, Tania Riddell1, Andrew Kerr2, Roger Marshall1, Shanthi Ameratunga1, Jeff Harrison2, Tim Kenealy2, Dale Bramley6, Wing Cheuk Chan2, Simon Thornley2, Gerhard Sundborn1, Rod Jackson1

1. Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, Auckland, New Zealand
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4. Department of General Practice and Primary Health Care, The University of Auckland, Auckland, New Zealand
5. Waitemata District Health Board, Auckland, New Zealand
6. Health Intelligence Unit, Counties Manukau District Health Board, Auckland, New Zealand
Aims and objectives
To examine whether standardised cardiovascular disease (CVD) risk assessment is associated with appropriate initiation and maintenance of medication in a large primary care cohort.

Methods
Overall, 90,631 people aged 30–80 years were followed for up to three years after CVD risk assessment between January 2006 and October 2009. Patients either had prior CVD or had CVD risk estimated. The individual risk profiles were anonymously linked to blood pressure-lowering and lipid-lowering dispensing data in the six months before and in consecutive six-month blocks after baseline assessment.

Results
At baseline, combination therapy was already used by two-thirds of patients with prior CVD, one-quarter with five-year CVD risk>10% and one-tenth with low CVD risk. Among these previously treated patients, dispensing for blood pressure-lowering, lipid-lowering, or both medications together declined by only 4–16% up to three years after baseline assessment, irrespective of risk category. Among patients untreated at baseline, combination therapy was initiated within six months for 21% with prior CVD, 16% with five-year risk>15%, 10% with 10–14% five-year risk, and 3% in the lowest risk category. Across the study population, patients with prior CVD had the highest dispensing rates for each medication category, and incrementally higher dispensing rates were noted as risk group increased.

Conclusions
In this primary care cohort, most patients already using CVD medications at baseline risk assessment maintained treatment over a maximum of three years follow-up, irrespective of estimated baseline risk. Among patients untreated at baseline, subsequent dispensing rates were strongly related to estimated risk group. Around 15–20% of untreated high-risk patients commenced combination pharmacotherapy within six months of risk assessment.

The impact of processes on care on hospitalisation among people with diabetes: a record linkage study

Elizabeth J Comino, Mark Harris, Fakhrul Islam
Centre for Primary Health Care and Equity, University of New South Wales, Sydney, Australia

Aims and objectives
Key strategies to improve diabetes management include widely disseminated treatment guidelines supported by practice incentives through Medicare, Australia’s universal health insurance scheme. This study explores the impact of accepted processes of diabetes care on hospitalisation for people with diabetes using record linkage.

Methods
A linked data collection comprising baseline data from 20,433 New South Wales residents participating in the 45 and Up Study with self-reported diabetes, their claims for medical care under Medicare and their hospital records held by the NSW Ministry of Health was created. Claims for processes of care (continuity of GP care, HbA1c testing, and completion of an annual cycle of care) for 15 months at recruitment were extracted as were hospital records for 12 months following recruitment. Adjusted relative rates were estimated using zero-inflated Poisson regression models.

Findings
Continuity of care, HbA1c testing, and record of an annual cycle of care was observed for 47.1%, 62.7% and 25.0% of participants respectively. At least one hospital admission was recorded for 32.8% of participants. Participants without continuity of care (RR: 1.11 (95% CI: 1.07–1.15)), at least one claim for HbA1c testing (RR: 1.12 (95% CI: 1.08–1.16)) or without a claim for completion of an annual cycle of care (RR: 1.32 (95% CI: 1.26–1.38)) were significantly more likely to be hospitalised.

Conclusions
Implementation of processes of care for people with diabetes reduces the risk of hospitalisation. Further research is needed to establish whether this is due to improved access to timely care or better control of symptoms such as blood sugar.

Power of data linkage: use of linked data to validate the incidence of acute coronary events in Australia

Anna Reynolds, Graz Hamilton, Lynelle Moon, Sushma Mathur
Health Group, Australian Institute of Health and Welfare, Canberra, Australia.

Aims and objectives
Coronary heart disease (CHD) is the largest single cause of death in Australia and monitoring the number of new cases of CHD is critical for health system planning and delivery. However, in Australia there is no national heart disease register or nationally linked data. In the absence of such data proxy measures have been developed, based on unlinked data, to estimate the incidence of acute of acute coronary events. The main objective of this study was to use linked data from two large Australian states to assess the validity and robustness of the method for estimating the incidence of acute coronary events in Australia.

Methods
This study used linked hospitalisation and deaths data from Western Australia and New South Wales to assess the consistency and accuracy of the key assumptions underlying
the method for estimating the incidence of acute coronary events. The linked data sets were used to assess the relationships between consecutive or multiple hospitalisations over time, coding of transfers and deaths in hospital, and concordance between hospital and death disease coding.

Results
Analysis of the linked datasets indicates that the assumptions underlying the method are largely valid. However, the results suggest that the method appears to underestimate the rate of acute coronary events.

Conclusions
This study highlights that using linked datasets is a powerful and valuable tool for assessing the accuracy and validity of data generated from unlinked administrative data. It also broadened our understanding of key factors that influence the estimation of acute coronary events using unlinked data.

Risk factors for death due to pandemic influenza A (H1N1) 2009 in New Zealand: a linked administrative data study

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2. Ministry of Health, Wellington, New Zealand
3. Environmental Science and Research, Wallaceville, New Zealand
4. NZ Pandemic Influenza Morbidity and Mortality Review Group, Wellington, New Zealand

Aims and objectives
Chronic health conditions and pregnancy appear to be major risk factors for complications of influenza A (H1N1) 2009. This study estimates the risks of H1N1-associated death by age and ethnicity during the 2009 influenza pandemic in New Zealand, adjusting for multiple measures of health status.

Methods
Relative mortality rate ratios were calculated from the 48 confirmed deaths during the pandemic and from population counts that use the joint distribution of age, ethnicity and comorbidities recorded in national linked administrative data. Stepwise regression was used to find the simplest model that explained the mortality risk.

Results
After controlling for age, obesity, respiratory conditions other than asthma, neurological conditions, malignancy (cancer) and pregnancy, no significant differences remained for mortality rates by ethnicity, diabetes, or asthma.

Conclusions
Morbid obesity (BMI 40+), malignancy, and respiratory conditions other than asthma were found to be the most important risk factors for mortality.

Measuring residential aged care in New Zealand – methodological challenges in using available data

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2. School of Population Health, The University of Auckland, Auckland, New Zealand
3. COMPASS, The University of Auckland, Auckland, New Zealand

Aims and objectives
Residential aged care (RAC) is used by older people who are no longer able to live independently. In New Zealand, monitoring of use has been limited to those receiving subsidies. Residents’ acute hospitalisations have not been reported. New ways of using existing data are presented describing utilisation of RAC and of hospitals by RAC residents.

Methods
Research survey data (OPAL, conducted in 2008 in Auckland) was linked to subsidy and hospitalisation data. Comparison of unsubsidised vs. subsidised tested the possibility that adjustments for private payers would bias counts in RAC. Numbers of deaths in hospital of RAC residents in four studies provided estimates of lifetime use of RAC. Adjusting for length-biased sampling of survey data permitted estimates of use of hospitalisations by RAC residents.

Results
Records of 5,961 residents aged 65+ years were matched with subsidy data; 25% were unsubsidised. Comparison of unsubsidised vs. subsidised showed that overall reported counts are understated at both high and low levels of care. In New Zealand, 38% of people aged 65+ in New Zealand die in RAC. We estimate a further 9% die in acute hospital that live in RAC; 47% is a minimal estimate of lifetime use, higher than most other countries.
Conclusions
Reported characteristics of residents may be biased in terms of age, gender and care needs. Reuse of existing data has meant that closer estimates of RAC use are available for New Zealand. Official New Zealand reports (in Ministry of Health, WHO and OECD reports for example) may understate use of RAC.

Measurement error in Cancer Council Victoria’s FFQ and correction for its effect on estimates of diet-disease association using recovery biomarkers

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Aims and objectives
Large epidemiological studies often collect data on food consumption using a food frequency questionnaire (FFQ). Intake of any particular nutrient is known to be measured with substantial error. A dietary calibration sub-study was, therefore, conducted by Cancer Council Victoria (CCV) to quantify the extent of measurement error in its FFQ and to enable correction for the effect of measurement error on estimates of diet-disease association.

Methods
A representative sample of approximately 900 participants of the Melbourne Collaborative Cohort Study (MCCS). Each participant completed the CCV-FFQ, three 24-hour diet recalls and a 24-hour urine collection. Urine was used to objectively measure the daily intake of nutrients for which a recovery biomarker was available. These calibration data were used to estimate correction factors, which in turn, can be used to correct for the effect of measurement error on estimates of association between nutrient intake and disease.

Results
Comparison of FFQ-based nutrient intake with a recovery biomarker showed that measurement error in the FFQ was substantial. Depending on the nutrient, measurement error may be greater among south European-born than Australian-born participants. Energy adjustment reduced measurement error among Australian, but not among south European-born participants. In illustrative applications, corrected estimates of association between a nutrient intake and disease were substantially greater than uncorrected estimates.

Conclusions
It is important to correct estimates of diet-disease association for measurement error in order to appropriately assess effect size. Correction factors for the CCV-FFQ can be applied to MCCS studies and potentially also to external studies.

Weekly cholecalciferol supplementation results in significant reductions in infection risk among the vitamin D deficient: results from the CIPRIS trial

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1 Menzies Research Institute Tasmania, University of Tasmania, Hobart, Australia
2 School of Pharmacy, University of Tasmania, Hobart, Australia
3 School of Medicine, University of Tasmania, Hobart, Australia

Aims and objectives
Observational studies suggest vitamin D deficiency may contribute to the risk of acute infections. We undertook an RCT of cholecalciferol supplementation as an intervention against acute infections.

Methods
A cohort of 34 adults was randomised to 20,000IU/week cholecalciferol or identical placebo and followed for 17 weeks during winter 2012. Infections were monitored by daily online infectious symptom reporting, with potential infections assessed in clinic.

Results
No treatment effect was observed in the aggregate for infection risk, duration or severity. However, on stratification by level of baseline serum 25-hydroxyvitamin D (25(OH)D), a significant treatment effect on infection risk was evident among those who were vitamin D deficient at the start of the study. This effect attenuated in an expected fashion on raising the threshold of vitamin D sufficiency. A similar, but less consistent and nonsignificant effect was seen for infection severity. Treatment was associated with significantly higher 25(OH)D compared to placebo; however the maximum 25(OH)D was 154nmol/L and no adverse events occurred.

Conclusions
The results of this study support a protective effect of vitamin D supplementation against the occurrence of acute infections among persons who are vitamin D deficient. Larger studies are needed to validate these findings.
Development and impact of redistribution methods for the Australian Burden of Disease Study

Lynelle Moon
Australian Institute of Health and Welfare, Canberra, Australia

Aims and objectives
A key component of burden of disease (BOD) methodology is reassigning inappropriately coded causes of death to align with causes of interest to the study. Despite the high quality of Australian deaths data, it contains inappropriately coded causes of death, usually arising from incomplete documentation on the death certificate. Redistribution of these deaths has not always been based on empirical evidence in previous BOD studies. The Australian BOD study is assessing the most appropriate methods for reassigning these deaths using direct evidence (from data linkage studies) and indirect empirical evidence from multiple causes of death (MCOD) data.

Methods
The quantity of deaths requiring redistribution using Global Burden of Disease (GBD) and Australian methods were compared. The impact on target causes using GBD redistribution algorithms and those derived locally were compared.

Results
The Australian methodology identified approximately 10% of deaths for redistribution compared to 18% using GBD methods. Redistribution using locally derived direct evidence for cancer-related causes and indirect empirical evidence from MCOD data for other causes, modified the patterns of cause of death (and years of life lost) compared to the GBD algorithms.

Conclusions
The quality and breadth of the Australian mortality data and the results of local linkage studies facilitates development of Australian-specific redistribution algorithms. The algorithms developed for the Australian BOD study provide a sound empirical basis for reassigning deaths and can improve the public and population health utility of the fatal burden estimates. These algorithms can also be used to inform redistribution algorithms for other BOD studies.

Death in the digital age: a comparison of cross-jurisdiction utility of an electronic coronial data retrieval system

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² Australian Centre for Agricultural Health and Safety, The University of Sydney, Sydney, Australia

Aims and objectives
To illustrate, using a comparison of quad-bike fatalities in New Zealand and Australia, how cross-jurisdiction electronic coronial data sources function, and the benefits and limitations of these systems for injury surveillance.

Methods
The National Coronial Information System (NCIS), Australia stores coronial files for the New Zealand and Australian coronial jurisdictions, providing a cross-jurisdiction retrieval system to access coronial data. Fatal injury coronial cases in New Zealand and Australia were identified from the NCIS using object of injury and key word searches; electronic coronial files were retrieved and reviewed with sociodemographic, injury and injury-event data abstracted and analysed.

Results
For the period July 2007 – July 2012, 38 quad-bike fatalities occurred in New Zealand; however, only 18 of these quad-bike fatalities were present in the NCIS system in January 2014. Close to 100% of quad bike cases were able to be identified for Australia. The discrepancy can be attributed to differences in the treatment of closed and open coronial cases between jurisdictions. Further examples will be given of differences in the way the NCIS functions between the two jurisdictions and of the impact of the NCIS for injury epidemiology surveillance and research in New Zealand compared with the Australian experience.

Conclusions
Despite promising electronic data accessibility and data utility, considerable caution should be applied when using New Zealand electronic coronial files from NCIS. For New Zealand, infrequent updates of closed coronial cases can result in incomplete case capture in the fatally injured population.
Supporting lower salt food choices for people with CVD: randomised controlled trial of the SaltSwitch smartphone app

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1 National Institute for Health Innovation, The University of Auckland, Auckland, New Zealand
2 George Institute for Global Health, University of Sydney, Sydney, Australia

Aims and objectives
To determine the effectiveness of the SaltSwitch smartphone application in lowering the salt content of food purchases made by households where at least one member has diagnosed cardiovascular disease (CVD).

Methods
SaltSwitch is a novel smartphone app to help people with CVD make lower salt food choices. The app enables shoppers to scan the barcode of a packaged food and receive an immediate, interpretive, traffic light nutrition label on the screen along with suggestions for healthier lower-salt alternatives. A six-week two-arm parallel RCT to determine the effectiveness of SaltSwitch began in June 2014. Three-hundred adults with CVD and their corresponding main household shoppers are being recruited from research lists, cardiac rehabilitation clinics, and communities in Auckland. Participants are randomised to either: (1) the SaltSwitch smartphone app; or (2) no intervention. The primary outcome is the salt content of household food purchases assessed. Secondary outcomes include: household purchases of saturated fat and energy, food expenditure, ambulatory blood pressure, and self-reported use and acceptability of the SaltSwitch app. Household nutrient purchases will be assessed using objective till receipt data; receipts will be scanned and electronically linked with branded food composition data.

Results
Details of app development, study design, and progress on recruitment will be presented. Data collection will be complete by November 2014, and trial results are due mid-2015.

Conclusions
The SaltSwitch smartphone app has the potential to improve lower salt intakes for people with CVD and effectiveness will be assessed in this robust RCT.

The public health and economic impact of leptospirosis in New Zealand

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In New Zealand, human leptospirosis ranks highest among notified human diseases transmitted from animals. Human pathogenic Leptospira serovars are prevalent in domestic livestock and in wildlife.

The disease predominantly affects the rural workforce and abattoir workers. Annual infection rates of workers in eight abattoirs averaged 9% (5–19%). Twenty percent of these infections were associated with moderate signs of illness, and 3% with severe clinical disease. Two percent of sheep abattoir workers were 4.4 days (SD: 8.0 days) absent from work due to mild-moderate clinical signs and 0.6% suffered serious from leptospirosis lasting several weeks. These pathogens also cause abortion in cattle, mortality of lambs and ewes, reduced growth rates and reproductive performance of deer, and many farmers invest in vaccination to protect against infection of humans. Thus, leptospirosis affects the net income from farming.

Data from abattoir worker studies about the prevalence, the incidence of seroconversion (i.e. new infections), associated rates of mild and severe disease, details about notified cases, and demographic information, and production effects on livestock farming were aggregated to approximate the public health and economic impacts of leptospirosis on the human population. Results suggested that the 14% of the total population living in rural environments suffered 96% of the disease burden. Based on 113 human cases notified in 2012, the estimated underreporting rate was 43-fold for mild and 12-fold for moderate to severe leptospirosis. Thus about 1,400 clinical cases may actually occur each year, a rate of 32 per 100,000. The estimated number of years lost due to lower quality of life was 36 per 100,000, a rate similar to the...
worldwide impact of cholera (65 per 100,000) or amoebiasis (35 per 100,000). The annual financial cost of working days lost and treatment was estimated as NZS30.4 million. Moreover, the loss of livestock production due to sub-optimal growth or reproductive performance adds to the total economic cost of this disease. Results of this study contribute to further economic considerations for continued investigations of the dynamics, reservoirs and sources for human exposure to *Leptospira* to be able to develop and propagate effective risk mitigation and possibly livestock vaccination strategies.

**Geographic divergence of bovine and human Shiga toxin-producing *Escherichia coli* O157:H7 genotypes in New Zealand**

**Patricia Jaros**¹, **Adrian Cookson**², **Donald Campbell**¹, **Grant Duncan**¹, **Deborah Prattley**¹, **Thomas Besser**³, **Smriti Shringi**³, **Patrick Carter**³, **Jonathan Marshall**³, **Steve Hathaway**³, **Nigel French**³

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4. Ministry for Primary Industries, Wellington, New Zealand

**Aims and objectives**

Shiga toxin-producing *Escherichia coli* O157:H7 (STEC O157) is a zoonotic pathogen of public health concern worldwide. This molecular epidemiological study compared the geographical distribution of genotypes of STEC O157 isolated from bovine and human sources in New Zealand and assessed evidence of localised transmission of STEC from cattle to humans in New Zealand.

**Methods**

Multivariable methods were applied to pulsed-field gel electrophoresis (PFGE, XbaI) and Shiga toxin-encoding bacteriophage insertion (SBI) genotyping data. SBI types of 40 bovine and 363 human STEC O157 isolates from NZ were evaluated.

**Results**

The molecular analysis of isolates’ PFGE profiles revealed three distinct clusters, each represented by a dominant SBI type (AY2a, WY12a, and ASY2c combined with SY2c). The distribution of SBI types observed differed between North and South Islands in bovine faecal (p < 0.001) and human isolates (p < 0.001), with SBI types AY2a and WY12a more prevalent in the North Island, and ASY2c/SY2c more common in the South Island. Results of population differentiation also showed a within-island-clustering of human genotypes, providing evidence for highly localised geographical structuring.

**Conclusions**

The observed geographical distinction between bovine and human STEC O157 isolates from the North and South Islands of New Zealand provides supporting evidence for localised transmission of STEC between cattle and humans (or transmission to both hosts from another environmental reservoir).

**One Health: building relationships between human and animal health professionals through epidemiology**

**Joanna McKenzie**¹, **Barry Borman**²

1. International Development Group in collaboration with EpiCentre, IVABS, Massey University, Palmerston North, New Zealand
2. Centre for Public Health Research, Massey University, Wellington, New Zealand

Building relationships between professionals in the human, domestic animal and wildlife health sectors underpins the One Health approach by generating mutual understanding, respect and trust as the basis for improved communication, sharing disease information and sharing responsibility for the integrated management of zoonotic diseases. Relationships are built on shared experiences; studying together and implementing collaborative field-based projects provide the opportunity to build enduring relationships at the same time as developing epidemiological skills. However, there are many challenges to achieving these outcomes when designing, delivering and supporting integrated formal and applied education programs for in-service participants from multiple health sectors in multiple countries who have different professional backgrounds, experience, prior learning levels, levels of seniority and socio-political environments.

We will discuss how Massey University managed the major challenges in building strong inter-sectoral relationships and contributing to the institutionalisation of One Health through delivering an integrated Master’s degree program to human and animal health professionals in seven countries of South Asia (Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka) plus China and Mongolia, and subsequently supporting applied learning in eleven collaborative epidemiology projects that investigated zoonoses in South Asia. Challenges included: designing teaching material of relevance to all sectors, managing multi-sectoral delivery of teaching material, creating opportunities for professionals from the different sectors and different countries to interact and supporting the activities so
they achieved positive outcomes both from a relationship-building and an epidemiological learning perspective, creating a government institutional environment that supported collaboration amongst the sectors in each country, communicating at a distance.

Healthcare usage and loss of productivity due to infectious gastroenteritis: Australia 2008–09

Yingxi Chen, Laura Ford, Gillian Hall, Timothy Dobbins, Martyn Kirk

National Centre for Epidemiology and Population Health, The Australian National University, Canberra, Australia

Aims and objectives

The aim of this study was to estimate the healthcare usage and loss of productivity due to gastroenteritis in Australia using the National Gastroenteritis Survey II.

