women's
health
australia

australian longitudinal
study on women's health

Annual Report
2016

CONTENTS

DIRECTOR'S REPORT

The Australian Longitudinal Study on Women's Health (ALSWH) celebrated its 20th year in 2016. Funded by the Australian Government Department of Health, ALSWH assesses women's physical and mental health, as well as socio-demographic and lifestyle factors, and their use of health services. The Study is a national research resource, and since its inception has provided an evidence base to the government and other decision-making bodies within Australia for the development and evaluation of policy and practice in many areas of service delivery that affect women.

This report outlines progress and achievements during 2016. A highlight of the year was the inaugural ALSWH Scientific Meeting, held in Newcastle from the 3rd to 6th of May. At the meeting, over 100 delegates met to present and discuss their research findings from the Study over the last 20 years - a summary of the event is included in this report.

During the year, a major report examining future health service use and costs was prepared for the Australian Government Department of Health. The report, 'Future health service use and cost: Insights from the Australian Longitudinal Study on Women's Health', used ALSWH data to identify expected trends in women's health status, health risks and behaviours over the next two decades. The report also linked ALSWH data with data on key health service use to indicate potential service burden for women with different health and social needs. Results from the report were presented at the 2016 Longitudinal Data Conference hosted by the Department of Social Services. A summary is also presented in this report.

ALSWH now involves more than 58,000 women, selected from the Australian population, in four cohorts that encompass the adult lifespan:

- Young women born 1989-95 (now aged 21-27 in 2016)
- Women born 1973-78 (now aged 38-42)
- Women born 1946-51 (now aged 65-70)
- Women born 1921-26 (now aged 91-96)

During 2016, the 1946-51 cohort were surveyed for the eighth time, and the 1989-95 cohort received their fourth survey. The women in the oldest cohort continued to receive surveys at six-monthly intervals, with surveys sent in May and November. A major substudy of the 1973-78 cohort, Mothers and their Children's Health (funded by the NHMRC), commenced in October, with all eligible members of the 1973-78 cohort invited to complete surveys assessing a range of important factors including their children's diet, physical activity, sleep patterns, milestones, and the mother's use of childcare. The children's data will then be linked with ALSWH's 20 years of data on their mother's health and socio-demographic factors to provide an unparalleled insight into child health and development.

This year we also took initial steps to expand the Study to collect biological data, with a pilot study investigating predictors of good glucose control for Australian women beginning in October. Selected women with diabetes from the 1973-78 and 1946-51 cohorts were invited to have tests for nutritional status and metabolic markers of their diabetes control, and asked to complete an on-line survey. This pilot will continue in 2017.

ALSWH data can be linked to selected external datasets and throughout the year, we have continued to work on developing our linked data capacity. Existing linkages of de-identified ALSWH data with Medicare Benefits Schedule (MBS), Pharmaceutical Benefits Schedule (PBS) and other health datasets (such as Aged Care data, cancer data, and state-based hospital and perinatal data) have been updated, and a new linkage with hospital emergency department data from Western Australia has been established.

ALSWH data are available for external use, and since the Study began in 1996 it has been provided to collaborators for use in approximately 700 research projects. During 2016, over 70 peer reviewed papers using ALSWH data were published or accepted for publication. We also continued to conduct subsidiary analyses, enhance data quality and documentation, and produce scientific papers and conference presentations on all aspects of women's health.

We would like to thank the Department of Health for their ongoing support of the Study, our colleagues for all their hard work, and the women who have continued their participation in the research over the last 20 years

Professor Gita Mishra and Professor Julie Byles

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2016 Major Report - Future health service use and cost: Insights from the Australian Longitudinal Study on Women's Health

The ALSWH major report for 2016 used ALSWH data to identify expected trends in health status, health risks, and behaviours over the next two decades, and to compare trends across cohorts. Linked data on key health service use for women with different health and social needs was also analysed to provide an indication of potential service burden. The report also examined projected health disparities between women with different socio-demographic characteristics. Findings of the report are summarised here – the full report is available on the Study website (www.alswh.org.au).

Needing help with daily tasks

The prevalence of Australian women aged 18 to 90 who needed help with daily tasks in 2015 was 3.9 per cent and this is predicted to increase to 4.6 per cent by 2035. As women age, their physical function scores decline and the prevalence of reported need for help with daily tasks increases. By the time women are in their late eighties, around 22 per cent will need help with daily tasks, and there is no evidence that this percentage will be lower for subsequent cohorts of women. Consequently, as the Australian population ages, the percentage of women who need help with daily tasks will increase proportionally. The increase in the number and proportion of women who need help is likely to translate into large increases in demands on healthcare and increases in healthcare costs.

Obesity

Total health expenditure for obese women will double over the next 20 years, whereas the rate of increase in MBS, PBS, and hospital costs will be slower for women who are not obese. Women's body mass index increases with age to around 70 years, and is higher with successive cohorts. The prevalence of women who are obese increased 3.5 fold in the 1973-78 cohort from 1996 to 2012 and 1.6 fold in the 1946-51 cohort from 1996 to 2013. The prevalence of women who are obese is higher in the 1989-95 cohort compared to when the 1973-78 cohort were the same age. The increasing prevalence of obesity across successive cohorts, the increase in weight associated with ageing, and the projected changes in population size and structure all lead to a large projected increase in the number of obese women over the next two decades. Our projections show that the number of obese women will double from 2.4 million (or 26.6 per cent) to 4.8 million (or 40.0 per cent) between 2015 and 2035.

Smoking

The prevalence of smoking decreases with age and across successive cohorts. The uptake of smoking in the 1989-95 cohort is lower than in the 1973-78 cohort at the same age. If this trend continues, from 2015 to 2035, the prevalence of smokers among Australian women aged 20-90 is predicted to decrease from approximately 10 per cent to 3 per cent. The consequence of this decrease in smoking will be a decrease in healthcare costs attributable to smoking.

Mental Health

With population growth, the number of women aged 20-90 with psychological distress will increase from 1.2 million to 1.7 million from 2015 to 2035 – however the prevalence of psychological distress in this population is projected to decrease from 14 per cent to 13.6 per cent over that same period due to population ageing. Mental health scores are relatively stable with age, and women in the 1921-26 cohort score slightly better than the 1973-78 cohort. Correspondingly, the prevalence of women with psychological distress decreases with age. Women who experience psychological distress in the 1946-51 and 1921-26 cohorts have higher MBS, PBS, and hospital costs than women who do not have psychological distress.

Dementia

The number of women in the Australian population living with dementia is predicted to double between 2015 and 2035 if the prevalence of dementia remains constant. If the incidence of dementia remains constant, the number of new cases of dementia diagnosed each year in Australian women is predicted to double between 2015 and 2035. By 2012, 20 per cent of the ALSWH older cohort aged 85-90 had a report or record of dementia. After accounting for the possible underestimation of dementia in the cohort, 28 per cent of women were estimated to have dementia by age 90.

Highest educational attainment

The prevalence of women who attain a university qualification has increased by birth cohort and over time within each cohort. The number of women with a university education is predicted to increase from 2.6 million (or 28.5 per cent) to 4.4 million (or 36.1 per cent) between 2015 and 2035. Women with university education have lower healthcare costs than women with no university education. Consequently, while healthcare costs will increase overall, the increase in costs will be lower among more educated women.

Ability to manage on income

Younger women found it most difficult to manage on their available income, however managing on income became easier with age. Women who have difficulty managing on income have more MBS, PBS, and hospital costs overall. The number of women aged 20-90 who have difficulty managing on income is predicted to increase from 3.5 million to 4.6 million between 2015 and 2035, however prevalence will decrease by 1 per cent. We recognise that this is likely to be an underestimate of the proportion of women who have difficulty managing on income over the next 20 years. Women who have difficulty managing on income are predicted to have a total of $1.6 billion in MBS costs, $3.4 billion in PBS costs, and $9.8 billion in hospital costs in 2035.

Marital status

The prevalence of women who have partners increases from early adulthood until the late thirties, and by middle age, approximately 80 per cent of women are married or are in a de facto relationship. The percentage of women who are divorced increases with age in the 1946-51 cohort, and the percentage of women who are widowed increases with age in the 1921-26 cohort. The total number of women aged 20-90 who have partners is projected to increase from 6.2 million in 2015 to 8.2 million in 2035, however the prevalence will remain stable at approximately 67 per cent.

There was no consistent trend for MBS, PBS, and hospital claims and costs between partnered and unpartnered women, except that hospital costs for partnered women in the 1973-78 cohort were approximately $1000 higher than unpartnered women. It is projected that in 2035, the MBS, PBS, and hospital costs for women with a partner will be $2.5 billion, $4.8 billion, and $14.2 billion, respectively. For women who do not have partners, it is projected that in 2035, the MBS, PBS, and hospital costs will be $1.6 billion, $3.7 billion, and $8.2 billion, respectively.

Area of residence

The percentage of women who live in a major city (approximately 70 per cent), inner regional areas (20 per cent), and outer region and remote areas (10 per cent) are relatively stable across all observed ages for the women in ALSWH. With population growth, the number of women who live in a major city will increase, however the proportion of women who live

in a major city is predicted to remain stable at 70 per cent. There was little difference in estimated MBS and PBS claims and costs between women who live in a major city and those who lived in a regional or remote area. However, hospital costs were higher for older women living in a major city than those who live in a regional or remote area.

Women who live in a major city are predicted to have total MBS, PBS, and hospital costs of $2.8 billion, $6.1 billion, and $17.1 billion, respectively, in 2035. In comparison, women who live in regional or remote areas are predicted to have total MBS, PBS, and hospital costs of $1.2 billion, $2.5 billion, and $6.7 billion, respectively, in 2035.
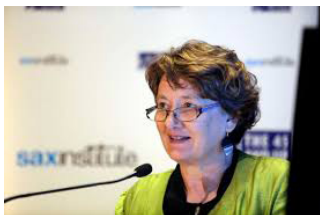
Summary

The overall effects of population ageing and population growth will result in an increase in healthcare expenditure. However, these effects are not equal for all population subgroups. A major driver of increased expenditure is obesity, with obesity rates increasing with age and over subsequent generations, and with obesity being a major driver of healthcare costs. Smoking is also a major driver of healthcare costs, but rates of smoking are projected to decrease so that smoking will account for a lower proportion of costs. Other factors likely to drive large increases in healthcare costs in the future include dementia and declines in physical function with consequent increased need for help with daily tasks. Education levels are projected to increase, potentially offsetting some increases in healthcare costs since women with higher levels of education have lower overall healthcare costs.

2016 Scientific Meeting: Reaping the Benefits

To celebrate our 20 year milestone, the Study hosted its inaugural Scientific Meeting. Themed, 'Reaping the Benefits', the meeting demonstrated how researchers, governments, and women are benefitting from Australia's largest, longest running study on women's health. More than 100 researchers, students and government representatives attended the four day event, held from the 3rd – 6th May, at the Hunter Medical Research Institute in Newcastle.

Internationally recognised health researchers Professor Sally Redman and Professor Emily Banks delivered engaging and thought provoking keynote addresses at the meeting. Professor Redman, CEO of the Sax Institute, has developed innovative approaches to increasing the use of evidence by policy agencies, and her keynote was titled 'Reaping the benefits: Cohorts and health policy, programs and services'. Professor Redman's address advocated the unique role that cohort studies have in informing policy and services, discussed how researchers and policy makers can and should develop stronger partnerships and ask 'better questions', and advocated the inclusion of more economic analysis and natural experiments in cohort studies. Professor Banks is Head of Chronic Disease Epidemiology and the National Centre for Epidemiology and Population Health at ANU, and Scientific Director of the 45 and Up study. Her keynote speech addressed the topic 'Large scale cohort studies: aligning science with policy and practice' and discussed the interplay of science and politics in the policy making process, discussing how and when cohort studies can best contribute to policy action. In her address, Professor Banks cited examples of the significant reduction in smoking related morbidity and mortality that have occurred in Australia.

Professor Sally Redman

Professor Emily Banks

The main conference program offered 40 presentations on the subthemes of ageing, sexual and reproductive health, abuse and trauma, lifestyle, health behaviour, transitioning through mid-life, mental health, and longitudinal research methods, as well as pre and post conference workshops.

Researchers and teams from around Australia attended a pre-conference workshop where they were able to tap into 20 years' worth of expertise and practical knowledge about the initiation and maintenance of longitudinal studies. The pre-conference workshop had a strong focus on the value of using social media and modern communication methods in participant recruitment, using the ALSWH recruitment of the 1989-95 cohort that took place in 2012-13 as a case study. The knowledge shared will assist future studies to conduct their projects efficiently and cost-effectively, while taking advantage of all the new opportunities afforded by online surveying and social media.

Collaborations were also fostered at the post-conference workshop between researchers, policy makers and policy implementers who came together to discuss research translation. While improved pathways from research discovery to implementation were the focus, the group acknowledged that this is most effective when communication channels remain open, allowing for feedback between all parties.

We are grateful for the support of the NSW Government Department of Industry, University of Newcastle, University of Queensland, Hunter Medical Research Institute and the Australian Government Department of Health. The Scientific Meeting facilitated networking opportunities which will lead to collaborations between institutions and individuals to further research and development, strengthen ties between collaborators, and ignite new ideas for research discovery.

PUBLISHED PAPERS

Aljadani H, Patterson A, Sibbritt D & Collins C.
Diet quality and 6-year risk of overweight and obesity among mid-age Australian women who were initially in the healthy weight range.
Health Promotion Journal of Australia, 2016; 27(1), 29-35.

