

Program

2015 Annual Collaborators' Meeting

Meeting objectives

- To provide a comprehensive update on the 45 and Up Study
- To promote and share high quality research findings using Study data
- To provide researchers, partners and other interested parties with an opportunity to meet and exchange ideas.

Study materials & publications

- With permission, presentation material and papers from the event will be made available on our website:

www.saxinstitute.org.au

- **Please note:** photos taken at the meeting may be used for promotional purposes.

Acknowledgements



The 45 and Up Study is managed by the Sax Institute in collaboration with major partner Cancer Council NSW; and partners: The National Heart Foundation of Australia (NSW Division); NSW Ministry of Health; NSW Government Family & Community Services – Carers, Ageing and Disability Inclusion; and the Australian Red Cross Blood Service.

We thank the many thousands of people participating in the 45 and Up Study.

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The Secure Unified Research Environment (SURE) is Australia's only remote-access data research laboratory for analysing routinely collected data. Launched in 2012, SURE now hosts data for 50 research studies, involving more than 30 different data collections and is accessed by over 140 users around Australia and internationally.

A live demonstration of the SURE facility will be available at the Collaborators' Meeting.

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PROGRAM

9.00AM	REGISTRATION		
Plenary 1			
9.30AM	Welcome Mr Robert Wells , Deputy CEO, Sax Institute		
9.35AM	Welcome to Country Uncle Ray Davison , Gadigal Elder		
9.45AM	Official opening The Hon. Jillian Skinner MP , Minister for Health		
9.55AM	Study update Professor Emily Banks , Scientific Director of the 45 and Up Study, Sax Institute		
10.05AM	Keynote address (introduced by Professor Emily Banks) Professor Karen Canfell (Cancer Council NSW) – Big data, big potential for predictive modelling in health		
10.50AM	MORNING TEA		
11.15AM	Plenary presentations: Ms Katie Irvine (CHeReL) – A new model for population-based data linkage Professor Merrilyn Walton (The University of Sydney) – Using patients' experiences of adverse events to improve health service delivery and practice Mr Michael Falster (University of New South Wales) – Visualising linked health data to explore health service use around preventable hospitalisations		
Parallel sessions			
12.00PM	Mental health Chair: Ms Peta Forder	Risk factors Chair: Dr Marianne Weber	Methods Chair: Dr Kim Sutherland
12.35PM	LUNCH		
1.20PM	Communicable diseases and immunization Chair: Dr Yingxi Chen	Cancer Chair: Dr Grace Joshy	Health services 1 Chair: Dr Lina Gubhaju
2.00PM	Other health issues Chair: Dr Weiwen Chen	Cardiovascular disease, diabetes and chronic diseases Chair: Dr Rosemary Korda	Health services 2 Chair: A/Prof Elizabeth Comino
Plenary 2			
2.35PM	Plenary presentations: Associate Professor Marcel Dinger (Garvan Institute) – Providing the ideal background for the future landscape of genomic research Associate Professor Meg Jardine (George Institute) – The impact of chronic disease progression: augmenting 45 and Up with community pathology data Professor Emily Banks/Ms Margo Barr (Sax Institute) – Summary of the day and opportunities for the 45 and Up Study into the future		
3.15PM	AFTERNOON TEA AND CLOSE		

KEYNOTE AND PLENARY SPEAKERS

Official opening

The Hon. Jillian Skinner MP has more experience in the health field than any other politician in Australia, having first been appointed Shadow Minister for Health in 1995. She has been NSW Minister for Health since April 2011 and was the first dedicated Minister for Medical Research in the state or nation. As Minister for Health she has overseen greater engagement in decision making by clinicians and staff to encourage innovation and new models of care, and has overseen record health spending to deliver tens of thousands more emergency department treatments, hospital admissions and elective surgeries. She previously held the role of Director of the NSW Office of Youth Affairs and has served on bodies such as the NSW Women's Advisory Council and the NSW Youth Advisory Council.

Keynote

Professor Karen Canfell is Director of Research at Cancer Council NSW and Adjunct Professor at Sydney Medical School, University of Sydney. She leads a program of research which provides policy-makers with an evidence base for decision making in cancer control. Her team's work underpins the findings of a recent major review of the Australian National Cervical Screening Program and Karen is also co-PI of the first ever large-scale trial of cervical screening in a population offered HPV vaccination, 'Compass', which is being conducted with the Victorian Cytology Service. Karen holds a number of competitive grants from NHMRC and other agencies and is one of the PIs for a recently awarded program grant from the National Institutes of Health (NIH) USA, 'CISNET-Cervix', which will involve modelling options for HPV prevention in the USA. In 2015, Karen received a Research Excellence Award from the NHMRC for the highest-ranked Career Development Fellowship in Population Health (L2) and was named one of '100 Women of Influence' in the AFR/Westpac awards.

Plenary 1

Ms Katie Irvine has managed the Centre for Health Record Linkage (CHeReL) since it was established in 2006 and has overseen significant growth in the Centre's data linkage services and infrastructure. The CHeReL is now an internationally recognised data linkage resource and one of Australia's largest secondary use health data linkage systems. With over 15 years of experience accessing and using administrative data from NSW government agencies, her areas of expertise include data governance, data linkage methodology and systems, statistics and performance reporting. Prior to joining the CHeReL, Katie worked in a variety of statistical, reporting and research roles with NSW Health, the NSW Department of Premier and Cabinet and University of Sydney.

Professor Merrilyn Walton is a leader in improving health system accountability and transparency to enhance patient experiences of care. She has developed patient safety curricula for the World Health Organization which are being used in health professional education worldwide. She is a statutory member of the Australian Health Practitioner Registration Agency, which has legal oversight for all health professionals. Professor Walton was one of the major architects of the NSW Health Care Complaints Act. She is currently Lead Investigator on a study of the patient experience of their healthcare as well as a study to enable evidence-based policy for complaint management for Australia.

Mr Michael Falster is an epidemiologist and biostatistician with the Centre for Big Data Research in Health at the University of New South Wales. He focuses on the use of administrative health data sets for research, statistical methods for exploring patterns of variation, and ways of simplifying and presenting complex data to assist research translation (for example, using visualisations). He coordinates the APHID (Assessing Preventable Hospitalisations InDicators) Study which explores the contribution of individual, hospital and primary care service level factors to variation in preventable hospitalisations in NSW.

Plenary 2

Associate Professor Marcel Dinger is conjoint Associate Professor at UNSW and Head of the Kinghorn Centre for Clinical Genomics (KCCG), which was established by the Garvan Institute in 2012 to advance the use of genomic data in patient care. Marcel also leads the Genome Informatics laboratory, which is focused on understanding the function of noncoding genomic regions that are associated with human disease and development. Prior to joining the Garvan Institute, Marcel headed the Cancer Transcriptomics laboratory located at the University of Queensland.

Associate Professor Meg Jardine is a clinical researcher at The George Institute for Global Health. She is currently supported by a co-funded Australian National Health and Medical Research Council Career Development Fellowship and National Heart Foundation Future Leader Fellowship. She is Head of George Clinical Renal Trials, Deputy Director of the Renal Division of The George Institute, a Conjoint A/Professor of Medicine at The University of Sydney, Deputy Chair of the Australasian Kidney Trials Network (AKTN) and a practising nephrologist at Concord Repatriation General Hospital, a University of Sydney teaching hospital. Her research has focussed on investigating the progression and complications of kidney disease and diabetes through epidemiological analyses of large scale datasets and the development and implementation of randomised clinical trials.

KEYNOTE AND PLENARY PRESENTATIONS

Keynote: Big data, big potential for predictive modelling in health

Professor Karen Canfell, Cancer Council NSW

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Policy-makers, clinicians and consumers have an ongoing need for accurate and up-to-date information about the benefits, harms and cost-effectiveness of existing and emerging new interventions in healthcare. Predictive modelling of future outcomes and costs underpins the evaluation of new drugs, technologies, and prevention initiatives. However, decision models are often built *de novo* for each new evaluation, which places practical constraints on model development time and complexity, limits the scope of data analysis performed to support calibration and validation activities, and prevents the knowledge gained from one evaluation to feed into the next. An alternative approach is to invest in centralised, comprehensive and data-driven population models of the natural history of disease. Such models embody an accumulation of knowledge gleaned from analysis of multiple large-scale data sources over time and provide a flexible platform which can be used to rapidly evaluate new interventions as they emerge.

Using the example of cervical cancer control, this talk will show how data-driven population models can be harnessed to underpin major policy changes across multiple countries. A cervical cancer model platform developed by the team at Cancer Council NSW has underpinned epidemiologic and economic evaluations of HPV vaccination in females and males, changes to the technologies used for following up women after cervical screening, and most recently, as part of the Renewal of the National Cervical Screening Program, has supported the planned 2017 implementation of 5-yearly HPV screening as a replacement for 2-yearly Pap smears. The platform has also been used for similar evaluations in other high income countries as well as low and middle income settings. As part of a new NIH collaborative research project (CISNET-Cervix) the platform is also now being harnessed to evaluate strategies for HPV vaccination and cervical screening in the USA.

Looking to the future, the capacity to use data from the 45 and Up study linked to routinely collected datasets opens up exciting possibilities for the development of population models in other disease areas. This endeavour will build capacity in health services research and health economics and provide a major new set of tools to facilitate policy translation.

Plenary 1

A new model for population-based data linkage

Ms Katie Irvine, NSW Health

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Background: The primary purpose of the Centre for Health Record Linkage (CHeReL) is to create and sustain a record linkage infrastructure for the health and human services sectors, and provide access to these resources to bona fide researchers, health planners and policy makers. The CHeReL is recognised as a significant state-wide research asset and has supported over 1000 investigators to access linked data.