Methods

In 2008–09, 7,578 participants across Australia were surveyed about common infectious illnesses. A gastroenteritis case was defined as a person experiencing ≥ 3 loose stools and/or ≥ 2 vomits in a 24-hour period, excluding cases with a non-infectious cause for their symptoms, such as pregnancy or consumption of alcohol. A stricter definition was applied if the person had concomitant respiratory symptoms, requiring ≥ 4 loose stools and/or ≥ 3 vomits in a 24-hour period. Lost productivity was considered any time full or part-time employed individuals missed from paid work due to having, or caring for someone with gastrointestinal illness. Results were weighted to obtain nationally representative estimates.

Results

Fifty-two (15%) of cases visited a doctor due to gastroenteritis, and 126 (37%) of cases reported taking at least one medication for their symptoms. Seventy-nine (23%) cases reported missing ≥ 1 days paid work due to gastroenteritis. Based on these results, an estimated 2.71 million (95% CI: 1.80–3.62 million) Australians visit a doctor due to gastroenteritis annually, and 5.5 million (95% CI: 4.4–6.6 million) courses of medication are used for gastroenteritis. Gastroenteritis results in a total of 8.7 million (95% CI: 5.2–12.2 million) days of missed work each year in Australia.

Conclusions

Gastroenteritis incurs considerable resource usage and substantial costs for employers in Australia. The indirect costs of gastroenteritis are significant, particularly from lost productivity.

Choosing optimal controls for a rheumatic fever case-control study in New Zealand

Michael G Baker¹, Diana Lennon², Jason Gurney³, Teuila Percival¹, Nevil Pierce⁴, Tony Merriman¹, Deborah Williamson⁵, Nikki Moreland⁶, Colleen Murray⁷, Nigel Wilson⁸, Catherine Jackson⁹, Jane Oliver¹, Richard Edwards¹

¹ University of Otago, Wellington, New Zealand
² The University of Auckland, Auckland, New Zealand
³ Institute of Environmental Science and Research Limited, Auckland, New Zealand
⁴ Auckland District Health Board, Auckland, New Zealand

Aims and objectives

This paper reviews issues around the choice of optimal control groups for a New Zealand case–control study to identify modifiable risk factors for rheumatic fever (RF). This is probably the most critical decision in designing an effective case-control study.

Methods

The study aims to estimate the contribution of potentially modifiable environmental factors (e.g. household crowding) host factors (e.g. vitamin D deficiency), healthcare (e.g. participation in the throat swabbing RF prevention programme), and organism characteristics (e.g. emm types of Streptococcus pyogenes associated with RF). An options appraisal was carried out for possible control groups based on these aims, RF epidemiology (95% of cases are Māori or Pacific children), potentially available control populations, issues of matching, and study resources.

Results

The key advantages and disadvantages of potential control groups will be presented. This study aims to recruit 200 RF cases over the 2014–16 period. It proposes using two control groups: 1) Population controls which include all children interviewed by the New Zealand Health Survey over this period (approximately 9,000); 2) A nested subsample of close-matched controls (400), matched to cases by age group, ethnicity, deprivation, geographic area, time period and gender who will be specifically interviewed and approached for suitable biological specimens.
Conclusions
There are increasing options for control populations for case-control studies. Because the New Zealand Health Survey provides access to a large population control group this has allowed us to use a second closely matched control population. Consequently, this study will have increased statistical power to investigate very specific hypotheses about risk factors for RF in vulnerable New Zealand children.

Concurrent session 3D:
Social and digital media in epidemiology 1
11:00am–12:30pm
Invited speaker: Robyn Whittaker

Social and digital media
Robyn Whittaker
National Institute for Health Innovation (NIHI), The University of Auckland, Auckland, New Zealand

This session will provide an overview of digital health, particularly the use of mobile communications technologies and new social media to reach into disadvantaged and traditionally under-served populations. Dr Whittaker will provide a summary of the international research and the current state of mPopulation Health, before introducing speakers from accepted papers related to this topic.

The use of mobile phone technology to improve data collection for vaccine safety monitoring
Annette Regan, Lauren Tracey, Christopher Blyth, Donna Mak, Peter Richmond, Paul Effler
School of Pathology and Laboratory Medicine, University of Western Australia, Perth, Western Australia

Aims and objectives
Active vaccine safety surveillance systems have historically relied on telephone surveys, which are time-intensive and often result in low response rates. In 2014, the Western Australia Department of Health explored the use of mobile phone data capture methods for monitoring influenza vaccine safety.

Methods
As part of the Follow-up and Active Surveillance of Trivalent influenza vaccine in Mums (FASTMum) program, an SMS was sent to 1,591 pregnant women who received influenza vaccine in 2014, asking whether an adverse event following immunisation (AEFI) was experienced. Women who replied ‘yes’ were sent a mobile-phone survey to ascertain AEFI details; 369 women were administered a similar telephone survey to compare AEFI reported by telephone to SMS.

Results
The incorporation of mobile phone technology resulted in a five-fold increase in sample size, a 36% reduction in cost, and the capture of data in near real-time. A greater proportion of women responded via SMS compared to telephone (85.7% and 71.3%, respectively); 33% of women opted to describe their AEFI by mobile-phone survey. Although women reporting by telephone were twice as likely to report any AEFI compared to SMS (30.0% and 13.9%, respectively), a similar proportion of women reported medically attended AEFIs by telephone and SMS. No serious vaccine-related events were reported by SMS or telephone.

Conclusions
Results support the safety of antenatal vaccination in near real-time. Although differences in mild reactions were detected, these results suggest the integration of mobile phone technology is a feasible method for improving the timeliness and efficiency of vaccine safety monitoring.

Google Flu Trends and the media: is Google Flu Trends set to take over from traditional influenza surveillance methods, or is the effect of media influence too great?
Monique Chilver
The Australian Sentinel Practices Research Network (ASPREN), Discipline of General Practice, The University of Adelaide, Adelaide, Australia

Aims and objectives
Influenza is a significant global public health issue, causing considerable mortality and morbidity worldwide. Surveillance is an important non-pharmaceutical method to control influenza. Recently, new methods of influenza surveillance, utilising the internet and social media, have been developed. Most notably, Google Flu Trends (GFT) was developed by the Google Corporation as a free, publicly available method of Influenza Like Illness (ILI) surveillance. We aim to compare influenza surveillance data from traditional sources, and compare this to Google Flu Trends data, and furthermore explore the effect of media attention on Google Flu Trends data.
Materials and methods

Weekly incidence of ILI by GoogleFlu Trends during 2007–13 was compared with data with data from two traditional surveillance systems: ILI data reported by the Australian Sentinel Practices Research Network (ASPREN) GP surveillance, and the national laboratory notifications of influenza reported to the National Notifiable Diseases Surveillance System (NNDSS), as well as the incidence of influenza-related media stories from Factiva.

Results

ILI rates recorded by ASPREN GPs, and Google Flu trends showed similar trends of influenza activity; however, this was not always consistent. Increases and peaks in laboratory notifications by NNDSS occurred after increases in ILI activity reported by ASPREN. Google Flu Trends appeared to show increases in rates when media attention increased, above that viewed by traditional surveillance systems.

Conclusions

Social media and internet-based influenza surveillance methods cannot replace classical methods, being highly influenced by influenza media coverage.

‘Healthy mobile check-ins’ study: using GIS in smartphones to track use of urban environment by survivors of endometrial cancer

Julie-Anne Carroll1, Mokia Janda1, Jess Rodgers2, Jaz Choi2, Pamela Pollock1, Tracy Washington3

1 Faculty of Health, Queensland University of Technology, Brisbane, Australia
2 Creative Industries Faculty, Queensland University of Technology, Brisbane, Australia
3 Science and Engineering Faculty, Queensland University of Technology, Brisbane, Australia

Aims and objectives

Our study aims to test the capacity of a newly developed smartphone innovation to obtain data on social, structural, and spatial determinants of the daily health-related behaviours of women living in urban Brisbane neighbourhoods who have survived endometrial cancer.

Methods

The women used a mobile web app designed specifically for the project to record GIS/location data on every destination they visited within their local urban neighbourhoods over a two-week period. Additionally, we gathered textual data on the social context/reasons for travel, as well as mode of transport to reach these destinations. The data was transported to SPSS and Google Earth for statistical and spatial analysis. We then met with the women to discuss lifestyle interventions to maximise their use of their local neighbourhoods in ways that could increase their physical activity levels and improve their overall health and wellbeing. These interventions will be evaluated and translated into a large-scale national study if effective.

Presenting the new general record of incidence of mortality (GRIM) books

Jeanette Tyas, Karen Bishop

Australian Institute of Health and Welfare, Canberra, Australia

Aims and objectives

To provide an up-to-date, accurate, accessible and useful presentation of long-term national cause of death data for a variety of data users, which can be accessed online using readily accessible software.

Methods

GRIM Books are interactive Excel workbooks that house historical and recent mortality data for specific causes of death in a readily accessible and easy-to-use format. They combine recent data from the AIHW’s National Mortality Database with historical deaths sourced from ABS reports. They contain data from 1907 to 2011. A suite of GRIM books has been created for a selected set of diseases of national health importance and public interest.

Results

The workbooks present age and sex-specific counts and rates of deaths and other summary measures of mortality including mean age at death, crude and age-standardised mortality rates and lifetime risk of dying for all and specific causes of death. The layout is simplified and user-friendly.

Conclusions

GRIM Books are the only known electronic source of historical tabulations of mortality by cause of death for Australia. They provide a useful reference for a broad audience for monitoring mortality in Australia, and address a
data gap by providing consistent, comprehensive and accurate deaths data in a format not available elsewhere. Many are available online, free of charge.

Concurrent session 3E: Mental health
11:00am–12:30pm

How does recent serious mental illness impact on colorectal cancer survival?

Ruth Cunningham1,2, Diana Sarfati1, James Stanley1, Debbie Peterson1, Sunny Collings1
1 Social Psychiatry and Population Mental Health Research Group, University of Otago, Wellington, New Zealand
2 Department of Public Health, University of Otago, Wellington, New Zealand

Aims and objectives
To quantify the effect of recent serious mental illness on survival from colorectal cancer, and to examine possible mediating factors.

Methods
Patients with colorectal cancer were identified from New Zealand’s Cancer Registry (2006–10), and their data linked to psychiatric service records (inpatient and community, 2001–10) and death records (2006–10).

Exposure: psychiatric service use in the five years prior to cancer diagnosis, divided into Group A (people with diagnoses of schizophrenia, bipolar affective disorder, schizoaffective disorder) and Group B (those with other or no recorded psychiatric diagnoses).

Outcome: cancer-specific survival.

Analysis: Cox proportional-hazards modelling. The maximum post-diagnosis follow-up time was five years.

Results
4,022 people with colorectal cancer diagnosed before age 65 were identified, of whom 190 had contact with psychiatric services in the five years prior (33 in Group A). Those in Group A were nearly three times as likely to die from their cancer after adjusting for demographic confounders (HR 2.92 (95% CI: 1.75–4.87)), while those in group B did not have a significantly elevated risk of death (HR 1.15 (95% CI: 0.84–1.59)). Further adjustment for stage, deprivation and comorbidity reduced the estimate for Group A (HR 2.01 (95% CI: 1.20–3.37)), while adjustment for these factors increased the estimate for Group B (HR 1.36 (95% CI: 0.99–1.88)).

Conclusions
People with recent psychiatric service use for Group A conditions have worse colorectal cancer survival than those with no psychiatric service contact. Delayed diagnosis is a factor in this disparity. Inequalities in cancer care are likely a factor in the differences in survival which remain after full adjustment.

Does wealth buffer the deleterious mental health effects of acquiring a disability in adulthood?

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1 Gender and Women’s Unit, Melbourne School of Population and Global Health, The University of Melbourne, Parkville, Australia
2 Population Health Strategic Research Centre, School of Health and Social Development, Deakin University, Burwood, Australia
3 McCaughey VicHealth Centre for Community Wellbeing, Melbourne School of Population and Global Health, The University of Melbourne, Parkville, Australia

Aims and objectives
To assess whether household wealth prior to onset of disability reduced the negative effects of acquisition of a disability on mental health.

Methods
Twelve waves of data from the Household Income and Labour Dynamics of Australia survey of Australians aged 15 years and older. Respondents who reported at least two consecutive waves of disability preceded by at least two consecutive waves without disability were included. Household wealth was defined as assets minus debt and the outcome measure was the mental health component score of the SF-36. Fixed-effects linear regression analysis was performed which included an interaction between disability acquisition and household wealth prior to disability acquisition. Models were adjusted for age, occupational status, relationship status and an age×disability acquisition interaction.

Results
The sample included 2,112 respondents and 16,162 observations. We found evidence to support effect modification by wealth prior to disability onset (LR χ2 =24.7, p<0.001). In adjusted models, the deterioration in mental health was greatest among the lowest wealth tertile (β=-2.72 (95% CI: -3.61, -1.83)) compared to the mid (β=-1.39 (95% CI: -2.10,-0.68)) and highest (β=-1.11 (95% CI: -1.74, -0.48)) tertiles. Exclusion of respondents reporting a psychological disability attenuated the results slightly but did not change the gradient.
Mental health, physical health, work and retirement in men and women: a prospective study of 21,608 Australians aged 55 to 69 years

**Aims and objectives**

This study aims to investigate the association between mental and physical health with retirement over time in older men and women.

**Methods**

Data at two time points were available for 21,608 men and women aged 55 to 69 years who were recruited through the 45 and Up Study in New South Wales, Australia. Outcomes were psychological distress (Kessler 10 score) and physical health (physical dysfunction score). Retirement status was predictor. Generalised estimating equations were used to investigate the longitudinal association between these measures obtained at two time points, for men and women separately.

**Results**

The transition to retirement was more likely to occur in men and women aged from 60 to 64 compared to other age groups. The mean K10 score was 2% higher in retired men than non-retired men (p=0.0039) but no evidence of a difference between retired women and non-retired women was found (p=0.72). The mean physical dysfunction score was 25% higher in retired men compared to non-retired men (p=0.0001) and 17% higher in retired women compared to non-retired women (p<0.0001). In men with increased physical dysfunction, the mean K10 score was 6% higher in retired men compared to non-retired men (p=0.0046). These results controlled for time, age, education, marital status, smoking status, BMI and comorbidities.

**Conclusions**

Wealth provides a buffer against the negative mental health consequences of acquiring a disability. It is important that government and non-government programs focus on people who are less economically secure as they are more vulnerable to deterioration in mental health and subsequent economic and health costs.

Healthy lifestyles are associated with a reduced incidence of depression in young adults: the Childhood Determinants of Adult Health Study

**Aims and objectives**

Individual health risk factors, such as smoking or weight, have bidirectional associations with mood disorders. As few studies have examined the role of multiple risk factors, we investigated these interrelationships in a prospective cohort study.

**Methods**

A lifestyle score comprising ten healthy behaviours (BMI, non-smoking, alcohol consumption, physical activity and six dietary components) was derived at baseline (2004–06; 26–36 years) and follow-up (2009–11; 31–41 years). At follow-up, the lifetime Computerised International Diagnostic Interview diagnosed mood disorder (depression/dysthymia) before baseline and between baseline and follow-up. Linear regression determined if mood disorder before baseline predicted changes in the lifestyle score over follow-up. Log-binomial regression estimated the relative risk of mood disorder over follow-up by baseline lifestyle score. Sex-specific analyses included these potential baseline confounding factors: age, socioeconomic position, parental and marital status, social support, history of cardiovascular disease, self-rated physical and mental health.

**Results**

Analyses included 1,204 participants (62% female). A history of depression at baseline was not significantly associated with changes in the lifestyle score from baseline to follow-up in men or women. Conversely, higher lifestyle scores at baseline were independently associated with a 25–30% reduced risk of an episode of mood disorder in men (RR=0.74 (95% CI: 0.56–0.99; p=0.040)) and women (RR=0.71 (95% CI: 0.58–0.87; p=0.001)) adjusted for all potential confounding factors. Sensitivity analyses excluding BMI from the lifestyle score or those with sub-syndromal mood disorders at baseline yielded similar results.
**Untangling the relationship between food insecurity and mental health**

**Kristie Carter**  
University of Otago, Wellington, New Zealand

**Aims and objectives**  
The aim of this research is to investigate the impact of changes in food security on changes in mental health over time and how these are influenced by changes in economic factors.

**Methods**  
We used three years of data from the longitudinal Survey of Family, Income and Employment (SOFIE: n=15,480) conducted by Statistics New Zealand (2002–10). Respondents were classified as food insecure if, in the last 12 months, they used food grants or banks, bought cheaper food to pay for other things, or often went without fresh fruit and vegetables. Psychological distress was measured using the Kessler-10 scale (score 10 to 50). Longitudinal fixed-effects models were used to examine the impact of changes in food insecurity on changes in psychological distress, controlling for time-invariant and time-varying confounding. Random-effects models were used to examine the impact of duration of food insecurity on psychological distress.

**Results**  
About 15% were food insecure each year, with 30% of the population experiencing food insecurity at least once across the time period. The fixed-effect model shows increased levels of psychological distress for those who become food insecure (OR: 0.78 (95% CI: 0.65–0.91)). The random-effects model showed that the longer time spent food insecure, the higher the level of psychological distress.

**Conclusions**  
There is a strong relationship between food insecurity and mental health, even after controlling for other social and economic factors. Interventions that enhance food security may lead to improvements in both physical and mental health.

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**Sickness absence and psychosocial job quality: an analysis from a longitudinal survey of working Australians, 2005–12**

**Allison Milner, Peter Butterworth, Rebecca Bentley, Anne-Marie Kavanagh, Anthony D LaMontagne**  
The McCaughey Vichealth Centre for Community Wellbeing, Melbourne School of Population and Global Health, The University of Melbourne, Parkville, Australia

**Aims and objectives**  
Sickness absence is associated with adverse health, and organisational and societal outcomes. This paper seeks to examine the relationship between changes in an individual’s overall psychosocial job quality and variation in sickness absence using a longitudinal cohort study of working Australians.

**Methods**  
The data source in this study was the Household, Income and Labour Dynamics in Australia (HILDA) survey. The outcome variables were any paid sick leave and the number of days of paid sick leave in a year. The main exposure variable was a psychosocial job quality index (levels of job control, demands and complexity, insecurity, and perceptions of unfair pay). Analysis was conducted using longitudinal fixed-effects logistic and negative binomial regression models.

**Results**  
There was a dose-response relationship between the number of psychosocial job stressors reported by an individual and the odds of paid sickness absence (1 adversity = OR: 1.26 (95% CI: 1.09–1.45; p=0.002); 2 adversities = OR: 1.28 (95% CI: 1.09–1.51; p=0.002); 3 adversities = OR: 1.58 (95% CI: 1.29–1.94; p<0.001)). The negative binomial regression models also indicated that individuals reported a greater number of days of sick leave in response to worsening psychosocial job quality.

**Conclusions**  
These results suggest that workplace interventions aiming to improve the quality of work could help reduce sickness absence.
Concurrent session 4A: Advances in record linkage 3
1:30–3:00pm

Cosmetic breast augmentation surgery and subsequent breastmilk feeding

Christine Roberts, Jian Sheng Chen¹, Mark S Sywak¹, Amanda Ampt¹
¹ Clinical and Population Perinatal Health Research, Kolling Institute, University of Sydney, Sydney, Australia
² Department of Endocrine and Oncology Surgery, Royal North Shore Hospital, St Leonards, Australia

Aims and objectives
To determine the impact of cosmetic breast augmentation surgery on subsequent breastmilk feeding.

Methods
Data were obtained from the New South Wales Perinatal Data Collection (PDC 2006–11) and the NSW Admitted Patient Data Collection (APDC: 2000–11). The PDC and APDC (including mothers’ and infants’ hospital admissions) were linked cross-sectionally for the birth and longitudinally to maternal hospital admissions up to ten years prior to birth. The primary outcomes were infants receiving breastmilk at discharge from birth care, either any or exclusively. The exposure of interest was cosmetic breast augmentation identified by a surgical procedure code. Crude and adjusted odds ratios (aOR) were estimated using logistic regression.

Results
Among 378,389 women who gave birth 2006–11, 892 (0.2%) had a record of prior breast augmentation. Overall, 334,955 (88.5%) infants were fed with at least some breastmilk at discharge including 309,205 (81.7%) who were fed breastmilk exclusively. After adjusting for sociodemographic and pregnancy factors, the singleton live-born term infants of women with breast augmentation were less likely to receive any breastmilk at discharge compared to the infants of women without breast augmentation (aOR 0.46 (95% CI: 0.38–0.55)). However, those infants receiving any breastmilk at discharge were not more or less likely to receive breast milk exclusively (aOR 0.90 (95% CI: 0.64–1.26)).

Conclusions
Lower rates of ‘any’ breastfeeding women with augmentation surgery may reflect personal preferences or may be a consequence of the surgical procedure. Counselling at the time of cosmetic breast augmentation surgery should include information about subsequent breastfeeding.