Issue addressed: The present study investigated the association between diet quality, measured using the Australian Recommended Food Score (ARFS), and 6-year risk of becoming overweight or obese in mid-age women from the Australian Longitudinal Study of Women's Health (ALSWH).

Methods: Women (n≤1107) aged 47.6-55.8 years who were a healthy weight (body mass index (BMI) between ≤18.5 and <25.0kgm-2) at baseline and who reported valid total energy intakes were included in the study. BMI was calculated from self-reported data in 2001 and 2007. ARFS scores were calculated from data collected using the Dietary Questionnaire for Epidemiological Studies Version 2. Logistic regression was used to examine the relationship between ARFS score as a continuous variable and risk of becoming overweight or obese.

Results: The 6-year incidence of overweight and obesity was 18.5% and 1.1%, respectively. The mean (± s.d.) ARFS (maximum possible 74) among those who remained within the healthy weight range and those who became overweight or obese at follow-up was 35.3±8.1 and 34.3±8.8, respectively. There was no relationship between baseline ARFS and risk of becoming overweight or obese over 6 years. Women who were smokers were more likely to become overweight or obese (odds ratio 1.5; 95% confidence interval 1.11-2.09; P≤0.008).

Conclusions: Poor diet quality was common among mid-age women of a healthy weight in the ALSWH. Higher diet quality was not associated with the risk of overweight or obesity after 6 years, yet smoking status was. So what? Better diet quality alone will not achieve maintenance of a healthy weight, but should be encouraged to improve other health outcomes.

Brady S, Hussain S, Brown W, Heriter S, Wany Y, Teede H, Urquhart D & Cicuttini.
Predictors of back pain in middle aged women: Data from the Australian Longitudinal Study on Women's Health.
Arthritis Care and Research, 2016; doi: 10.1002/ acr.22982.

Background: Back pain causes greater disability worldwide than any other condition, with women more likely to suffer from back pain than men. Our aim was to identify modifiable risk factors for back pain in middle-aged women.

Methods: Women born between 1946 and 1951 were randomly selected from the national health insurance scheme database to participate in The Australian Longitudinal Study of Women's Health. Self-reported data on back pain in the last 12 months, weight, physical activity and other socio-demographic factors were collected in 1998, 2001, 2004, 2007, 2010 and 2013. In 1998, 12,338 women completed the survey and 10,011 (74%) completed the 2013 survey.

Results: At baseline, median (range) age was 49.5 (44.6 – 53.5) years and 54% reported back pain. In multivariate analysis, baseline weight and depression were positive predictors of back pain over each 3 year survey interval and over the following 15 years, whereas participation in vigorous physical activity was protective. The effects of weight on back pain were most marked in women with a BMI ≥25.

Conclusions: Back pain is common in middle-aged women. Increased weight, weight gain and depression were independent predictors of back pain over 15 years, whereas participation in vigorous physical activity was protective. Targeting these lifestyle factors is an important area for future research on reducing the burden of back pain in middle-aged women.

Brady SR, Hussain SM, Brown WJ, Heritier S, Billah B, Wang Y, Teede H, Urquhart DM & Cicuttini FM.
Relationships between weight, physical activity, and back pain in young adult women.
Medicine, 2016; 95(19), e3368.

Back pain causes enormous financial and disability burden worldwide, which could potentially be reduced by understanding its determinants to

develop effective prevention strategies. Our aim was to identify whether modifiable risk factors, weight and physical activity, are predictive of back pain in young adult women. Women born between 1973 and 1978 were randomly selected from the national health insurance scheme database to participate in The Australian Longitudinal Study of Women's Health. Self-reported data on back pain in the last 12 months, weight, height, age, education status, physical activity, and depression were collected in 2000, 2003, 2006, 2009, and 2012. In 2000, 9688 women completed the questionnaire and 83% completed follow-up 12 years later. At baseline, median age was 24.6 years and 41% had self-reported back pain. For every 5kg higher weight at baseline, there was a 5% (95% confidence interval [CI] 4%-6%) increased risk of back pain over the next 12 years. Higher weight at each survey also predicted back pain risk 3 years later ($P<0.001$). The effects of weight on back pain were most significant in those with BMI ≥25kg/m and were observed at all levels of physical activity. Inadequate physical activity and depression were independent predictors of back pain over the following 12 years (both $P<0.001$), after adjusting for age, weight, height, and education status. Back pain is common in community-based young adult women. Higher weight, inadequate levels of physical activity, and depression were all independent predictors of back pain over the following decade. Furthermore, the adverse effects of weight on back pain were not mitigated by physical activity. Our findings highlight the role of both higher weight and physical inactivity in back pain among young women and suggest potential opportunities for future prevention.

Brown W & Pavey T.
Physical activity in mid-age and older women: Lessons from the Australian Longitudinal Study on Women's Health.
Kinesiology Review, 2016; 5(1), 87-97.

The Australian Longitudinal Study on Women's Health (ALSWH) commenced in Australia in 1996 when researchers recruited approximately 40,000 women in three birth cohorts: 1973–1978, 1946–1951, and 1921–1926. Since then participants have completed surveys on a wide range of health issues, at approximately three-year intervals. This overview describes changes in physical activity (PA) over time in the mid-age and older ALSWH cohorts, and summarizes the findings of studies published to date on the determinants of PA, and its associated health outcomes in Australian women. The ALSWH data show a significant increase in PA during mid-age, and a rapid decline in activity levels when women are in their 80s. The study has demonstrated the importance of life stages and key life events as determinants of activity, the additional

benefits of vigorous activity for mid-age women, and the health benefits of 'only walking' for older women. ALSWH researchers have also drawn attention to the benefits of activity in terms of a wide range of physical and mental health outcomes, as well as overall vitality and well-being. The data indicate that maintaining a high level of PA throughout mid and older age will not only reduce the risk of premature death, but also significantly extend the number of years of healthy life.

Brown WJ, Kabir E, Clark B & Gomersall S.
Maintaining a healthy BMI: Data From a 16-Year Study of young Australian women.
American Journal of Preventive Medicine, 2016; 51(6), e165-e178.

Introduction: The aims of this prospective cohort study were to examine 16-year trajectories of weight and BMI in young adult women who had a healthy BMI in 1996 and determinants of remaining in the healthy BMI category.

Methods: A total of 4,881 women with healthy BMI at baseline and either healthy, overweight, or obese BMI at 16-year follow-up reported their weight, height, health, and health behaviours in six surveys of the Australian Longitudinal Study on Women's Health between 1996 (aged 18-23 years) and 2012 (aged 34-39 years). Determinants of BMI maintenance were estimated using binary logistic regression and generalized estimating equations in 2015.

Results: Almost 60% remained in the healthy BMI category from 1996 to 2012, (mean weight gain, 0.19 kg/year), 29% transitioned to overweight BMI (0.83 kg/year), and 11.6% transitioned to obese (1.73 kg/year). The mean rates of annual weight gain in each group were consistent over time. Only three factors (low alcohol, moderate/high physical activity, having a university degree) were positively associated with maintaining a healthy BMI. Additional behavioral factors (smoking, high sitting time, energy intake, dieting, takeaway food, and use of oral contraceptives), as well as blue collar occupation, separation/divorce/widowhood, and major illness were negatively associated with BMI maintenance.

Conclusions: To prevent the transition from healthy to overweight/obese BMI, weight gain must be limited to <0.5 kg/year. Women with healthy BMI, but with higher rates of weight gain in their early 20s, could be identified by health professionals for assistance with prevention of becoming overweight/obese.

Byles J, Curryer C, Vo K, Forder P, Loxton D & McLaughlin D.
Changes in housing among older women: Latent class analysis of housing patterns in older Australian women.
Urban Studies, 2016; 1-17.

Scant research exists on the patterns of changes in older women's housing, and whether and when women transition into residential aged care (RAC). This study aimed to identify groups of women with different housing patterns (latent classes) over time, with a secondary aim to describe socio-demographic and health characteristics of women in each class. We analysed linked data for 9575 women born 1921–1926 from the Australian Longitudinal Study of Women's Health (ALSWH), Australian National Death Index, and Residential Aged Care (RAC) administrative records for the years 1999 through to 2011. Seven distinct housing patterns (classes) were identified over time. Four classes showed a stable pattern: living in a house for most surveys (47.0%), living in a house but with earlier death (13.7%), living in an apartment (12.8%), living in a retirement village (5.8%). One class showed a pattern of downsizing: moving from a house to retirement village (6.6%). Two patterns showed transition: from an apartment or retirement village, to RAC and death (7.8%), and from house to RAC (6.4%). This study provides new evidence about socio-demographic and health influences on housing patterns and entry into residential care in later life. These findings can inform policy and aged care planning for women in later life, by identifying patterns of transition into residential aged care, or alternatively, remaining in the community.

Chojenta C, Lucke J, Forder P & Loxton D.
Maternal health factors as risks for postnatal depression: A prospective longitudinal study.
Plos One, 2016; 11(1), 1-9.

Purpose: While previous studies have identified a range of potential risk factors for postnatal depression (PND), none have examined a comprehensive set of risk factors at a population-level using data collected prospectively. The aim of this study was to explore the relationship between a range of factors and PND and to construct a model of the predictors of PND.

Methods: Data came from 5219 women who completed Survey 5 of the Australian Longitudinal Study on Women's Health in 2009 and reported giving birth to a child.

Results: Over 15% of women reported experiencing PND with at least one of their children. The strongest positive associations were for postnatal anxiety (OR = 13.79, 95%CI = 10.48, 18.13) and antenatal depression (OR = 9.23, 95%CI = 6.10, 13.97). Positive associations were also found for history of depression and PND, low SF-36 Mental Health Index, emotional distress during labour, and breastfeeding for less than six months.

Conclusions: Results indicate that understanding a woman's mental health history plays an important role in the detection of those who are most vulnerable to PND. Treatment and management of depression and anxiety earlier in life and during pregnancy may have a positive impact on the incidence of PND.

Clark BK, Pavey TG, Lim RF, Gomersall SR & Brown WJ.
Past-day recall of sedentary time: Validity of a self-reported measure of sedentary time in a university population.
Journal of Science and Medicine in Sport, 2016; 19(3), 237-241.

Objectives: To assess the validity of the Past-day Adults' Sedentary Time-University (PAST-U) questionnaire, modified for a university population, compared with activPAL.

Design: Participants (n = 57, age = 18–55 years, 47% female, 65% students) were recruited from the University of Queensland (students and staff).

Methods: Participants answered the PAST-U questionnaire, which asked about time spent sitting or lying down for work, study, travel, television viewing, leisure-time computer use, reading, eating, socialising and other purposes, during the previous day. Times reported for these questions were summed to provide a measure of total sedentary time. Participants also wore an activPAL device for the full day prior to completing the questionnaire and recorded their wake and sleep times in an activity log. Total waking sedentary time derived from the activPAL was used as the criterion measure. Correlation (intraclass correlation coefficient, ICC) and agreement (Bland–Altman plots) between PAST-U and activPAL sedentary time were examined.

Results: Participants were sedentary (activPAL-determined) for 66% of waking hours. The correlation between PAST-U and activPAL sedentary time for the whole sample was ICC = 0.64 [95% confidence interval (CI) = 0.45, 0.77]; and higher for non-students (ICC = 0.78, 95%CI 0.52, 0.91) than students (ICC = 0.59, 95%CI 0.33, 0.77). Bland-Altman plots revealed that the mean difference between the two measures was 5 min although limits of agreement were wide (95% limits of agreement: −3.9 to 4.1 h).

Conclusions: The PAST-U provides an acceptable measure of sedentary time in this population, which included students and adults with high workplace sitting time.

Coles J Y, Anderson A & Loxton D.
Breastfeeding duration after childhood sexual abuse: An Australian cohort study.
Journal of Human Lactation, 2016; 32(3), NP28-NP35.

Background: Childhood sexual abuse (CSA) is prevalent across the world. Childhood sexual abuse is associated with poorer health, but information on its impact on breastfeeding is limited. In this study, the authors investigated the link between CSA and duration of breastfeeding for 6 months or more.

Objective: The purpose of this study was to determine the association between CSA and breastfeeding duration for Australian women.

Methods: Data from 3778 women from the 1973-1978 cohort of the Australian Longitudinal Study on Women's Health were used. A stepped approach was used to assess the association between CSA and breastfeeding the first child for 6 months or more with logistic regression modelling, adjusting for significant socio-demographic characteristics, health behaviours, and adult violence.

Results: The 15.5% of women who had experienced CSA were less educated, younger, and more likely to be smokers and to have experienced adult violence. The CSA group was less likely to breastfeed for 6 months or more (odds ratio [OR], 0.78; 95% confidence interval [CI], 0.65-0.93), even after adjusting for smoking (OR, 0.81; 95% CI, 0.68-0.98) and adult violence (OR, 0.80; 95% CI, 0.67-0.96). There was no longer a significant association once socio-demographic factors were adjusted for, which remained true in the fully adjusted model (OR, 0.90; 95% CI, 0.75-1.09).

Conclusion: Women who experienced CSA were successfully able to maintain breastfeeding at a level similar to those who had not experienced CSA after controlling for socio-demographic factors. Further testing of whether the effects of CSA are mediated through social variables is warranted to investigate whether addressing social factors in service provision may be key to improving breastfeeding duration.

Cramer H, Sibbritt D, Adams J & Lauche R.
The association between regular yoga and meditation practice and falls and injuries: Results of a national cross-sectional survey among Australian women.
Maturitas, 2016; 84, 38-41.