Since 2006, the CHeReL has used a distributed data linkage model that relies heavily on data custodians for its operation. This model has a number of significant disadvantages. A proposed new model for population-based data linkage in NSW and the ACT will be described that can maintain the separation principle and achieve short and predictable data delivery timeframes for end users.

Method and Results: The development of a new model has been informed by the experience of population-based data linkage centres in other jurisdictions. This includes provincial data linkage centres in Canada which have for many years operated internal third party linkage functions with the approval of data custodians and relevant ethics committees. The proposed new model also draws on developments by the Western Australian Data Linkage Branch which has successfully developed a new model and achieved reductions in the median delivery times by up to 90% for some data collections. It is proposed that the

CHeReL's operating model be changed to consolidate data delivery processes in a newly established Data Integration Unit within the CHeReL. The Unit will be separately staffed to preserve best practice separation principles and may carry out the release of linked data on behalf of data custodians.

Conclusions: A new model for population-based data linkage will better manage the growing demands placed on data custodians and their agencies as the demand for CHeReL services grows, and will support the increasing requirement from researchers and government agencies for more timely and predictable access to population based linked data from NSW and ACT.

Yesterday's Deaths: Understanding the tradeoffs between timeliness and ascertainment for near real-time data linkage

Ms Katie Irvine, NSW Health

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1 Centre for Health Record Linkage, 2 NSW Ministry of Health

Background: Up-to-date data on the vital status of study participants is important for cohort management and interest continues to grow amongst stakeholders for improvement in the currency of linked death data in NSW. Modifications to data linkage processes can improve the currency of linked data but also impact on the quality of the information that is available for cohort management. We have therefore investigated the potential to modify data linkage processes so that data is linked daily rather than quarterly and based on deaths that were notified to the NSW Ministry of Health the previous day ('yesterday's deaths'). This study aimed to provide a framework for understanding the data quality impact of linking 'yesterday's deaths' and quantify these impacts using data for a large NSW cohort

Method: A framework for understanding the data quality impact was developed by the Centre for Health Record Linkage and an experimental method was designed to compare current linkage practice with different strategies for linking yesterday's deaths.

Results: Changes in linkage quality arise from several sources: incomplete notification of the most recently occurring deaths (known as delayed registrations), differences in the availability of up to date personal information from other data sources (e.g. linked hospitalisation data) that help to facilitate accurate linkage, and the adoption of faster probabilistic linkage techniques that skip some computational and/or manual steps (e.g. clustering and clerical review) that are performed in conventional probabilistic linkage processes. Different linkage strategies are compared to investigate these effects and evaluate the degree of trade-off between timeliness and ascertainment when linking a daily death data feed compared to a quarterly feed.

Conclusions: High quality and current information about vital status can be obtained through data linkage, but there are tradeoffs between timeliness and ascertainment that can be expected to impact on cohort management and research.

Using patients' experiences of adverse events to improve health service delivery and practice

Professor Merrilyn Walton, The University of Sydney

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Background: Evidence of the patient experience is fundamental to creating effective health policy and service responses, yet we lack knowledge about their experience of adverse events (AEs). Our research redresses this significant deficit by undertaking an investigation of the experience of AEs amongst recently hospitalised patients in New South Wales.

Objectives: To investigate the experiences of patients in New South Wales hospitals, and in particular, the experiences of those who have suffered an AE.

Methods: A survey was developed based on previous validated patient experience survey tools and administered to a sample of recently hospitalised patients from the 45 and Up data bank (a large cohort study of 267,153 adults in New South Wales). The sample was identified using data linkage conducted by

CHeReL; this is the first time a patient sample has been identified in this way. The mixed method study captured quantitative and qualitative data regarding patients' experiences in hospital; the nature and frequency of any AEs experienced; the impact of AEs on patient outcomes; whether the patient experienced an Open Disclosure process (formal or informal) and whether the patient made a complaint or initiated legal action.

Results: Of those invited to participate, 7661 responded with eligible surveys. Of these, 7% reported having an adverse event (healthcare incident). The data are currently being analysed. We will present an overview of the types of incidents reported, the characteristics of patients who report incidents and overview their reports of open disclosure and complaints.

Conclusions: Minimising harm to patients is a great challenge for all health services and providers. By capturing data about the patient experience of adverse events we may be able to identify key factors associated with AEs in hospital from the patients' perspective. We may also add to knowledge about whether patient experience data should be routinely collected along with other incident monitoring.

Visualising linked health data to explore health service use around preventable hospitalisations

Mr Michael Falster, University of New South Wales

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Authors: Falster MO^{1*}, Jorm LR¹, Leyland A²

1 University of New South Wales, 2 University of Glasgow

Background: Data visualisations have potential to enhance understanding of complex patterns of information. However, few tools exist for visually exploring longitudinal health data, and these have not been widely adopted for research. This study demonstrates the utility of a simple data visualisation, 'Trajectories of Individual Patient Service use' (TIPS), using a case study of 'preventable' hospitalisations – which are used internationally as an indicator of access to primary care, but for which the actual use of services leading up to hospitalisation is largely unknown.

Methods: Linked data* on hospital admissions, emergency department (ED) presentations, deaths, and Medicare claims† for general practitioner (GP) and specialist consultations for 266,950 participants in the 45 and Up Study were used to create TIPS around preventable hospitalisation. For each study participant, each type of service was plotted against time, with different coloured dots and lines representing hospital stays, consultations, and deaths. A variety of TIPS were explored, structured according to patient characteristics, such as number of preventable hospitalisations or date of first admission, while displaying time over calendar year or centred on the date of admission.

Results: The use of TIPS revealed common usage patterns across health services, with a clustering of GP visits in the lead up to, and following, preventable hospitalisation. People with more preventable hospitalisations, or a longer length of hospital stay, also had higher numbers of GP visits, ED presentations, other types of hospitalisation, and deaths.

Conclusions: The TIPS visualisations provided a powerful tool for exploring and displaying patterns of health service use. For preventable hospitalisations, they demonstrated admitted patients tended to have higher overall levels of engagement with the healthcare system, and did not show evidence of limited access to primary care in the lead up to hospitalisation.

*Data linkage performed by CHeReL.

†Medicare data supplied by Department of Human Services.

Plenary 2

The Medical Genome Reference Bank – Providing the ideal background for the future landscape of genomic research

Associate Professor Marcel Dinger, Garvan Institute of Medical Research

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1 Garvan Institute of Medical Research

The advent of low cost, high quality whole genome sequencing (WGS) has revolutionised scientific research in the last decade, serving to advance our understanding of human biology and disease at an exponential rate. This technology is now being utilised as a clinical application, providing rapid and accurate diagnoses of increasing numbers of inherited genetic diseases, including cardiomyopathy, intellectual disability, developmental delay and various neural and musculoskeletal disorders.

To maximise the efficiency of disease-specific genomic analyses in both the research and clinical setting, whole genome sequences from ~4000 healthy, elderly Australian individuals will be analysed to create a high quality database, depleted of damaging variants that will act as a powerful filter to distinguish between causal and passenger genetic variation. The Medical Genome Reference Bank (MGRB) program, funded by the NSW State Government, has been specifically established to leverage the Illumina HiSeq X Ten sequencing platform at the Garvan Institute's Kinghorn Centre for Clinical Genomics (KCCG), to sequence participants of the 45 and Up and Aspirin in Reducing Events in the Elderly (ASPREE) studies, to provide such a resource for national and international health and medical researchers. In addition, these data will also prove invaluable to further our understanding of the genetics of healthy aging.

The MGRB will generate an unprecedented amount of genomic information, promoting and encouraging significant scientific discovery by employing a hierarchical data management system, which will maintain participant privacy and confidentiality, whilst maximising the utility of the database. The development of the database, which will commence in early 2016, promises to provide the ideal background for the future of genomic research in Australia, and will serve to facilitate the transition and effectiveness of WGS in clinical practice.

EXTEND45: Extending the 45 and Up Study to define chronic diseases prevalence, treatments, severity and outcomes in NSW

Associate Professor Meg Jardine, The George Institute for Global Health

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Authors: Jardine M^{*1,2}, Foote C^{1,2}, Sukkar L¹, Rogers K¹, Vo K¹, Comino E³, Liu B⁴, Zoungas S^{1,5}, Toyama T¹, Gallagher M^{1,2,6}, Knight J¹, Jan S¹, Peiris D¹, Wong G^{7,8}, Chow C^{1,8}, Pollock C⁹ and Cass C¹⁰ in the name of the EXTEND 45 Steering Committee

1 The George Institute for Global Health, affiliated with The University of Sydney, 2 Concord Repatriation General Hospital, University of Sydney, 3 Primary and Community Health Research Unit, University of New South Wales, 4 Sax Institute, 5 Monash Medical Centre, 6 Concord Clinical School, University of Sydney, 7 School of Public Health, University of Sydney, 8 Westmead Hospital, University of Sydney, 9 Kolling Institute, Royal North Shore Hospital, University of Sydney, 10 Menzies School of Health Research, Charles Darwin University

Background: Large prospective observational studies of real world chronic disease management and the resultant health outcomes provide evidence that is essential and complementary to randomised trial evidence. We aim to create a prospectively recruited, longitudinal cohort of NSW adults to study the prevalence, management and outcomes of people with identifiable chronic diseases, particularly diabetes and chronic kidney disease.

Methods: EXTEND45 is following established methodology, employing probabilistic data linkage procedures of the 45 And Up study to administrative datasets through the Centre for Health Record Linkage. Additional linkages to community pathology datasets and to the End Stage Kidney Disease registry are being undertaken. The flagship project will assess the extent and predictors of treatment gap in the delivery of best evidence for the prevention of cardiovascular events and disease progression.