The role of maternal education in the trajectory of malnutrition in children aged <5 years in Bangladesh, 1996–2011

M.D. Tanvir Hasan
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Aims and objectives
Malnutrition in children aged <5 years is a serious public health problem in low and middle-income countries, including Bangladesh. Improvement of maternal education can contribute effectively to reducing malnutrition in children aged <5 years. We examined the association of maternal education with malnutrition in children aged <5 years for the past 15 years (1996 to 2011) in Bangladesh and quantified the minimum level of education required for the mothers to achieve better nutritional outcome of children.

Methods
We used pooled data from five nationwide demographic and health surveys conducted in 1996 – 97, 1999 – 2000, 2004, 2007, and 2011 in Bangladesh including 28,941 children aged <5 years. A log-binomial regression model was used to examine the association between maternal education and malnutrition in children, measured by stunting (height/length for age z-score below -2 SD), underweight (weight-for-age z-score below -2 SD), and wasting (weight/height z-score below -2 SD).

Results
The prevalence of stunting decreased by 18.8% (from 60.0% to 41.2%), underweight by 16.0% (from 52.2% to 36.2%), and wasting by 5.1% (from 20.6% to 15.5%) between 1996 and 2011. In pooled adjusted models over time, children of mothers with secondary or higher education were at lower risk of childhood stunting (RR: 0.86 (95% CI: 0.82–0.90)), underweight (RR: 0.84 (95% CI: 0.79–0.88)), and wasting (RR: 0.81 (95% CI: 0.73–0.90)) compared to children of mothers with no education.

Conclusions
Future policy to tackle malnutrition in Bangladesh may consider promotion of women’s education at least up to the secondary level.
Exploring the data collection process for a regional trauma registry in New Zealand

Bridget Kool1, Grant Christey2, Shanthi Ameratunga1, Ross Lawrenson3, and Nina Scott1,4

1 School of Population Health, The University of Auckland, Auckland, New Zealand
2 Waikato Trauma Service, Waikato Hospital, Hamilton, New Zealand
3 Te Puna Oranga, Māori Health, Waikato District Health Board, Hamilton, New Zealand
4 Waikato Clinical School, Waikato District Health Board, Hamilton, New Zealand

Aims and objectives
The Midland Regional Trauma System (MRTS) was established to ensure best practice in trauma care for the region. The trauma registry, a key component of the MRTS, has the potential to inform injury prevention and evaluate and improve trauma care quality. This study investigated aspects of the MRTS data collection processes that can translate this ‘potential’ to effective system improvement mechanisms.

Methods
In March 2014, staff members responsible for the collection of trauma registry data for the five hospitals in the MRTS were invited to participate in an anonymous online survey. Topics addressed included: training and support, ethnicity data capture, and familiarity with the trauma data form.

Results
The five (out of seven) MRTS data collectors who responded had spent 3 to 48 months in this role (mean: 26 months). They reported spending 25 to 80% of their time completing trauma data forms. Most felt the time allocated, and training and ongoing support for data collection were adequate. The survey identified inconsistencies in the use of the form with respect to interpretation of ‘major trauma’, calculating ICU length of stay, and ethnicity data-collection and recording, factors found to be worthy of attention to strengthen the overall data quality and efficiency of the registry.

Conclusions
Efforts to increase the quality of trauma registry data collected for the MRTS should focus on the development of an ethnicity data collection protocol, increased feedback regarding data quality issues, and consideration given to the use of electronic data capture.

Elevated iron stores in pregnancy and risk of gestational diabetes

Amina Khambalia1, Christine L Roberts1, Aidan McElduff1, Jonathan Morris1, Katie Powell3, Vitomir Tasevki2, Natasha Nassar2

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2 Department of Obstetrics and Gynaecology, Royal North Shore Hospital, Sydney, Australia.
3 Pacific Laboratory Medicine Services, St Leonards, Australia

Background
The rise in gestational diabetes mellitus (GDM) places greater demand on resources to manage high-risk pregnancies and prevent adverse perinatal outcomes. High levels of serum ferritin (SF) have been associated with type 2 diabetes; however, it is uncertain whether elevated SF are associated with GDM and reflect increased iron stores or inflammation.

Aims and objectives
To determine whether first trimester SF is associated with subsequent GDM in absence of inflammation.

Methods
Serum samples for women with first trimester screening were linked to birth and hospital discharge records for data on maternal characteristics and GDM diagnosis. Blood was analysed for iron stores (SF, µg/L), tissue iron (transferrin receptor: TfR; nmol/L) and inflammation (C-reactive protein: CRP; mg/L). Women with CRP>5 or pre-existing diabetes were excluded. Odds ratios for GDM adjusted for age, parity, plurality, country of birth, smoking, private vs. public hospital, low SES, gestational age, maternal weight and CRP levels.

Results
Of 3,882 pregnancies, 3.5% developed GDM. Compared to no GDM, GDM pregnancies had higher median SF (32.8 vs. 25.2, p=0.0002); but not TfR (15.8 vs. 15.1, p=0.06) levels. Adjusted model found increased odds of GDM by SF (OR: 1.45 (95% CI: 1.10–1.92)).

Conclusions
Elevated iron stores are associated with GDM in the absence of overt inflammation and may be important for early identification of high-risk pregnancies.
Methodological considerations for Indigenous burden of disease estimates for Australia

Michelle Gourley, Jessica Zhang, Michael McGrath, Ilona Brockway
Australian Institute of Health and Welfare, Canberra, Australia

Aims and objectives
As part of the Australian Burden of Disease Study 2011, the AIHW is updating burden of disease estimates for the Aboriginal and Torres Strait Islander populations. A number of methodological issues need to be considered in producing Indigenous burden of disease estimates.

Methods
A detailed review of the methods used in previous burden of diseases studies was undertaken. This included the Global Burden of Disease study, the previous Australian and Indigenous studies and the recent New Zealand study. From this review, the AIHW identified the key challenges and issues to consider for producing Indigenous burden of disease estimates. These issues were examined and discussed with an Indigenous Reference Group established in order to determine the most appropriate methodology for updated Indigenous estimates.

Results
Key methodological challenges and issues identified for producing Indigenous burden of disease estimates included:

• Best approach for adjusting for Indigenous under-identification in mortality and morbidity data
• Need for data aggregation (e.g. combining years) to overcome small numbers
• How to derive disease prevalence estimates when no Indigenous data are available
• Feasibility of including social determinants as risk factors in the study
• Best approach for measuring the ‘gap’ in disease burden between Indigenous and non-Indigenous Australians.

Conclusions
This work informs the final methodology used to calculate Indigenous burden of disease estimates for Australia and will be a useful resource for other countries with Indigenous populations undertaking burden of disease studies.

Sociodemographic predictors of stillbirth and neonatal death in New Zealand: findings from linkage of national maternity and perinatal mortality data

Lynn Sadler1,2 on behalf of the Perinatal and Maternal Mortality Review Committee (PMMRC)

1 Department of Obstetrics and Gynaecology, The University of Auckland, Auckland, New Zealand
2 Women’s Health, Auckland District Health Board, Auckland, New Zealand

Aims and objectives
To determine whether ethnicity, age, socioeconomic status, smoking, parity and body mass index are independently associated with perinatal mortality.

Methods
The Perinatal and Maternal Mortality Review Committee (PMMRC) perinatal dataset 2008–12 was matched to the national maternity collection (derived from lead maternity carer claims data and hospital discharge data) by NHI. Cases with missing BMI, parity and smoking data were excluded, resulting in exclusion of mothers cared for by hospital maternity services. Multiple pregnancies and deaths from congenital abnormalities were excluded. Multivariable logistic regression analysis included demographic variables identified by univariable analyses in New Zealand to be associated with stillbirth and neonatal death. Outcomes were stillbirth from 20 weeks gestation and neonatal death of babies born at 20–27 weeks and from 28 weeks gestation.

Results
Women with a high BMI, who smoked during pregnancy, were having their first birth, and women of Indian ethnicity had higher odds of stillbirth. Women who smoked, were of Māori or Pacific ethnicity, were having a first birth, and/or living in areas of higher socioeconomic deprivation had increased odds of neonatal death at 20–27 weeks gestation. Smokers also had an increased odds of neonatal death from 28 weeks gestation.

Conclusions
The maternity data collection facilitates analyses to determine independent associations between demographic variables and perinatal death adjusting for confounders such as BMI and smoking. These findings support recommendations: 1) to improve smoking cessation and weight loss promotion; 2) to investigate the needs of Māori, Pacific and Indian mothers; and 3) for policies to address the impact of socioeconomic deprivation on health.
Concurrent session 4B: Epidemiology and cost-effect modelling
1:30–3:00pm
Invited speaker: Tony Blakely

What can epidemiologists offer to – and learn from – disease and cost-effectiveness modelling? Lots!

Tony Blakely, Nick Wilson, and on behalf of BODE³ Programme
Burden of Disease Epidemiology, Equity and Cost-Effectiveness Programme, Department of Public Health (BODE³ Programme), University of Otago, Wellington, New Zealand.

Aims and objectives
To outline the methods used in disease and cost-effectiveness studies that intersect with epidemiology.

Methods, data and examples
The following will be overviewed:

- The general approach of data inputs, a ‘model’, and outputs of health gain (e.g. QALYs), cost and cost-effectiveness.
- The rich data that the New Zealand health sector has, often through epidemiological methods, that can be used as inputs. Examples presented will include:
  - Cancer registry data, for incidence and survival projections
  - New Zealand Burden of Disease data, further analysed to generate epidemiologically coherent sets of incidence, mortality, case fatality, remission, etc. (e.g. using software tools such as DisMod).
  - HealthTracker data, in particular rich data on health system costs by sociodemographics, disease and phase of the disease journey (e.g. first year of diagnosis, last six months of life).
- The general approach of Monte Carlo simulation and probabilistic simulation to incorporate uncertainty.
- The ‘classic’ Markov model, using HPV vaccination as an example.
- Discrete event simulation: – modelling time-to-event, as opposed to transition rates between events, using the provision of cancer care coordinators for colon cancer as an example.

A cost-utility analysis of regularly raising tobacco taxation to help achieve the New Zealand government’s smokefree nation goal

Tony Blakely¹, Amber Pearson¹, Linda Cobiac¹,², Nhung Nghiem¹, Nick Wilson¹
¹ Burden of Disease Epidemiology, Equity and Cost-Effectiveness Programme, Department of Public Health (BODE³ Programme), University of Otago, Wellington, New Zealand
² School of Population Health, University of Queensland, Brisbane, Australia

Aims and objectives
We aimed to model the health and cost impacts of annual increases in tobacco excise tax in the New Zealand setting.

Methods
Business-as-usual estimates for future smoking prevalence were produced using an updated tobacco forecasting model for New Zealand (using smoking data from censuses). The modelled intervention was of various tobacco excise tax increases. We then conducted a cost-utility analysis using a multi-state life table model of all New Zealand adults alive in 2011, modelled out to death (3% discounting).

Results
Compared to a business-as-usual projected smoking prevalence of 9.9% in New Zealand adults in 2025, 10% annual tax increases reduced smoking prevalence to 8.7% (95% uncertainty interval [UI]: 8.6% to 8.9%). Māori also benefited, but the smoking prevalence in 2025 was still 18% for both Māori men and women.
Preliminary results for the modelled tax (at 10% per year) indicated substantial health gain at 54,000 QALYs (95% UI: 50,000–58,000) over the remaining life of the cohort. Benefits were nearly double for 20% annual tax increases. Due to the small intervention cost (that of a single law) and a large gain in averted disease-treatment costs, there were large net cost savings; e.g. for the 10% tax (NZ$2.3 billion [95% UI: 2.1–2.5 billion]) from the intervention. The modelled tax intervention generated about four times the health gain per capita for Māori than non-Māori.

**Conclusions**

This modelled tobacco tax intervention was found to produce large health gain and also large savings in health system costs. It was also pro-equity.

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**Validation of a synthetic population for use in a micro-simulation**

**Josh Knight**

Section of Epidemiology and Biostatistics, School of Population Health, The University of Auckland, Auckland, New Zealand

**Aims and objectives**

The validation of a synthetic New Zealand population for use in a cardiovascular disease medication micro-simulation.

**Methods**

A range of data sources was used to compare the synthetic population with the ‘real world’ New Zealand population. This was to provide evidence that the synthetic population was representative dataset on which to base the micro-simulation. The focus was on three aspects of the population: a comparison of aggregated data; the maintenance of appropriate heterogeneity; and the inter-variable correlations present in the population. Tools were used to assess the agreement of these factors and the overall appropriateness of the synthetic population.

**Conclusions**

The use of micro-simulation methods, based on individuals rather than cohorts, to investigate the implications of health policy has become more common. The hidden burden of a micro-simulation is often the requirement for a broad-based yet fine-grained dataset from the population of interest. In scenarios where there is not sufficient real-world data, a synthetic population is often created from a range of real-world data sources. A strength of the micro-simulation method is the ability to deal with population heterogeneity; however, this heterogeneity must be carefully managed when creating a synthetic population. Where a synthetic population is developed, however, it must be validated to ensure that the micro-simulation it is used within does not generate misleading results under a ‘garbage in – garbage out’ scenario.

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**Economic evaluation of a school intervention to reduce the risk of rheumatic fever**


1. School of Population Health, The University of Auckland, Auckland, New Zealand
2. Griffith University, Brisbane, Australia
3. Starship Children’s Hospital, Auckland, New Zealand

**Aims and objectives**

To evaluate the cost effectiveness of ‘sore throat clinics’ (STCs) for prevention of acute rheumatic fever (ARF) in children in primary/intermediate schools.

**Methods**

A Markov model was developed to represent the lifetime impact of one year of primary prevention of ARF with STCs in high-risk New Zealand schools. It includes the incidence rate, natural history and costs of ARF and rheumatic heart disease; secondary prophylaxis; medical management of carditis; cardiac valve repair/replacement; the efficacy of community preventive interventions; and the annual cost per child of STCs. The model takes a healthcare payer perspective, discounting future costs and health benefits at 3.5% per annum.

**Results**

If STCs are 59% efficacious and cost NZ$135 per child per year, for schools at an incidence rate of 75 per 100,000, STCs can be expected to cost about NZ$560,000 per QALY gained or NZ$190,000 per ARF case averted or NZ$52 million per death averted. These figures are sensitive to the efficacy and annual cost of the intervention and the incidence of ARF but robust to uncertainty in other variables. The cost drivers are project workers and laboratory culture, and the main uncertainty is the efficacy of the intervention in New Zealand high-risk schools.

**Conclusions**

Sore throat clinics in high-risk schools are likely to reduce the risk of acute rheumatic fever and thereby improve survival of Māori and Pacific children. Their cost effectiveness could be improved by containing staffing costs and/or reducing the cost of laboratory diagnosis. Implementation of this intervention could reduce the striking disparity between Māori/Pacific and others.
Efficient use of clinical analytics in implementing best patient care

Efthy Stavrou, Jennie Pares, Liz Hay
Health Economics and Evaluation Team, NSW Agency for Clinical Innovation, Sydney, Australia

Aims and objectives
The Agency for Clinical Innovation (ACI) is the lead NSW agency for engaging clinicians and developing, implementing and evaluating new models of care. A Model of Care (MoC) outlines best practice of patient care, ensuring the right care is provided at the right time to the right patient group.

Methods
The process for developing, implementing and evaluating a MoC are: epidemiological evidence, cost and service growth (forecast modelling), and clinical expertise are integrated to develop a MoC. After the MoC is implemented, a formative evaluation which includes patient-centred and economic outcomes of the implementation is conducted. Data sources utilised throughout the process include administrative data (e.g. APDC, EDDC, RBDM) and specific clinical databases (e.g. Trauma, Osteoarthritis Care).

Results
Specific examples of improving the management of clinical patient groups including providing the results of the baseline analysis, formative evaluations, service utilisation and financial impacts will be presented. For example, in implementing the osteoporotic re-fracture prevention program, it was estimated that over 240,000 re-fractures; 150,000 patient readmissions and 250,000 bed-days would be prevented in NSW at a saving of $238 million.

Conclusions
Clinical and administrative data are sources for conducting service utilisation and cost analyses of patient groups efficiently. Best practices of care are developed in an informed manner and if proven to have a positive evaluation, may be implemented throughout the State.
Obesity is a risk factor for a late stage of breast cancer at diagnosis in Australian women residing in urban and rural areas: a data linkage study

Janni Leung¹, Jennifer Martin¹, Annette Dobson¹, Samantha McKenzie¹, Deirdre McLaughlin¹

¹. School of Population Health, The University of Queensland, Brisbane, Australia

Aims and objectives
To quantify the effects of individual and area-level risk factors on stage of breast cancer diagnosis in a population of Australian women.

Methods
Data were drawn from the Australian Longitudinal Study on Women’s Health 1946–51 cohort, linked with cancer registry data from three Australian states (NSW, QLD, and VIC). The sample included 205 women identified from the linked cancer registry data with a breast cancer diagnosis. Breast cancer stage at diagnosis was categorised by comparing stage 0 or I as ‘not advanced’ (localised; tumour size 20mm or smaller without positive nodes), and stage II, III, or IV as ‘advanced’.

Results
Women who were obese were more likely to be diagnosed at an advanced stage of breast cancer (52% advanced) than their normal weight (30%) or overweight (41%) counterparts. After adjusting for survey year, country of birth, education, marital status, rural or urban residence, BMI, smoking, and menopause status, logistic regression results showed that obesity was the strongest risk factor for an advanced stage at breast cancer diagnosis. Women who were obese were at 2.70-higher odds (95% CI: 1.18–6.17) of being diagnosed at an advanced stage.

Conclusions
Obesity was associated with a higher risk of advanced stage of disease at breast cancer diagnosis after individual and sociodemographic risk factors were considered. Given that women are becoming increasingly obese, this paper provides further evidence for targeting interventions for obesity as a public health priority.

Socioeconomic and geographic disparities: measuring concordance with treatment guidelines and time to treatment for people with lung cancer

Kalinda Griffiths¹, Jesse Cunningham¹, Xui Qin Yu¹, Leonardo Simonella¹, Jane Young¹

¹. Menzies School of Health Research, Sydney Medical School, University of Sydney, Sydney, Australia

Background
Lung cancer is the greatest cause of cancer death in Australia, resulting in considerable disease burden. Mortality rates are shown to be higher in lower socioeconomic groups and those living regionally and remotely. Outcome can be improved by evidence-based treatment. Through measuring concordance with national guidelines we can investigate disparities in socioeconomic status, geographic locality, and evidence-based treatment and time to evidence-based treatment.

Aims and objectives
To investigate associations between SES, geographic locality and evidence-based treatment, and time from diagnosis to evidence-based treatment.

Methods
A retrospective cohort analysis of the NSW Lung Cancer Patterns of Care Study dataset. Nine guidelines from the 2004 ‘Australian Clinical Practice Guidelines for the Prevention, Diagnosis and Management of Lung Cancer’ determined numerators and denominators for evidence-based treatment analysis. Predictors of evidence-based treatment and time to treatment were identified through logistic regression and Cox proportional-hazards regression.

Results
For 1,214 eligible patients, evidence-based treatment ranged from 4% to 79%, depending upon the guideline. Remoteness was independently associated with lower rates of evidence-based treatment for surgical management of those with stage I and stage II non-small-cell lung carcinoma (NSCLC) (p=0.00), lobectomy for those with operable NSCLC (p=0.02) and longer waiting times to treatment (p=0.01). SES was associated with lower evidence-based chemotherapy for advantaged patients with stage IV NSCLC (p=0.02).

Conclusions
These results suggest geographic locality and SES play independent roles in evidence-based treatment. Monitoring evidence-based treatment and exploring ways in which people with lung cancer can better receive timely diagnosis and evidence-based treatment are important in reducing disparity gaps.
Screen-detected ductal carcinoma in-situ as a risk factor for subsequent invasive breast cancer

Elizabeth Buckley¹, Thomas Sullivan¹, Janet Hiller², Gelareh Farshid³, David Roder¹

¹ School of Population Health, University of South Australia, Adelaide, Australia
² Faculty of Health, Arts and Design, School of Health Sciences, Swinburne University of Technology, Hawthorne, Australia
³ SA Health, Adelaide, Australia

Aims and objectives
Australian population data indicate the risk of invasive breast cancer (IBC) in women following ductal carcinoma in-situ (DCIS) is four times the risk normally experienced by women. In contemporary settings where treatment practices are characterised by more conservative surgery, and where there is widespread breast screening, it would be useful to examine how the risk of IBC following screen-detected DCIS varies according to treatment.

Methods
All women participating in screening between 1989 and December 2010 in South Australia were included in the study. Follow-up time from first screening to breast cancer was censored if no IBC was diagnosed or if they died of causes other than breast cancer. The relative risk of IBC in women with a history of screen-detected DCIS, compared to women without a screen-detected DCIS diagnosis, was estimated by age and time since diagnosis, and initial course of treatment.

Results
The increase in hazard of IBC following screen-detected DCIS was 4.0-fold (95% CI: 3.3–4.8), with estimates also varying by age and time since diagnosis. Estimates of relative risk according to course of treatment were approximately 4.8 (95% CI: 3.8–6.0) and 2.5 (95% CI: 1.5–4.1) for women treated by local excision and mastectomy, respectively.