Introduction: Falls are the leading cause of injuries in women across all ages. While yoga has been shown to increase balance, it has also been associated with injuries due to falls during practice. This study aimed to analyse whether regular yoga or meditation practice is associated with the frequency of falls and fall-related injuries in upper middle-aged Australian women.

Methods: Women aged 59–64 years from the Australian Longitudinal Study on Women's Health (ALSWH) were queried regarding falls and falls-related injuries; and whether they regularly practiced yoga or meditation. Associations of falls and falls-related injuries with yoga or meditation practice were analysed using chi-squared tests and multiple logistic regression modelling.

Results: Of 10,011 women, 4413 (44.1%) had slipped, tripped or stumbled, 2770 (27.7%) had fallen to the ground, 1398 (14.0%) had been injured as a result of falling, and 901 (9.0%) women had sought medical attention for a fall-related injury within the previous 12 months. Yoga or meditation was practiced regularly by 746 (7.5%) women. No associations of falls, fall-related injuries and treatment due to falls-related injury with yoga or meditation practice were found.

Discussion: No association between yoga or meditation practice and falls or fall-related injuries have been found. Further studies are warranted for conclusive judgement of benefits and safety of yoga and meditation in relation to balance, falls and fall-related injuries.

de Luca K, Parkinson L, Downie A, Blyth F & Byles J.
Three subgroups of pain profiles identified in 277 women with arthritis: A latent class analysis.
Clinical Rheumatology, 2016; doi: 10.1007/s10067-016-3343-5.

The objectives were to identify subgroups of women with arthritis based upon the multi-dimensional nature of their pain experience and to compare health and socio-demographic variables between subgroups. A latent class analysis of 227 women with self-reported arthritis was used to identify clusters of women based upon the sensory, affective, and cognitive dimensions of the pain experience. Multivariate multinomial logistic regression analysis was used to determine the relationship between cluster membership and health and socio-demographic characteristics. A three-class cluster model was most parsimonious. 39.5 % of women had a unidimensional pain profile; 38.6 % of women had moderate multidimensional pain profile that included additional pain symptomatology such as sensory qualities and pain catastrophizing; and 21.9 % of women had severe multidimensional pain profile that included prominent pain symptomatology such as sensory and affective qualities of pain, pain catastrophizing, and neuropathic pain. Women with severe multidimensional pain profile have a 30.5 % higher risk of poorer quality of life and a 7.3 %

higher risk of suffering depression, and women with moderate multidimensional pain profile have a 6.4 % higher risk of poorer quality of life when compared to women with unidimensional pain. This study identified three distinct subgroups of pain profiles in older women with arthritis. Women had very different experiences of pain, and cluster membership impacted significantly on health-related quality of life. These preliminary findings provide a stronger understanding of profiles of pain and may contribute to the development of tailored treatment options in arthritis.

Dillon G, Hussain R, Kibele E, Rahman S & Loxton D.
Influence of intimate partner violence on domestic relocation in metropolitan and non-metropolitan young Australian women.
Violence Against Women, 22(13); 1597-1620.

Data from a national, population-based longitudinal study of Australian women (26-34 years) were analyzed to investigate the association between domestic relocation and multiple explanatory factors, namely intimate partner violence (IPV), metropolitan versus non-metropolitan residence, education, income, housing tenure, number of children, and changes in relationship status. Experience of IPV in the past 12 months was significantly associated with increased odds of domestic relocation. This association remained significant after controlling for age, social support, area of residence, income, number of children, education, and housing situation. Change in relationship status attenuated the association between recent IPV and domestic relocation. Metropolitan versus non-metropolitan residence had no major influence on these results.

Dillon G, Hussain R, Loxton D & Khan A.
Rurality and self-reported health in women with a history of intimate partner violence.
PLoS ONE, 2016; 11(9), e0162380.

Objective: To investigate differences in self-reported health among Australian women with a history of intimate partner violence (IPV) in relation to rurality of residence.

Methods: Data were drawn from six survey waves of the Australian Longitudinal Study on Women's Health 1973–78 birth cohort. Self-reported general and mental health scores derived from the SF-36 scale were compared for women with a history of IPV living in metropolitan, regional and rural areas. Multivariable generalised estimating equations were constructed adjusting for income hardship, number of children, education, social support, age and marital status.

Results: Women with a history of IPV living in regional and rural areas had no significant differences in self-reported general health scores compared to their metropolitan counterparts. Rural women affected by IPV had slightly better self-reported mental health than equivalent women living in metropolitan or regional areas. The socio-demographic factors with the strongest association with self-reported health were income, education, social support, and number of children.

Conclusions: Women in regional and rural areas were no more disadvantaged, in terms of self-reported general health or mental health, than IPV affected women living in major cities in Australia.

Dontje ML, Krijnen WP, de Greef MHG, Peeters GMEE, Stolk RP, van der Schans CP & Brown WJ.
Effect of diagnosis with a chronic disease on physical activity behavior in middle-aged women.
Preventive Medicine, 2016; 83, 56-62.

Objective: Although regular physical activity is an effective secondary prevention strategy for patients with a chronic disease, it is unclear whether patients change their daily physical activity after being diagnosed. Therefore, the aims of this study were to (1) describe changes in levels of physical activity in middle-aged women before and after diagnosis with a chronic disease (heart disease, diabetes, asthma, breast cancer, arthritis, depression); and to (2) examine whether diagnosis with a chronic disease affects levels of physical activity in these women.

Methods: Data from 5 surveys (1998–2010) of the Australian Longitudinal Study on Women's Health (ALSWH) were used. Participants (N = 4840, born 1946–1951) completed surveys every three years, with questions about diseases and leisure time physical activity. The main outcome measure was physical activity, categorized as: nil/sedentary, low active, moderately active, highly active.

Results: At each survey approximately half the middle-aged women did not meet the recommended level of physical activity. Between consecutive surveys, 41%–46% of the women did not change, 24%–30% decreased, and 24%–31% increased their physical activity level. These proportions of change were similar directly after diagnosis with a chronic disease, and in the years before or after diagnosis. Generalized estimating equations showed that there was no statistically significant effect of diagnosis with a chronic disease on levels of physical activity in women.

Conclusion: Despite the importance of physical activity for the management of chronic diseases, most women did not increase their physical activity after diagnosis. This illustrates a need for tailored interventions to enhance physical activity in newly diagnosed patients.

Eftekhari P, Forder P & Byles J.
Asthma cycle of care uptake among Australian older women with asthma.
International Medicine Journal, 2016; 46(8), 990–991.

Our findings show that ACC is used by a minority of women in later life. However, this proportion is higher than the average population rate of 17.6/1000 asthma patients aged 65 years and older. Greater use of ACC and written action plans for older women with asthma may improve healthcare and outcomes for these women.

Eftekhari P, Forder PM, Majeed T& Byles JE.
Impact of asthma on mortality in older women: An Australian cohort study of 10413 women.
Respiratory Medicine, 2016; 119, 102-108.

Background: Comorbid conditions frequently coexist with asthma in older adults and can alter the natural history of asthma, complicating management and affecting overall prognosis and survival.

Objectives: This study investigates the impact of asthma on mortality among older women, with a specific interest in influence of comorbidities and social factors on survival of older women with asthma.

Design: Participants were from the Australian Longitudinal Study on Women's Health and were born between 1921 and 1926. Cox proportional hazards were used to evaluate mortality rates for women with and without asthma, after adjustment for comorbidities and other factors.

Results: Of 10,413 women aged 73-78, 829 (8%) reported having been diagnosed by a doctor for asthma. Women with asthma had a higher likelihood of heart disease, hypertension, thrombosis, bronchitis/emphysema, osteoporosis and major illnesses ($p < 0.0001$). Asthma was associated with increased risk of death (HR = 1.31, 95%CI 1.18-1.45, $p < 0.0001$). After adjusting for age, demographic factors, comorbidities, risk factors, residential area and social support, women with asthma retained a 17% increased risk of death compared to women without asthma (HR = 1.17, 95%CI 1.03-1.32, $p = 0.016$).

Conclusion: Older women with asthma have a higher rate of mortality compared with other women of the same age. This increased risk of death remains after age, demographic factors, comorbidities, risk factors, residential area and social support have been taken into account.

Fisher C, Adams J, Hickman L & Sibbritt.
The use of complementary and alternative medicine by 7427 Australian women with cyclic perimenstrual pain and discomfort: A cross-sectional study.
BMC Complementary and Alternative Medicine, 2016; 16(1), 129.

Background: To assess the prevalence of cyclic perimenstrual pain and discomfort and to detail the pattern of complementary and alternative (CAM) use adopted by women for the treatment of these symptoms.

Methods: Data from the 2012 national Australian Longitudinal Study of Women's Health (ALSWH) cross-sectional survey of 7427 women aged 34–39 years were analysed to estimate the prevalence of endometriosis, premenstrual syndrome (PMS), irregular or heavy periods and severe dysmenorrhoea and to examine the association between their symptoms and their visits to CAM practitioners as well as their use of CAM therapies and products in the previous 12 months.

Results: The prevalence of endometriosis was 3.7 % and of the perimenstrual symptoms assessed, PMS was most prevalent at 41.2 % whilst irregular bleeding (22.2 %), heavy periods (29.8 %) and severe period pain (24.1 %) were reported at lower levels. Women with endometriosis were more likely than non-sufferers to have consulted with a massage therapist or acupuncturist and to have used vitamins/minerals, yoga/meditation or Chinese medicines ($p < 0.05$). PMS sufferers were more likely to consult with an osteopath, massage therapist, naturopath/herbalist or alternative health practitioner and to have used all forms of CAM therapies except Chinese medicines than women who had infrequent PMS (all $p < 0.05$). Women with irregular periods did not have different patterns of CAM use from non-sufferers and those with heavy periods did not favour any form of CAM but were less likely to visit a massage therapist or use yoga/meditation than non-sufferers ($p < 0.05$). For women with severe dysmenorrhoea there was no difference in their visits to CAM practitioners compared to non-sufferers but they were more likely to use aromatherapy oils ($p < 0.05$) and for more frequent dysmenorrhoea also herbal medicines, Chinese medicines and other alternative therapies compared to non-sufferers (all $p < 0.05$).

Conclusions: There is a high prevalence of cyclic

perimenstrual pain and discomfort amongst women in this age group. Women were using CAM differentially when they had specific symptoms of cyclic perimenstrual pain and discomfort. The use of CAM needs to be properly assessed to ensure their safe, effective use and to ascertain their significance as a treatment option enabling women with menstrual problems and their care providers to improve their quality of life.

Frawley J, Hall H, Adams J & Sibbritt D.
Health care utilisation of women who experience pregnancy-related reflux, nausea and/or vomiting.
Journal of Maternal-Fetal and Neonatal Medicine, 2016; doi: 10.1080/14767058.2016.1232711.

Objective: Nausea, vomiting and reflux are common conditions experienced by women during pregnancy. The objective of this project was to examine women's use of health services for these conditions.

Methods: The study sample was obtained via the Australian Longitudinal Study on Women's Health. A total of 2445 women who were pregnant or who had recently given birth in 2009 were invited to complete a sub-survey in 2010 about pregnancy and health service utilisation. A response rate of 79.2% was obtained.

Results: During their pregnancy, 604 (32.9%) respondents experienced nausea, with 255 (42.2%) of these women seeking help from a health care practitioner. A total of 201 women (11%) reported repeated vomiting, and 637 women (34.7%) reported reflux, of which 78.6% and 59.2% sought help, respectively. There were no significant differences in the mental and physical health measures between women with nausea, vomiting and/or reflux who sought help and women who did not. Having private health insurance with obstetric cover was associated with seeking help for reflux; this was the only demographic measure significantly associated with seeking help for any condition.

Conclusion: Research is required to understand why many women do not seek professional help for common gastrointestinal conditions during Pregnancy.

Frawley J, Peng W, Sibbritt D, Ward L, Lauche R, Zhang Y & Adams J.
Is there an association between women's consultations with a massage therapist and health-related quality of life? Analyses of 1,800 women aged 56-61 years.
Journal of Bodywork and Movement Therapies, 2016; 20(4): 734-739.

Background: The use of complementary and alternative medicine (CAM) is commonplace in Australia with massage being a popular CAM modality.

Methods: A total of 2120 mid-age (56–61 year old) women who consulted a CAM practitioner were invited to participate in this study. The Short-Form (SF-36) questionnaire was used to measure women's health-related quality of life.

Results: A total of 1800 women returned the questionnaire generating a response rate of 85.0%. Overall, 912 (50.7%) women visited a massage therapist in the previous 12 months. Women with lower quality of life scores for bodily pain (p = 0.012) and/or emotional health (p = 0.029) were more likely to consult a massage therapist than those with higher scores.

Conclusion: The implications of these associations are important for informing healthcare providers in providing effective and coordinated care for patients with pain and mood symptoms.

Frawley J, Sibbritt D, Broom A, Gallois C, Steel A & Adams J.
Complementary and alternative medicine practitioner use prior to pregnancy predicts use during pregnancy.
Women and Health, 2016; 1-14.