Results: A collaborative Steering Committee has been formed to oversee the EXTEND45 program including representatives from The George Institute, the Universities of Sydney and New South Wales, the Sax Institute, and clinical experts from NSW hospitals. The Steering Committee is responsible for the general oversight of the study, will provide scientific advice and has final approval of analysis protocols, ethics applications and publications. A peer-reviewed Cardiovascular Research Network Research Development Project Grant will support the first analyses with further funding actively sought. A number of community pathology providers are supporting the project. Datasets have been prepared and the first linkages are underway. Proposals for additional analyses of EXTEND45 data from external researchers are encouraged where these are coherent with the overall program.

Conclusion: EXTEND45 augments the 45 And Up Study by the addition of longitudinal pathology variables that facilitate the identification and management of identifiable chronic diseases. The governance structures have been designed to efficiently facilitate collaborative projects that lie within the broad scope of the EXTEND45 program.

PARALLEL SESSION PROGRAM

Parallel sessions			
	THOMAS ROOM	BROADWAY ROOM	JONES/HARRIS ROOM
12.00PM	Mental health Chair: Ms Peta Forder	Risk factors Chair: Dr Marianne Weber	Methods Chair: Dr Kim Sutherland
12:00pm	Maintain Your Brain - a collaboration with the 45 and Up Study Prof Henry Brodaty , University of New South Wales	A nested case-control study of non-melanoma skin cancer: quantifying the relationship with tobacco and alcohol consumption Dr Marianne Weber , Cancer Council NSW	Using the 45 and Up Study to develop outcome and process indicators for enhanced reporting of the performance of the NSW public healthcare system Dr Kim Sutherland , Bureau of Health Information
12:14pm	Does hazardous work impact later life mental health in 1261 Australian baby-boomers? Ms Peta Forder , University of Newcastle	Congratulations on your retirement and welcome to a healthier lifestyle: A prospective study of 27,257 Australian older adults Dr Melody Ding , The University of Sydney	Diagnosis based criteria to identify adverse drug reactions (ADRs) in ICD-coded data Dr Wei Du , The Australian National University
12:21pm	Work after age 65 for Australian men and women Miss Kha Vo , The George Institute for Global Health	Vegetarian dietary patterns and all-cause mortality in the 45 and Up Study Dr Seema Mhrshahi , The University of Sydney	Ongoing collection and reporting on impact of the 45 and Up Study Miss Hayley Hughes , Sax Institute
12:28pm		Fruit and vegetable consumption and all-cause mortality: Evidence from a large Australian cohort study Ms Binh Nguyen , The University of Sydney	
12.35PM	LUNCH		
	THOMAS ROOM	BROADWAY ROOM	JONES/HARRIS ROOM
1.20PM	Communicable diseases and immunization Chair: Dr Yingxi Chen	Cancer Chair: Dr Grace Joshy	Health services 1 Chair: Dr Lina Gubhaju
1:20pm	Non-typhoidal Salmonella infection in older adults: a prospective study of incidence and risk factors Dr Yingxi Chen , The Australian National University	The cost-effectiveness of a specialised clinic for individuals at high risk of melanoma Miss Caroline Watts , The University of Sydney	Compliance with healthdirect telephone triage recommendations among older patients Dr Danielle Tran , University of New South Wales
1:32pm	Incidence and risk factors for hospitalisation with gastroenteritis in a cohort of older Australians Dr Yingxi Chen , The Australian National University	Health service use by people diagnosed with cancer in the 45 and Up Study compared with the NSW cancer population Ms Nicola Creighton , Cancer Institute	Continuity of care measures calculated from claims data: nonlinear associations with health status and hospital use Dr Bich Tran , University of New South Wales
1:44pm	Factors associated with pertussis vaccination in a cohort of older Australian adults Miss Amalie Dyda , University of New South Wales	Five year mortality predictors in Australian men 45 years of age and older Dr Grace Joshy , The Australian National University	Preventive care and access to primary healthcare among older Aboriginal and non-Aboriginal adults Dr Lina Gubhaju , Baker IDI Heart and Diabetes Institute

	THOMAS ROOM	BROADWAY ROOM	JONES/HARRIS ROOM
2.00PM	Other health issues Chair: Dr Weiwen Chen	Cardiovascular disease, diabetes and chronic diseases Chair: Dr Rosemary Korda	Health services 2 Chair: A/Prof Elizabeth Comino
2:00pm	Mortality risk associated with fractures in The 45 and Up Study Dr Weiwen Chen , Garvan Institute of Medical Research	Variation in readmission and mortality following hospitalisation with a diagnosis of heart failure Dr Rosemary Korda , The Australian National University	Determinants of overnight hospital admissions for Australians aged 85+ in their last year of life Ms Xenia Dolja-Gore , University of Newcastle
2:14pm	Uptake of procedures for lower urinary tract symptoms (LUTS) among middle aged and older Australian men Ms Kay Soga , The Australian National University	Prevalence of undiagnosed diabetes in New South Wales, Australia Dr Pavla Vaneckova , The Australian National University	Health service use and excess health care costs associated with chronic illness and lifestyle risks among NSW workers – initial findings Mr Mark Bartlett , Sax Institute
2:21pm	Cross-sectional study of urinary incontinence in women Ms Alexandra Fogg , The Australian National University	Physical disability and daily care requirements among people with and without diabetes Dr Grace Joshy , The Australian National University	Feasibility study of establishing a cohort on 'integrating care for older people within Central and Eastern Sydney' A/Prof Elizabeth Comino , University of New South Wales
2:28pm	Factors associated with self-rated quality of life in Australia: A population-based study of 252,704 adults in the 45 and Up Study Mr Tian Bai , The Australian National University	Exploring workforce participation and chronic diseases of mid-age Australians over the life course Tazeen Majeed , University of Newcastle	Use of 45 and Up linked data to evaluate the impact of quality use of medicine programs on prescribing in primary care and associated health outcomes Dr Zhixin Liu , NPS Medicine Wise

MENTAL HEALTH (12.00PM-12.35PM)

Maintain Your Brain –a collaboration with the 45 and Up Study

Professor Henry Brodaty, University of New South Wales

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1 University of New South Wales, 2 University of Sydney, 3 Australian National University, 4 Melbourne University, 5 Monash University, 6 Western Sydney University, 7 Sax Institute

Background: As there are no disease modifying treatments for Alzheimer's disease (AD) and other dementias, more attention is focusing on preventing or delaying cognitive decline. Evidence is accumulating that attending to environmental risk factors can reduce the risk of Alzheimer's by 30%. The Centre for Healthy Brain Ageing at UNSW is leading an RCT to compare active intervention with a control condition to prevent cognitive decline in 18,000 55–75 year olds recruited from the 45 and Up Study.

Methods: Participants with at least one risk factor for dementia who agree to be randomised will receive an intervention program delivered largely online and based on addressing modifiable risk factors for dementia in general and AD in particular, namely physical inactivity, cognitive inactivity, depression, overweight and obesity, diabetes (type 2), high blood pressure and smoking. Intervention modules will be customised to individual risk profiles using modified tools developed by our team to assess the risk of developing AD and dementia. Controls will be emailed information about risk factors and how to minimise them and sent annual reminders including tips for exercise, cognitive stimulation, socialisation, diet and health checks.

Results: Outcome measures will be reassessed annually for intervention and control participants. The primary outcome will be a computerised cognitive testing tool supplemented by more detailed examination if dementia is suspected. Secondary outcomes will reduction in dementia risk scores (e.g. depression, waistline, blood pressure, cholesterol – depending on individual risks), self-rated memory, self-reported exercise (with objective measures in sub-sample), self-reported diet, weight, BMI, depression and well-being, socialisation and use of health services.

Conclusion: Preparation for the trial is underway with the launch anticipated in second half of 2016. This will be the largest such trial in the world and its monitoring and intervention delivery will make it scalable nationally and internationally.

Does hazardous work impact later life mental health in 1261 Australian baby-boomers?

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Objective: To examine whether hazardous work during the lifecourse has an impact on current mental health for people aged 60–64 years.

Participants: 684 men and 577 women participated in the 2011 Australian Life Histories and Health Survey (a substudy within the 45 and Up Study cohort), a retrospective investigation of health and life experiences among Australian baby-boomers (born 1947–1951).

Methods: A self-complete questionnaire and life history calendar were completed by the participants, followed by a computer-assisted telephone interview recording key life events. Participants answered detailed questions about their employment over their lifetime, as well as questions concerning their health status over their lifetime and their current mental wellbeing. Latent class analyses were used to classify different working patterns over the lifetime according to self-reported physically demanding or hazardous work conditions, separately for men and women. The association between lifetime pattern of workplace hazard exposure and current mental health was then evaluated using logistic regression.

Results: Five distinct lifetime work patterns, according to physically demanding or hazardous work exposure, were identified separately for men and women. Around one-third of men participated in continued physically demanding or hazardous work across their lifetime, in comparison to one fifth of women. Men who were exposed to physically demanding or hazardous work conditions in early life and left paid work in mid-later life had more than nine times higher odds for poor mental health in later life when compared to men who were in paid work throughout their life with little or no hazardous conditions (OR=9.41, 95% CI 4.23 to 20.91, p=<0.001).

Conclusion: Hazardous work patterns with early exit from the workforce are associated with high risk of mental health problems for men, but not for women.

Work after age 65 for Australian men and women

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Background: This study examines the hours in paid work for Australian men and women older than 65, and the associations between paid work with education and specific health conditions.

Methods: Data from 45 and Up Study (baseline) and the SEEF (Social, Economic and Environmental Factors) sub-study (follow up) were used in this analysis. SEEF collected additional data on social, economic and environmental background on participants one to five years after 45 and Up baseline survey. The sample was restricted to 20,109 men and women aged over 65 years at baseline who provided a valid response for number of hours in paid work at both time points. Associations between paid work, education level and health conditions were investigated using longitudinal GEE models, separately for men and women and adjusted for other demographic variables.