Conclusions
Comparison of these results with population data suggest that the relative risk of IBC in women with screen-detected DCIS was consistent with the broader Australian population. These data also suggest that there are approaches to care that would reduce the risk of IBC.

Association between mammographic density and breast cancer risk by mode of detection

Kavitha Krishnan¹², John L Hopper¹, Jennifer Stone²³, Carmel Apicella², Dallas R English¹², Graham Giles¹², Laura Baglietto²

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³ Centre for Genetic Origins of Health and Disease, University of Western Australia, Australia
⁴ Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Australia

Aims and objectives
Our aim is to investigate the concurrent association between mammographic density (MD) in terms of dense area of the breast (DA) or percentage mammographic density (PMD), non-dense area of the breast (NDA) and body mass index, and risk of breast cancer by the type of detection mode of the tumours to better understand the separate risks attributed to breast disease and masking of tumour.

Methods
A matched, nested case-control data from the Melbourne Collaborative Cohort Study consisting of 358 screen detected cases and 168 interval cases was used for the study.

Results
Higher DA or PMD was associated with increased risk of breast cancer regardless of the mode of detection of the tumours, but the risk estimates were higher for interval cases than screen-detected cases (corresponding to a 1 standard deviation (SD) increase for screen-detected and interval cases; DA RR=1.43 (95% CI: 1.22–1.69) and RR=1.90 (95% CI: 1.49–2.42), and PMD RR=1.42 (95% CI: 1.21–1.66) and RR=2.01 (95% CI: 1.60–2.52), respectively). NDA was not associated with risk among screen detected cases but a protective association was observed among interval cases corresponding to a 1 SD increase; NDA RR=0.53 (95% CI: 0.39–0.71).

Conclusions
Dense tissue in the breast, measured in terms of absolute amount or percentage, is a possible risk factor for breast cancer and masking. Non-dense tissue does not seem to play a role in risk but may be a protective factor for masking which could be the result of less dense tissues in the breast.
Cancer risk in people with type 1 and type 2 diabetes in Australia: 1997–2007

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Aims and objectives
Evidence linking diabetes and cancer is accumulating. However, many studies do not address these associations by diabetes type or for rarer cancer outcomes, usually due to limitations in sample size. The aim of this study was to explore the excess risk of overall and site-specific cancer incidence among people with type 1 (T1DM) and type 2 diabetes (T2DM) using one of the largest diabetes registries in the world.

Methods
The study included 917,829 (8.5% T1DM; aged 0–75 years) individuals registered on the Australian National Diabetes Service Scheme. Cancer outcomes up until 31st December 2007 were collected by linkage to the Australian Cancer Database. Cancer incidence rates were compared to the general population using standardised incidence ratios (SIRs).

Results
Among T1DM, significant SIRs were observed for overall cancer (SIR: 1.08 (95% CI: 1.04–1.14)); pancreas (SIR: 2.47 (95% CI: 1.90–3.20)); liver (SIR: 2.39 (95% CI: 1.74–3.29)); colorectal (SIR: 1.23 (95% CI: 1.07–1.41)); kidney (SIR: 1.36 (95% CI: 1.05–1.75)); stomach (SIR: 1.42 (95% CI: 1.02–1.96)); thyroid (SIR: 1.37 (95% CI: 1.09–1.73)); uterine (SIR: 1.50 (95% CI: 1.13–1.99)); and decreased SIRs for prostate (SIR: 0.60 (95% CI: 0.49–0.72)). For T2DM: overall (SIR: 1.13 (95% CI: 1.13–1.14)); pancreas (SIR: 2.33 (95% CI: 2.25–2.42)); liver (SIR: 2.69 (95% CI: 2.56–2.82)); colorectal (SIR: 2.69 (95% CI: 2.56–2.82)); kidney (SIR: 1.54 (95% CI: 1.48–1.61)); stomach (SIR: 1.36 (95% CI: 1.30–1.43)); thyroid (SIR: 1.31 (95% CI: 1.22–1.42)); bladder (SIR: 1.22 (95% CI: 1.17–1.28)); oesophagus (SIR: 1.11 (95% CI: 1.04–1.19)); gallbladder (SIR: 1.48 (95% CI: 1.36–1.61)); ureter (SIR: 1.74 (95% CI: 1.66–1.83)); ovarian (SIR: 1.15 (95% CI: 1.07–1.25)); breast (SIR: 1.12 (95% CI: 1.09–1.15)); non-Hodgkin’s lymphoma (SIR: 1.20 (95% CI: 1.16–1.25)); acute myeloid leukaemia (SIR: 1.19 (95% CI: 1.09–1.50)); prostate (SIR: 0.87 (95% CI: 0.86–0.89)).

Conclusions
We show that T1DM is associated with an excess risk for a number of site-specific cancers, and these are similar to T2DM, albeit fewer reached significance. These findings support the concept that hyperglycaemia, rather than insulin resistance, links diabetes to cancer, and we suggest screening for cancers in diabetes patients is particularly important.

Validation of a designer Australian smartphone app to replace written weighed food records in nutrition research.

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Aims and objectives
Accurate dietary assessment is critical to determine relationships between food and disease. Valid measurement is time-consuming, costly and places considerable burden on participants and/or the nutritional epidemiologist. The now widespread use of smartphones provides an opportunity for keeping diet diaries and lessening burden. Few commercial apps that use the Australian database of foods are available. The aim of this research was to design and test the usability and validity of our app.

Methods
A web-based app was developed informed by an initial prototype that underwent usability testing. The database available was AUSNUT2007. University students (aged 19 to 24 years) were invited to take part via emails and flyers. Sixty-six students used the app to record all food and beverage intake for five days. During this time 24 hour recalls were conducted at random on three collection days. Comparative validity was assessed using Student’s t-test, Pearson’s correlation and Bland-Altman statistics.

Results
Fifty-two students submitted usable data. No differences in mean macronutrient intake were detected. All macronutrients and 15 micronutrients showed good correlation, with r ranging from 0.54 for thiamine to 0.85 for protein (p<0.01); the only exception was sugars for which the smartphone app returned higher values. Bland-Altman plots indicated wide limits of agreement for energy but validity at the group level.
Wearable cameras enhance the accuracy of 24-hour dietary recalls: a validation study using doubly labelled water

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Aims and objectives
A pilot study indicated wearable cameras may reduce under-reporting of energy intake (EI) in the 24-hour dietary recall method used in large-scale dietary assessment. The present study aimed to validate the wearable camera-assisted 24-hour dietary recall using doubly labelled water (DLW), and examine the feasibility of image analysis to assess the context of eating episodes.

Methods
Total energy expenditure (TEE) was assessed over a 15-day DLW protocol. Forty adult participants (males: n=20, age=35±17 yrs, BMI=27±8 kg/m$^2$; females: n=20, age=28±7 yrs, BMI=22±2 kg/ m$^2$) used a SenseCam (SC) wearable camera in free-living conditions on four days and EI was assessed using three multiple-pass 24-hour dietary recalls (MP24). SC images were viewed by participants after the MP24s and changes to the self-reported intake were recorded. Comparisons were made between TEE and EI assessed by MP24 and MP24+SC. Image analysis assessed the context of eating episodes (duration, location, environment, seating position, social interaction, viewing media screens).

Results
Among men, MP24 and MP24+SC underestimated TEE by 17% and 9%, respectively (p<0.001 and P=0.02). Among women, MP24 and MP24+SC underestimated TEE by 13% and 7%, respectively (p<0.001 and P=0.004). Wearable camera assistance (MP24+SC) reduced the magnitude of under-reporting by approximately 48% for men and women compared to the MP24 alone (p<0.001, and p<0.001). Images from 71% of eating episodes (528/743) allowed context assessment, 29% of episodes had absent, underexposed or blurry images.

Conclusions
The wearable camera (MP24+SC) reduced the magnitude of under-reporting by approximately 48% in men and women, and the image analysis was feasible to assess the context of eating episodes.

Reality check ahead: validation of a virtual supermarket to measure food purchase behaviour

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Aims and objectives
The Virtual Supermarket (VS) is an innovative three-dimensional software application designed in the image of a real supermarket (RS) that can be used for experimental studies. This study aimed to validate the VS by comparing virtual and real-life food purchasing behaviour and by obtaining participant feedback on perceived sense of ‘presence’ (‘a psychological state of being there’).

Methods
Eligible main household shoppers were invited to conduct three shopping occasions in the VS over three consecutive weeks, complete the validated Presence Questionnaire and collected their grocery till receipts for that same period. Proportional expenditure ($) and the proportion of products purchased over 18 major food groups were compared between the virtual and real supermarkets. Data were analysed using repeated measures mixed models.

Results
Eighty-six participants completed one shop in the VS, of which 60 participants (70%) returned their real grocery till receipts. The four food groups with the highest relative expenditures were the same for the virtual and real shopping occasions (e.g. fresh fruit and vegetables; bread and bakery; dairy; and meat and fish). Significant differences in proportional expenditures were observed for six groups, with largest differences (virtual–real) for: dairy (6.5%; p<0.001); fresh fruit and vegetables (3.1%; p=0.04); and snack foods (2.6%; p<0.001).
Conclusions
Shopping patterns in the VS were comparable to those in real life and results show that, overall, the VS is a valid tool to measure food purchasing behaviour. Nevertheless, it is important to improve the functionality of some food categories, in particular fruit and vegetables and dairy.

Obtaining participants for an online epidemiological study
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Background
In the past 30 years, a large proportion of cancer research has focused on the five most common cancers. The Forgotten Cancers Project is an epidemiological research program into less common cancers, with the aim of investigating the genetic, lifestyle, and environmental causes of these cancers.

Aims and objectives
To recruit people with less common cancers (‘cases’) through mixed media means, including public campaigns, and direct them to a web-based portal (online registration, consent forms and questionnaires).

Methods
A number of different recruitment strategies have been used, including a TV ad campaign, Google ad words, promotion through other Cancer Council events (e.g. Relay for Life) and external stakeholder engagement. Facebook ads will be trialled in the coming months. Google analytics and registration data will be used to track the effectiveness of various strategies.

Results
The number of hits on the website can be directly correlated with promotional events. While the number of registrations also shows peaks around these same events, the number of registrations is proportionally small. No association was found between the average daily session length and number of registrations (Spearman’s rho=0.15). Over the three years of the study, modifications to the website and targeting of media messages appears to have resulted in a decrease in the ‘bounce’ rate.

Conclusions
In studies with fairly narrow eligibility criteria, or where the condition under study is relatively rare, broad promotional activities result in a large increase in traffic to the website but a relatively small conversion to registrations.
Development and evaluation of a mHealth cardiac rehabilitation system

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Aims and objectives
Home-based cardiac rehabilitation improves mortality and cardiac risk, but replicating centre-based exercise prescription and monitoring practices is difficult. Advances in mobile sensors, smartphones and mobile broadband access enable real-time remote exercise prescription and monitoring in almost any environment. We aimed to develop and evaluate a remote telemonitoring system comprising wireless biosensors, a custom smartphone application and middleware platform.

Methods
An iterative process was undertaken to develop a system to remotely deliver exercise-based cardiac rehabilitation. Biosensor measurement validity and data transmission reliability were evaluated during simulated daily activities, and low, moderate and high intensity exercise among healthy individuals and cardiac patients.

Results
Sensor measurement biases were small (heart rate=-0.30–1.10 10⁻¹min⁻¹; respiratory rate=1.25–0.39 10⁻¹min⁻¹). Measurement reliability was generally excellent (p=0.87–0.97, all p<0.001; ICC=0.94–0.98, all p<0.001; CV=2.24–7.94%), although respiratory rate measurement reliability was poor among atrial fibrillation participants (p=0.43, p<0.001; ICC=0.55, p<0.001; CV=16.61%). Data loss was minimal (<5%) when all system components were active; however, instability of the network hosting the remote data capture server resulted in some data loss. App features were developed to include real-time remote exercise monitoring, automated exercise feedback, goal-setting and goal achievement feedback, and location mapping.

Conclusions
System validity was sufficient for remote exercise monitoring. Remote exercise monitoring has the potential to augment home-based cardiac rehabilitation. A production version of this telemonitoring system has been developed, and is currently being evaluated in a randomised controlled trial.

Dialysis outcomes of older Indigenous and non-Indigenous Australians and New Zealanders

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Aims and objectives
Increasing numbers of older people are commencing dialysis; however, few Indigenous patients in Australia and New Zealand are aged ≥65 years and their outcomes are unknown. We compared mortality hazards between older Indigenous and non-Indigenous patients in Australia and older Māori (Indigenous), Pacific and European patients in New Zealand.

Methods
This was a retrospective cohort study of older adults (≥65 years) commencing dialysis from 2001–11, identified from the Australia and New Zealand Dialysis and Transplant Registry. Ethnicity was categorised by treating clinicians. Indigenous (n=263) and non-Indigenous (n=10,713) patients in Australia and Māori (as Indigenous) (n=388), Pacific (n=207) and European patients (n=1,025) in New Zealand were followed until death, loss to follow-up, recovery of renal function or 31 December 2011. Mortality was compared using multivariable Cox proportional-hazards models.
Results
In Australia, 166 Indigenous and 6,265 non-Indigenous patients died during follow-up. Mortality rates per 100 patient-years were 23.9 for Indigenous and 21.2 for non-Indigenous patients. Indigenous patients had a 20% increased risk of mortality compared with non-Indigenous patients (adjusted hazard ratio 1.20 (95% CI: 1.02–1.41). In New Zealand, 248 Māori, 102 Pacific and 670 European patients died. Mortality rates were 24.8 for Māori, 18.3 for Pacific and 25.1 for European patients. There was no evidence of a difference in mortality for either Māori or Pacific adults compared with European patients.

Conclusions
While Indigenous status appears to be associated with survival for older dialysis patients in Australia, ascertainment of ethnicity and its association with mortality for older New Zealanders requires further exploration.

Estimating the relative contribution of risk factors and social determinants to the health gap between Indigenous and non-Indigenous Australians

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Aims and objectives
The gap in health outcomes between Indigenous and non-Indigenous Australians is large and persistent. In order to inform future government policy, analysis was undertaken to quantify the relative contribution of behavioural risk factors, social determinants, and access to health services to the health gap.

Methods
Analysis was conducted on the Aboriginal and Torres Strait Islander Health Survey (2004–05) and the National Health Survey (2004–05) and data accessed through the Australian Bureau of Statistic’s Remote Access Data Laboratory. Logistic regression was used to measure the association between a composite measure of ‘good health,’ incorporating self-assessed health, morbidity and emotional distress, and explanatory variables by Indigenous status.

Results
After controlling for demographic factors, the baseline health gap between Indigenous and non-Indigenous Australians was 16 percentage points. Together, behavioural risk factors and social determinants accounted for 57% of this gap. A negative relationship between health and use of health services was consistently observed: individuals with worse health were more likely to have accessed health services over the period. Therefore, the contribution of access to health services was not able to be estimated from the available data.

Conclusions
The analysis indicated that social determinants account for substantially more of the health gap than behavioural risk factors. However, the complexity of the relationship between health determinants and health outcomes is reinforced by the fact that more than 40% of the health gap remained unexplained after incorporating 11 of the most common and powerful explanatory variables.

Hepatitis B immunity: a comparison of national prisoner and population serosurveys

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Aims and objectives
In Australia, Hepatitis B (HBV) vaccination is recommended for injecting drug users (IDU), Indigenous adults and prisoners due to their high risk of infection. National serosurveys of prisoners and the general population in 2007 provided an opportunity to inform vaccination policies in both the prison and community setting.

Methods
Comparison of HBV surface antibody (HBsAb) results was possible for males aged 18–58 years, and HBV core antibody (HBcAb) results for males ages 18–29 years. Sera positive for HBsAb were classified as immune from past exposure (HBcAb positive) or from vaccination (HBcAb negative). Proportions immune were compared.

Results
Male prisoners aged 18–58 years had a higher seroprevalence of HBsAb than the general population (46.4% vs. 39.4%; p=0.061). In 18–29 year olds, higher HBsAb seroprevalence was due to past infection (12.9% vs. 3.0%; p=0.001), rather than vaccine-conferred immunity (35.3% vs. 43.4%; p=0.097). All
prisoner groups, but especially IDU, those of Indigenous heritage, or with a previous episode of imprisonment had higher levels of immunity from past infection than the general population (19.3%, 33.0%, 17.1% respectively vs. 3.0%; p<0.05). Vaccine-conferred immunity in IDU and in those with a previous episode of imprisonment was similar to the general population, whilst Indigenous prisoners, non-IDU and first-time entrants had significantly lower levels (26.4%, 26.2% and 20.7% respectively vs. 43.4%; p<0.05).

Conclusions
Improving prison-based HBV vaccination would not only help to prevent transmission in the prison setting, but also protect vulnerable members of the community who are both at high risk of infection and entering prison.

Māori health profiles

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Background
Māori Health Profiles are being developed for each District Health Board region in Aotearoa. They will present information on the health status of the Māori population in order to support the development of health needs assessments, guide improvements in the health of the indigenous population and achieve equity. It is hoped this data will support District Health Boards (DHBs) and other organisations to implement the refreshed Māori Health Strategy, He Korowai Oranga.

Aims and objectives
This project aims to identify old and new indicators of Māori health need. A national Māori Health Profile will be produced and also one for each of the 20 DHB regions. In addition, a four-page summary will present key information for each DHB region and an educational resource package will be developed in order to aide understanding of the Māori Health Profiles and facilitate their use and uptake.

Methods
Key stakeholders will be consulted in order to develop required indicators and shape the content and format of the report. Big data will be used to calculate context, process and outcome measures that compare the situation of Māori in each DHB with non-Māori locally and nationally. Spine graphs will be used to present ‘at a glance’ summaries of Māori health and equity for each DHB. Educational resources will be developed to assist DHBs, communities, Māori health providers, and other end-users to understand the context of their districts.

Reliability of electronic cemetery records in ascertaining vital status in historical cohorts

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Aims and objectives
Ascertainment of vital status is a particular challenge in studies of Australian historical cohorts when the time last known to be alive precedes National Death Index (NDI) data. Electronic cemetery records are a possible source of vital status; however their reliability is unknown. We used the NDI as a gold standard to assess the reliability of electronic cemetery records in ascertaining vital status in a cohort study.

Methods
In a historical cohort of former workers of a Tasmanian cement factory, Tasmanian electronic cemetery records/databases were checked for ‘fact of death’ for workers last known to be alive after 01 January 1980 (N=867, 31% of the cohort). The same cohort was also linked to the NDI. Sensitivity, specificity, and positive and negative predictive values (PPV and NPV) of cemetery records were calculated.

Results
The NDI identified 78 deaths (9%) while cemetery checks found 50 deaths (6%). The sensitivity of cemetery matching was low (53.8% (95% CI: 42.2–65.2), while specificity was 99.0% (95% CI: 98.0–99.6). Positive and negative predictive values were also good, 84.0% (95% CI: 70.9–92.8) and 95.6% (95% CI: 94.0–96.9), respectively.

Conclusions
The results show that deaths identified from electronic cemetery records can be reliable (i.e. high PPV), even though this method only identified about half of deaths (i.e. low sensitivity). This methodology is useful when sources of vital status ascertainment are limited, for example in cases where vital status at the beginning of the NDI is unknown.
The role of alcohol in four-wheel motor vehicle crashes in Fiji

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Aims and objectives
In the absence of reliable quantitative data in Pacific Island countries and territories, we investigated the contribution of alcohol to four-wheel motor vehicle crash injuries in Viti Levu, Fiji.

Methods
A prospective population-based case control study conducted in 2005–6 examined the association between alcohol use and motor vehicle crashes resulting in at least one person being killed or hospitalised for 12 hours or more. Drivers or their proxies of eligible case vehicles (n=140) and a random sample of control vehicles identified in roadside surveys (n=752) completed interviewer-administered questionnaires ascertaining information on personal, vehicle, and environmental factors including alcohol use.

Results
After adjusting for potential confounders, there was a three-fold increase in the odds of injury-involved crashes for motor vehicles driven by people who reported alcohol use in the preceding 12 hours (OR=5.2 (95% CI: 1.1–9.4)). While almost half the drivers of case (49%) and control vehicles (46%) reported usual drinking patterns suggestive of hazardous drinking, and a fifth of drivers of case (22%) and control (20%) vehicles screened positive for problem drinking on the CAGE questionnaire, these factors were not significantly associated with motor vehicle injury-related crashes.

Conclusions
Driving following drinking is an important contributor to the burden of four-wheel motor vehicle crash injuries in Fiji. The relative frequency of hazardous drinking among the study population highlights the need to design and implement a range of strategies (including enforcement of current drink driving legislation) that take account of societal and cultural norms that influence alcohol use and drink driving.
Diet quality is not associated with obesity risk in mid-age women in the Australian Longitudinal Study on Women’s Health

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Aims and objectives
To investigate the association between the diet quality measured by the Australian Recommended Food Score (ARFS) and six-year risk of overweight/obesity.