The objective of the authors in this study was to determine if prior visits to a complementary and alternative medicine (CAM) practitioner were associated with CAM use during pregnancy. The study sample comprised the Australian Longitudinal Study on Women's Health. Women were surveyed prior to pregnancy in 2006, and then again in 2010 if they were pregnant or had recently given birth, and asked a range of questions relating to demographic variables, health status, and use of CAM. A multivariable analysis identified significant covariates associated with visits to specific CAM practitioner modalities during pregnancy. Of the 447 women who consulted a CAM practitioner prior to pregnancy, 62.4% (n = 279) continued this use during pregnancy. Prior use of massage therapy, acupuncture, herbalist/naturopath, or chiropractor was related to use of the same service during pregnancy. Higher income and working full-time were associated with the continued use of massage, while continued visits to a chiropractor were associated with having depressive symptoms, a urinary tract infection, and living in a rural community. Prior use of CAM was highly related to continuing use during pregnancy. Further research is required to elucidate the benefits women attain from a CAM-model of care that they do not get from their conventional maternity care providers alone.

Frawley J, Sundberg T, Steel A, Sibbritt D, Broom A & Adams J.
Prevalence and characteristics of women who consult with osteopathic practitioners during pregnancy: A report from the Australian Longitudinal Study on Women's Health (ALSWH).
Journal of Bodywork and Movement Therapies, 2016; 20(1), 168-172.

Background/aim: The use of complementary medicine (CM) is common during pregnancy with visits to osteopathic practitioners growing in recent years. This study was conducted to investigate the prevalence and characteristics of women who consult osteopathic practitioners during pregnancy.

Method: The study sample was obtained via the Australian Longitudinal Study on Women's Health (ALSWH). The women answered questions about consultations with osteopathic practitioners, pregnancy-related health concerns and attitudes to CM use.

Results: A total response rate of 79.2% (1835) was obtained. Of these, 104 women (6.1%) consulted with an osteopath during pregnancy for a pregnancy-related health condition. Women were more likely to consult an osteopath if they suffered from back pain, sadness, weight management issues, or had a history of retained placenta.

Conclusion: Women are visiting osteopaths for help with common pregnancy health complaints, highlighting the need for research to evaluate the safety, clinical and cost effectiveness of osteopathy in pregnancy.

Gresham E, Collins C, Mishra G, Byles J & Hure A.
Diet quality before or during pregnancy and its effects on adverse pregnancy and birth outcomes: The Australian Longitudinal Study on Women's Health.
Public Health Nutrition, 2016; 19(16), 2975-2983.

Objective: To assess whether diet quality before or during pregnancy predicts adverse pregnancy and birth outcomes in a sample of Australian women.

Design: The Dietary Questionnaire for Epidemiological Studies was used to calculate diet quality using the Australian Recommended Food Score (ARFS) methodology modified for pregnancy.

Setting: A population-based cohort participating in the Australian Longitudinal Study on Women's Health (ALSWH).

Subjects: A national sample of Australian women, aged 20-25 and 31-36 years, who were classified as preconception or pregnant when completing Survey 3 or Survey 5 of the ALSWH, respectively. The 1907 women with biologically plausible energy intake estimates were included in regression analyses of associations between preconception and pregnancy ARFS and subsequent pregnancy outcomes.

Results: Preconception and pregnancy groups were combined as no significant differences were detected for total and component ARFS. Women with gestational hypertension, compared with those without, had lower scores for total ARFS, vegetable, fruit, grain and nuts/bean/soya components. Women with gestational diabetes had a higher score for the vegetable component only, and women who had a low-birth-weight infant had lower scores for total ARFS and the grain component, compared with those who did not report these outcomes. Women with the highest ARFS had the lowest odds of developing gestational hypertension (OR=0·4; 95 % CI 0·2, 0·7) or delivering a child of low birth weight (OR=0·4; 95 % CI 0·2, 0·9), which remained significant for gestational hypertension after adjustment for potential confounders.

Conclusions: A high-quality diet before and during pregnancy may reduce the risk of gestational hypertension for the mother.

Hall H, Lauche R, Adams J, Steel A, Broom A & Sibbritt D.
Healthcare utilization amongst pregnant women who experience sciatica, leg cramps and varicose veins: A cross-sectional survey of 1,835 pregnant women.
Women and Birth, 2016; 29(1), 35-40.

Background: Common discomforts of pregnancy experienced in the lower extremity include sciatica, leg cramps and varicose veins. Whilst research attention has focused on aetiology and outcomes, the health service utilisation of pregnant women suffering from these complaints has been largely overlooked.

Aim: To examine the health status and health service utilisation profile of pregnant women experiencing sciatica, leg cramps or varicose veins.

Methods: Linear and logistic regression was applied to a cross-sectional survey of a pregnant women drawn from the 1973 to 1978 cohort (aged 31–36 years in 2009), of the Australian Longitudinal Study on Women's Health (n = 1835). Participant's demographics, health status and health service utilisation were compared for all three complaints based upon three subgroups (yes, sought help; yes, did not seek help; no).

Findings: A number of women experienced sciatica (22.1%), leg cramps (18.2%) or varicose veins (9.4%). Of these, a greater proportion of women with sciatica

(79.3%) or varicose veins (71.5%) sought help for their condition compared with women with leg cramps (46.7%). Comparisons between women with the conditions of interest who did seek help and those who did not only found that women with a university degree were 0.29 (95% CI: 0.10, 0.85) times less likely to seek help for their condition compared to women with a school only education.

Conclusion: Further research examining all health seeking behaviour and treatment use of pregnant women who experience lower extremity problems is required in order to facilitate safe, effective and coordinated maternity care to further support these women during pregnancy.

Harris M, Byles J, Townsend N & Loxton D.
Perceptions of coping with non-disease-related life stress for women with osteoarthritis: A qualitative analysis.
BMJ Open, 2016; 6, e010630.

Objective: Coping with arthritis-related stress has been extensively studied. However, limited evidence exists regarding coping with stress extraneous to the disease (life stress). This study explored life stress and coping in a subset of older women with osteoarthritis from a larger longitudinal study.

Setting: An Australian regional university.

Design: This qualitative study involved semi-structured telephone interviews. Potential participants were mailed a letter of invitation/participant information statement by the Australian Longitudinal Study on Women's Health (ALSWH). Invitations were sent out in small batches (primarily 10). Interviews were conducted until data saturation was achieved using a systematic process (n=19). Digitally recorded interviews were transcribed verbatim and de-identified. Data were thematically analysed.

Participants: Women who indicated being diagnosed or treated for arthritis in the previous 3 years in the fifth survey of the ALSWH (conducted in 2007) provided the sampling frame. Potential participants were randomly sampled by a blinded data manager using a random number generator.

Results: Coping with life stress involved both attitudinal coping processes developed early in life (i.e., stoicism) and transient cognitive and support-based responses. Women also described a dualistic process involving a reduction in the ability to cope with ongoing stress over time, coupled with personal growth.

Conclusions: This is the first study to examine how individuals cope with non-arthritis-related stress. The findings add to the current understanding of stress and coping, and have implications regarding the

prevention of arthritis in women. Importantly, this study highlighted the potential detrimental impact of persistent coping patterns developed early in life. Public health campaigns aimed at stress mitigation and facilitation of adaptive coping mechanisms in childhood and adolescence may assist with arthritis prevention.

Heesch KC, van Gellecum YR, Burton NW, van Uffelen JGZ & Brown W.
Physical activity and quality of life in older women with a history of depressive symptoms.
Preventive Medicine, 2016; 91, 299-305.

Physical activity (PA) is positively associated with health-related quality of life (HRQL) in older adults. It is not evident whether this association applies to older adults with poor mental health. This study examined associations between PA and HRQL in older women with a history of depressive symptoms. Participants were 555 Australian women born in 1921-1926 who reported depressive symptoms in 1999 on a postal survey for the Australian Longitudinal Study on Women's Health. They completed additional surveys in 2002, 2005 and 2008 that assessed HRQL and weekly minutes walking, in moderate PA, and in vigorous PA. Random effects mixed models were used to examine concurrent and prospective associations between PA and each of 10 HRQL measures (eight SF-36 subscales; two composite scales). In concurrent models, higher levels of PA were associated with better HRQL (p<0.001). The strongest associations were found for the bodily pain, physical functioning, general health perceptions, social functioning and vitality measures. Associations were attenuated in prospective models, more so for mental HRQL-related scales than for physical HRQL-related scales. However, strong associations (>3 point differences) were evident for physical functioning, general health, vitality and social functioning. For women in their 70s-80s with a history of depressive symptoms, PA is positively associated with HRQL concurrently, and to a lesser extent prospectively. This study extends previous work by showing significant associations in older women with a history of depressive symptoms. Incorporating PA into depression management of older women may improve their HRQL.

Hickey M, Schoenaker D, Joffe H & Mishra G.
Depressive symptoms across the menopause transition: Findings from a large population based cohort study.
Menopause, 2016; 23(12); 1287-1293.

Objective: The aim of the study was to describe the trajectories of depressive symptoms in a large population-based cohort of midaged women, and

to examine the associations of current and changing reproductive stage with depressive symptoms over time.

Methods: Prospective, population-based cohort study of 13,715 women aged 45 to 50 years followed up for over 15 years (Australian Longitudinal Study on Women's Health). Nearly 6,000 women provided complete data for this study. Menopause status was determined from questionnaires about hysterectomy, oophorectomy, hormone therapy, and menstrual patterns. Depressive symptoms were measured using the Center for Epidemiologic Studies Depression scale (CESD-10).

Results: Latent class analysis indicated four distinct profiles of CESD-10 scores over 15 years: stable low (80.0%), increasing (9.0%), decreasing (8.5%), and stable high (2.5%). Those with "increasing" depressive symptoms were more likely to have had bilateral salpingo-oophorectomy or be perimenopausal at baseline compared with women in the "stable low" group. Depressive symptoms were higher in perimenopausal women, (higher CESD-10 score of 0.19, 95% CI 0.02, 0.31), after hysterectomy alone (0.53, 95% CI 0.31, 0.74), bilateral salpingo-oophorectomy with/without hysterectomy (0.85, 95% CI 0.58, 1.12), hormone therapy users (0.19, 95% CI 0.01, 0.36), and after starting or stopping hormone therapy compared with postmenopausal women (adjusted for socio-demographic factors, vasomotor symptoms, health behaviors, and history of depression diagnosis or treatment).

Conclusions: Depressive symptoms follow distinct trajectories across the menopause transition. Most women have stable symptoms, but around 9% have increasing symptoms and a similar proportion (8.5%) decreasing symptoms. Increasing depressive symptoms were independent of vasomotor symptoms but were associated with oophorectomy and stopping or starting hormone therapy. A large number of women were excluded due to missing data, and thus the results should be interpreted with caution.

Holden L, Ware R & Lee C.
Trajectories of mental health over 16 years amongst young adult women: The Australian Longitudinal Study on Women's Health.
Developmental Psychology, 2016; 52(1), 164-175.

This article used data from 5,171 young women participating in the Australian Longitudinal Study on Women's Health, a nationally representative longitudinal cohort study, to identify longitudinal trajectory patterns of mental health across 6 surveys over 16 years of early adulthood, from age 18-23 to age 34-39. In addition, we identified both predictors and outcomes of these trajectories. Using group-based trajectory modelling, we identified four distinct trajectory groups of mental health. The mental health of most participants (55%) was consistently high, with 12% improving, 24% varying, and 9% frequently low. The authors considered characteristics at the beginning and end of the trajectory period, taking a life-course perspective to understand vulnerabilities to, and outcomes of, low or variable poor mental health trajectories. Financial difficulties, poor general health, and weight or shape dissatisfaction were characteristics at Survey 1 that distinguished all other trajectory groups from those with consistently high mental health. Other differences were specific to one or two groups. By the end of the trajectory period, the improving mental health group showed few differences from those with consistently high mental health. However, those with varying and low mental health showed evidence of social disadvantage, poor physical and emotional health, and unhealthy behaviors, and were less likely to be mothers. The ability to identify distinct trajectories of mental health in early adulthood, and their correlates, provides evidence to underpin population health interventions targeting the prevention of mental health problems among this population group.

Holowko N, Jones M, Tooth L, Koupil I & Mishra G.
Combined effect of education and reproductive history on weight trajectories of young Australian women: A longitudinal study.
Obesity, 2016; 24(10), 2224-2231.

Objective: To investigate the combined effect of education and reproductive history on weight trajectory.

Methods: The association of education with weight trajectory (1996-2012) in relation to reproductive history was analyzed among 9,336 women (born 1973-1978) from the Australian Longitudinal Study on Women's Health using random effects models.

Results: Compared with women with a university degree/higher, lower-educated women were 2 kg heavier at baseline and gained an additional 0.24 kg/year. Giving birth was associated with an increase in weight which was more pronounced among women having their first birth <26 years of age (2.1 kg, 95% CI: 1.5-2.7), compared with 26 to 32 years or >32 years. While younger first-time mothers had a steeper weight trajectory (+0.16 kg/year, 95% CI: 0.1-0.3), this was less steep among lower-educated women. High-educated women with a second birth between 26 and 32 years had 0.9 kg decreased weight after this birth,

while low-educated women gained 0.9 kg.

Conclusions: While the effect of having children on weight in young adulthood was minimal, women having their first birth <26 years of age had increased risk of weight gain, particularly primiparous women. Educational differences in weight persisted after accounting for reproductive history, suggesting a need to explore alternative mechanisms through which social differences in weight are generated.

Holowko N, Jones M, Tooth L, Koupil I & Mishra G.
High education and increased parity are associated with breastfeeding initiation and duration among Australian women.
Public Health Nutrition, 2016; 21, 1-11.