Results: The proportion of participants older than 65 doing paid work was 11.3% at baseline and 8.0% at follow up, with the majority indicating part time hours. The odds of doing paid work increased with higher education level, and decreased with time, age, poorer physical function, and having health conditions (high blood pressure, diabetes, stroke and breast cancer). Unpartnered women were more likely to work than partnered women.

Conclusion: This study quantifies the importance of education and health factors in determining continued participation of Australian men and women in paid work in later life. These factors need to be considered for policies aiming to increase workforce participation beyond 65 years of age.

RISK FACTORS (12.00PM-12.35PM)

A nested case-control study of non-melanoma skin cancer: quantifying the relationship with tobacco and alcohol consumption

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Background: There is inconclusive evidence regarding aetiological roles for smoking and alcohol in the development of non-melanoma skin cancer (NMSC). This study quantified the relationship of these factors to risk of squamous cell carcinoma (SCC) and basal cell carcinoma (BCC).

Methods: 916 histopathologically confirmed cases of BCC, 433 cases of SCC, and 1224 sex- and age-matched controls aged 45–84, were recruited from The 45 and Up Study. Self-reported data on sun exposure, place of residence, sun sensitivity, tobacco, and alcohol were collected, along with blood samples. Bloods were tested for cotinine levels. Logistic regression was used to estimate odds ratios and 95% confidence intervals BCC or SCC, in relation to smoking status and alcohol consumption adjusted for key demographic, and sun-related factors.

Results: Ever smoking was associated with a place of birth outside of Australia, being male, ever using blood pressure medication, ever using a sunbed, having an outdoor job, and never getting screened for NMSC. Nevertheless, smoking status was not associated with SCC or BCC either in unadjusted or fully adjusted models. Smoking status was not associated with SCC or BCC when analyses were stratified by sex, country of birth, skin colour, or cancer site, nor by smoking intensity, duration, or level of serum cotinine. Alcohol consumption was associated with a place of birth outside of Australia, being male, younger age groups, and never using blood pressure medication. BCC was associated with current and ever drinking compared to lifetime abstainers, and with red wine specifically. SCC was not associated with drinking status.

Conclusions: This is one of the largest population-based case control studies of NMSC and it does not support a role for smoking in the development of SCC or BCC but provides evidence to suggest that alcohol consumption is associated with BCC.

Congratulations on your retirement and welcome to a healthier lifestyle: A prospective study of 27,257 Australian older adults

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Background: Population aging is associated with a rising burden of non-communicable disease, profoundly impacting health policy and practice. Adopting and adhering to healthy lifestyles in middle or older age can protect against morbidity and mortality. Retirement brings opportunities to reconfigure habitual lifestyles and establish new routines. This study aimed to examine the longitudinal association between retirement and a range of lifestyle risk behaviors among a large population-based sample of Australian adults.

Method: Study sample included working adults (n=27257) aged 45 or older at baseline (2006-2009). Lifestyle behaviors, including smoking, alcohol use, physical activity, diet, sedentary behavior, and sleep, were measured at both baseline and followed up (2010). Logistic regression models (in 2014) estimated the odds of having each risk factor at follow-up and multiple linear regression models calculated the change in total number of risk factors, adjusted for baseline risk and other covariates. Socio-demographic characteristics and reasons for retirement were tested as potential effect modifiers.

Results: During the 3.3 years follow-up 3106 respondents retired. Retirement was associated significantly with reduced odds of smoking (AOR=0.74), physical inactivity (AOR=0.73), excessive sitting (AOR=0.34), and healthier sleep patterns (AOR=0.81). There was no significant association between retirement and alcohol use or fruit and vegetable consumption. Change in the total number of lifestyle risk factors differed significantly by reason for retirement.

Conclusion: In a large population-based Australian cohort, retirement was associated with positive lifestyle changes. Health professionals and policy makers should consider developing special programs for retirees to capitalise on the healthy transitions through retirement.

Vegetarian dietary patterns and all-cause mortality in the 45 and Up Study

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Background: The vegetarian dietary pattern is thought to have health benefits including reductions in risk for type 2 diabetes, hypertension, and obesity. A majority of the evidence to date suggests that vegetarians also have lower mortality rates when compared with non-vegetarians, however many of these studies were conducted in populations who may have other lifestyle factors responsible for the protective effects.

Objective: To evaluate the association between vegetarian dietary patterns and all-cause mortality in a large Australian cohort.

Design: Setting and Participants: The 45 and Up Study is a longitudinal cohort study of men and women based in NSW, Australia. The association between vegetarian dietary pattern and survival time was analysed using Cox proportional hazards models, adjusted for a number of potential confounders. Statistical analysis was conducted in SAS v9.3.

Exposures: Vegetarian dietary pattern was assessed using a questionnaire at baseline (2006-2009). All-cause mortality was determined by linking NSW registry data from 2006 to 2014 (ChReL).

Results: A total of 237 221 participants with a mean age of 62.3 (46.3% men) were included in the final analysis. Vegetarian diet had a protective effect against risk of death [HR= 0.73 (95% confidence interval (CI) 0.58-0.92, P = 0.007] when compared with a non-vegetarian diet. After adjustment for several factors including smoking, alcohol, physical activity, marital status, education, and comorbidities, this effect was not significant [HR= 1.12 (95% CI 0.89-1.41), P = 0.316].

Conclusions and relevance: This is the first Australian prospective cohort study to investigate the association between vegetarian diet and all-cause mortality. We found no significant evidence that vegetarian dietary pattern had a protective effect on all-cause mortality.

Fruit and vegetable consumption and all-cause mortality: Evidence from a large Australian cohort study

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Background: There is growing evidence for a relationship between fruit and vegetable consumption and the risk of all-cause mortality (ACM). Few studies, however, specifically explored consuming raw versus cooked vegetables in relation to health and mortality outcomes. The purpose of this study was to examine the relation of ACM with: a) fruit and vegetable consumption, either combined or separately; b) the consumption of raw versus cooked vegetables in the 45 and Up Study cohort.

Methods: Self-reported baseline questionnaire data (2006-09) from 267,197 adults were linked to mortality data up to June 2014 by the Centre for Health Record Linkage (CHeReL). Fruit and vegetable consumption was assessed by validated short questions. Crude and adjusted hazard ratios were calculated using Cox proportional hazard models. Covariates included socio-demographic characteristics, health-related and dietary variables.

Results: During a mean follow-up of 6.5 years, 20,363 (7.6%) participants died from all causes. In the fully adjusted model, increasing combined consumption of fruit and vegetables was associated with reductions in ACM (P for trend = 0.005, hazard ratio for highest versus lowest consumption quartile: 0.91; 95% confidence intervals: 0.86-0.97). Separate consumption of fruit and vegetables, as well as consumption of raw or cooked vegetables, were associated with a reduced risk of ACM in the crude and minimally adjusted models (all P for trend <0.0001), but these associations no longer remained significant in the fully adjusted models. Significant effect modifiers of the association between fruit and vegetable consumption and ACM included age, sex and BMI.

Conclusions: Combined fruit and vegetable consumption was inversely related to ACM in this large cohort of Australian middle-aged and older adults. Further studies examining the effects of raw versus cooked vegetables are needed.

METHODS (12.00PM-12.35PM)

Using the 45 and Up Study to develop outcome and process indicators for enhanced reporting of the performance of the NSW public healthcare system

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Background: Assessing and reporting on performance in the NSW public healthcare system is important both for accountability and quality improvement purposes. The complexity of healthcare means that assessment often requires data from a range of sources that reflect different elements of patient care delivered both within and outside hospital. The 45 and Up Study and its permissions for data linkage provides an opportunity for the BHI to enhance and refine measures used to assess performance.

Aims: The aim is to develop outcome and process indicators with appropriate risk adjustment and cohort stratification to support fair and meaningful assessments of performance. Areas of development include: identification of patient trajectories and risk factors in unplanned readmissions and complications following hospitalisation; development of enhanced measures of comorbidity using medication information linked to other databases; development of whole-of-system measures of utilisation, capturing substitution of services across sectors; measurement of variation in recommended care pre-admission or post-discharge.

Methods: As well as descriptive statistics, indicators based on statistical models that measure clinical variation in outcomes following contact with health services at a hospital level and/or a district level are developed. Models are constructed using appropriate modelling techniques (e.g. multi-level logistic regression). Associations with patient characteristics and comorbidities, primary care contacts and medication use are tested for inclusion in a risk-adjusted predictive model.

Results and Conclusions: Models are assessed using estimates of association with relevant risk factors, variation (e.g. ICC) and predictive accuracy (c-statistics). An assessment is made of the potential for using the BHI risk-standardised ratio method for measuring clinical variation. Each indicator is assessed for use in publicly reporting an accurate, fair and comprehensive picture of performance of the NSW public healthcare system in the specified area.

Diagnosis based criteria to identify adverse drug reactions (ADRs) in ICD-coded data

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Background: There are multiple methods for ascertaining ADRs from routinely collected International Classification of Diseases (ICD) coded data collections. We aimed to compare the level of ascertainment by different ICD-based case selection criteria to capture ADR related hospitalisation.

Methods: The scientific literature was reviewed to identify different ICD-based criteria for ADR-related case selection. Algorithms to capture ADRs were developed based on candidate hospital ICD-10 diagnoses and external-cause codes, incorporating previously published causality ratings that a specific diagnosis was ADR-related. The algorithms were applied to hospitalisation data for 45 and Up Study participants from 2011-13, using the NSW Admitted Patient Data Collection linked through CHeReL.