Methods
In the prospective cohort, the Australian Longitudinal Study on Women’s Health, dietary intake was reported by food frequency questionnaire (FFQ) and body mass index assessed from self-reported height and weight in 2001 and 2007 (BMI only). Healthy weight women (18.5 ≤BMI< 25.0kg/m²) who were free from chronic disease and aged 47.6–55.8 years (n=3,403) and who had plausible Total Energy Intakes (TEI) (sub-sample n=1,107) were included. ARFS was calculated from a subset of 74 items from the FFQ.

Results
The six-year incidence in total and plausible TEI sub-samples for overweight was 21% and 18.5% and obesity 1% and 1.1%, respectively. Mean ARFS was 33.0 (SD: 8.56) and 35.1 (SD: 8.23) in the total and plausible TEI sub-samples, respectively, with no relationship between ARFS and risk of overweight/obesity. Women who had quit smoking at baseline (OR=1.47 (95% CI: 1.01–2.13; p=0.043)) and those reporting a higher baseline weight were more likely to become overweight/obese (OR=1.14 (95% CI: 1.10–1.18; p<0.001)).

Conclusions
Higher diet quality was not associated with the six-year incidence of overweight/obesity. Promoting a greater variety of healthful foods does not lead to excessive weight gain or loss in mid-age women.

Risky driving and driver injuries: missed opportunities for prevention

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Aims and objectives
To investigate the extent to which risky driving and driver injury are associated with subsequent fatal and serious non-fatal driver injuries in a large cohort study of New Zealanders.

Methods
At recruitment in 1998–99, the New Zealand Blood Donors’ Health Study participants completed a questionnaire including self-reported information on risky driving, traffic convictions and medically attended traffic injuries in the previous twelve months. Cox proportional-hazards analyses investigated the associations of these factors with motor vehicle driver injuries resulting in death or hospital admission identified through prospective record linkage to national databases up to 31 December 2012.

Results
Among the 18,994 participants driving at recruitment (48% male, 29% aged 16–24 years), there was substantial heterogeneity in risky driving behaviours in the previous twelve months (e.g. self-reported speeding 71.7%, drink-driving 23.7%, driver injury 1.38%). During the median 13.8 year follow-up period (2,614,222 person-years), 247 incident driver injury cases (9 fatalities, 238 hospital admissions) were identified. Multivariable analyses examining risk factors for serious driver injury at follow-up found moderate to strong evidence of associations with a history of racing for excitement (adjusted HR=1.81 (95% CI: 1.16–2.78)), traffic convictions (adjusted HR=2.22 (95% CI: 1.55–3.22)) and medically attended driver injuries (adjusted HR=2.19 (95% CI: 0.90–5.35)). There were no significant interactions in these associations by age, gender or ethnicity.

Conclusions
Well-recognised risky driving behaviours and experiences provide important under-utilised opportunities for intervention that could reduce the risk of subsequent fatal or serious non-fatal road injury.
Differences in cancer survival between New Zealand and Australia: Implications for improvement in New Zealand’s cancer care

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Aims and objectives
To compare cancer survival in New Zealand and in Australia to indicate the potential improvements in New Zealand’s cancer care.

Methods
Population-based cancer survival data, from national cancer registration that cover all primary cancers excluding squamous and basal cell skin cancers, in New Zealand and in Australia were compared for the patients registered in 2006–10 by genders and cancer sites. Cancer survival was compared using relative survival rates (RSRs) at three time points: 1, 5, and 10 years.

Results
Cancer survival in Australia was significantly higher than that in New Zealand for all cancer combined in both genders (5-year RSRs – in males: 0.65 in Australia vs. 0.61 in New Zealand; and in females: 0.67 vs. 0.63), and for several cancer sites: 15/24 cancer sites for males and 17/26 for females including bowel, lung, female breast, and prostate at least at one time point. Other sites including melanoma, larynx, and cervix showed no or non-significant differences. When applied to 2010 registrations, preventable deaths from major cancers in New Zealand were estimated to be 17.3% for prostate and 4.4% for lung in males; 20.7% for breast and 6.7% for lung in females (note: registrations for bowel cancers were unable to be obtained separately).

Conclusions
Despite similar healthcare systems, there were substantial differences in cancer survival between two countries. These differences represent a considerable number of preventable deaths in New Zealand and manifest the discrepancies in cancer care. The reasons for differences are to be addressed to indicate room for possible improvements in New Zealand health system.

Development and pilot-testing of an evidence-based weight loss mobile telephone app

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Aims and objectives
Addressing the obesity epidemic requires innovative, scalable behaviour change approaches with broad reach and sustainability. Mobile technology may help meet these objectives. This study aimed to develop and pilot-test a theory-based mobile telephone weight loss app, Empower, among adults.

Methods
Empower was designed based on evidence-based behaviour change strategies, including control theory constructs such as setting weight loss, physical activity and dietary goals; self-monitoring; and receiving tailored feedback. A convenience sample of 16 participants, mean age 35 years (SD: 9), were provided with the app for their iPhone (or on a loaned iPod) and asked to use it for one month. They completed pre and post-test surveys assessing experience with mobile apps, and (post-test only) Empower app use/perceptions.

Results
At pre-test all participants reported that they had used mobile apps at least occasionally. At post-test, ten participants reported using the Empower app daily or on most days. All but two reported that they found it easy to use; all but three agreed using the app was enjoyable. However, six participants indicated that the app didn’t work the way they wanted it to, and nine noted that the app did not do everything they expected it to. Suggested improvements related to increasing flexibility to enter data, adding more goals and tips, and improving aesthetics.

Conclusions
This study provided useful data to inform the refinement of an evidence-based weight loss app that, if shown to be effective in a future trial, could potentially help reduce the burden of obesity-related morbidity.
Instrumental variable meta-analysis of randomised trials of epidural analgesia in labour to adjust for non-compliance

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Aims and objectives

Intention-to-treat analysis of randomised controlled trials may cause bias towards the null where non-compliance with the allocated intervention occurs. Instrumental variable analysis allows estimation of the causal effect adjusted for non-compliance. The aim of this study is to compare intention-to-treat and instrumental variable meta-analysis of the association between epidural analgesia in labour and caesarean section using data from published studies.

Methods

The study was restricted to 27 trials in a recent Cochrane Systematic Review. For trials with data on compliance, the association between epidural analgesia in labour and caesarean section was calculated using intention-to-treat analysis and instrumental variable analysis. Fixed-effects meta-analysis was used to calculate pooled risk ratios.

Results

In 18 trials with data on compliance, 23% of women allocated to epidural analgesia did not comply and 27% of women allocated to the control received epidural analgesia. Data on outcomes in non-compliant groups were available for 10 trials. Using instrumental variable analysis, the pooled risk ratio for caesarean section following epidural analgesia in labour was 1.37 (95% CI: 1.00–1.89; p=0.049) compared to 1.19 (95% CI: 0.93–1.51; p=0.16) using intention-to-treat analysis.

Conclusions

Intention-to-treat meta-analysis underestimates the effect of receiving epidural analgesia in labour on caesarean section compared to instrumental variable meta-analysis.

Stroke prevention on an international scale: the Stroke Riskometer™ app

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Aims and objectives

The medico-social significance of stroke and other non-communicable disorders (NCD) that share the same risk factors with stroke, such as ischaemic heart disease (IHD), dementia (cognitive decline) and diabetes mellitus, is huge and increasing. Preventive efforts may have a significant impact on this burden as 90% of strokes can be prevented. This project involved creation of a multiplatform app to help with prevention of ‘The Stroke Riskometer’ and planning for an international cohort trial.

Methods

Data collection for the smartphone-based international prospective cohort study will occur in 2015–17. The App will be available in the top 11 most spoken languages. Those downloading the app will be able to opt in to the cohort study. If the person agrees to participate, he/she will be asked to provide a contact email address. Once the questionnaire is completed and the ‘Calculate the risk’ button is pressed, data will be transferred to the central database on a special AUT server. Within 12 months participants will be automatically notified of the need to complete the questionnaire again to allow collection of the follow-up data (new events, changes in risk factors).

Results

To date, the app has been downloaded over 6,000 times across more than 70 countries, the majority of which were in New Zealand (which is where the app has been advertised). An international collaboration to use this for epidemiological study is described.
MRSA in the community: transmission analyses from the community-onset Staphylococcus aureus household cohort (COSAHC) Study, Australia

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Aims and objectives
To describe prevalence and dissemination of Staphylococcus aureus (S. aureus) strains in households with community-onset infections.

Methods
Patients were identified via specimens from a private pathology service (Oct 2008 – Dec 2010). 291 participants with S. aureus infections, including 139 patients with MRSA infections and a frequency-matched random sample of 152 people with infections with methicillin-sensitive S. aureus (MSSA), and 446 household members, were followed for up to two years. Patients and household contacts provided nose and axillar swabs, demographic information and medical and exposure history (occupation, sporting activities, pets, household interactions). All isolates were characterised using PFGE, MLST, spa typing, and PVL.

Results
737 people participated including 291 index cases. S. aureus carriage was common at baseline with 58% of index cases colonised in nose and/or axilla, and 50% of household contacts. Household nasal carriage was 49.7% (11.3% MRSA, 38.4% MSSA). Generally, MRSA nasal colonisation rates diminished over time. Logistic regression modelling revealed the proportion of household contact less than 18 years of age to be positively associated with S. aureus transmission (OR: 8.02 (95% CI:1.6–40.9)) independent of households size. The S. aureus type causing the original infection was also a predictor, with MRSA infections protective for MSSA transmission (OR: 0.40 (95% CI: 0.2–0.8)) and strongly predictive of MRSA transmission (OR: 86.7 (95% CI: 15.3–489.0)). Colonisation in the index case at baseline was also associated with MRSA transmission in households (OR: 4.5 (95% CI: 1.6–12.9)). PVL was inversely associated with transmission, especially for MRSA (OR: 0.16 (95% CI: 0.05–0.52)).

Conclusions
Differences in persistence and penetration in the household by strain type should guide patient and contact management.

Diverticular disease as a chronic condition

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Aims and objectives
In western populations, at least 70% of people aged 80+ years have colonic diverticula, compared to 33% in those aged 50–59 years. The epidemiology of the disease has not been described in New Zealand. This paper describes hospitalisations from the disease, reflecting requests from those with the disease for reliable information about managing their condition.

Methods
Data for hospital discharges and mortality in New Zealand were obtained from the Ministry of Health for the 20-year period 1992–2011. Age and sex-specific rates of admission are demonstrated; age-standardised rates describe trends. The prevalence pool is estimated using death data.

Results
113,056 hospitalisations in 76,305 people for diverticular disease (DD) were recorded over the 20 years. DD annual discharge rates per thousand rise steeply with age: from 0.5 for those aged 50–54 years, to 1.3 for those aged 70–74, and 2.1 for those aged over 85 years. Before the age of 45 years, rates for women were lower than for men, but higher after the age of 70 years. Rates of increase of first-in-a-lifetime admissions for men aged under 50 years were approximately twice those in other age groups. As at November 2011, over 24,000 people were living having had a previous hospital admission for diverticular disease.

Conclusions
Investigating gender difference in incidence, increasing rates especially among young men, and a high genetic component may lead to new understandings. Given the prevalence pool, population ageing and the trends described, reliable evidence is needed to explain diverticular formation, inflammation and continuing management of the condition.
Is self-reported sun exposure a reliable measure of sun exposure?

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Background

Epidemiological studies of cancer commonly aim to measure sun exposure, either for the purpose of assessing sun damage to skin or to measure vitamin D exposure. Currently, two epidemiological studies being conducted at Cancer Council Victoria are collecting both clinical and self-report measures of sun exposure.

Aims and objectives

The aims of this interim analysis were to calculate:

- Inter-rater reliability of skin grading by microtopography
- The associations between self-reported and clinical measures of skin type and sun damage to skin.

Methods

Participants were asked to report their sun exposure (including skin colour, tanning ability, residential history and hours spent outside) and to attend a clinic to provide clinical measures of sun exposure—skin surface topography (microtopography) and spectrophotometry readings of skin colour.

Results

This analysis reports on the first 317 participants who presented for clinical assessment. There was exact agreement between all three graders for 136 (43%) of impressions. The weighted kappa was $k=0.68$ (95% CI: 0.62–0.74). The correlations between self-reported and clinically measured skin type (Spearman’s $\rho=0.40$, $p<0.05$) and skin damage due to UVB exposure (Spearman’s $\rho=0.15$) were low. Whether self-reported or clinical measures were used, increasing age was significantly associated with an increased likelihood of skin damage.

Conclusions

Due to the variety of assumptions that are required to be made when computing self-reported total UVB exposure, clinical measures are preferable, however this is not always possible. When examining predictors of skin damage, the findings were similar whether self-report or clinical measures were used.

The use of ‘standard drinks’ to measure alcohol consumption in developing world

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Aims and objectives

Some questionnaires used in surveys request respondents to report quantity of alcohol consumed in terms of numbers of ‘standard drinks’. Our primary aim was to investigate whether self-reported information on standard drinks are predictive of blood pressure and prevalence of hypertension.

Methods

This study included 14,706 participants (46.5% males, response proportion 64.1%) aged 25–64 years selected from a nationally representative population-based survey of Vietnam. Measurements of frequency of alcohol consumption, of numbers of standard drinks consumed, and blood pressure were made using WHO STEPS protocols. Data were analysed using complex survey methods.

Results

Numbers of standard drinks reported by men were associated with blood pressure/hypertension, particularly in rural areas ($p<0.001$ for trend), less so for last week consumption than for last year consumption. Few women (<2%) consumed alcohol regularly. Self-reported information on the number of standard drinks consumed per drinking occasion was not independent of reported frequency of occasions, and provided at best minor gains in model calibration and subject discrimination over those provided by information on frequency of consumption. Most of the calibration and discrimination possible from self-reported information on alcohol consumption were provided by binary responses to questions on whether alcohol had been consumed during the reference period.

Conclusions

Self-reports of quantity of alcohol consumed in terms of standard drinks have predictive validity for elevated blood pressure in populations unfamiliar with the concept. However, the usefulness of the information is questionable because gains in model calibration and subject discrimination are minor.
**Income mobility in New Zealand: a descriptive analysis**

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**Aims and objectives**

The purpose of this study is to describe short and long-term mobility in income in New Zealand.

**Methods**

This study utilises eight years of data from the longitudinal Survey of Family, Income and Employment (SoFIE) to examine dynamics in income for individuals from 2002 to 2010 (N=18,000). The measure of real disposable equivalised household income is the total after-tax and payroll deductions income of all individuals in the household, adjusted for household composition and to the CPI.

**Results**

There is substantial change in incomes between one year and the next, for people of all income levels. The largest increases in income could be seen in respondents who started out in the lowest income groups and stability or declines in incomes were found in those who were in the highest income group at baseline.

Although there are strong correlations in individual’s income between the years, there was lots of mobility in income from year to year. Over 60% of the population changed income decile groups over the first two years of the study. Movements in income were more likely to adjacent income groups. The patterns of mobility were greater over eight years, with only 20% of the population staying in the same income decile group over the study period.

**Conclusions**

The levels of income mobility are similar to other international panel surveys. More research is needed examining what factors, such as changes in employment or family circumstances are causing people to move up and down the income ladder.

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**The changing face of disease surveillance – the past, the present and what lies ahead**

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Disease surveillance has come a long way since its origins in Europe in the 1300’s during the Black Death, where ships carrying passengers showing symptoms were quarantined to prevent the spread of the disease. Fast forward to the end of the 20th century, where the majority of western countries have established disease surveillance systems for a variety of diseases. Using influenza as an example, some of the major advancements in surveillance in Australia in the past decade will be discussed, including community internet-based surveillance, proteomics surveillance and data extraction powered syndromic surveillance. Finally, what lies-ahead for the future? With advancements in social media surveillance, rapid point-of-care testing and GIS-based surveillance, disease detection is set to keep on evolving in future years.

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**Predictors of disability among a cohort of 2,856 injured New Zealanders**

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**Aims and objectives**

To 1) determine the prevalence of disability 24 months after injury for hospitalised and non-hospitalised participants in the Prospective Outcomes of Injury Study; and 2) identify predictors of disability and poor health service experiences.

**Methods**

Participants (18–64 years) were recruited from an injury claims register managed by ACC. Interviewer-administered questionnaires collected information on pre-injury demographic, health and psychosocial factors, injury characteristics, health experiences up to three months following injury (five questions) and disability (based on the WHODAS) at 24 months following injury. Multivariable models estimating relative risks of poor outcomes were developed using modified Poisson regression methods.
Results

Of 2,856 participants, 25% were hospitalised. Pre-injury disability was experienced by 5% of the cohort, but 24 months after injury 13% in both the hospitalised and non-hospitalised groups, experienced disability. Of 28 predictor variables, only four (pre-injury disability, ≥2 chronic conditions, BMI≥30 and trouble accessing healthcare) were common to both groups. Māori within the hospitalised group appear to be at higher risk of disability relative to non-Māori (RR=1.69). Inadequate household income was independently associated with four out of five poor health service experiences: not enough time to discuss health (RR=1.57), limited participation in decision-making (RR=1.29), insufficient information (RR=1.22) and health needs not being understood (RR=1.39).

Conclusions

Considerable disability is experienced, equally, by hospitalised and non-hospitalised groups. It is concerning that Māori are at increased risk of disability. Injured New Zealanders with certain characteristics are at risk of reporting poor health service experiences three months after injury.

Sun exposure, vitamin D status and acculturation in East Asian Australians

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Aims and objectives

East Asian immigrants to western countries commonly have higher prevalence of vitamin D deficiency than the host country’s population. This discrepancy is less marked in migrants who are more acculturated to the host country’s lifestyle. We examined self-reported and objectively measured skin type and sun exposure, and markers of acculturation in relation to vitamin D status (measured as the serum concentration of 25-hydroxyvitamin D (25(OH)D) in East Asians living in Canberra, Australia.

Methods

The Asian Australian Health Study was a community-based cross-sectional study involving 100 East Asian Australians aged 18–80 years. Data on sociodemographic factors, health behaviours and acculturation variables were collected by self-completed questionnaire; skin colour was measured by reflectance spectrophotometry. Participants kept a sun diary and wore an electronic ultraviolet radiation (UVR) dosimeter for seven days. Serum concentrations of 25(OH)D and cardio-metabolic biomarkers were measured on fasting blood.

Results

In a multiple linear regression model, predictors of 25(OH)D concentration were season of blood collection, use of vitamin D supplements, UVR exposure, body mass index, physical activity and having private health insurance (R2=0.57). Greater acculturation (as measured by language and time proxies) was associated with lower risk of vitamin D deficiency (deseasonalised 25(OH)D level <50nmol/l) (adjusted Odds Ratio (aOR): 0.22 (95% CI: 0.04–0.96)). The association between acculturation and vitamin D deficiency was mediated by physical activity and time outdoors. Vitamin D deficiency was associated with higher total cholesterol levels (>5.0mmol/L) in this population (aOR: 7.48 (95% CI: 1.51–37.0)).

Conclusions

More acculturated individuals had higher vitamin D status due to greater sun exposure and outdoor physical activity. Targeted public health approaches to migrants retaining a more traditional lifestyle are required to manage the high prevalence of vitamin D deficiency in this population group.

Epidemiological response capacity in the Western Pacific Region: need for a regional solution

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Aims and objectives

The populous Western Pacific Region has difficult-to-access small countries stretched in large area that lack public health response capacity to infectious diseases emergencies. Some of the regional countries have epidemiological capacity. Small countries, when needing support, rely on international public health support. In order to address these issues, available regional resources were reviewed.

Methods

We reviewed the regional epidemiology programs, identified countries without them, selected three regional countries without them, and reviewed their public health systems. For this purpose, their data from past five years’ morbidity, mortality, surveillance systems, reported outbreaks, major natural disasters and public health workforce capacity was reviewed. This information was researched from online resources, peer-reviewed journals and grey literature.

Results

Small-island countries lacked epidemiology training programs to address public health challenges. There were gaps in outbreaks response and integration of available surveillance systems in three selected countries. There was a gap in demand and availability of infectious disease
response capacity. This gap is disproportionality higher in smaller countries. There were public health emergency event identified when even the presence was epidemiology training programs was outnumbered by the impact of disaster and needed international support.

Conclusion
Lack of trained workforce is a challenge for poorly resourced small-island countries in the region. Presence of vulnerable populations and the occurrence of a high existing burden of infectious diseases are additional risks. A regional solution and developed nation's role to offer support was identified. The study recommendations' are taken up by the ARM Network.

Health-related quality of life of caregivers of stroke patients in Vietnam
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Aims and objectives
Little is known about the welfare of carers of stroke survivors in Vietnam. This study assessed their health-related quality of life (HRQoL) after three months of caring for a stroke patient.

Methods
Main carers of first-ever stroke patients admitted to the stroke unit of a major hospital in Ho Chi Minh City from June to September 2012 were interviewed three months post-stroke. HRQoL was assessed using the Duke Health Profile (DHP). Stroke severity was determined using the National Institutes of Health Stroke Scale and the modified Rankin Scale. Mean DHP values were compared with those from a population-based survey of city residents eight years earlier and with those of the stroke patients cared for, each weighted to reflect the age-distribution of the carers, and between levels of patient and caregiver characteristics.