Objective: Breast-feeding is associated with positive maternal and infant health and development outcomes. To assist identifying women less likely to meet infant nutritional guidelines, we investigated the role of socio-economic position and parity on initiation of and sustaining breast-feeding for at least 6 months.

Design: Prospective cohort study.

Setting: Australia.

Subjects: Parous women from the Australian Longitudinal Study on Women's Health (born 1973–78), with self-reported reproductive and breast-feeding history (N 4777).

Results: While 89% of women (83% of infants) had ever breast-fed, only 60% of infants were breast-fed for at least 6 months. Multiparous women were more likely to breast-feed their first child (~90% v. ~71% of primiparous women), and women who breast-fed their first child were more likely to breast-feed subsequent children. Women with a low education (adjusted OR (95% CI): 2·09 (1·67, 2·62)) or a very low-educated parent (1·47 (1·16, 1·88)) had increased odds of not initiating breast-feeding with their first or subsequent children. While fewer women initiated breast-feeding with their youngest child, this was most pronounced among high-educated women. While ~60% of women breast-fed their first, second and third child for at least 6 months, low-educated women (first child, adjusted OR (95% CI): 2·19 (1·79, 2·68)) and women with a very low (1·82 (1·49, 2·22)) or low-educated parent (1·69 (1·33, 2·14)) had increased odds of not breast-feeding for at least 6 months. Conclusions: A greater understanding of barriers to initiating and sustaining breastfeeding, some of which are socio-economic-specific, may assist in reducing inequalities in infant breast-feeding.

Hubbard I, Vo K, Forder P & Byles J.
Stroke, physical function, and death over a 15-year period in older Australian women.
Stroke, 2016; 47(4), 1060-1067.

Background and Purpose: As populations age, an increasing number of older women are living with stroke. This study looks at long-term outcomes for women with stroke, comparing mortality rates for women with poor physical function (PF) and those with higher levels of function. The purpose is to understand not only how long women might live after a stroke, but also how long they live with physical disability.

Methods: The study uses 15 years of data on women from the Australian Longitudinal Study on Women's Health 1921 to 1926 cohort. The risk of stroke and the risk of stroke and poor PF were estimated using Cox proportional hazard model. Among women who reported a stroke during the study period, mortality risk was compared according to their physical functioning level after that stroke.

Results: Almost half of the women who had a stroke and poor PF survived past 10 years. The 10-year mortality rate was 37% for women with stroke and adequate PF and 51% for women with stroke and poor PF at the time of the stroke (hazard rate ratio, 1.52; 95% CI, 1.18–1.95; P=0.0015 adjusting for demographic and health covariates).

Conclusions: This study provides evidence of the long-term outcomes of stroke among older women, with women living for many years with poor PF. This outcome has important implications for the women's quality of life during their later years and in understanding the burden of disability associated with stroke.

Jackson C, Gardiner P & Pathirana T.
Depression, anxiety and risk of hypertension in mid-aged women: A prospective longitudinal study.
Journal of Hypertension, 2016; 34(10), 1959-1966.

Objectives: The evidence for an association between depression and anxiety and increased hypertension risk is inconsistent. We aimed to investigate the association between each of depression and anxiety and incident hypertension.

Methods: We included women born between 1946 and 1951 from the Australian Longitudinal Study on Women's Health, surveyed triennially from 1998 to 2013, without a history of hypertension at baseline. We defined depression using the Center for Epidemiological Studies Depression scale shortened version 10 and anxiety using self-reported doctor-diagnosis. We related depression and anxiety to

incident hypertension, using generalized estimating equations, adjusting for time-varying covariates.

Results: Among 9182 women, 2738 developed hypertension during 15-year follow-up. Depression was associated with a 30% increased odds of hypertension [age-adjusted odds ratio (OR) 1.30, 95% confidence interval (CI) 1.19–1.43]. This attenuated and was no longer significant in fully adjusted analyses (OR 1.07, 95% CI 0.96–1.20). Adjusting for BMI alone reduced the association markedly (OR 1.19, 95% CI 1.08–1.31). Anxiety was similarly associated with increased odds of hypertension, but this association became nonsignificant after adjusting for depression (OR 1.12, 95% CI 0.97–1.30).

Conclusion: The frequently observed association between depression and hypertension may be explained by confounding, whereas comorbid depression may account for the apparent effect of anxiety on hypertension risk. However, further research is needed to determine whether factors such as BMI play a mediating role on a causal pathway between depression and hypertension. Nevertheless, weight and weight gain among women with depression should be closely monitored to reduce potential effects on hypertension risk.

Jackson CA, Dobson AJ, Tooth LR & Mishra GD.
Lifestyle and socioeconomic determinants of multimorbidity patterns among mid-aged women: A longitudinal study.
PLOS One, 2016; 11(6), e0156804.

Background: Little is known about patterns of associative multimorbidity and their aetiology. We aimed to identify patterns of associative multimorbidity among mid-aged women and the lifestyle and socioeconomic factors associated with their development.

Methods: Participants were from the Australian Longitudinal Study on Women's Health. We included 4896 women born 1946–51, without multimorbidity in 1998. We identified multimorbidity patterns at survey 6 (2010) using factor analysis, and related these patterns to baseline lifestyle and socioeconomic factors using logistic regression. We dichotomised factor scores and determined odds ratios (OR) with 95% confidence intervals (CI) for associations between characteristics and odds of a high versus low factor score.

Results: We identified five multimorbidity patterns: psychosomatic; musculoskeletal; cardiometabolic; cancer; and respiratory. Overweight and obesity were respectively associated with increased odds of having a high score for the musculoskeletal (adjusted OR 1.45 [95% CI 1.23, 1.70] and 2.14 [95% CI 1.75, 2.60]) and cardiometabolic (adjusted OR 1.53 [95% CI 1.31,

1.79] and 2.46 [95% CI 2.02, 2.98]) patterns. Physical inactivity was associated with increased odds of a high score for the psychosomatic, musculoskeletal and cancer patterns (adjusted OR 1.41 [95% CI 1.13, 1.76]; 1.39 [95% CI 1.11, 1.74]; and 1.35 [95% CI 1.08, 1.69]). Smoking was associated with increased odds of a high score for the respiratory pattern. Education and ability to manage on income were associated with increased odds of a high score for the psychosomatic pattern (adjusted OR 1.34 [95% CI 1.03, 1.75] and 1.73 [95% CI 1.37, 1.28], respectively) and musculoskeletal pattern (adjusted OR 1.43 [95% CI 1.10, 1.87] and 1.38 [1.09, 1.75], respectively).

Conclusions: Distinct multimorbidity patterns can be identified among mid-aged women. Social inequality, physical activity and BMI are risk factors common to multiple patterns and are appropriate targets for reducing the risk of specific multimorbidity groups in mid-life women.

Joham A, Nanayakkara N, Ranasinha S, Zoungas S, Boyle J, Harrison C, Forder P, Loxton D, Vanky E & Teede H.
Obesity, polycystic ovary syndrome and breastfeeding: An observational study.
Acta Obstetricia et Gynecologica Scandinavica, 2016; 95(4), 458-466.

Objectives: Polycystic Ovary Syndrome affects nine to 21% of reproductive-aged women. The relationships between PCOS, body mass index (BMI) and breastfeeding are unclear. We aim to examine breastfeeding in women with and without Polycystic Ovary Syndrome (PCOS) and the relationship to body mass index (BMI).

Methods: This is a cross-sectional study set in the general community. Participants are women, aged 31-36 years, from the Australian Longitudinal Study on Women's Health (ALSWH), a large community-based study. Data was analysed from the first child of respondents to Survey five (2009) reporting at least one live born child. Logistic regression analysis was used to examine factors associated with breastfeeding. The main outcome measures studied were breastfeeding initiation and duration and the main explanatory variables included self-reported PCOS and BMI.

Results: Of the 4898 women, 6.5% reported PCOS (95% CI: 5.8%-7.2%). Median duration of breastfeeding was lower in women reporting PCOS (6 months, 2 to 10 months) compared to women not reporting PCOS (7 months, 3 to 12 months), p=0.001. On multivariable regression analysis, there was no association between PCOS and breastfeeding outcomes. However, being overweight or obese was associated with not initiating breastfeeding and with breastfeeding less than six

months, after adjusting for confounders.

Conclusions: High BMI is negatively associated with breastfeeding, whereas PCOS status, per se, does not appear to be related to breastfeeding initiation and duration, after adjusting for BMI.

Johnstone M & Lee C.
Lifestyle Preference Theory: No match for young Australian women
Journal of Sociology, 2016; 52(2), 249-265.

Women's work and family choices are affected by social pressures and external constraints. Understanding young women's aspirations for future work and family is important for understanding their future needs and for developing supportive work–family practices and policies. Despite criticism, Lifestyle Preference Theory has been argued to explain women's life choices, and historically has been used to inform Australian policy. We address three issues: whether Lifestyle Preference Groups are consistent with young Australian women's stated preferences; whether aspirations are consistent over time; and whether women's later lives are consistent with their earlier stated preferences. Using four waves of data from the Australian Longitudinal Study on Women's Health (ALSWH), young women's work and family aspirations were investigated cross-sectionally and longitudinally. Most aspired to both paid work and family; most changed their preferences over time; and the fit between preferences in 2000 and lifestyle in 2009 was modest. Lifestyle Preference Theory was not an adequate fit to the data.

Koupil I, Tooth L, Heshmati A & Mishra G.
Social patterning of binge eating, bulimia and compensatory behaviours in young adult women: Results from the Australian Longitudinal Study on Women's Health.
Public Health Nutrition, 2016; 1-11.

Objective: To study social patterning of overeating and symptoms of disordered eating in a general population.

Design: A representative, population-based cohort study.

Setting: The Australian Longitudinal Study on Women's Health (ALSWH), Survey 1 in 1996 and Survey 2 in 2000.

Subjects: Women (n= 12,599) aged 18–23 years completed a questionnaire survey at baseline, of whom 6866 could be studied prospectively.

Results: Seventeen per cent of women reported episodes of overeating, 16 % reported binge eating and 10 % reported compensatory behaviours. Almost 4 % of women reported symptoms consistent with

bulimia nervosa. Low education, not living with family, perceived financial difficulty (OR=1.8 and 1.3 for women with severe and some financial difficulty, respectively, compared with none) and European language other than English spoken at home (OR=1.5 for European compared with Australian/English) were associated with higher prevalence of binge eating. Furthermore, longitudinal analyses indicated increased risk of persistent binge eating among women with a history of being overweight in childhood, those residing in metropolitan Australia, women with higher BMI, smokers and binge drinkers.

Conclusions: Overeating, binge eating and symptoms of bulimia nervosa are common among young Australian women and cluster with binge drinking. Perceived financial stress appears to increase the risk of binge eating and bulimia nervosa. It is unclear whether women of European origin and those with a history of childhood overweight carry higher risk of binge eating because of genetic or cultural reasons.

Lai JS, Oldmeadow C, Hure AJ, McEvoy M, Byles J & Attia J.
Longitudinal diet quality is not associated with depressive symptoms in a cohort of middle-aged Australian women.
British Journal of Nutrition, 2016; 115(5): 842-50.

There is increasing evidence for the role of nutrition in the prevention of depression. This study aims to describe changes in diet quality over 12 years among participants in the Australian Longitudinal Study on Women's Health in relation to changes in depressive symptoms. Women born between 1946 and 1951 were followed-up for 12 years (2001-2013). Dietary intake was assessed using the Dietary Questionnaire for Epidemiological Studies (version 2) in 2001, 2007 and every 2-3 years after that until 2013. Diet quality was summarised using the Australian Recommended Food Score (ARFS). Depressive symptoms were measured using the ten-item Centre for Epidemiologic Depression Scale at every 2-3-year intervals during 2001-2013. Linear mixed models were used to examine trends in diet quality and its sub-components. The same model including time-varying covariates was used to examine associations between diet quality and depressive symptoms adjusting for confounders. Sensitivity analyses were carried out using the Mediterranean dietary pattern (MDP) index to assess diet quality. Minimal changes in overall diet quality and its sub-components over 12 years were observed. There was a significant association between baseline diet quality and depression (β=-0.24, P=0.001), but this was lost when time-varying covariates were added (β=-0.04, P=0.10). Sensitivity analyses showed similar performance for both ARFS and MDP

in predicting depressive symptoms. In conclusion, initial associations seen when using baseline measures of diet quality and depressive symptoms disappear when using methods that handle time-varying covariates, suggesting that previous studies indicating a relationship between diet and depression may have been affected by residual confounding.

Lauche R, Hall H, Adams J, Steel A, Broom A & Sibbritt D.
Healthcare utilization amongst pregnant women who experience sleeping problems, and/or tiredness or fatigue: A cross-sectional survey of 1,835 pregnant women.
Sleep and Breathing, 2016; 20(1), 355-362.

Introduction: Sleeping problems and fatigue in pregnancy are often accepted as a normal part of pregnancy; however, these conditions can be linked to serious consequences for both the mother and child. Despite established links between sleeping disturbance and a wide range of pregnancy complications, little is known about the health-care utilisation of women experiencing sleeping problems and fatigue. This study addresses the existing gap in the literature by examining cross-sectional data to identify health service utilisation patterns of pregnant women experiencing sleeping problems and/or tiredness or fatigue.

Methods: In 2010, a sub-study of the Australian Longitudinal Study on Women's Health was conducted as a cross-sectional survey of 2445 women who had recently given birth. Associations between reported symptoms of sleeplessness and/or tiredness or fatigue and health service utilisation were determined using logistic regression analysis.