Results: Of 538,773 hospitalisations among study participants from 2011-13, 19.7% (n=106,336) had diagnosis codes with causality ratings indicating varying probabilities of being ADR-related; 1.0% (n=5,808) had hospitalisation diagnosis codes that were completely or almost certainly due to medication use (causality ratings: A1 and A2) and 2.0% (n=10,854) had ADR-related external-cause codes (ICD-10: Y40-Y59). Overall, 2.2% (n=11,988) were classified as having an ADR according to external-cause codes and/or diagnosis codes that were completely or almost certainly due to medication use. Selection criteria based on standard external-cause codes alone (Y40-Y59) captured 80.3% (n=4666) of hospitalisations completely or almost certainly due to medication use. Common drug-induced diagnoses uncaptured by external-cause codes included haemorrhagic disorder, hypotension, mental and behavioural disorders, and opioid poisoning.

Conclusion: Highly selective use of single ADR-related hospital diagnosis codes in addition to external-cause codes yielded a modest increase in detection of ADR with potential clinical significance. In surveillance studies, adding drug-induced diagnosis codes to external cause codes enhances the capture of ADR-related hospitalisations. Validated combinations of diagnosis codes could potentially further enhance capture.

Ongoing collection and reporting on impact of the 45 and Up Study

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Background: The 45 and Up Study was established as a collaborative research infrastructure to meet the need for research on ageing and health and to bridge the gap between research and policy.

Use of the resource can be easily quantified, such as the number of projects, publications and media interest. It is not so easy to report on the impact of the 45 and Up Study and, in particular, its role in the translation of research into policy.

This study tries to identify the role of the 45 and Up Study in the translation of research into policy.

Methods: To identify examples of translation of research into policy from the 45 and Up Study, we employed a four-way approach; 1) researchers who had published a paper in the past 12 months were asked four questions regarding the dissemination of their research and its possible influences on policy, programs and/or service provider decisions; 2) searched the public domain for published reports, policies, etc.; 3) spoke to our partner organisations regarding their use of the research; 4) added specific questions to the researcher application form regarding potential policy impact.

Results: Researchers were able to retrospectively report on the dissemination of their results via publication, conference or media, however, once the research was available in the wider public sphere knowledge of its' impact was minimal. While researchers prospectively reported an expectation that their research would inform on and influence changes to policies, guidelines and service providers.

Conclusion: Further research into the long-term impact and translation into policy once findings are disseminated into the wider public sphere is required. There is a need for innovative ways to disseminate information thereby allowing researchers, policy makers and service providers to report their findings and research impact systematically and dynamically.

COMMUNICABLE DISEASES (1.20PM-2.00PM)

Non-typhoidal Salmonella infection in older adults: a prospective study of incidence and risk factors

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Background: Non-typhoidal Salmonella (NTS) is one of the most common bacterial pathogens, and causes a significant health burden globally. We aimed to investigate the incidence and risk factors for notification and hospitalisation due NTS infections in older adults.

Methods: The 45 and Up Study is a large-scale Australian prospective study of adults aged ≥ 45 years (mean 62.7 years) at recruitment in 2006–8. Self-reported demographic, health and dietary information from 265,074 participants were linked to laboratory-confirmed NTS notification, hospitalisation and death records by the NSW Centre for Health Record Linkage. We estimated the incidence of notification and hospitalisation for NTS infections and calculated hazard ratios (HRs) using Cox regression, adjusting for sociodemographic, health and behavioural variables.

Results: Over a total follow-up of 1,120,242 person-years, 333 adults had a NTS notification and 101 were hospitalised; the incidence rate was 29.7 (95% CI: 26.9–33.3) and 9.0 (95% CI: 7.4–10.9) per 100,000 person-years, respectively. After adjustment, the risk of NTS notification did not differ by age, but hospitalisation progressively increased with increasing age. Notifications increased for adults living in outer regional or remote areas (aHR 2.05, 95% CI 1.35–3.10), those taking proton pump inhibitors (PPI) (aHR 1.87, 95% CI 1.43–2.40), and those reporting chicken/poultry intake at least once per day (aHR 3.16, 95% CI 1.25–7.98).

Conclusions: The burden of Salmonella infections is substantial in an ageing population. The high rates found in remote area suggest potential higher rates of environmental transmission in this area. Continuing measures to prevent and reduce bacterial contamination of poultry are essential to reduce foodborne Salmonella infections.

Incidence and risk factors for hospitalisation with gastroenteritis in a cohort of older Australians

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Background: Infectious gastroenteritis is an important cause of morbidity in adults. We aimed to estimate the incidence and risk factors for gastroenteritis-related hospitalisations in older adults.

Methods: The 45 and Up Study is a large-scale Australian prospective study of adults aged ≥ 45 years (mean 62.7 years) at recruitment in 2006–8. Self-reported demographic, health and dietary information from 265,440 participants were linked to infectious gastroenteritis hospitalisation data by the NSW Centre for Health Record Linkage. We estimated the incidence of hospitalisation for infectious gastroenteritis and calculated hazard ratios (HR) using Cox regression, adjusting for sociodemographic, health and behavioural variables, with age as the underlying time variable.

Results: There were 6077 incident infectious gastroenteritis admissions over 1,111,000 person-years. Incidence increased exponentially with increasing age; from 2.4 per 1,000 (95% CI 2.2–2.5) in 45–54 years olds to 9.5 per 1,000 (95% CI 9.2–9.8) in those aged 65+ years. After adjustment, infectious gastroenteritis hospitalisation was significantly more common in those reporting use of proton pump inhibitors (PPIs) (HR 1.6, 95% CI 1.5–1.7), and those with poorer self-rated health (HR 4.2, 95% CI 3.6–4.9).

Conclusions: Infectious gastroenteritis results in hospitalisation of approximately 1% of people ≥ 65 years old each year. Hospitalisation in the elderly is costly and prevention with supportive care should be a public health priority.

Factors associated with pertussis vaccination in a cohort of older Australian adults

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Background: In Australia pertussis vaccines are not funded for adults by the National Immunisation Program. In NSW between 2009 and 2012, free pertussis vaccines were available to adults in close contact with infants, including grandparents and carers.

Methods: Participants in the 45 and Up Study, a cohort of NSW residents aged >45 years, were asked to complete a questionnaire in 2012, which included questions about recent pertussis vaccination. We estimated coverage and examined the factors associated with reported receipt of pertussis vaccine using multivariate logistic regression models.

Results: Of the 41,413 participants invited to complete the questionnaire, 27,036 participants' responses were available at the time of analysis (65.3%). The response rates for men and women were 64.5% and 65.9% respectively; for those <65 years and >65 years were 66.6% and 64.4% respectively; and for those with household incomes of <\$50,000 annually and >\$50,000 annually were 62.8% and 72.6% respectively. Reported pertussis vaccination in the previous 5 years was 19.6% (95% CI 19.1–20.2). Coverage varied from 15.0% (95% CI 13.8–16.3) in those aged 45–54 years, peaking at 60–64 years (24.6%, 95% CI 23.4–25.8), and was lowest in those >85 years (5.7%, 95% CI 4.5–7.2). In adjusted analyses other factors associated with vaccination included being female (aOR 1.66, p<0.01) and higher income (aOR 1.15, p<0.01). Groups less likely to report vaccination included those born in a non-English speaking country (aOR 0.54, p<0.01), smokers (aOR 0.64, p<0.01), those who had not had children (aOR 0.56, p<0.01) and those living alone (aOR 0.80, p<0.01).

Conclusion: Higher uptake of vaccine among women is consistent with the focus on contact with infants. Lower uptake among persons from non-English speaking countries has important implications for communication strategies.

CANCER (1.20PM-2.00PM)

The cost-effectiveness of a specialised clinic for individuals at high risk of melanoma

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Background: A melanoma High Risk Clinic (HRC) was established in 2006 at the Sydney Melanoma Diagnostic Centre in order to evaluate a new model of surveillance care in which people at high risk of new primary melanomas are regularly monitored with total body photography and sequential digital dermoscopy imaging. The median thickness of new melanomas detected in the clinic was in situ (IQR, in situ-0.60mm). The aim of our study was to establish if this model for early detection is cost-effective.

Methods: A decision-analytic Markov model simulating patient care in a specialised clinic compared with standard community care for those at high risk of new primary melanoma was constructed using a 10-year time horizon. Cost and outcome data were obtained from patients' records for the HRC and for the intervention arm from 607 participants identified as high risk from the 45 and Up Study (who completed the questionnaire between 2006 and 2009) linked to the Medicare Benefits Schedule, and through CHeReL to the NSW Central Cancer Registry and the Admitted Patient Data Collection. Data from the Melanoma Patterns of Care study was also utilised. Quality adjusted life year (QALY) weights for each melanoma stage were sourced from published literature.

Results: Preliminary results indicate the mean total cost per patient managed within the HRC over 10 years was \$17,265. Mean total cost per patient managed with standard care over 10 years was \$38,257. The difference in the mean QALY gain over 10 years was 1.03. The HRC was 'dominant' over standard care indicating that HRC provides both a reduction in costs and improvement in quality-adjusted life years gained. In part this is due to 2.3 fewer excisions per person per year on average in the HRC.

Conclusions: Our model suggests management of people at high risk of melanoma through a HRC is cost effective. Further sensitivity analyses will be conducted to explore variations in excision rates and cost estimates in the model.

Acknowledgement: Commonwealth Department of Human Services (DHS) for MBS data

Health service use by people diagnosed with cancer in the 45 and Up Study compared with the NSW cancer population

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Background: Differences between the characteristics of people in the 45 and Up Study and the wider NSW population are well-described. However, little is known about how the health service use of people with cancer in the 45 and Up Study reflects that of the NSW cancer population.

Methods: The study population was all people aged ≥45 years with a new case of cancer recorded on the NSW Central Cancer Registry diagnosed between February 2006 and December 2009. We measured the number of emergency department (ED) attendances and hospital admissions in the year before and the year following cancer diagnosis using data linked by the Centre for Health Record Linkage. We used these measures of health service use since we were able to quantify them for the entire population from linked ED and hospital separation data.