Result
The study included 108 carers of mean age 45.9 (SD: 14.1) years (69.4% female). Most carers were children (50%) or spouses (37%). The mean DHP scores of the carers declined with age and were higher for males, generally higher than population reference values, higher than those of the stroke patients, inversely related to the severity of stroke of the patient cared for, and correlated with their own EQ5D scores on dimensions that measured similar constructs.

Conclusions
Carers of the most severely affected stroke survivors had poorest HRQoL, but overall their DHP scores were higher than population reference values. This may reflect the wider family context of caring in Vietnam, with responsibilities assigned to healthy members best able to cope.

Managing suspected cancer in primary care in New Zealand: an international study
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Background
The study is the New Zealand arm of the International Cancer Benchmarking Partnership (ICBP) Module 3. It investigates the ways of managing suspected cancer by general practitioners (GP) in the United Kingdom and other European countries, Canada, Australia and New Zealand.

Aims and objectives
1. To determine potential barriers to primary care access for the diagnosis of cancer, access to cancer investigations, and access to specialist review.
2. To determine reasons for ethnic and geographic disparities in diagnosis and management of suspected cancer in primary care.
3. To clarify GP knowledge and attitudes regarding the management of suspected cancer.

Methods
The nationwide online survey collects data from vocationally registered GPs, general-registrant doctors working in general practice, and GP registrars. Recruitment undertakes snowball sampling and study advertising via New Zealand GP College and promotion at national GP events. The questionnaires include demographic characteristics of GP practices; patient vignettes assess practice administration including organisation of follow-up and referrals specific to the case, GP cancer education, access to specialist advice and investigations, and the role of MOH cancer guidelines to GP in patient management.

Result
The study is in progress and results will be presented.
Developing the evidence for a national salt reduction program for India

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Background
While the evidence base for salt reduction in controlling hypertension is strong, the data required to translate evidence into policy and reduced population salt intake are mostly absent. Few countries, India included, have the data required to develop, implement and evaluate salt reduction programs.

Aims and objectives
The objective is to conduct an integrated, multifaceted research program that will provide the baseline information required to support the implementation of a national salt reduction program for India.

Methods
The research methods will comprise three main components:
1. A stakeholder analysis including government, industry, consumers and non-governmental organizations.
2. A cross-sectional population survey of an age and sex-stratified random population sample of 1,200 individuals drawn from urban (slum and non-slum) and rural areas of North and South India.
3. A systematic survey of the nutritional composition of processed and restaurant foods.

Expected outcomes and results
The primary outcome will be a practical plan for the implementation of a national salt reduction program in India. Secondary outcomes will be
- The identification of key action, feasibility, acceptability and impact themes
- 24-hr urinary sodium level in the overall study population
- Sodium levels in packaged and restaurant foods

Conclusions
This study will help gain insight into effective strategies to influence food industry and consumer behaviours to reduce population salt intakes in India. With cardiovascular diseases already the leading cause of death in most parts of India, and cardiovascular disease events occurring on average a decade earlier than in the West, the potential significance of salt reduction for the health of the population is clear.

A community-based prospective cohort study of exclusive breastfeeding in central Nepal

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Aims and objectives
This study investigated exclusive breastfeeding rates, and compared the duration of exclusive breastfeeding between rural and urban mothers in central Nepal using an alternate cohort methodology.

Methods
A community-based prospective cohort study was conducted among 639 recently delivered mothers representative of the Kaski district of Nepal. Breastfeeding information was obtained at birth (n=639), 4 weeks (n=639), 12 weeks (n=615) and 22 weeks (n=515) through repeated interviews using validated questionnaires. Risk of cessation of exclusive breastfeeding was assessed by Cox regression analysis.

Results
Although nearly all mothers (98%) breastfed up to six months, the exclusive breastfeeding rate declined rapidly from 90.9% at birth to 29.7% at 22 weeks. Urban women experienced significantly shorter (p=0.02) exclusive breastfeeding duration (mean: 104.5 (95% CI: 95.8–113.1 days)) and were more likely to cease exclusive breastfeeding (hazard ratio (HR): 1.28 (95% CI: 1.03–1.60)) than their rural counterparts (mean 144.7 (95% CI: 132.3–157.1 days)). Breastfeeding problem (HR: 2.07 (95% CI: 1.66–2.57) and caesarean delivery (HR: 1.88 (95% CI:1.36–2.62)) were also significantly associated with exclusive breastfeeding cessation.

Conclusion
Despite the almost universal practice of breastfeeding, exclusive breastfeeding rates declined substantially over time. Exclusive breastfeeding up to six months was more common in rural than urban areas of central Nepal. Urban mothers also exclusively breastfed for shorter durations than rural mothers.
Patterns and correlates of screen time among adolescents in Bangladesh

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Aims and objectives
Screen time (i.e. television/DVD, video games, computer use, Facebook/Twitter) has been negatively associated with several health outcomes including obesity and cardiovascular disease. To date, no studies in Bangladesh have examined screen time in adolescents. The purpose of this study was to investigate the patterns and sociodemographic correlates of screen time among school children of Dhaka City, Bangladesh.

Methods
A total of 898 students (439 boys, 459 girls; mean age 14.27, SD: 1.15) from eight secondary schools of Dhaka City, Bangladesh completed a self-administered questionnaire. A modified version of the Adolescent Sedentary Activity Questionnaire was used to collect information on screen time on past week, including weekdays and weekends. Screen time was categorised as ≤ 2 hours or > 2 hours per day, reflecting a widely used screen time recommendation.

Results
About 80% of the adolescents reported of having had more than 2 hours/day of screen time, with higher rates on weekends (91%) than weekdays (77%). About 83% of the male adolescents reported to have high screen time compared to 76% of females. High screen time was more common among obese adolescents than their counterparts who had normal BMI (87% vs. 78%). Use of high screen time among adolescents increases with the increase of family income. Multi-level logistic regression analysis identified specific socio-demographic factors associated with >2 hours/day of screen time.

Conclusions
This study identifies characteristics of adolescents who need special attention to reduce screen time. Longitudinal studies are needed to understand the causal relationships between these variables.

Comparison of different pathways to the diagnosis of melanoma

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Aims and objectives
This study will assess the impact of different pathways to the diagnosis of melanoma, including those using newer digital image and computer-based systems, in the Waikato region. We are comparing four different patient pathways leading to the diagnosis of melanoma in Waikato; private sector patient initiated MoleMap® screening, public sector Virtual Lesion Clinic, and standard private and public referrals. We are evaluating the efficiency of diagnosis as indicated by the depth distribution of melanomas and aspects of the time course of the process to diagnosis and referral.

Methods
All invasive and in-situ melanomas diagnosed histopathologically in 2010–12 in the Waikato region will be assessed and analysed using descriptive statistics, multivariable analyses for categorical and quantitative outcomes, and proportional-hazards models for time-dependent variables. We are also assessing clinical outcomes of a cohort of subjects assessed by MoleMap examinations in Waikato in 2010–12 with a recommendation for excision of lesions suspicious of melanoma, to measure the proportion of patients who underwent biopsy or excision, the time interval to biopsy, and features of those patients and their skin lesions.

Results
Results will be presented based on approximately 1,000 melanomas diagnosed over three years.

Impact
The study will provide new information on the efficacy of new technology and services for the diagnosis of melanoma, and will be valuable in planning improvements in melanoma diagnostic and assessment services in New Zealand.
Hospital presentations for food allergy in New Zealand children

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Aims and objectives
The epidemiology of food allergy in New Zealand has been incompletely described. The published data do not enable prevalence or temporal trends to be described. Due to the difficulties inherent with the establishment of stable and repeatable measures of food allergy prevalence in the community or primary care settings, emergency department visits or hospital admissions for food related allergic reactions are used as a disease burden measure that allows temporal trends to be investigated. We aimed to describe the annual rate of hospitalisations for food related allergic reactions in New Zealand children (<14yo) and temporal trends in hospitalisation.

Methods
Cases, identified from the National Minimum Dataset (NMDS), include children (<14y) presenting with a food-related allergic reaction as defined by ICD diagnostic codes (1988–2011). Cases form the numerators and census population estimates the denominators in rate calculations. How these rates vary over time and with demographics will be determined using rate ratios, 95% confidence intervals and other appropriate statistical comparative methods. Rates by age, gender, ethnicity and territorial local authority will be described.

Conclusions
Only a minority of children with food allergy require inpatient hospital care for management of this problem. Large increases in hospitalisation rates for food allergy have been reported in recent years in Australia and the United States. Our study will enable us to determine if similar trends have occurred in New Zealand and will allow the rate of hospitalisation for food allergy in New Zealand to be compared with other developed countries.

Online dietary assessment for research: The Automated Self-Administered 24-hour Dietary Recall System for Australia (ASA24-Aus)

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Aims and objectives
Due to the complexities in assessing what people eat, the field of dietary assessment has looked to technology to assist in measuring food intakes, primarily focusing on web-based and mobile tools that use digital images. The focus of this research is to develop and evaluate a self-administered 24-hour dietary recall for Australia (‘ASA-Aus’).

Methods
The Automated Self-Administered 24-hour Dietary Recall System (‘ASA24’), is a web-based tool developed by United States National Cancer Institute (US NCI) that guides participants through a self-administered 24-hour recall interview to assess food and beverage intake. The interview uses standardised, detailed questions about food preparation, portion sizes and additions to foods. The system is designed to automate both the coding and analysis of reported foods to provide daily nutrient and food group intake estimates. In collaboration with the NCI, a consortium of Australian researchers will adapt the ASA24 to the Australian context to account for variations in food consumed, portion sizes and nutrient composition.

Results
Five Australian research groups are working to develop the ASA24-Aus. The ASA24 has already been used by over 950 US researchers to collect over 130,000 dietary recalls and is being used in three biomarker sub-studies of large cohorts in the US (Harvard Nurses’ Health Study, Harvard Health Professionals Follow-Up Study, and the National Institutes of Health-AARP Diet and Health Study).
Conclusions
The ASA24-Aus will provide an online dietary assessment system allowing high quality, automated assessment of dietary intake for use in a range of research settings and study designs.

GP databases reveal inappropriate prescribing of oral anti-thrombotics for patients with atrial fibrillation

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Aims and objectives
To determine for New Zealand patients ≥ 60 years of age with atrial fibrillation (AF): (1) the distribution of annual risk of stroke or thromboembolism (S/TE); (2) warfarin and aspirin prescribing patterns; and (3) the potential for risk-based prescribing to reduce S/TE events.

Methods
Risk factors for S/TE and prescribing patterns for warfarin and/or aspirin were determined for 2,143 men and 1,777 women ≥60 years of age with AF from MedTech32 GP databases. CHA2DS2-VASc risk scores were calculated for each patient and annual S/TE events were estimated. Rates of major bleeding were obtained from the literature.

Results
81% of men and 97% of women had >3.5% annual risk of S/TE. 28% of these were prescribed aspirin; 27% of men and 24% of women had warfarin; and the remainder had no antithrombotic. 46% of low-risk men were prescribed an antithrombotic. Prescribing of warfarin was more likely for individuals with age <75 years and/or heart failure and/or a history of stroke/TIA. An estimated 270,000 quality-adjusted life-years (QALYs) gained (95% uncertainty interval (UI): 210,000–330,000). This intervention produced net savings of NZ$3.47 billion over the lifetime of the modelled population. Health gains were moderately less (250,000 QALYs) for a tax on sodium (with this rising until achieving the same 2,300 mg/day target). This tax was estimated to generate up to NZ$452 million in revenue per annum in 2021. Replicating a package of interventions previously used in the United Kingdom delivered 110,000 QALYs; and for the mass media campaign component of this United Kingdom package alone: 32,000 QALYs. All of these four interventions were cost-saving compared to the ‘do nothing’ comparator (including in scenario analyses). Health gain per person was greater for Māori than for non-Māori.

Conclusions
Anticoagulant therapy with warfarin is under-utilised for patients with high or very high risk of S/TE and over-utilised for low-risk patients. Risk-based prescribing of anticoagulants could avert about 800 S/TE events each year but cause similar numbers of major bleeding events.

Cost-utility analysis of four population-level interventions to reduce health loss from dietary salt intake

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Aims and objectives
To model the cost and health (inequality) impacts of four dietary sodium reduction interventions in New Zealand.

Methods
We conducted a cost-utility analysis using a Markov macro-simulation model of all New Zealand adults alive in 2011 (health system perspective, 3% discounting). Data were included for baseline parameters (disease incidence, survival and mortality), for health system costs (using individual-level administrative data [HealthTracker]), and for the modelled interventions.

Results
The largest health gain arose from the potential intervention of a legally mandated sinking lid on sodium supply (down to 2,300 mg/day per adult): with a mean of 270,000 quality-adjusted life-years (QALYs) gained (95% uncertainty interval (UI): 210,000–330,000). This intervention produced net savings of NZ$3.47 billion over the lifetime of the modelled population. Health gains were moderately less (250,000 QALYs) for a tax on sodium (with this rising until achieving the same 2,300 mg/day target). This tax was estimated to generate up to NZ$452 million in revenue per annum in 2021. Replicating a package of interventions previously used in the United Kingdom delivered 110,000 QALYs; and for the mass media campaign component of this United Kingdom package alone: 32,000 QALYs. All of these four interventions were cost-saving compared to the ‘do nothing’ comparator (including in scenario analyses). Health gain per person was greater for Māori than for non-Māori.

Conclusions
All four modelled interventions delivered major health gains, major cost savings and reduced ethnic inequalities in health. The sodium tax might be particularly advantageous as it could raise funds for other health programmes.
The impact of roads on health-related quality of life of residents in Auckland, New Zealand

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² Audiology Discipline, School of Population Health, The University of Auckland, Auckland, New Zealand

Aims and objectives

Many New Zealanders live in close proximity to motorways and thus are subjected to the effects of road traffic noise and air pollution. The main objective of this study was to investigate whether there was a dose-response relationship for proximity to motorways and health-related quality of life.

Methods

A subjective measure of health-related quality of life was obtained from residents living at various distances from a major motorway using the World Health Organization Quality of Life (WHOQoL) questionnaire. Questionnaires were distributed to five groups based on the road-to-residence distance: < 50, 50–150, 150–400, 400–2,000, and >2,000 metres (n=100 for each group). Sampling was carried out in low socioeconomic status areas with New Zealand’s Deprivation scores of 8–10.

Results

The four WHOQoL domain scores of people living <150 metres from the motorway were significantly lower than those of people living further away. People living <150 metres from the motorway also experienced more noise annoyance. There was a dose-response relationship for people living < 50 and 50–150 metres from the motorway. The influence of noise on health-related quality of life in these groups was mediated, at least in part, through increased noise annoyance. Dose-response relationship was not observed for people living > 150 metres from the motorway.

Conclusions

Results from this study will be of significance to urban planners in the design of new urban developments. Future studies are recommended to identify if such results can be replicated in people residing in high socioeconomic status areas.

Recent trends in age and sex-specific heart disease mortality in Australia

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Aims and objectives

There is international evidence that the large reductions in ischaemic heart disease (IHD) mortality rates observed over recent decades have occurred predominantly within older age groups. The aim of this study was to examine age and sex-specific trends in IHD mortality between 1970 and 2011 in Australia.

Methods

Age, sex and cause-specific death data and corresponding population data were obtained from the WHO. Age-specific death rates in ten-year age bands were calculated for deaths coded as being due to IHD. Joinpoint analysis was conducted to identify significant inflexion points in mortality trends, for each subgroup. Average annual percentage changes in mortality rates were calculated with respect to the underlying joinpoint model.

Results

Australia has demonstrated among the most remarkable declines in IHD mortality in the world over the last four decades. Significant decreases in mortality rates have continued in most age and sex groups. The largest observed average annual decreases in mortality since 2000 were in the 65–74 year age group. There was evidence of a slowing or plateau of previously decreasing rates in the 25–44 year age groups, which may have begun as early as the early 1980s, and of a similar slowing among those aged 45–64 years that has begun much later, since around 2006.

Conclusions

Despite enviable successes to date, recent increases in heart disease risk factors such as obesity and diabetes may present a significant future burden of heart disease mortality in Australia.
Risk factors associated with intentional and unintentional poisoning: findings from the New Zealand Blood Donors’ Health Study

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Aims and objectives

Notwithstanding difficulties in ascertaining intent, aetiological studies on adult poisoning typically focus on intentional or unintentional events as distinct entities. This study investigated the risk factors associated with intentional and unintentional poisoning resulting in hospital admission or death among adult New Zealanders.

Methods

The 22,389 participants aged 16 and older comprised the New Zealand Blood Donors’ Health Study (NZBDHS) cohort who completed a baseline self-report questionnaire (including demographic, personal health, psychosocial and lifestyle information) at recruitment in 1998/1999. Outcome data on poisoning-related admissions and deaths up to 31 December 2012 were collected prospectively through electronic record linkage of participants’ unique identifiers to the national minimum mortality and morbidity databases. Baseline characteristics associated with intentional and unintentional poisoning at follow-up were investigated using Cox proportional-hazards analysis.

Results

During the median follow-up period of 13.8 years (308,068 person-years), 285 poisoning events (187 intentional, 108 unintentional) were identified. Multivariable models revealed that both intentional and unintentional poisoning at follow-up were associated with depressive symptoms (intentional poisoning: adjusted HR=1.97 (95% CI: 1.28–3.03); unintentional poisoning: adjusted HR=1.66 (95% CI: 0.93–2.96) and suicidal ideation at recruitment (intentional poisoning: adjusted HR=3.72 (95% CI: 2.40–5.78); unintentional poisoning: adjusted HR=2.45 (95% CI: 1.33–4.51)). While unadjusted estimates suggested illegal drug use was also a risk factor for intentional and unintentional poisoning, these associations were attenuated after adjustment for demographic and other variables.

Conclusions

The findings of this large prospective injury cohort study suggest that interventions addressing mental health problems could have the potential of reducing serious poisoning events irrespective of intent.

Hospital costs for stroke patients admitted to a stroke unit in Ho Chi Minh City, Vietnam

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Aims and objectives

We aimed to estimate the cost of in-hospital management of stroke patients admitted to a stroke unit in a teaching major hospital in Ho Chi Minh City, Vietnam.

Methods

A consecutive sample of 450 patients with ischaemic stroke or intracerebral haemorrhage admitted between June and September 2012. Itemised hospital costs were extracted from electronic administration records. Stroke severity was assessed by doctors using National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS).

Results

Cost data were available for 438/450 patients (48% female, mean age 62.5 years (SD: 14.0), 76% ischaemic stroke; 54% had health insurance). Mean length of stay (LOS) was 6.4 days (SD: 4.2) with median 5.0 days. Mean total cost in hospital was AUS905. Mean cost per day was AUS146. Stroke unit treatment costs accounted for 76% of total costs. Mean ‘out-of-pocket’ costs for patients with health insurance was AUS386 (46% of total treatment costs). Treatment costs were similar by age and sex, but were greater for those with severe stroke (NIHSS ≥7) and severe disability (mRS≥3) (each p<0.001) attributable to longer LOS. Diagnostic imaging and bed-day fees explained nearly half of total hospital costs, and about 60% of ‘out-of-pocket’ patient costs.

Conclusions

This information provides an understanding of the costs of stroke in Vietnam. Hospital costs of treatment for stroke in a stroke unit were 1.7-times greater than the monthly average income per capita of Ho Chi Minh City residents in 2012. Greater efforts to prevent stroke in Vietnam are needed.
The effectiveness of antenatal influenza vaccination in preventing influenza infection in newborns

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Aims and objectives
The World Health Organisation lists pregnant women as the highest priority for seasonal influenza vaccination. Randomised clinical trials have shown that maternal vaccination can reduce the incidence of laboratory-confirmed influenza infection in infants <6 months old and likely results in improved health at birth. However, limited population-based research is available to support the extension of these results to a population-level.

Methods
The Links to Healthier Mums and Bubs project uses a series of data linkages to create a birth cohort of infants born to vaccinated and unvaccinated mothers. Vaccination records, birth/death records, hospitalisation records, and notifications of influenza infection were linked for all births occurring during influenza season in Western Australia between 2012 and 2013. The relative risk of influenza will be calculated for infants born to vaccinated mothers compared to unvaccinated mothers. The incidence of hospitalisations for respiratory infections will be compared as well as differences in birth outcomes between groups.

Results
Data were obtained from 11,306 births (2,334 vaccinated and 8,972 unvaccinated) in 2012 and 11,582 births (4,046 vaccinated and 7,536 unvaccinated) in 2013. Initial study results will focus on the relative risk of laboratory-confirmed influenza.

Conclusions
The Links to Healthier Mums and Bubs study is the first large-scale, population-based cohort study investigating antenatal immunisation in the southern hemisphere and will provide additional evidence of the effectiveness of antenatal influenza vaccination in preventing infection in infants and mothers. These results can be used to determine population-wide benefits of maternal influenza immunisation and inform national public health policies.