Results: During their pregnancy, 15.2 % of women experienced sleeping problems while 35.4 % experienced tiredness or fatigue. Women most commonly consulted with an obstetrician (n=96) or a general practitioner (GP) (n=74) for their tiredness or fatigue rather than a midwife (n=56). A substantial number of women sought help from a complementary and alternative medicine (CAM) practitioner for sleeping problems (33 %) or tiredness/fatigue (28 %).

Discussion: Sleeping problems and/or tiredness or fatigue is reported by a reasonable percentage of pregnant women, and women obtain assistance from conventional and CAM practitioners for their symptoms, but not all seek help. Given the serious implications of untreated sleep- and fatigue-related symptoms for mother and baby, this area of research deserves and requires more attention.

Leigh L, Byles J & Mishra G.
Change in physical function among women as they age: Findings from the Australian Longitudinal Study on Women's Health.
Quality of Life Research, 2016; doi: 10.1007/ s11136-016-1422-3.

Purpose: Decline in physical function is common in older age, with important consequences for health-related quality of life, health care utilisation, and mortality. This study aimed to identify patterns of change in physical functioning (PF) for women in later life.

Methods: PF was measured longitudinally using the ten-item subscale of the Medical Outcomes Study 36-item Short Form Health Survey, for 10 515 participants of the Australian Longitudinal Study on Women's Health, who completed at least two surveys between 1999 (aged 73-78 years) and 2011 (aged 85-90 years). Conditional and unconditional latent profile analysis was conducted separately for deceased and surviving subgroups of women to uncover latent patterns of change in PF scores over time.

Results: Four patterns of change were identified for women who were still alive in 2011 (N = 5928), and four similar classes for deceased women (N = 4587): (1) 'poor PF' representing women with low PF scores, (2) 'moderate PF', (3) 'high PF', and (4) 'very high PF', where scores remained very high. All patterns exhibited a decrease in PF over time. Factors which predict low PF included sedentary levels of exercise, obese and overweight BMI, difficulty managing on income, and lower education.

Conclusions: The results provided evidence for a gradual decrease in PF for all women with age; however, there was no evidence for an increased rate of decline prior to death.

Leigh L, Hudson I & Byles J.
Sleep difficulty and disease in a cohort of very old women.
Journal of Aging and Health, 2016; 28(6), 1090-1104.

Objective: The objective of this study was to investigate the association between chronic diseases and sleep difficulty in older women.

Method: A total of 10,721 women from The Australian Longitudinal Study on Women's Health, aged 70 to 75 years at baseline (1996), who answered sleep questionnaire data over 15 years follow-up, were surveyed. Longitudinal sleep difficulty class was regressed on baseline diseases.

Results: Arthritis and heart disease were the strongest predictors of sleep difficulty; odds ratios for belonging to the greatest sleep difficulty class were 2.27 (95% confidence interval [CI] = [1.98, 2.61]) and 1.8 (95%

CI [1.5, 2.16], respectively. Bronchitis/emphysema, osteoporosis, asthma, diabetes, and hypertension also predicted greater sleep difficulty.

Conclusion: Older women diagnosed with the aforementioned significant diseases may also be at greater risk of sleep difficulty. These women may need counselling or treatment for their sleep difficulty, to prevent depression, cognitive function decline, falls, frailty, and increased mortality, as well as greater risk of nursing home placement, well known to be reinforced by sleep trouble, and the associated health care costs and societal impacts poor sleep quality has for older adults.

Leigh L, Jagger C & Byles J.
Body Mass Index and Healthy Life Expectancy in old and very old women.
British Journal of Nutrition, 2016; 116(4), 692-699.

There is conflicting evidence for the effect of BMI on mortality at older ages, and little information on its effect on healthy life expectancy (HLE). Longitudinal data were from the 1921-1926 cohort of the Australian Longitudinal Study on Women's Health (n 11 119), over 18 years of follow-up. Self-rated health status was measured at each survey, and BMI was measured at baseline. Multi-state models were fitted to estimate the effect of BMI on total life expectancy (TLE) and HLE. Compared with women of normal weight, overweight women at the age of 75 years had similar TLE but fewer years healthy (-0.79; 95 % CI -1.21, -0.37) and more years unhealthy (0.99; 95 % CI 0.56, 1.42). Obese women at the age of 75 years lived fewer years in total than normal-weight women (-1.09; 95 % CI -1.77, -0.41), and had more unhealthy years (1·46; 95 % CI 0.97, 1.95 years). Underweight women had the lowest TLE and the fewest years of healthy life. Women should aim to enter old age at a normal weight and in good health, as the slight benefit on mortality of being overweight is offset by spending fewer years healthy. All outcomes were better for those who began in good health. The relationship between weight and HLE has important implications for nutrition for older people, particularly maintenance of lean body mass and prevention of obesity. The benefit of weight loss in obese older women remains unclear, but we support the recommendation that weight-loss advice be individualised, as any benefits may not outweigh the risks in healthy obese older adults.

Leung J, Martin J & McLaughlin D.
Rural-urban disparities in stage of breast cancer at diagnosis in Australian women.
Australian Journal of Rural Health, 2016; 24(5), 326-332.

Design: Individual-level longitudinal data were linked with cancer registry data from New South Wales (New South Wales Cancer Registry linked by the Centre for Health Record Linkage (CHeReL)), Queensland (Queensland Cancer Registry) and Victoria (The Cancer Council Victoria).

Setting: Participants were drawn from the Australian Longitudinal Study on Women's Health 1946-1951 cohort (n = 13 715).

Participants: The sample included 195 women identified from the linked cancer registry data with a breast cancer diagnosis.

Interventions: Rural or urban residence was measured using Accessibility/Remoteness Index of Australia Plus. Individual characteristics and socio-demographic variables examined included survey year, menopausal status, country of birth, education and marital status.

Main outcome measures: A late stage of breast cancer at diagnosis was defined based on the TNM Classification of Malignant Tumours.

Results: A late stage of breast cancer diagnosis was observed in 36% of women residing in urban areas and 40% of women residing in rural areas. After adjusting for individual characteristics, we found that obesity was the strongest risk factor for a late stage of breast cancer at diagnosis.

Conclusions: Given that women are becoming increasingly obese, and that the rate of obesity is higher in the Australian rural population, this paper provides further evidence for targeting interventions for obesity, particularly in rural Australia, as a public health priority.

Leung J, Smith MD & McLaughlin D.
Inequalities in long term health-related quality of life between partnered and not partnered breast cancer survivors through the mediation effect of social support.
Psychooncology, 2016; 25(10), 1222-1228.

Objective: To compare long-term quality of life outcomes by marital status among women living with breast cancer, and to test the mediation effects of social support as an underlying factor.

Methods: Data are drawn from 1996 to 2010 of the Australian Longitudinal Study on Women's Health. The sample included 505 women with breast cancer with six years of follow-up data. Social support was measured by the Medical Outcomes Study Social Support Survey (MOS-SSS). Physical and mental health-related quality of life (HRQOL) was measured using the Short-Form Health Survey (SF-36).

Results: Breast cancer survivors who did not have a partner, compared to those who had a partner, had significantly lower levels of social support, which

was associated with poorer HRQOL. Social support mediated the relationship between not having a partner and poorer HRQOL. Results were consistent after taken into consideration socio-demographic characteristics, which included age, highest level of education, country of birth, and area of residence.

Conclusions: Women recovering from breast cancer who do not have partners have poorer physical and mental HRQOL, than those with partners, with a lack of social support as an underlying inequality. Partners of breast cancer survivors are importance sources in the provision of social support to help them maintain well-being and quality of life.

Lo TKT, Parkinson L, Cunich M & Byles J.
Discordance between self-reported arthritis and musculoskeletal signs and symptoms in older women.

Background: Arthritis is a gendered disease where women have a higher prevalence and more disability than men with arthritis of the same age. Health survey data is a major source of information for monitoring of the burden of arthritis. The validity of self-reported arthritis and the determinants of its accuracy among women have not been thoroughly studied. The objectives of this study were to: 1) examine the agreement between self-report diagnosed arthritis and musculoskeletal signs and symptoms in community-living older women; 2) estimate the sensitivity, specificity, and predictive values of self-reported arthritis; and 3) assess the factors associated with the disagreement.

Methods: A cross-sectional survey of women was undertaken in 2012–13. The health survey asked women about diagnosed arthritis and musculoskeletal signs and symptoms. Agreement between self-reported arthritis and musculoskeletal signs symptoms was measured by Cohen's kappa. Sensitivity, specificity, and predictive values of self-reported arthritis were estimated using musculoskeletal signs and symptoms as the reference standard. Factors associated with disagreement between self-reported arthritis and the reference standard were examined using multiple logistic regression.

Results: There were 223 participants self-reported arthritis and 347 did not. A greater number of participants who self-reported arthritis were obese compared to those who did not report arthritis. Those who reported arthritis had worse health, physical functioning, and arthritis symptom measures. Among the 570 participants, 198 had musculoskeletal signs and symptoms suggesting arthritis (the reference

standard). Agreement between self-reported arthritis and the reference standard was moderate (kappa = 0.41). Sensitivity, specificity, and positive and negative predictive values of self-reported arthritis in older women were 66.7, 75.5, 59.2, and 81.0% respectively. Regression analysis results indicated that false-positive is associated with better health measured by the Short Form 36 physical summary score, the Health Assessment Questionnaire disability index, or the Western Ontario and McMaster University Osteoarthritis Index total score; whereas false-negative is negatively associated with these variables.

Conclusion: While some women who reported diagnosed arthritis did not have recent musculoskeletal signs or symptoms, others with the signs and symptoms did not report diagnosed arthritis. Researchers should use caution when employing self-reported arthritis as the case-definition in epidemiological studies.

Lo TKT, Parkinson L, Cunich M & Byles J.
Factors associated with the healthcare cost in older Australian women with arthritis: An application of the Andersen's Behavioural Model of Health Services Use.

Objective: Factors associated with the utilisation of health care have not been rigorously examined in people with arthritis. The objective of this study was to examine the determinants of health care utilisation and costs in older women with arthritis using the Andersen's behavioural model as a framework.

Study design: Longitudinal cohort study.

Methods: Participants of Surveys 3 to 5 of the Australian Longitudinal Study on Women's Health who reported arthritis were included in the study. Information about health care utilisation and unit prices were based on linked Medicare Australia data, which included prescription medicines and health services. Total health care costs of participants with arthritis were measured for the years 2002 to 2003, 2005 to 2006, and 2008 to 2009, which corresponded to the survey years. Potential explanatory variables of the health care cost and other characteristics of the participants were collected from the health surveys. Explanatory variables were grouped into predisposing characteristics, enabling factors and need variables conforming to the Andersen's Behavioural Model of Health Services Use. Longitudinal data analysis was conducted using generalized estimating equations.

Results: A total of 5834 observations were included for the three periods. Regression analysis results show that higher health care cost in older Australian

women with arthritis was significantly associated with residing in an urban area, having supplementary health insurance coverage, more comorbid conditions, using complementary and alternative medicine, and worse physical functioning. It was also found that predisposing characteristics (such as the area of residence) and enabling factors (such as health insurance coverage) accounted for more variance in the health care cost than need variables (such as comorbid conditions).

Conclusion: These results may indicate an inefficient and unfair allocation of subsidised health care among older Australian women with arthritis, where individuals with less enabling resources and more socio-economic disadvantages have a lower level of health care utilisation. Future research may focus on evaluating the effectiveness of policies designed to reduce excessive out-of-pocket costs and to improve equity in health care access in the older population.

Mishra G, Chung H, Pandeya N, Dobson A, Jones L, Avis NE, Crawford SL, Gold EB, Brown D, Sievert LL, Brunner E, Cade J, Burley VJ, Greenwood DC, Giles GG, Bruinsma F, Goodman A, Hayashi K, Lee JS, Mizunuma H, Kuh D, Cooper R, Hardy R, Obermeyer CM, Lee KA, Simonsen MK, Yoshizawa T, Woods NF, Mitchell ES, Hamer M, Demakakos P, Sandin S, Adami H-O, Weiderpas E & Anderson D.
The InterLACE study: Design, data harmonization and characteristics across 20 studies on women's health.
Maturitas, 2016; 92, 176-185.

Objectives: The International Collaboration for a Life Course Approach to Reproductive Health and Chronic Disease Events (InterLACE) project is a global research collaboration that aims to advance understanding of women's reproductive health in relation to chronic disease risk by pooling individual participant data from several cohort and cross-sectional studies. The aim of this paper is to describe the characteristics of contributing studies and to present the distribution of demographic and reproductive factors and chronic disease outcomes in InterLACE.

Study design: InterLACE is an individual-level pooled study of 20 observational studies (12 of which are longitudinal) from ten countries. Variables were harmonized across studies to create a new and systematic synthesis of life-course data.

Main outcome measures: Harmonized data were derived in three domains: 1) socio-demographic and lifestyle factors, 2) female reproductive characteristics, and 3) chronic disease outcomes (cardiovascular disease (CVD) and diabetes).