Results: There were 127,175 NSW residents aged ≥45 diagnosed with cancer in the study period, with 13,402 of these participating in the 45 and Up Study. People from the 45 and Up Study were less likely to present to an ED in both the year before and the year after a diagnosis of cancer (20% v 26% before; 35% v 46% after). The 45 and Up participants had a similar number of hospital stays in the year following cancer diagnosis but had slightly more days in hospital (median 7 v 10 days) and a greater proportion of stays in private hospitals (28% v 40%).

Conclusions: Differences in the health service use of the 45 and Up participants may impact on inferences about the health service use of NSW cancer population. We expect the relationship between patient characteristics and health service use in the 45 and Up participants to be generalisable to the NSW cancer population. Use of techniques, such as weighting, may reduce potential biases in the quantification of health service use.

Five year mortality predictors in Australian men 45 years of age and older

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Background: There have been no large-scale empirical assessments of predictors of mortality in middle-aged and older Australian men. This project aimed to develop and validate a prediction score for 5-year mortality using age and self-reported health measures.

Methods: Using 45 and Up Study questionnaire and linked death data, we assessed associations of all-cause mortality to 40 measures of demographic, health, and lifestyle factors with Cox proportional hazards modelling; multiple imputations by chained equations were used. The final prediction model was validated internally using 10-fold-cross-validation; Harrell's C-index values were estimated. Survival estimates from the 45 and Up Study were calibrated to the Australian population using items common to the 45 and Up Study and Australian Health Survey.

Results: Of 123,697 men aged ≥45 years at baseline, 12,160 died during a median follow-up of 5.9 years. In age-adjusted analyses, self-reported health was the strongest predictor of all-cause mortality (C-index 0.827(95%CI 0.824-0.831)). We validated two prediction models for all-cause mortality; (i) model with age group and self-rated, and (ii) full model based on 19 questions [age and self-rated health; limitation in: walking 1km, moderate activities, climbing several flights of stairs, lifting, dressing and bending; needing help with daily tasks; previous cancer, diabetes, heart disease, stroke and/or Parkinson's disease; smoking; feeling tired, feeling everything was an effort; BMI; physical activity(≥150min/week); and treatment for osteoporosis]. Both models showed good discrimination and compared well with observed all-cause mortality rates for Australian males in 2012. Calibrated model estimates could be used in combination with life tables to predict risks for different calendar periods.

Conclusion: Along with age, simple measures such as self-rated health, which can be obtained without physical examination, were strong predictors of all-cause mortality in the 45 and Up Study. These prediction scores could be used to identify high-risk individuals and guide policy and practice.

HEALTH SERVICES 1 (1.20PM-2.00PM)

Compliance with Healthdirect telephone triage recommendations among older patients

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Background: Healthdirect helpline – a telephone triage and advice service in Australia – provides standardised expert advice for patients calling the service. This study assessed the extent to which older patients follow the advice and the variations according to characteristics of patients and calls.

Methods: Records of 11,480 Healthdirect calls (July 2008-December 2011) were linked to baseline questionnaire, emergency department (ED) presentation, hospital admission and medical claims data for 8647 participants. Study outcomes include compliance among patients who were told to “Attend ED immediately”, “See a doctor immediately, within 4 or 24 hours”, “Self-care”, and self-referral to ED in 24 hours among patients who were given non-urgent advices. The variations were determined by multivariable logistic regression modelling.

Results: Compliance with the advice “Attend ED immediately”, “See a doctor” and “Self-care” was 68.6%, 64.6% and 77.5% respectively, and self-referral to ED was 7.5%. Older patients (≥ 65 years) were more like to comply to see a doctor, less likely to self-care and more likely to self-refer to ED. Those living in the most advantaged areas were more likely to see a doctor and less likely to self-refer to ED. Compliance (attend ED immediately or see a doctor) was lower in rural and remote areas. Patients having high levels of psychological distress were less likely to attend ED and those taking ≥ 5 medications were less likely to see a doctor as advised. Calls in the after-hours period, by someone on patient’s behalf, and where the original intention being contact ambulance or ED were associated with patient compliance (attend ED immediately or see a doctor) and self-referral to ED. Patients calling for cardiovascular, bleeding, gastrointestinal, and facial injuries symptoms were more likely to self-refer to ED.

Conclusion: Knowledge about the types of patients and their action following triage advice will assist in refining triage practice and training staff to best encourage patient compliance and facilitate access to care.

Continuity of care measures calculated from claims data: non-linear associations with health status and hospital use

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Context: Relational continuity of care (COC), or a provider-patient relationship that is consistent over time, has been identified as an essential element of good primary care. Measures of COC derived from claims data are commonly used in the literature. This study investigated the relationships between these measures and individuals’ health status.

Methods: The analysis included 225,761 participants in the 45 and Up Study. Medicare claims for consultation with general practitioners (GPs), which were supplied by DHS, were used to calculate two metrics: usual provider continuity (UPC) and continuity of care score (COC score) for subjects who had 4+ claims in the 2-year period following study entry. Participants’ health status at baseline according to levels of COC was compared using descriptive statistics. Associations between COC and hospital services use (visit to emergency department or hospitalisation) were examined using negative binomial regression.

Results: The average of UPC and COC score was 71% and 56%, respectively. Sixteen percent of the cohort achieved 100% COC on both measures, and these participants had significantly fewer average GP claims than others (12 claims versus 16). Both socio-demographic and health characteristics of participants varied significantly among different categories of COC. There was a non-linear association between COC and health status, such that COC generally increased with declining health, but participants with 100% COC were healthier than those whose COC was high, but less than 100%. There was also a non-linear association between COC and hospital service use.

Conclusion: Our findings showed that health status is a determinant of claims-based measures of COC. Healthier individuals with fewer GP claims are more likely to achieve 100% COC than sicker individuals with more claims. Caution should be exercised when treating claims-based COC as a continuous variables and individuals with 100% COC should be analysed as a separate group.

Preventive care and access to primary healthcare among older Aboriginal and non-Aboriginal adults

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Background: Aboriginal Australians have a significantly higher chronic disease burden than non-Aboriginal Australians, which may partially be due to barriers in accessing primary and preventive healthcare. This study aimed to examine differences in preventive care and healthcare access among older Aboriginal and non-Aboriginal adults from the 45 and Up Study.

Methods: Cross-sectional self-reported data from 314 Aboriginal and 59,175 non-Aboriginal participants from a sub-study of the 45 and Up Study (The Social, Economic and Environmental Factors in Health [SEEF] study). Odds ratios (OR) for healthcare variables, adjusted for age, sex and geographic location, were estimated for Aboriginal versus non-Aboriginal participants.

Results: Aboriginal participants had a lower odds of getting a same-day urgent GP appointment (OR 0.6, 95% CI 0.5–0.8), a higher odds of traveling >1 hour to the nearest hospital (2.1, 1.1–3.8) and GP (1.9, 1.2–3.0) and were less confident in their ability to manage their health (0.7, 0.6–0.9) than non-Aboriginal people. Attributed to a shortage of money, Aboriginal participants had a higher odds of reporting not collecting a prescription medicine (5.3, 3.8–7.5), not getting a medical test/treatment (3.9, 2.7–5.5) and limiting fruit/vegetable consumption (3.7, 2.6–5.1) compared to non-Aboriginal participants. Overall, 8.9% of Aboriginal participants and 2.8% of non-Aboriginal participants were smokers who had not received smoking cessation advice from their GPs in the previous 12 months. Among those who were overweight or obese, Aboriginal participants had a higher odds of being advised to increase their physical activity (1.8, 1.3–2.3) and eat less high fat/cholesterol food (1.7, 1.3–2.2) than non-Aboriginal participants.

Conclusions: There are important differences in reported healthcare access factors between Aboriginal and non-Aboriginal people that need to be considered when devising health policy. Compared to non-Aboriginal participants Aboriginal participants have greater financial constraints in accessing healthcare. More effort is required from GPs to advise Aboriginal smokers to quit.

OTHER HEALTH ISSUES (2.00PM-2.35PM)

Mortality risk associated with fractures in The 45 and Up Study

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Background: Increased mortality is well-recognised following hip and vertebral fractures but fewer data are available for non-hip, non-vertebral fractures.

Objectives: To examine mortality risk in men and women following all fractures presenting to Emergency.

Methods: Baseline questionnaire data from the 45 and Up Study were linked to the Emergency Department Data Collection (EDDC), Admitted Patient Data Collection (APDC) and Registry of Births Marriages and Death (RBDM). The Centre for Health Record Linkage (CHeReL) linked the datasets. Fractures were identified from the EDDC and ADPC using the ICD 9, 10, SNOMED and procedure codes. Death data was obtained from the RBDM. Participants were followed from recruitment (2006–2008) till either death or 31 December 2013. Mortality hazard ratios (HR) between those who did and did not fracture were calculated using Cox proportional hazards regression.

Results: 123,910 men (mean age 63.8 years (SD 11.1)) and 143,158 women (61.8 years (SD 11.1)) were included for analysis. The mean length of follow-up for the cohort was 5.6 years (SD 1.2). Women had 9468 fractures and 7134 deaths, and men had 5645 fractures and 11,161 deaths. Overall mortality rate was higher in men (15.2/1000 person years) than women (7.9/1000 person years). After adjusting for age, body mass index, smoking, prior fracture, and co-morbidities, fracture HRs ranged from 2.00 for elbow and humeral fractures to 3.02–3.71 for hip fractures in both women and men. There was also evidence of increased mortality after wrist fractures in both women (HR 1.27, 95% CI: 1.02–3.33) and men (HR 1.55, 95% CI: 1.02–2.19) and ankle fractures in men (HR 1.47, 95% CI: 1.02–2.12). In general, relative risk of mortality was higher in the younger participants.