Sun exposure behaviours and cardiovascular lifestyle risk factors among women in Sweden

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Aims and objectives
Sun exposure is the primary determinant of vitamin D status, low levels of which predict cardiovascular (CV) disease. The study aim is to assess the association between sun behaviour patterns and CV lifestyle risk factors.

Methods
Data come from baseline interviews in 1991–92 of 49,258 women aged 30–50 years enrolled in the Swedish Women’s Lifestyle and Health Cohort Study. For each of the second through fourth decades of life (ages 10–39 years), women were asked about: annual number of sunburns; annual number of weeks vacationing at a beach; and times per month using a solarium. They were ranked based on their exposure over the three decades, corrected for number of years if aged 30–39 years, and also ranked on their sunscreen use at baseline interview.

Results
Alcohol drinking had the strongest associations (all positive) with all sun behaviours, especially with beach holidays and solarium use, and less strongly with sunburn frequency (p<0.0001). Moderate associations were seen for tobacco smoking (positively with solarium use and beach holidays, and negatively with sunburn frequency and sunscreen use, p<0.0001). The weakest associations were seen for physical activity (positively with beach holidays, and use of solaria and sunscreens (p<0.01), and negatively with sunburn, p<0.01), and for BMI (negatively with beach holidays, solarium use and sunscreen use, and positively with sunburn, p<0.01).

Conclusions
The relatively consistent direction of associations that alcohol, physical activity and BMI each have with sun behaviours suggest that they are potential confounders in the association between sun behaviour and CV disease.
A Western Australia retrospective birth cohort medical record linkage study: an epidemiological investigation with special focus on occupational exposures to endocrine disrupter chemicals

Adeleh Shirangi¹² and The Collaborative Group

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Aims and objectives
This presentation will introduce a new birth cohort study in Western Australia. The study will investigate possible risks associated with selected adverse birth outcomes such as low birthweight, preterm delivery, inadequate foetal growth, foetal death and neonatal death in relation to selected paternal and maternal socio-demographic, reproductive characteristics and occupational exposures to Endocrine Disrupting Chemicals (EDCs).

Methods and progress report
The study is a retrospective cohort medical record linkage study consisting of all births in WA, including live births, stillbirths and neonatal death during 1998–2010 (about 400,000 births) identified through WA Data Linkage Unit. The project holds human ethics approvals from WA Department of Health and University of WA and all data including information on birth outcomes, demographic, reproductive characteristics and maternal and paternal occupation have been collected. Parental occupation will be coded to a standard measure using the Australian and New Zealand Standard Classification of Occupations. A newly developed Australian Job Exposure Matrix is created to classify the likelihood of exposure to EDCs and will be linked to the WA linked database. Descriptive and analytical studies will be conducted to study distribution and determinants of epidemiological investigations. The project so far attracted funding support from a UWA Research Development Award, an internal support from NHMRC Capacity Building Grant, and a New Independent Researcher Infrastructure Support award from Government of WA, Department of Health. The research will allow a better understanding of risks associated with the factors of interest, underpin prevention strategies and facilitate international comparisons.

The sexual literacy of the student population of the University of Tasmania: results of the RUSSL Study

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4 School of Medicine, University of Tasmania, Hobart, Australia
5 Tasmanian Sexual Health Services, Hobart, Australia.

Aims and objectives
Evidence suggests a varied deficit in the sexual literacy among university student populations. This being so, we sought to evaluate the sexual literacy among students at the University of Tasmania.

Methods
Students were solicited to participate in our study and complete an anonymous online questionnaire. Recruitment was during August 2013 and including email invitations, flyers and social media. The questionnaire assessed sexual literacy using the ARCSHS National Survey of Australian Secondary Students and Sexual Health Survey and the Sexual Health Questionnaire, and queried demographics, sexual education and sexual experience. Predictors of literacy scores were evaluated by linear regression.

Results
The study recruited 1,786 participants, or 8.2% of the student population, of similar composition to the general university student population.

Sexual literacy was significantly higher among females and those of older age. Sexual education was a positive predictor of literacy, as was an open communication about sexuality in the household. Literacy scores increased with sexual experience, in terms of absolute experience, partner number (same and opposite sex), diversity of sexual activity and earlier age of sexual debut.

As we had hypothesised a priori, students in medical disciplines had the highest sexual literacy. Less expected were the stark and significant differences by birthplace and religious affiliation. Compared to Australian and New Zealander students, overseas-born students had significantly lower sexual literacy scores, this effect driven by students from Malaysia, India, and Pakistan. Compared to agnostic/atheist-identifying students, those of Muslim, Buddhist and Protestant identifications had significantly lower scores. Importantly, many of these associated were robust to adjustment for age, sex, and sexual education.
Conclusions
This study has found a varied sexual literacy by sex, age, sexual education and sexual experience, as well as by birthplace and some religious affiliations. These findings have import for orientation and education programs at the University of Tasmania.

Description and comparison of anatomic distribution of basal cell and squamous cell carcinoma
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Aims and objectives
Keratinocyte cancers (KC), basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), are the most common cancers among fair-skinned populations. While studies have indicated that the anatomic distribution of BCC and SCC differ, few have comprehensively compared them in a large population-based sample. The aim of this study was to compare the anatomic distribution of BCC and SCC.

Methods
This study was nested within ‘The QSkin Study’, a cohort of 43,794 Queensland residents aged 40 to 69 years at baseline in 2011. Participants with KCs were identified through linkage to Medicare and pathology laboratories. We calculated the relative tumour densities (RTD) of defined body sites, by dividing the proportion of tumours occurring at a specified site by the proportion of skin area of that site.

Results
A total of 4,857 KCs were identified in 2,210 participants; 75% were BCCs. Most BCCs were on the head/neck (40%) and trunk (34%); most SCCs were on the head/neck (33%) and arms (35%). The RTDs of BCC and SCC were highest on the head/neck. The greatest difference in RTD between BCC and SCC was on the back/buttocks region (BCC/SCC ratio: 8:1). While the pattern of RTDs did not differ with age for BCC, the RTD for SCC on the scalp/ear was two-fold higher in older (55–69 years) compared with younger (40–54 years) adults.

Conclusions
Knowledge about the anatomic distribution of BCC and SCC may provide insight into their diagnoses and aetiology.

What influences the association between previous and future crashes among cyclists?
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Aims and objectives
This study investigated the association between experience of a previous crash and incidence of future crashes among cyclists using a propensity score approach.

Methods
The Taupo Bicycle Study is a prospective cohort study involving 2,590 adult cyclists who were recruited from the Lake Taupo Cycle Challenge in 2006 and followed over a median period of 4.6 years through linkage to insurance claims, hospital discharges, mortality records and police reports. The crash involvement propensity was estimated using propensity scores based on their demographic, cycling and residential characteristics. Cox regression modelling for repeated events was performed with multivariable and propensity score adjustments.

Results
A total of 801 (31.0%) participants reported having experienced at least one bicycle crash in the twelve months prior to the baseline survey. They had a higher risk of experiencing crash events during follow-up (hazard ratio (HR)=1.43 (95% CI: 1.28–1.60)), but in the stratified analysis this association was significant only in the highest two quintiles of the propensity score. The association was stronger for previous crashes that had received medical care (HR=1.63 (95% CI: 1.41–1.88)) compared to those that had not (HR=1.30 (95% CI: 1.14–1.49)).

Conclusions
Previous crash experience increased the risk of future crash involvement in high-risk cyclists and the association was stronger for previous crashes attended medically. The specific characteristics that explain the ‘high risk’ status of some cyclists warrant further investigation. The findings indicate also that health service providers could play an important role in preventing bicycle crash injuries.
Mortality inequalities in Australia, 2009–11

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Australian Institute of Health and Welfare, Canberra, Australia

Aims and objectives

• To describe the nature and magnitude of inequalities in overall mortality, leading causes of death and potentially avoidable deaths in relation to sex, remoteness of residence, socioeconomic disadvantage, country of birth and Indigenous status, using a selection of relevant measures of inequality

• To provide an up-to-date statistical reference for policymakers, service providers, planners and researchers on mortality inequalities in Australia.

Methods

Deaths data come from the AIHW National Mortality Database and are based on deaths registered from 2009–11. Mortality rates were directly age-standardised to the 2001 Australian standard population to enable comparison between groups. Rate ratio, rate difference, and measures of excess deaths were used to quantify relative and absolute inequalities.

Results

Substantial mortality inequalities exist in the Australian population by all of the population characteristics examined. These inequalities are seen for overall mortality, and for specific causes of death, including potentially avoidable deaths and most leading causes of death. In many cases these inequalities have existed for decades or more.

Conclusions

Each of these mortality inequalities examined highlights areas where actions could be targeted to further reduce potentially avoidable deaths. While it is difficult to ascertain precisely how much better or worse certain population groups are faring compared to others, it is clear that large mortality inequalities still exist in Australia today.

Feasibility, acceptability and potential effectiveness of a mobile health (mHealth) weight management programme for New Zealand adults

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Aims and objectives

Mobile health (mHealth) behaviour change programmes offer a potentially cost-effective way to reach many individuals who do not currently access weight loss services. We developed a mHealth weight management programme using proven face-to-face behaviour change techniques and incorporating target population input. Our aim was to evaluate the feasibility, acceptability and potential effectiveness of this programme for ethnically diverse adults.

Methods

Fifty-three adults who had a BMI of >25 kg/m² and wanted to lose weight (81% female, mean age 42 years, mean BMI 35.7 kg/m², 26% Māori, 34% Pacific) received the eight-week mHealth weight loss programme. Anthropometric measures were taken at two face-to-face assessments at baseline and 12-weeks (i.e. four weeks after cessation of intervention).

Results

Twelve-week follow-up measurements were available for 36–53 participants (68%). Thirty-five participants (66%) reported reading ‘all or most’ text messages sent and 96% responded to at least one text data collection question over the eight-week active intervention period. Eighty-one per cent of participants logged in to the study website at least once during the eight-week study period. In the intention-to-treat analysis, mean weight change was -1.0 kg (SD: 3.1) at 12 weeks (p=0.024) and change in BMI was -0.34 kg/m² (SD: 1.1) (p=0.026).

Conclusions

A mHealth weight management programme is feasible to deliver to an ethnically diverse population. Changes in body weight and BMI at 12 weeks indicate that the programme could be effective in supporting people with weight loss. However, the high dropout rate indicates a need for further improvements to the programme.
Lifestyle factors and risk of endometrial cancer for women with germline mutations in DNA mismatch repair genes

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Aims and objectives

A women carrying a germline mutation in a DNA mismatch repair (MMR) gene is at increased risk of endometrial cancer, colorectal cancer and several other cancers. The aim of the study was to investigate associations between lifestyle factors and risk of endometrial cancer for women with MMR gene mutations using the largest dataset to date.

Methods

This study comprised 976 female mutation carriers (361 MLH1, 472 MSH2, 90 MSH6 and 53 PMS2) from the Colon Cancer Family Registry (148 from Canada, 542 from Australia, and 286 from United States of America). During 41,710 person-years of observation from birth, 140 carriers (14%) were diagnosed with endometrial cancer. Using Cox proportional-hazards regression weighted to correct for ascertainment bias, we estimated hazard ratios (HRs) for associations between lifestyle factors and risk of endometrial cancer for carrier women, adjusting for measured potential confounders.

Results

A decreased risk of endometrial cancer was associated with use of multivitamin supplements (for 1–3 years: HR=0.31 (95% CI: 0.12–0.81), and for >3 years: HR=0.47 (95% CI: 0.23–0.96)) and ever use of oral contraceptives (HR=0.41 (95% CI: 0.26 - 0.65)) compared with never use. There was no evidence of associations with intake of calcium or folic acid supplements, aspirin or ibuprofen, consumption of beer or liquor, cigarette smoking, use of hormone replacement therapy, and increased adult body mass index.

Conclusions

Intake of multivitamin supplements and oral contraceptives might reduce risk of endometrial cancer for women with MMR gene mutations.
## Delegate list (current as of 29 September 2014)

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108  AEA Annual Scientific Meeting  Auckland, New Zealand, 2014
Annual General Meeting Agenda
Australasian Epidemiological Association

Friday 10 October 2014, 12:30–1:30pm NZST
New Zealand Lower 1, Aotea Centre, Auckland, New Zealand

Agenda

1. Attendance and apologies
2. Election of Council Members
3. Minutes of 2013 AGM
4. Business arising
5. President's report
6. Public Officer
   6.1 Appointment of Public Officer
7. Treasurer's report
   7.1 Appointment of auditor
8. Strategic Planning Officer report
9. Results of Membership survey
10. New Zealand report
11. Australasian Epidemiologist
12. Report on Local AEA Chapters
13. Student report
14. Awards
15. Other business

Minutes, Australasian Epidemiological Association Annual General Meeting
Monday 21st October 2013, 4.30-5.30pm CST, Boulevard Auditorium, Brisbane Convention Centre, Brisbane Queensland

1. Attendance and Apologies
Apologies: Joan Cunningham, Tiffany Gill, Michaela Riddell
Proxies; Roseanne Freak-Poli (Leigh Blizard), Fiona Clay (Tony LaMontagne), Joan Cunningham (Tony LaMontagne), Suhail Doi (Shahzad Syed)

Present: Thomas Astell-Burt, Leigh Blizard, Kristie Carter, Yingxi Chen, Elizabeth Comino, Mary-Ann Davey, Xiaqi Feng, Jane Ford, Paul Gardiner, John Gray, Browyn Haasdyk, Jane Halliday, Andrew Hayen, Diana Hindmarsh, Quan Huynh, Amina Khambalia, Matthew Knuiman, Anthony LaMontagne, Brigid Lynch, Sarah McNaughton, Thais Miles, Gita Mishra, Evi Muggli, Matthew Page, Kira Patterson, Camille Raynes-Greenow, Michael Riddell, Christine Roberts, Laura Rodwell, Linda Slack-Smith, Lahn Straney, Sheena Sullivan, Lee Taylor, Bridie Thompson, Siranda Torvaldsen, Shahid Ullah, Alison Venn, Maryanne Woolley

2. Election of Council Members
Tony LaMontagne reported that council elections were held in mid-2013. Dr Tiffany Gill had been re-elected to Council. Maryanne Woolley (from the Aust Bureau of Statistics) was elected as the student rep, and Dr Michaela Riddell and Prof Linda Slack-Smith were elected. Tony LaMontagne announced that Linda Slack-Smith was President-Elect. Terms for these new (and continuing) Council members begin at the AGM.

3. Minutes of 2012 AGM
Motion: Tony LaMontagne proposed that the minutes of the 2012 AGM be accepted as a true and accurate record.
Proposed: Tony LaMontagne
Seconded: Kristy Sanderson
Motion carried.

4. Business Arising
There was no business arising from the minutes of the previous Annual General Meeting.

5. President's Report
Tony LaMontagne presented the Presidents report. He thanked the Brisbane Conference Organising Committee, led by Gita Mishra and Megan Ferguson in collaboration with Iceberg Events for their efforts in putting together this year's ASM. Tony also thanked all of those members and colleagues who have and will offer short courses in association with the conference, something he encouraged all to continue to build in the future. Tony also noted the success of the 2012 Population Health Congress in Adelaide. The Congress was attended by 1113 registrants with a profit of $25,500 for the AEA. The 2014 ASM has been convened by Prof Robert Scragg (University of Auckland) and Kristie Carter (NZ AEA President, University of Otago, Wellington) and will be held in Auckland.

Council has also created a new Sponsorship Policy, based on a hybrid between PHAA and the IEA's policies. The Policy was recently approved by Council and is on the website. The NZ Conference Organising Committee are piloting the policy while preparing for Auckland 2014.

On behalf of all, Tony farewelled Yu Sun Bin our Student Rep. Sun brought great energy and insight to the role, and helped to streamline processing of Student Awards, expansion of the Top Student Prize program, and co-authored a scoping report on the potential use of social media by AEA. Tony also reported that Siranda Torvaldsen is the outgoing Vice-
President and Membership Officer. He thanked Siranda for her dedication and commitment to the AEA and said that she will be sorely missed—having served a total of three terms. Tony on behalf of the Association and Council thanked Siranda and wished her well.

Tony further reported that, improvements to the organisational manual (led by Strategic Planning Officer Amina Khambalia) have been on-going. Tony reported that the AEA was invited by DOHA to comment on a national communicable diseases framework. A submission was prepared with member input under the leadership of Council members Siranda Torvaldsen and Andrew Hayen, emphasising in particular the epidemiology and biostatistics workforce issues. The AEA is also pursuing membership in the Joint Policy Committee of the Societies of Epidemiology (14 national and international epidemiology societies and associations).

Two new life memberships and two mentoring awards are to be conferred tonight at the conference dinner. Tony encouraged unsuccessful nominations to renominate next year as the competition was very strong. The other award schemes have continued to be well-subscribed this year, including two mid-career ($3,500 each to Jane Hocking and Brigid Lynch) and two early career awards ($2,500 each to Matthew Page and Sheena Sullivan). We thank the Life Members who contributed to review of the mid-career awards and Council Members who reviewed the EC applications. There were 2 awardees of the Early Career Workshop: Guan Huynh and Xiaoji Feng, and 12 Student Conference Travel Awards. AEA also advertised an Indigenous Conference Travel Award scheme this year, one for members of Aboriginal or Torres Strait Islander background and one for members of Māori or Pacific descent, but received only 1 eligible applicant who subsequently withdrew. We are developing strategies to improve recruitment of applicants next year, and encourage all members to advertise this award.

Tony concluded by saying that it has been a busy and productive year for the Association, and he looked forward to serving the Association for a final year as President in collaboration with Linda, our new President-Elect.

6. Public Officer
Camille Raynes-Greenow reported that Len Smith has been the Public Officer (the Registrar General Officer’s representative) since at least 2001 and undertook this responsibility again in 2013–14.

6.1 Appointment of Public Officer
Len Smith has agreed to continue as the Public Officer for 2013–14.

Motion: that Len Smith be re-appointed as the Public Officer for 2013–14.
Proposed: Camille Raynes-Greenow
Seconded: Siranda Torvaldsen
Motion carried.

7. Treasurer’s Report
Andrew Hayen presented the Treasurer’s Report. Net assets increased from $250,909.16 to $255,325.26 at June 30, 2013. The Association held $64,230.00 in its cheque account and $177,094.86 in the cash management account. The budget for the next financial year accounted for an estimated loss of $25,000.00 for AEA 2013 Brisbane Conference. This is now likely to be an overestimate of the Conference loss.

Motion: that the Treasurer’s Report be accepted.
Proposed: Andrew Hayen
Seconded: Amina Khambalia
Motion carried.

7.1 Appointment of Auditor
Andrew Hayen reported that Steven Allen agreed to be the Auditor for 2013–14.

Motion: Steven Allen be reappointed as auditor for 2013–14.
Proposed: Andrew Hayen
Seconded: Siranda Torvaldsen
Motion carried.

8. Strategic Planning Officer Report
Amina Khambalia presented the Strategic Planning Officer report. The majority of KPIs have been met, or have had significant progress made towards their completion. The AEA continues to meet its core Key Performance Indicators focused on the needs of members. Specific Key Performance Indicators progress included initiating a new indigenous student award for up to $1,000 each for an Australian and a New Zealand member and providing support for the formation of a new AEA chapter in the ACT. Amina thanked all council members for the significant contributions that they have made towards the Key Performance Indicators.

Motion: Strategic Officer’s Report be accepted
Proposed: Amina Khambalia
Seconded: Kristie Sanderson
Motion carried.

9. Membership Officer’s Report
Siranda presented the Membership Officers Report. At the end of June 2013 there were 684 members. AEA members are eligible to join the International Epidemiology Association for a fee of US$25. New membership forms and renewal forms for AEA members can be downloaded from the AEA website. These are handled independently by IEA. This year, 108 AEA members (16%) are also IEA members. AEA membership fees are unchanged at $95, with a discounted rate of $60 for students, retired members and members in ‘special circumstances’, (e.g unemployed or maternity leave). Convention Associates continues to manage the Australian membership list, the New Zealand list is managed by Shirley Wilson (shirlee.wilton@otago.ac.nz). Contact details can now be updated online, go to the Membership tab of the AEA website (www.aea.asn.au/) or contact relevant membership manager (above).

Motion: that the Membership Officer’s report be accepted.
5. AEA President’s Report

Thank you, Auckland

I’d like to begin by thanking Robert Scragg as head of the Conference Organising Group here in Auckland, Kristie Carter for serving both with the Organising Group and as liaison to AEA Council, Rod Jackson for leading the Sponsorship Committee, and Rachel Cook from Conference Innovators for their role in both the planning and execution of the conference. There are also whole groups we are indebted to, with too many individual names to list: the Conference Organising Group, the Scientific Committee, and all of those local members, students, and others who’ve helped out less formally. It’s always a gargantuan task to run an ASM, so on behalf of the Association and its members, we thank you all sincerely.