Results: InterLACE pooled data from 229,054 mid-aged women. Overall, 76% of the women were Caucasian and 22% Japanese; other ethnicities (of 300 or more participants) included Hispanic/Latin American (0.2%), Chinese (0.2%), Middle Eastern (0.3%), African/black (0.5%), and Other (1.0%). The median age at baseline was 47 years (Inter-quartile range (IQR): 41-53), and that at the last follow-up was 56 years (IQR: 48-64). Regarding reproductive characteristics, half of the women (49.8%) had their first menstruation (menarche) at 12-13 years of age. The distribution of menopausal status and the prevalence of chronic disease varied considerably among studies. At baseline, most women (57%) were pre- or peri-menopausal, 20% reported a natural menopause (range 0.8-55.6%) and the remainder had surgery or were taking hormones. By the end of follow-up, the prevalence rates of CVD and diabetes were 7.2% (range 0.9-24.6%) and 5.1% (range 1.3-13.2%), respectively.

Conclusions: The scale and heterogeneity of InterLACE data provide an opportunity to strengthen evidence concerning the relationships between reproductive health through life and subsequent risks of chronic disease, including cross-cultural comparisons.

Otterbach S, Tavener M, Forder P, Powers J, Loxton D & Byles J.
The effect of motherhood and work on women's time pressure: A cohort analysis using the Australian Longitudinal Study on Women's Health.
Scandinavian Journal of Work, Environment and Health, 2016; 42(6), 500-509.

Objectives: The aim of this study was to analyze the prevalence and determinants of time pressure among younger Australian women born between 1973-78 over a 17-year period.

Methods: Using six surveys (N=14,247 at baseline in 1996) from the Australian Longitudinal Study on Women`s Health, we estimated fixed-effects ordered logistic regression models.

Results: More than two thirds of women felt rushed, pressured, too busy every day or a few times a week, and time pressure substantially increased over the observed 17-year period. Baseline estimates show that time pressure is significantly (P<0.001) associated with being employed and being a mother with coefficients ranging from 0.255 [95% confidence interval (95% CI) 0.188–0.322] for being employed to 0.273 (95% CI 0.168–0.377) for having children. The multivariate analysis further indicates that time pressure is significantly related to a number of personal, family, and work characteristics such as number and age of children, economic insecurity such as having financial

difficulties, concern about employment stability, or the length of the working week.

Conclusions: Understanding the sources of time pressure and identification of certain groups which are particularly vulnerable to it is important if policy-makers aim to design and successfully implement health policies, and family-friendly parental leave and child-care policies.

Parkinson L, Moorin R, Peeters G, Byles J, Blyth F, Caughey G, Cunich M, Magin P, March L & Pond D.
Incident osteoarthritis associated with increased allied health services use in 'baby boomer' Australian women.
Australian and New Zealand Journal of Public Health, 2016; 40(4), 356-61.

Objective: To explore impact of incident osteoarthritis (OA) on health services use by Australian women born 1946–51.

Methods: Secondary analysis of Australian Longitudinal Study on Women's Health survey data linked to Medicare Australia databases (2002 to 2011). Medicare services use was compared for two groups: OA group (n=761) – reported incident OA in 2007; Never group (n=4346) – did not report arthritis in time frame. Interrupted time series regression compared health services use over time.

Results: The OA group had higher health services use than the Never group. Rate of services use increased over time for both groups. Rate of increase in quarterly doctor attendances was significantly lower for the OA group after onset of OA, with no corresponding change for the Never group.

Conclusions: A pre-existing higher use of health services is associated with reporting incident OA, compared to those who never report arthritis. After onset of OA, rate of doctor use reduced and allied health use increased, consistent with recommended Australian treatment guidelines.

Implications: This study provides a rare insight into change in healthcare use for people reporting incident OA, against an appropriate comparison group, highlighting the importance of early diagnosis of OA to optimise effective use of health services.

Pavey TG, Peeters GMEE, Gomersall SR & Brown WJ.
Long term effects of physical activity level on changes in healthy Body Mass Index over 12 years in young adult women.
Mayo Clinic Proceedings, 2016; 91(6), 735–744.

Objectives: To examine the effects of overall level and timing of physical activity (PA) on changes from a

healthy body mass index (BMI) category over 12 years in young adult women.

Patients and methods: Participants in the Australian Longitudinal Study on Women's Health (younger cohort, born 1973-1978) completed surveys between 2000 (age 22-27 years) and 2012 (age 34-39 years). Physical activity was measured in 2000, 2003, 2006, and 2009 and was categorized as very low, low, active, or very active at each survey, and a cumulative PA score for this 9-year period was created. Logistic regression was used to examine relationships between PA accumulated across all surveys (cumulative PA model) and PA at each survey (critical periods PA model), with change in BMI category (from healthy to overweight or healthy to obese) from 2000 to 2012.

Results: In women with a healthy BMI in 2000, there were clear dose-response relationships between accumulated PA and transition to overweight (P=.03) and obesity (P<.01) between 2000 and 2012. The critical periods analysis indicated that very active levels of PA at the 2006 survey (when the women were 28-33 years old) and active or very active PA at the 2009 survey (age 31-36 years) were most protective against transitioning to overweight and obesity.

Conclusion: These findings confirm that maintenance of very high PA levels throughout young adulthood will significantly reduce the risk of becoming overweight or obese. There seems to be a critical period for maintaining high levels of activity at the life stage when many women face competing demands of caring for infants and young children.

Peeters G, Rainbird S, Lorimer M, Dobson A, Mishra G & Graves S.
Improvements in physical function and pain sustained for up to 10 years after knee or hip arthroplasty irrespective of mental health status before surgery: 9,737 middle-aged and 9,292 older women from the Australian Longitudinal Study on Women's Health.
Acta Orthopaedica, 2016; 87, 1-14.

Background and purpose: There are concerns that mental health (MH) may influence outcomes of total knee arthroplasty (TKA) or total hip arthroplasty (THA). We examined effects of poor MH before surgery on long-term outcomes of osteoarthritis-related TKA or THA in women.

Patients and methods: The data were from 9,737 middle-aged participants (47–52 years) and 9,292 older participants (73–78 years) in the Australian Longitudinal Study on Women's Health who completed surveys between 1998 and 2013. Dates of arthroplasties were obtained from the Australian Orthopaedics Association National Joint Replacement

Registry. Participants without procedures were matched with participants with procedures. Trajectories of the Short-Form 36 scores for physical functioning, bodily pain, social functioning, and mental health based on mixed modeling were plotted for participants with and without surgery (stratified according to mental health, separately for TKA and THA, and for middle-aged and older participants).

Results: In middle-aged women with poor and good MH, TKA improved physical function and reduced bodily pain, with improvements sustained up to 10 years after surgery. TKA con-tributed to restoration of social function in women with good MH, but this was less clear in women with poor MH. In both MH groups, mental health appeared to be unaffected by TKA. Similar patterns were observed after THA, and in older women.

Interpretation: Recovery of physical and social function and reductions in pain were sustained for up to 10 years after surgery. Improvements in physical function and pain were also observed in women with poor mental health. Thus, in our view poor mental health should not be a contraindication for arthroplasty.

Peeters G, Tett S, Hollingworth S, Gnjidic D, Hilmer S, Dobson A & Hubbard R.
Associations of guideline recommended medications for acute coronary syndromes with fall-related hospitalizations and cardiovascular events in older women with ischemic heart disease.
Journals of Gerontology Series A Medical Sciences; 2016, 1-7, doi:10.1093/gerona/glw111.

Background: Guidelines for acute coronary syndrome recommend statins, β-blockers, angiotensin-converting-enzyme inhibitors or renin-angiotensin system blockers, and antiplatelet agents for the secondary prevention of cardiovascular events. The aim was to examine associations between guideline recommended medications and fall-related hospitalizations and cardiovascular events in robust and frail older women.

Methods: 2002-2011 surveys from the Australian Longitudinal Study on Women's Health linked with administrative hospital, pharmaceutical and death registry data (2003–mid-2011) were used. 885 women (82.7±2.7 years, range 76-90) had prior admission for ischemic heart disease and ≥1 claims for any of the four medication classes. 413 (46.7%) were robust and 472 (53.3%) frail. Fall-related admissions; cardiovascular event-related admissions or death; and cardiovascular death were recorded. Associations between each of the exposures and outcomes were analyzed using survival analyses with non-

cardiovascular death as a competing risk.

Results: There were 192 fall-related admissions and 314 cardiovascular events including 82 deaths. Using four recommended classes (compared to using one) was associated with increased risks of fall-related admissions (hazard ratio [HR] =2.57, 95% confidence interval [CI]=1.24-5.33), but not with cardiovascular events (HR=1.41, CI=0.97-2.05) or cardiovascular death (HR=0.68, CI=0.35-1.34). Associations for fall-related admissions were stronger in frail participants (HR=5.46, CI=1.34-22.30) than robust (HR=1.37, CI=0.48-3.95).

Conclusions: In older women with ischemic heart disease, the combination of the four recommended medication classes was associated with increased risk of falls, particularly among frail women, with no statistically significant gain in cardiovascular health. The risks of falls and consequential morbidity in women over 75 needs consideration when prescribing medications after myocardial infarction.

Powers J, Duffy L, Burns L & Loxton D.
Binge drinking and subsequent depressive symptoms in young women in Australia.
Drug and Alcohol Dependence, 2016; 161, 86-94.

Background: The long-term impact of binge drinking on subsequent depressive symptoms is unclear. The aims were to identify longitudinal patterns of binge drinking and whether binge drinking preceded depressive symptoms in the short-term (1–6 years) and long-term (10–15 years).

Methods: Longitudinal data from 1996, 2000 and 2009 mailed surveys of 8,197 women in the 1973–78cohort of the Australian Longitudinal Study on Women's Health. Latent class analysis was used to identify binge drinking patterns and logistic regression to estimate associations with subsequent depressive symptoms.

Results: Five binge drinking trajectories were identified with predicted proportions of women who were very infrequent (24%), fluctuating infrequent (17%), frequent (17%), very frequent (26%) or extremely frequent binge drinkers (16%) between 16 and 21 years. At 22–27 years, depressive symptoms were significantly higher for extremely frequent binge drinkers (31% versus 21% in the short-term; 22% versus16%-18% in the long-term) than for less frequent bingers. Unadjusted odds of depressive symptoms were1.70 (95%CI: 1.38; 2.08) times for extremely frequent binge drinkers than very infrequent bingers and were 1.30 (95%CI: 1.04; 1.63) after adjusting for demographics, relationships and experience of violence. At 31–36 years, the odds of depressive symptoms were 1.34 (95%CI: 1.09–1.64) times for extremely frequent than very infrequent

binge drinkers, but were not significant after adjusting for relationships and violence.

Conclusions: Extremely frequent binge drinking (more than weekly) in late adolescence appears to elevate the risk of subsequent depressive symptoms in young women in their early twenties and thirties, emphasising the need for preventive strategies to curb binge drinking.

Rowlands I, Mishra G, Dobson A, Loxton D, Lucke J & Teede H.
Young women's psychological distress after a diagnosis of polycystic ovary syndrome or endometriosis.

Study question: Do young women with polycystic ovary syndrome (PCOS) or endometriosis report more psychological distress than their peers without a history of these conditions?

Summary Answer: Young women (aged 18-23 years) with PCOS or endometriosis had a greater risk of moderate to severe psychological distress than women without a history of these conditions.

What is known already: Psychological distress appears common among women with PCOS and endometriosis. However, population-based studies that examine the psychological outcomes for adolescents and young women are generally absent from the literature.

Study design, size, duration: This is a secondary analysis of data collected from 17 015 young, Australian women participating in a national, longitudinal cohort study. Women were first surveyed in 2012-2013 when they were aged 18-23 years. In 2014, women completed the second survey when they were aged 19-24 years and 11324 (67%) women responded.

Participants/materials, setting, methods: We analysed data from 11 238 women who participated in both Surveys 1 and 2 and who responded to questions about PCOS and endometriosis. Using logistic regression, we compared the odds of moderate to severe psychological distress at Surveys 1 and 2 for women reporting a recent diagnosis (within the last 12 months) of PCOS or endometriosis and women with a pre-existing diagnosis, with that for women without a history of these conditions.

Main results and the role of chance: At Survey 2, around 60% of women reporting a diagnosis of PCOS or endometriosis had moderate to severe levels of psychological distress. Compared to women without a history of these conditions, the odds of moderate to severe psychological distress at Survey 2 were significantly higher for women recently diagnosed with PCOS [Adjusted Odds Ratio (AOR)

= 1.62, 95% CI = 1.21-2.18] or endometriosis (AOR= 1.77; 95% CI = 1.20-2.63) and for women with a pre-existing diagnosis of PCOS (AOR = 1.57, 95% CI = 1.30-1.89) or endometriosis (AOR = 1.61; 95% CI = 1.26-2.06). Women recently diagnosed with PCOS or endometriosis also had a greater likelihood of moderate to severe distress in the year prior to their diagnosis. The association between PCOS and psychological distress was attenuated when adjusting for BMI, but hormonal contraceptive use did not attenuate the risk of distress among the women with PCOS or endometriosis.

Limitations, reasons for caution: All data were self-reported and, therefore, the diagnoses of PCOS or endometriosis were not confirmed by a medical practitioner.

Wider implications of the findings: Health professionals should be aware of the potential psychosocial and healthcare needs among young women with these conditions, particularly women with PCOS who are obese. While hormonal contraceptives may help to regulate the hormonal aspects of these conditions, they do not appear to reduce women's psychological distress. Because psychological distress among the young women in this study remained elevated even after diagnosis, this supports the need for multidisciplinary health care to help women adjust to their diagnosis and treatment regimens and facilitate positive, long-term mental health outcomes. Future research that examines medical and psychosocial sources of distress for young women with PCOS and endometriosis is needed.