Conclusion: In the community dwelling 45 and Up Study cohort, a wide variety of fractures were associated with increased mortality after adjustment for comorbidities. The causes of this increased mortality need exploring.

Uptake of procedures for lower urinary tract symptoms (LUTS) among middle aged and older Australian men

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Background: Lower urinary tract symptoms (LUTS) procedures are the most frequent reason for hospitalisation among men; transurethral prostatectomy is a common surgical intervention for chronic LUTS. Little large-scale evidence exists on patterns of uptake of transurethral prostatectomy in Australia. This study aimed to investigate the relationship of socio-demographic and health-related factors to non-cancer related transurethral prostatectomy rates.

Methods: Prospective study of male participants in the 45 and Up Study, with baseline survey data linked to hospitalisations and deaths. Cox proportional hazards models estimated hazard ratios for transurethral prostatectomy in relation to baseline characteristics, adjusting for age (Model 1), additionally for smoking, alcohol consumption, region of birth, body-mass-index, and region of residence (Model 2), and additionally for need (modified International Prostate Symptoms Score, Model 3). Men with previous prostatectomy and/or bowel/genital/urinary-tract cancer were excluded from the analyses. Diagnoses of these cancers since baseline were considered competing risks and censored.

Results: There were 3416 incident procedures among 106,769 men (median follow-up 5.8 years, incidence rate 5.49 per 1000 person years). In all three models, annual household income \geq \$70,000 (versus $<$ \$20,000), private health insurance and living in major cities (versus more remote) were associated with a higher rates of LUTS procedures. There were no significant associations between baseline diabetes, stroke, high blood pressure or cardiovascular disease and LUTS procedures. Men reporting severe versus no physical functional limitations, high versus low psychological distress, or poor versus excellent self-rated health were at least 36% more likely to undergo procedures overall (Model 2), but were at least 24% less likely to undergo procedures following additional adjustment for need (Model 3).

Conclusion: The relatively high uptake of LUTS procedures, relative to need, among men in high-income households, living in major cities and with private health insurance suggests inequality. The low uptake associated with poorer overall health requires further exploration.

Cross-sectional study of urinary incontinence in women

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Background: Urinary incontinence (UI) is a common, but under-researched, health issue. Little large-scale population-based evidence exists regarding characteristics of UI for middle-aged and older Australian women.

Methods: Baseline 45 and Up Study self-reported survey data from 137,017 women were used. Frequent UI was defined as being troubled by leaking urine 4–6 times/wk or more. Strength of associations between frequent UI and socio-demographic and health-related factors was estimated using unconditional logistic regression, adjusting for age and excluding women with previous prolapse repair surgery. Analyses were stratified by limitations to physical functioning.

Results: Overall, 44% of participants reported trouble with leaking urine. Prevalence and frequency increased with age. Prevalence of frequent UI was 13% overall, ranging from 9% (ages 45–49) to 24% (ages \geq 80). Age-adjusted odds of frequent UI decreased with increasing education (tertiary qualification versus no school certificate, OR=0.53 (95% CI 0.50–0.56)) and household income (\geq \$70,000 p.a. versus $<$ \$20,000 p.a., OR=0.57 (0.54–0.61)). Odds were elevated among those living in remote or very remote areas versus major cities (OR=1.16 (1.03–1.32)), current smokers versus never smokers (OR=1.55 (1.45–1.65)), obese versus healthy-weight women (body-mass-index of 40–50kg/m² versus 18.5– $<$ 20kg/m², OR=5.80 (5.05–6.67)), low versus high physical activity (OR=1.50 (1.43–1.69)), multiparous (\geq 3) versus nulliparous women (OR=1.59 (1.49–1.70)), high versus low psychological distress (OR=2.99 (2.82–3.17)) and among those with comorbid conditions (e.g. heart disease versus no heart disease, OR=1.45 (1.36–1.53)). Odds were particularly elevated for women rating quality of life (OR=6.12 (5.47–6.84)) and health (OR=7.61 (6.84–8.48)) as poor versus excellent, and for women with severe versus no limitations to physical functioning (OR=4.88 (4.59–5.19)). Associations remained after stratifying by physical functioning.

Conclusions: Frequent UI was associated with a number of socio-demographic and health-related factors. Strongest relationships were observed for very high body mass index, high parity, and poor quality of life and overall health. Modifiable factors suggest possible avenues for prevention.

Factors associated with self-rated quality of life in Australia: A population-based study of 252,704 adults in the 45 and Up Study

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Background: Few studies have investigated factors associated with quality of life (QoL) in older adults in Australia. Evidence of the relationship of joint consideration of physical functional limitation and psychological distress to self-rated QoL is lacking.

Methods: 252,704 residents of NSW aged 45 and over completed a questionnaire including asking them to rate their QoL on a 5 point scale. The relationship between self-rated QoL and socio-demographic, health behavioural, and health-related factors was estimated, using logistic regression to calculate adjusted odds ratios.

Results: QoL was rated as poor by 1.7% of participants, fair by 9.0%, good by 28.3%, very good by 37.3% and excellent by 23.7%. The adjusted odds for self-rated poor/fair versus good/very good/excellent QoL were higher among people aged 75 and over, who resided in remote area, who spoke a language other than English at home compared to other cohort members. The adjusted odds were lower in those with private health insurance, higher education level, higher annual household income, and greater physical activity. The adjusted odds of lower QoL were significantly greater in current versus never-smokers (OR, 95%CI: 1.85, 1.75–1.94). Except breast cancer, every illness was associated with significantly lower QoL compared with not having that disease. The adjusted odds ratios for self-rated poor/fair versus good/very good/excellent QoL were 8.58 (8.18–8.99) in people with high psychological distress (n, %: 7700, 45.1%); 4.47 (4.20–4.75) in people with severe physical functional limitation (12,043, 41.0%); and 22.27 (20.01–24.78) in people with both high psychological distress and severe physical functional limitation (3826, 70.0%).

Conclusion: Self-rated QoL varied across socio-demographic, health behavioural and health-related factors in Australia. QoL was particularly low among those with severe psychological distress and/or physical functional limitation.

CARDIOVASCULAR DISEASE (2.00PM-2.35PM)

Variation in readmission and mortality following hospitalisation with a diagnosis of heart failure

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Background: Hospitalisation for heart failure is common and readmission and post-discharge mortality rates are relatively high. However, large-scale quantitative data on the magnitude and nature of variation in these outcomes is scarce. We examined patient- and hospital-level variation in the risk of unplanned readmission and mortality following discharge from hospital with heart failure.

Methods: 45 and Up Study baseline survey data were linked to hospital and mortality data (to Dec 2011) through the Centre for Health Record Linkage. Multilevel logistic regression models quantified the variation in 28-day readmission and 30-day mortality between hospitals and examined which patient- and hospital-level characteristics were associated with these outcomes.

Results: Preliminary findings: 5,570/265,946 eligible participants (2.1%) had a heart failure admission, in 244 different hospitals; 29% were readmitted within 28 days of discharge (first readmission —18% planned, 11% planned) and 4.0% died within 30 days. Unplanned readmission and post-discharge mortality rates varied across hospitals, however this between-hospital variation did not account for a significant proportion of the total variation in outcomes once individual patient characteristics were accounted for. Patient characteristics associated with a higher risk of unplanned readmission included prior hospitalisation for cardiovascular disease and for anemia, comorbidities at the time of admission and lower social interaction scores. Similarly, risk of 30-day mortality was associated with patient- rather than hospital-level factors, in particular age, sex and comorbidity.

Conclusions: Findings suggest that underlying issues contributing to high levels of readmission and mortality in people with heart failure are system-wide rather than specific to particular hospitals, with variation in these outcomes essentially attributable to patient-level factors. They provide preliminary support for the need for patient-centred strategies to optimise heart failure management, such as discharge planning and accessible community services, as well as the importance of enhanced preventative strategies.

Prevalence of undiagnosed diabetes in New South Wales, Australia

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Background: An individual with undiagnosed diabetes is someone who has not been diagnosed by a physician but whose plasma glucose levels satisfy established criteria for diabetes. The most recent estimate of the burden of undiagnosed diabetes in the total population of Australia is 2.2%, compared with 5.2% for diagnosed diabetes. This study aims at estimating the prevalence of undiagnosed diabetes in New South Wales (NSW), identifying geographic regions with high prevalence of undiagnosed diabetes, and determining which factors may be associated with the observed incidence pattern.

Methods: We utilise an existing model developed by one of our co-authors to predict diabetes at the individual level, using biomedical data from the North-West Adelaide Health Survey. We apply the model to data from the 45 and Up Study, a health survey of 260,000 NSW individuals over the age of 45. We estimate the prevalence of undiagnosed diabetes as the difference between the predictions of the model and self-reported diabetes in the 45 and Up Study, aggregated at the Statistical Local Area (SLA) level. We use hierarchical mixed effects multilevel modelling to explore associations between the SLA level undiagnosed diabetes and various demographic, socio-economic and environmental factors (e.g., population density, remoteness, green space and transport-dominant areas) as well as access to general practitioners.

Results: The regional prevalence of undiagnosed diabetes in NSW exhibits significant geographic variation. It is possible to identify associations between undiagnosed diabetes and various socio-economic and environmental variables. However, most of the geographic variation is unexplained.

Conclusions: This is a unique spatial analysis serving multiple purposes. First, it provides insight into the determinants of undiagnosed diabetes. Second it facilitates the geographically targeting of specific sub-populations for health promotion campaigns, and by mapping the unexplained geographic variation it points to areas of interest where inefficiencies and inequities in health care may be at play.