This past year and my three-year term as President

While in the spirit of thanking people for contributions to AEA, I’d like to acknowledge Council for all their efforts this past year (which you will hear about in more details through each of their reports today), as well as those contributing over the course of my three-year term. For this past year, special thanks go to outgoing Council members: Kristie Carter as New Zealand Representative, and Kerrianne Watt as Co-Editor of the Australasian Epidemiologist. Special thanks to our continuing elected members: Amina Khambalia (Vice-President, Strategic Planning Officer, Governance Officer), Michaela Riddell (Treasurer), Camille Raynes-Greenow (Secretary), Andrew Hayen (Membership Officer), Tiffany Gill (Chapters Coordinator), as well as to our essential co-opted members Steve Simpson (who has stepped up to the role of full Editor of the AE—huge thanks to Steve for that), Maryanne Woolley (Student Rep). Other key people in making AEA work include Julia Malone, who has been our Executive Officer over my three-year term and is now finishing up, and Ashley Fletcher, who looks after the AEA website. Last but not least, we have Linda Slack-Smith transitioning from President-Elect to President today, but more on that at the end of this meeting.

As outlined in the Agenda for today, we’ll have detailed reports from various members of Council, so I’ll try to just give a quick overview. Our finances are in good order, as our Treasurer Michaella will detail for you. While we have expanded our array of AEA awards and prizes, we’ve been careful to do so without running down our reserves. On the subject of awards, we’re very pleased to be awarding two new Indigenous Researcher Conference Awards, one each for Australia and New Zealand (more details later), and we’re awarding an all-time high of 19 Student Conference Awards, which has had an oral presentation accepted. It’s been a pleasure over my three years on Council to see parallel improvements in the quality of applications. I’d also like to thank our reviewers for these awards (from both within and external to Council) as well as those who have made positive efforts to nominate colleagues for Mentoring Awards and Life Memberships. We are currently considering a new Teaching Award, as well as adding a teaching epi and...
bio’ stream to our ASM, and welcome input from any interested members.

We developed a Sponsorship policy last year (available on our website) which we’ve piloted for the first time here in Auckland. We’ll continue to refine the policy by comparing notes and experiences with the IEA (International Epidemiological Association) and APHA (American Public Health Association), the two main associations we borrowed from in developing our policy. This is an area that will warrant careful ongoing attention by Council and membership into the future, as pressure mounts in opposing directions: with public scepticism of potential conflicts of interest growing at the same time that neutral or uncontroversial sources of funding are dwindling (e.g. sponsorship from government health departments).

Tiffany as our Chapters Coordinator has continued to support chapters and special interest groups, of which we currently have seven and welcome more. Due to the most part to the tireless efforts of Amina, knowing what you’re supposed to be doing on Council is easier than ever, with substantially revised and expanded Organisational Manual (e.g. including job descriptions for each role). I hope that will encourage more people to run for Council or get involved in other ways. As a means to capturing some ‘institutional memory,’ Amina has also extracted a lot of historical material from the Org Manual and developed a separate AEA historical record document. Interested members are encouraged to have a look at these on our website.

Connecting with partner associations in Australia, the region…and globally!

We have diligently continued the tradition initiated under Leigh Blizzard’s Presidency of collaborating with three Australasian public health partner organisations to run a triennial Population Health Congress. Building on the success of the 2012 Congress in Adelaide, we are once again joining forces with the Public Health Association of Australia (PHAA), Australian Health Promotion Association (AHPA), and Australasian Faculty of Public Health Medicine (AFPHM) to run the 2015 Population Health Congress, this time in Hobart from 6–9 September 2015. Professor Linda Slack-Smith, our President-Elect, has bravely taken on the role of Scientific Committee Chair for the Congress, following on from past President Leigh Blizzard’s excellent work as Scientific Committee Chair in 2012.

We also participated this past year in a bid led by the PHAA and our other Population Health Congress partners for the 2017 World Federation of Public Health Associations conference. We recently learned that this bid was successful, and AEA will be a partner in hosting that meeting in Melbourne in a few years’ time. Although it will follow the 2015 Congress by just two years, this will take the place of our triennial Population Health Congress (that would have otherwise taken place in 2018).

We have most recently extended our outreach to the global level by bidding for the International Epidemiology Association’s 2020 World Congress of Epidemiology (WCE). We have secured $100K in Victorian government sponsorship for a start. President-Elect Linda Slack-Smith and I, as well as several other AEA members (we were well represented there), attended the WCE in Anchorage this year and presented our pitch at the IEA Business Meeting. The good news is that our pitch was well-received and the AEA booth in the Exhibition Hall was a big hit. With the able assistance of Milena Dalton (a Melbourne Convention Bureau employee who continuously attended the AEA booth), and several AEA members/Melbourne Bid Ambassadors attending the conference, we ‘liberated’ hundreds of (hopefully chlamydia-free) clip-on koalas along with hard copies of our bid outline (see the AEA website) and other AEA paraphernalia. The bad news is that there is an unprecedented number of up to EIGHT bids (5 presented at the IEA Business Meeting, with 3 more possible). In the end, the winner will be decided by popular vote of the IEA membership in March of next year. We’ll see!

Continuing on the global theme… I will finish as your (glorious) AEA President this year, but will continue to serve AEA (as an IEA-liaison co-opted AEA Council member, TDB) and the discipline as the recently-elected Western Pacific Regional Counsellor of the IEA for 2014-2017. At the risk of repeating Andrew (our Membership Officer), I urge AEA members who have not taken up joint AEA-IEA membership to do so—only 16% of AEA members are joint IEA members! For an additional $25 you get IEA membership and an e-subscription to the IJE. For those who aren’t aware and might find extra motivation in this bit of news: the IJE has recently topped the public health journal category with a 2-point jump to an Impact Factor of 9! In addition, as an IEA member, you might be keen on attending the 2017 IEA World Congress in Saitama, Japan.

Those of you who are (and will soon be?) IEA members, do be sure to participate in the March 2015 vote for the location of the 2020 IEA World Congress, wherever you might like it to be.

Another way in which we are connecting globally is through the International Joint Policy Committee of the Societies of Epidemiology (http://www.ipce-se.org). If you have a look at the web page, you’ll see our Association acknowledged as the 15th member organisation. Our particular interest here is in policy development affecting the conduct of epidemiology (such as privacy-related legislation). Our Council members Amina and Camille have been trading off participation in the frequent teleconferences involved. Any members interested in learning more or participating can talk to Amina, Camille, or myself.

Looking ahead

We will soon be calling for expressions of interest to host the 2016 AEA ASM. Hoping that this will be an incentive to those who might be interested, I’d like to offer to work with the 2016 Conference Organising Group. In my new role as IEA Regional Counsellor, I am interested in the possibility of co-badging our 2016 ASM as a meeting of the IEA Western Pacific region. This wouldn’t be the first time we’ve done this, though it’s been a while. Recall that Leigh Blizzard and Neil Pearce, as Scientific Committee Chairs, did this once for our 2007 ASM in Hobart. This would involve exploring interest in
the region (which I would contribute), inclusion of relevant themes (e.g. climate change for Pacific Island nations), and possibly seeking additional bursary funds to bring some people to the meeting from low and middle-income countries in our region (which I would help on). We also have a lot of international PhD students studying here, so perhaps we could craft a session or roundtable relevant to their experiences and future plans (e.g. ways to stay in touch and continue exchanges after their return to home countries). This would be a valuable contribution to our discipline in general, as well to capacity-building and exchange in the region. As the world gets smaller, it’d be great to see Association’s contributions grow internationally.

Closing remarks

It’s now time for me to say farewell as your President. It’s been a pleasure working for the Association and with a great bunch of people in Council over the last few years. It was a steep learning curve at first but I was well-supported by past Presidents, Council members, and other colleagues too numerous to name. I look forward to continuing to contribute to AEA in other ways, in particular in regards to our relationship with IEA.

As my final act as AEA President, it’s now my honour to hand over to our President-Elect, Professor Linda Slack-Smith, who will serve as our President from 2014–17. We’re very fortunate to have Linda stepping into this role, and it’s important to note that she has already been contributing substantially over the past year. Please join me in welcoming Linda as our new President.

Professor Tony D LaMontagne
AEA President (outgoing)

7. AEA Treasurer’s Report for the year ended 30 June 2014

Balance Sheet:
Net assets decreased from $255,325.26 to $248,189.49 as at 30 June 2014. The association held $43,570.57 in the cheque account and $177,094.86 on deposit in a cash management trust.

Profit and Loss:
We budgeted for a significant loss (-$42,870.00) during financial year 2013 – 2014 in anticipation of decreased revenue from the 2013 AEA conference. This loss was not realised and indeed conference revenue returned to AEA was $32,208.14 (includes repayment of seed funding). Total income was $46,397.74 above budgeted earnings due to the success of the AEA conference. Membership income, however, was less than budgeted ($46,957.50 vs. $48,750.00) in the financial year 2013 – 2014. Bank interest was lower than budget forecast, as was AE publication income. No copyright payments were received during the 2013 – 2014 financial year. Total expenses were $10,663.51 more than budget forecast due to additional student awards and strategic initiatives offered at the 2013 – 2014 AEA conference. AE publication expenses were also higher than budget forecast ($23,166.06 vs. $13,000.00). Due to site improvements and upgrading, the cost of the website increased. Legal expenses incurred were also higher than budgeted.

Budget for the 2014 – 2015 financial year:
For the financial year 2014 – 2015 we have budgeted for a loss of $23,550.00. The budget assumes a small profit of only $5,000.00 from the AEA conference in Auckland and additionally incorporates continued investment in student awards and strategic initiatives such as the Early-Career Researcher Travel awards (2 x $2,500), Mid-Career Researcher travel awards (2 x $3,500) Indigenous awards (2 x $1,000) and 18 student conference awards (18 x $500). Publication costs of AE have increased and bank interest income has decreased. The Association continues to support the production of the AE publication as well as support activities for each state chapter to promote the association and facilitate networking events.

Michaela Riddell
Honorary Treasurer, Australasian Epidemiological Association
michaela.riddell@monash.edu
## Australasian Epidemiological Association Inc.

### Balance Sheet as at 30 June 2014

with previous financial year

<table>
<thead>
<tr>
<th>Balance Sheet as at</th>
<th>June 30th, 2013</th>
<th>June 30th, 2014</th>
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<tbody>
<tr>
<td><strong>Assets</strong></td>
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<tr>
<td>Current Assets</td>
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<td>Cash on Hand, Cheque Account</td>
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<td>Deposits Paid (AEA Conference)</td>
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<td>$27,524.06</td>
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<tr>
<td><strong>Total Assets</strong></td>
<td>$255,325.26</td>
<td>$248,189.49</td>
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</table>

| Liabilities         |                 |                 |
| Current Liabilities | $0.00           | $0.00           |
| **Total Liabilities** | $0.00       | $0.00           |
| **Net Assets**      | $255,325.26     | $248,189.49     |

| Equity               |                 |                 |
| Retained Earnings    | $216,004.88     | $220,410.98     |
| Current Year Earnings | $4,406.10      | $-7,135.77      |
| Historical Balancing | $34,914.28     | $34,914.28      |
| **Total Equity**     | $255,325.26     | $248,189.49     |
# Australasian Epidemiological Association Inc.

## Profit & Loss Statement

for the year ended 30 June 2014 with previous financial year and budget

<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>QLD Chapter</td>
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<td>NSW Chapter</td>
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<td>Other expenses</td>
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<tr>
<td><strong>Total Expenses</strong></td>
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<td>$91,783.51</td>
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<td><strong>Net Profit / (Loss)</strong></td>
<td>$4,406.10</td>
<td>-$7,135.77</td>
<td>-$42,870.00</td>
<td>-$23,550.00</td>
</tr>
</tbody>
</table>
8. AEA Strategic Planning Officer Report

The AEA Strategic Plan acts as a guide for the work of AEA council. The Plan consists of 6 Strategies, each with a set of Action Areas. Each Action Area is subdivided into Key Performance Indicators, which in total include 109 indicators. Council members report on Key Performance Indicators biannually (including at this time for the AEA AGM).

This year brings to a close the guidelines that were developed for 2011 to 2014. As Council has made its way through the Strategic Plan for these years, a large majority of KPIs have been met. Importantly, the AEA continues to meet its core Key Performance Indicators designed to focus on the needs of its Australian and New Zealand members. These KPIs include the annual scientific meeting, which provides networking, training and professional development opportunities; the publication of the Australasian Epidemiologist including a conference edition and fortnightly circulation of the AE Bulletin, both of which ensure effective communication with and between members; finally the provision of awards to students, early-career researchers, mid-career researchers, mentors, and honorary members, which recognise the excellent service and contributions of AEA members.

This past year, the present council has devoted a great deal of time and energy towards building strategic alliances. Council members are actively involved in planning for the Population Health Congress 2015 conference in Hobart and Melbourne’s bid for the World Congress of Epidemiology 2020. Council members have also secured positions on international epidemiological organisations, including regional councillor on the International Epidemiological Association (IEA) and Australasian representatives for the International Joint Policy Committee of the Societies of Epidemiology (IJPC-SE). Other areas of strength include improving documents related to the governance of AEA, such as the organisational manual and a historical document. Areas where future progress can be made include further work on developing a manual to help future AEA conference organisers and the revamping of AEA logos and the website.

I would like to thank all council members for the significant contributions that they have made towards the Key Performance Indicators and for making my role as Strategic Planning Officer an enjoyable one.

Dr Amina Khambalia
AEA Strategic Planning Officer

9. AEA Membership report

Membership

There were 689 members as at June 30, 2014, which is a small increase since June 30, 2013 when there were 684 members. Of the Association’s 689 members, there were 624 resident in Australia, 54 were resident in NZ, and 11 were resident in other countries. We had 146 members join AEA in 2014.

At the end of January 2014, we removed non-financial members from the membership database. Non-financial members were removed following a final expiry notice, and no longer receive AEA membership benefits.

Of the 689 members of AEA, the majority 498 (73%) were ordinary members, 167 (24%) were student members and 11 (1.6%) were retired, 2 (0.3%) were in the ‘special circumstances’ category and 11 (1.6%) were life members.

Figure: AEA membership by geographical location and membership type

This year, 108 AEA members (16%) were also members of the International Epidemiology Association (IEA). All AEA members are eligible to join the IEA for US$25. New membership forms and renewal forms for AEA members can be downloaded from the AEA website. These are handled independently by IEA. Note that membership of IEA is by calendar year, not financial year.

Membership fees

In 2013–14, AEA membership fees have remained at $95. There is also a discounted membership fee of $60 for students, retired members and members in ‘special circumstances’ (e.g. those who are unemployed or on maternity leave).

Management of membership list

The AEA is grateful to Convention Associates, which manages the AEA membership list, and also distributes items such as the electronic Bulletin to the membership list. Please note that members are now able to update their contact details via the AEA website (www.aea.asn.au/). Alternatively, members can update their contact details by advising Convention Associates (convention@optusnet.com.au). New Zealand members should contact Shirlee Wilton (shirlee.wilton@otago.ac.nz).

A note of thanks

The AEA council is extremely grateful to Dr Siranda Torvaldsen, for her efforts as a Council Member, including being the AEA’s membership officer from 2009–10 to 2012–13.

Dr Andrew Hayen
AEA Membership Secretary
10. New Zealand Representative Report

Membership
At the end of June 2014 there were 55 members, of which over 15% were students (see membership report), over 18% were new members. There has been a large influx of members since July 2014 reflecting the AEA ASM in Auckland in October.

Conference
The New Zealand AEA has been working closely with Professor Robert Scragg, School of Population Health, University of Auckland and the 2014 AEA conference committee on the 2014 AEA ASM in Auckland in October.

Finances
The New Zealand AEA has $14,557.43 in the current account, with $7,093.54 in a fixed-term deposit. The New Zealand AEA provided $10,000 seed funding for the 2014 AEA ASM, which will be returned later in 2014.

Dr Kristie Carter
AEA New Zealand Representative

11. Australasian Epidemiologist Report

Business at AE is busy but productive. This year we have produced one issue on Communicating Epidemiology. We had planned on a second issue between that issue and the Conference issue on Addiction Epidemiology. Unfortunately, contributors were a bit tardy getting submissions in on time so that issue is now going to come out a bit after the Conference issue, probably in November. Thereafter, we will have an issue on Veterinary Epidemiology, probably coming out in February 2015.

Dr Steve Simpson, Jr.
Editor, Australasian Epidemiologist

12. Student Representative Report

At the end of June 2014, the AEA is up 23 student members from the previous financial year, for a total of 167 student members. Student members comprise 24% of the total membership. Welcome to all new student members!

Congratulations to those new members who have joined as a result of being awarded the Top Student Prize in Introductory Epidemiology or Biostatistics subjects. In Semester 2, 2013, there were 17 Top Student Prizes awarded, and in Semester 1, 2014, 41 students have been nominated. Details for these and the numerous other awards supporting students and general members can be found online at http://www.aea.asn.au/membership/prizes-for-members.

I encourage all student members to get involved with AEA activities in whatever way they can, whether it be supporting chapter activities or publishing in the AE. If you have any student event ideas please contact me. And look out for the call for the next student representative!

Maryanne Woolley
AEA Student Representative

14. AEA Website Report

Online members
- Registered: 239
- Council: 11
- Administration: 3

1. Homepage (14,136)
2. How do you become an Epidemiologist (4,616)
3. What is Epidemiology? (4,239)
4. Job advertisements (3,415)
5. About membership (1,512)
6. 2013 Conference (1,358)
7. PhD opportunities (1,270)
8. 2014 Conference (1,199)
9. What is an Epidemiologist? (962)
10. Bulletin (651)

Figure. Visitors to the AEA website: Aug 2012 – Aug 2014
One Vision – Many Voices

The theme for the 2015 congress is “One Vision, Many Voices”. This theme will be explored and discussed through the following sub themes:

- Engagement and Advocacy Action
- Research and Knowledge Transfer
- Grand Challenges and Wicked Problems
- Health Places and Spaces
- Vulnerable Populations
- Advancing Public Health Policy

The program will include international and nationally recognised experts who will inspire and provoke conversation.

It is expected the some 600+ abstracts will be received from across Australia, New Zealand and internationally. Bringing together knowledge, debate, conversation and learning amongst participants from all across the health industry.

Welcome

On behalf of the Organising Committee it is my pleasure to welcome you to the 3rd Population Health Congress, to be held on 6 – 9 September 2015 at the Hotel Grand Chancellor, Hobart. We anticipate this exciting environment will engage over 800 population health professionals working in all fields of practice and research.

Provocative and constructive perspectives from leading researchers, practitioners and policy makers will form the core of the program, around which lively debates, workshops and networking opportunities also will be available to progress action on key population health issues.

We look forward to talking to you about this congress and its possibilities it presents for your organisation.

Heather Yeatman
2015 Congress Convenor
President, Public Health Association of Australia

Visit the website to download the Sponsorship and Exhibition Prospectus

www.populationhealthcongress.org.au
The Australasian Epidemiologist is a publication of the Australasian Epidemiological Association (AEA) that is distributed free to all members of the AEA. It is published three to four times per year. Contributions appearing in the Australasian Epidemiologist do not necessarily reflect the views of the AEA or the Editors. Articles are intended to inform members of the most recent epidemiological research being done in Australasia and to stimulate thought, discussion and comment, particularly with respect to the relationship between epidemiology and public health practice and policy. Contributions should be sent to the Editors.

Editor
Dr Steve Simpson, Jr.
Menzies Research Institute Tasmania
Hobart, TAS 7000, Australia

Chief Scientific Editor
Dr Priscilla Robinson
School of Public Health
Faculty of Health Sciences
La Trobe University
Bundoora, VIC 3086, Australia

Dr Jane Hocking
Bundoora, VIC 3086, Australia

La Trobe University
Faculty of Health Sciences
School of Public Health

Dr Priscilla Robinson
School of Public Health
Faculty of Health Sciences
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Bundoora, VIC 3086, Australia

Dr Jane Hocking
Bundoora, VIC 3086, Australia

La Trobe University
Faculty of Health Sciences
School of Public Health

Advertising enquiries
Contributions and advertising enquiries should be directed to the AEA Executive Officer: Julia Malone
University of Melbourne, VIC 3010, Australia

Advertising rates (GST inclusive)
Quarter page A$150
Full page A$415
Half page A$230
Insert A$220

Information for authors
We will consider written contributions that do not essentially duplicate already published material and are not being simultaneously considered for publication elsewhere.

Categories of publication
Original articles for peer review
Reports of original research findings including studies of statistical or methodological issues. (Please note: these articles are not required to be congruent with the theme of the Round Table).

Round Table
Forum for dissemination without peer review of research findings, discussion and debate around current topics. Articles may be about original research, ethical issues, opinions and perspectives, personal experiences, new methodologies, a review of the literature or a discussion of policy and its impact on research and public health practice. Contributions in this category must be consistent with the theme of a forthcoming Round Table.

Dialogue
Letters to the Editors in response to previous articles or letters.

Teaching epidemiology
Discussion of teaching matters, practice and policy.

Book reviews and course reviews
Contribution length (maximum)

Article
3,000 words
(plus tables and 50 references)

Opinions/perspectives
1,500 words
(plus one table and 25 references)

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1,500 words
(plus 15 references)

Teaching epidemiology
1,000 words

Book review
500 words

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250 words

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