Physical disability and daily care requirements among people with and without diabetes

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Background: Diabetes and its complications impact significantly on the health and functional status of individuals, including on quality of life and life expectancy. Although diabetes is known to be associated with an increased risk of overall functional impairment, there is little evidence on the association with different types of impairments and how it varies across socio-demographic characteristics and health conditions. This study compared physical functioning limitations, daily care assistance requirements and self-reported health conditions among people with and without diabetes.

Methods: Self-reported data from the 45 and Up Study baseline questionnaire were used. Outcomes included physical functioning limitations, needing help with daily tasks (yes/no); and self-reported disabilities (poor eyesight, poor memory, and hearing loss). Modified Poisson regression with robust error variance was used to estimate prevalence ratios (PR) and 95% confidence intervals (CI), comparing prevalence of each outcome in those with self-reported diabetes to those without, adjusting for potential confounders.

Results: 3,918 (9.0%) of 266,777 participants reported having been diagnosed with diabetes, including 2740 (1.0%) diagnosed in the last two years. Compared to those without diabetes, those with diabetes were more likely to: have severe physical functioning limitation (PR=1.60, 95%CI 1.57–1.63); need help with daily tasks (1.93, 1.86–2.01), report poor eyesight (1.54, 1.44–1.64); report poor memory (1.35, 1.26–1.44); and hearing loss (1.04, 1.03–1.05). PRs increased according to diabetes durations for all outcomes (Ptrend<0.05), except for vigorous activities and hearing loss.

Conclusion: These findings provide population-based evidence on diabetes sequelae and care requirements, quantifying declines in physical function, eyesight, memory, hearing and ability for self-care associated with diabetes. The relatively high level of physical functional limitations among people with diabetes has implications for diabetes care and management.

Exploring workforce participation and chronic diseases of mid-age Australians over the life course

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Background: Population ageing is a result of successful public health policies and medical advancement. However, it has presented unique challenges for governments and their policies. For instance, increasing prevalence of chronic diseases, decreasing work participation and resultant dependency at older ages are of importance in current labour policy environment. This study identified associations between workforce participation patterns and chronic diseases (diabetes, asthma, depression and arthritis) with a gendered perspective.

Methods: We used data from 1261 mid-age participants of the Australian Life History and Health Survey (LHH), aged 60–64 year in 2011. LHH was conducted as a sub-study of the Sax Institute's 45 and Up Study, and recruited residents of New South Wales (NSW, Australia) aged 45 years and older. Latent class analysis identified dominant workforce patterns and associations between workforce patterns and chronic diseases were explored by multinomial regression models.

Results: Of the 1261 participants, there were 684 men and 577 women. Diabetes, asthma, depression and arthritis were less prevalent in men and women in class 'mostly full time work', compared to other workforce patterns. The odds of 'mostly full time work' were lower for men reporting depression or arthritis, while among women, depression was associated with 'increasing part time work' after adjusting early and adult life factors.

Conclusion: The results strengthen the importance of policies focused on promoting and preserving health of young and mid-age workers, and creating supportive environment for those with chronic health issues over the life course.

HEALTH SERVICES 2 (2.00PM-2.35PM)

Determinants of overnight hospital admissions for Australians aged 85+ in their last year of life

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Background: A disproportionate use of hospitals has been found towards the end of life. Very old adults however are often excluded from such research. This study aimed to examine factors associated with overnight hospital length of stay (LOS) for those ≥85 years in their last year of life.

Methods: 45 and Up Study survey data was linked to the NSW Admitted Patients Data Collection through the Centre for Health Record Linkage. Predictors of overnight hospital admissions were examined using logistic regression. A separate analysis for the subgroup of the population that experienced an admission to hospital in the last year of life was then examined. Coefficient estimates associated with LOS were estimated at the 25th, 50th, 75th and 90th quantiles of the LOS distribution.

Results: Of the 3364 decedents who were aged ≥85 years in their last year of life, 86.2% had at least one overnight hospital stay in the year prior to death. The median LOS for these people was 4 for Q1, 14 for Q2, 31 for Q3 and 65 for Q4. Statistically significant differences were found between those who did and did not have a hospital admission in their last year of life for living independently, age at death and physical activity ($p < 0.01$). No significant differences were found for gender. Marginal differences across factor estimates using quantile regression were found for a subset of the sample that had a hospital admission that were not detected in the logistic regression model.

Conclusions: Most very old people will have at least one hospital admission in the last year of life and there is a wide range of LOS. There is a need for a much greater understanding of the drivers of extended hospital use in the last year of life as well as how to improve the last months for these people.

Health service use and excess health care costs associated with chronic illness and lifestyle risks among NSW workers – initial findings

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Background: Chronic diseases and related lifestyle risk factors lead to significant morbidity and associated health service usage and cost. Health service use and the long term costs associated with treatment and management of CVD and diabetes is significant. The workplace is acknowledged as an important setting for health promotion interventions.

This study seeks to describe health service use and estimate excess health sector costs associated with workers who have a newly acquired chronic illness or lifestyle risk.

Methods: Through linking the 45 and Up Study participant data at baseline and follow-up, those with self-reported incident chronic illness (CVD or diabetes) or lifestyle risk (obesity) were identified. Further linkage (undertaken by the Centre for Health Record Linkage) to NSW hospitalisations, ED, deaths and MBS data (provided by the Commonwealth Department of Human Services) allows health service use and associated costs following diagnosis to be described and compared. Costs associated with any differential service use will be estimated using AR-DRGs cost and the Medicare Benefits Schedule fee.

Results: 43,627 Study participants, re-surveyed at follow-up, reported working full or part time at baseline survey and were included in the study. The mean time to follow-up was 3.7 years. 54% of the study population were female and the mean age at follow up was 59.4 years (47.5–96.8 years). 10.7% (n=4660) reported newly diagnosed CVD, 2.2% (n=937) diabetes and 5.6% (n=2436) now had a BMI greater than 29 kg/m² (obese). This represents 7430 participants with newly diagnosed illness or lifestyle risk. 51.3% of this group are female and the mean age is 60.0 years (47.8–96.3 years).

Analysis continues and further results will be presented at the Collaborators' Meeting.

Conclusion: The study will provide evidence as to the potential savings to Australian health care system that can be achieved when well-supported, evidence based health promotion programs are brought to scale.

Feasibility study of establishing a cohort on 'integrating care for older people within Central and Eastern Sydney'

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Background: Health service planners and managers want to better predict the needs of their population, ensuring that patients with chronic care need receive timely well-integrated care. This paper explores the feasibility of identifying community dwelling residents within Central and Eastern Sydney (CES) to identify effective intervention points for targeted resources.

Methods: Using the Sax Institutes' 45 and Up Study (n=267,000), 31,173 participants, resident in the common catchment areas of CES Primary Health Network (CESPHN), South Eastern Sydney (SESLHD), and Sydney Local Health Districts (SLHD) were identified. In addition, 6672 (21%) also participated in the SEEF Study, which collected enhanced data about socioeconomic and environmental factors. Baseline data were linked to available administrative data enabling exploration of health and service use. Stakeholder interviews aimed to identify interest in this work and research questions of interest.

Results/discussion: Demographic characteristics of CES participants were broadly similar to major metropolitan areas: approximately half (52%) were aged >60 years at recruitment, 48% were male, and 36.5% were born overseas. Participants had higher qualifications and income.

The major strength of the data was the potential capacity to link to local data and provide access to a community dwelling population within the CES catchment. The limitation of the study was the smaller population; this could be addressed by generalising research to the larger cohort where appropriate. Stakeholder interviews identified general support and specific opportunities to inform planning particularly around issues relating to integration of health care services. Identified research priorities include integration of care, falls' risk, and GP follow up after discharge.

Conclusion: The cohort will support questions of interest to CESPHN, SLHD, and SESLHD. The next stage of the study will be to engage wider group of stakeholders and to explore the participant and system factors that influence access to integrated care.

Use of 45 and Up linked data to evaluate the impact of quality use of medicine programs on prescribing in primary care and associated health outcomes

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Background: NPS MedicineWise regularly evaluates the impact of its quality use of medicine (QUM) programs on prescriber behaviour in general practice using PBS data, but the measurement of program impact on consequent health outcomes has just started recently.

Objective: This study aimed to evaluate the long-term impact of NPS QUM programs on medication use and patient health outcomes.

Methods: Two educational program evaluations were conducted, with evaluation population and outcome measures derived based on the large study cohort, the 45 and Up Study, linked with health administrative data. (1) Stroke Prevention program (2009): interrupted time series approach was applied to assess the change in rate of first time aspirin prescriptions and rate of primary stroke related hospitalisations following program intervention in population with high risk of cardiovascular disease (CVD) (2) Hypertension management program (2003): retrospective cohort study design was used and logistic regression analysis was applied to compare the guideline concordance of prescribed antihypertensive regimen between patients seeing GPs in 'high' program participation regions' and 'low' participation regions'; and the association between guideline concordance and cardiovascular outcome measures.

Data for prescribing (PBS) and for medical service (MBS) were supplied by DHS, and linked to 45 and Up participants through CHeReL.

Results: We found that (1) The Stroke Prevention Program was associated with increased (by 19.8%, 95% CI: 1.6%–38.0%) new initiation of aspirin; and decreased (by 17.3%, 95% CI: 1.8%–30.0%) hospitalisation due to primary ischemic stroke in the high risk CVD population (N=90,023). (2) The hypertension management program was associated with improved guideline concordance (adjusted OR=1.15, 95% CI: 1.01–1.31); and the guideline concordance is associated with lower odds of hospitalisation due to MI (adjusted OR=0.89, 95% CI: 0.82–0.97).

Conclusion: Large scale linkage data enhanced the capacity of program impact evaluation from prescribing behaviour to health outcome. The provision of evidence-based educational program in primary care is effective in changing prescriber behaviour and positively impacting patient health outcomes.