Schoenaker D, Soedamah-Muthu & Mishra G.
Quantifying the mediating effect of body mass index on the relationship between a Mediterranean diet and development of maternal pregnancy complications: The Australian Longitudinal Study on Women's Health.

Background: The contribution of body mass index (BMI) to the observed associations between dietary patterns and risk of gestational diabetes mellitus (GDM) and hypertensive disorders of pregnancy (HDP) remains unclear.

Objective: The objective of this study was to formally quantify the mediating effect of prepregnancy BMI in these associations.

Design: Women (aged 25–30) participating in the Australian Longitudinal Study on Women's Health were not pregnant at baseline in 2003 and reported ≥1 pregnancy up to 2012. GDM and HDP diagnoses were self-reported for each pregnancy and validated

in a subset. A Mediterranean diet score was created by use of a baseline-validated food-frequency questionnaire and dichotomized to reflect low adherence (<25th percentile) and higher adherence (≥25th percentile). A causal inference framework for mediation analysis was used to estimate total, natural direct, and natural indirect effects of the prepregnancy Mediterranean diet on incident GDM and HDP and proportions mediated through prepregnancy BMI.

Results: In 3378 women without a history of diabetes, 240 (7.1%) developed GDM. HDP was reported in 273 (8.6%) of 3167 women with no history of hypertension. Low adherence to the Mediterranean diet was associated with higher risk of GDM (OR: 1.35; 95% CI: 1.02, 1.60) and HDP (OR: 1.41; 95% CI: 1.18, 1.56), after adjustment for education, parity, polycystic ovary syndrome, energy intake, and physical activity. Proportions mediated through prepregnancy BMI (per 1-kg/m2 increase) were 32% and 22% for GDM and HDP, respectively.

Conclusion: These findings suggest that prepregnancy BMI as a single mediator contributes substantially to the total effects of the prepregnancy Mediterranean diet on GDM and HDP risk.

Shivappa N, Schoenaker D, Herber J & Mishra G.
Association between inflammatory potential of diet and risk of depression in mid-aged women: The Australian Longitudinal Study on Women's Health.
British Journal of Nutrition, 2016; 116(6), 1077-1086.

Dietary factors and inflammation markers have been shown to play a role in the development of depression. However, there are very few studies that have explored the association between inflammatory potential of diet and risk of depression. In this study, we examined the association between the dietary inflammatory index (DII), which was developed specifically to measure the inflammatory potential of diet, and risk of depression in the middle-aged cohort of the Australian Longitudinal Study on Women's Health. A total of 6438 women with a mean age of 52.0 (sd 1.4) years at baseline were followed-up at five surveys over 12 years (2001-2013). Depression was defined as a score of ≥10 on the Center for Epidemiologic Studies Depression-10 scale. The DII score, a literature-derived, population-based dietary index that has been validated against several inflammatory markers, was computed on the basis of dietary intake assessed using a validated FFQ. Generalised estimating equations were used to estimate relative risk (RR) of depression according to DII score. Models were adjusted for energy intake, highest education completed, marital status,

menopause status and symptoms, personal illness or injury, smoking status, physical activity, BMI and depression diagnosis or treatment. In total, 1156 women (18 %) had scores≥10 on the CESD scale over the course of 9 years. Women with the most anti-inflammatory diet had an approximately 20 % lower risk of developing depression compared with women with the most pro-inflammatory diet (RRDII quartile 1 v. 4: 0.81; 95 % CI 0.69, 0.96; P trend=0.03). These results suggest that an anti-inflammatory diet is associated with lower risk of depression in middle-aged Australian women.

Sibbritt D, Ladanyi S & Adams J.
Healthcare practitioner utilisation for back pain, neck pain and/or pelvic pain during pregnancy: an analysis of 1835 pregnant women in Australia.
International Journal of Clinical Practice, 2016; 70(10), 825-831.

Aims: Back, neck and/or pelvic pain are common symptoms experienced by pregnant women. Although pregnant women are known to use complementary and alternative medicine (CAM) frequently, no research to date has provided in-depth examination of healthcare practitioner utilisation of pregnant women who experience back, neck and/or pelvic pain.

Methods: A sub-study of 1835 pregnant women from the nationally representative Australian Longitudinal Study on Women's Health (ALSWH). Demographics, health status and healthcare utilisation measures were analysed for symptoms of back, neck and/or pelvic pain during pregnancy, using regression models.

Results: During their pregnancy, 39.5% women experienced back pain, 12.4% experienced neck pain and 16.3% women experienced pelvic pain. Pregnant women were more likely to consult a massage therapist for their back pain (32.3%) and neck pain (39.9%), and another alternative practitioner (27.3%) or obstetrician (22.1%) for pelvic pain, while some women did not seek treatment (<30%). Women who sought help for each symptom reported significantly worse levels of mental and physical health across most SF-36 domains (P<.05). Women without health insurance, or pregnancy-relatedhealthcare insurance were less likely to seek treatment.

Discussion and conclusion: Pregnant women experiencing back, neck and/or pelvic pain frequently consult CAM practitioners, particularly if they have healthcare insurance. There is a need for all healthcare practitioners providing maternity care to enquire about possible back, neck and pelvic pain amongst women in their care and be cognisant of possible corresponding CAM use for such symptoms.

Sibbritt D, Lauche R, Sundberg T, Peng W, Moore C, Broom A, Kirby E & Adams J.
Severity of back pain may influence choice and order of practitioner consultations across conventional, allied and complementary health care: A cross-sectional study of 1851 mid-age Australian women.
BMC Musculoskeletal Disorders, 2016; 17(1), 393.

Background: Back pain is a common, disabling and costly disorder for which patients often consult with a wide range of health practitioners. Unfortunately, no research to date has directly examined the association between the severity of back pain and back pain sufferers' choice of whom and in what order to consult different health practitioners.

Methods: This is a sub-study of the large nationally representative Australian Longitudinal Study on Women's Health (ALSWH). The mid-age cohort women (born 1946-51, n = 13,715) of the ALSWH were recruited from the Australian national Medicare database in 1996. These women have been surveyed six time, with survey 6 being conducted in 2010 (n = 10,011). Mid-age women (n = 1851) who in 2010 had sought help from a health care practitioner for their back pain were mailed a self-report questionnaire targeting their previous 12 months of health services utilisation, health status and their levels of back pain intensity.

Results: A total of 1620 women were deemed eligible and 1310 (80.9 %) returned completed questionnaires. Mid-age women with back pain visited various conventional, allied health and CAM practitioners for care: 75.6 % consulted a CAM practitioner; 58.4 % consulted a medical doctor; and 54.2 % consulted an allied health practitioner. Women with the most severe back pain sought conventional care from a general practitioner, and those who consulted a general practitioner first had more severe back pain than those who consulted another practitioner first. Following the general practitioner visit, the women with more severe back pain were more likely to be referred to a conventional specialist, and those with less severe back pain were more likely to be referred to a physiotherapist.

Conclusions: Our findings suggest that women with more severe back pain are likely to visit a conventional practitioner first, whereas women with less severe back pain are likely to explore a range of treatment options including CAM practitioners. The improvement of back pain over time following the various possible sequencing of consultations with different types of health practitioners is a topic with implications for ensuring safe and effective back pain

care and worthy of further detailed investigation.

Sibbritt D, Lui C, Kroll T & Adams J.
Prevalence of glucosamine and omega-3 fatty acid use and characteristics of users among mid-age women: Analysis of a nationally representative sample of 10,638 women.
Journal of Nutrition, Health and Aging, 2016; 20(6), 637-644.

Background: There has been a dramatic increase in the use of dietary supplements over the last few decades and both omega-3 fatty acids and glucosamine are two of the best-selling dietary supplements in many countries. An understanding of omega-3 fatty acids and glucosamine consumption is of significance to health care providers and for future health promotion activities.

Methods: This research involved analysis of data collected from a nationally-representative sample of Australian women as part of the Australian Longitudinal Study on Women's Health (ALSWH). Participants' use of omega-3 fatty acids (FA), glucosamine, their demographics, health status and health care utilisation were measured. Analysis included logistic regression modelling. Results: Of the 10,638 women in the study, 26.8% reported use of omega-3 FA and 15.9% glucosamine. Women with osteoarthritis (OR=2.529; 95% CI: 2.190, 2.921), other arthritis (OR= 1.618; 95% CI: 1.375, 1.905), and joint pain (OR= 2.699; 95% CI: 2.305, 3.160) were more likely to use glucosamine (all p<0.001). In contrast, those with diabetes (OR= 0.471; 95% CI: 0.343, 0.646) or depression (OR= 0.764; 95% CI: 0.657, 0.887) were less likely to use glucosamine (both p<0.001). Women with osteoarthritis (OR=1.481; 95% CI: 1.297, 1.691) and joint pain (OR= 1.456; 95% CI: 1.306, 1.622) were more likely to use omega-3 FA (all p<0.001).

Conclusions: Substantial prevalence rates for use of glucosamine and omega-3 FA amongst mid-aged women highlights the need for health practitioners and policymakers to be mindful of the possible significant role of such supplement use as part of patient health-seeking behaviours.

Sibbritt D, Peng W, Chang S, Liang H & Adams J.
The use of conventional and complementary health services and self-prescribed treatments amongst young women with constipation: An Australian national cohort study.
Digestive and Liver Disease, 2016; 48(11), 1308-1313.
Background: Little research has been conducted

regarding the comprehensive health service utilisation in constipation care. This study investigates the comprehensive health service utilisation amongst Australian women with constipation.

Methods: This study draws upon data from the Australian Longitudinal Study on Women's Health. A total of 8074 young women were asked about their frequency of constipation, measures of quality of life, and use of a range of health services and self-prescribed treatments via two postal surveys conducted in 2006 and 2009, respectively.

Results: The prevalence of constipation was 18.5% amongst women in 2009. Constipated women had poorer quality of health than women without constipation. Women who sought help for constipation were more likely to visit multiple groups of conventional and complementary health practitioners compared to women who did not experience constipation (p < 0.005). However, women were less likely to visit a specialist for the management of constipation over time (2006 to 2009). There was an increase in the proportion of women with constipation who self-prescribed vitamins/minerals over time (p < 0.001).

Conclusion: Although only 4.5% of women sought help for their constipation, given the increasing use of multiple health services across time, more studies are required regarding the optimal treatment in constipation care.

Stanford S, Jones M & Loxton D.
Understanding women who self-harm: Predictors and long-term outcomes in a longitudinal community sample.
Australian & New Zealand Journal of Psychiatry, 2016, doi:10.177/0004867416633298.

Objective: There is growing awareness of the range of psychosocial, lifestyle, and socio-demographic factors related to self-harm, however this research is often limited by using cross-sectional or convenience samples. And while we generally assume that young adults who self-harm experience poorer long-term outcomes, longitudinal research is needed. This paper builds on prior research using a large, representative, longitudinal sample.

Methods: 5765 Australian women completed 5 surveys (age 18-23 to 31-36). Six-month self-harm was measured by self-report. We had two aims: firstly to predict future self-harm, separately for women with and without prior self-harm. Secondly, to identify outcomes 3 and 6 years following self-harm.

Results: Six-month self-harm prevalence was 2.5%. Predictors among women without recent self-harm included depression, dieting behaviours, number of male sexual partners, and abuse. Among women with recent or current self-harm, predictors were number of dieting behaviours, tiredness of life, and stress. Women who self-harmed reported poorer outcomes, namely greater difficulties in relationships at 3- and 6-year follow-up.

Conclusions: Longitudinal risk factors for self-harm differed depending on prior self-harm status, and included depression, dieting behaviours, tiredness of life and stress. These factors may serve as warning signs for new or continued self-harm. This study offers new insight into long-term outcomes up to six years after self-harm, particularly with relationships

Stewart Williams J, Ling R, Searles A, Doran C & Byles J.
Identification of higher hospital costs and more frequent admissions among mid-aged Australian women who self-report diabetes mellitus.
Maturitas, 2016; 90, 58-63.

Objective: To ascertain whether the hospital costs for mid-aged Australian women who self-reported diabetes mellitus (DM) and who had one or more hospital admission during an eight and a half year period were higher than the hospital costs for other similarly aged non-DM women.

Methods: The sample comprised 2,392 mid-aged women, resident in New South Wales (NSW) Australia and participating in the Australian Longitudinal Study on Women's Health (ALSWH), who had any NSW hospital admissions during the eight and a half year period 1 July 2000 to 31 December 2008. Analyses were conducted on linked data from ALSWH surveys and the NSW Admitted Patient Data Collection (APDC). Hospital costs were compared for the DM and non-DM cohorts of women. A generalized linear model measured the association between hospital costs and self-reported DM. Results: Eight and a half year hospital costs were 41% higher for women who self-reported DM in the ALSWH surveys (p < 0.0001). On average, women who self-reported DM had significantly (p < 0.0001) more hospital admissions (5.3) than women with no reported DM (3.4). The average hospital stay per admission was not significantly different between the two groups of women.

Conclusions: Self-reported DM status in mid-aged Australian women is a predictor of higher hospital costs. This simple measure can be a useful indicator for public policy makers planning early-stage interventions that target people in the population at risk of DM.

Tavener M, Chojenta C & Loxton D.

Generating qualitative data by design: the Australian Longitudinal Study on Women's Health qualitative data collection.

Objectives and importance of study: The purpose of this study was to illustrate how qualitative free-text comments, collected within the context of a health survey, represent a rich data source for understanding specific phenomena.

Study type: Work conducted with data from the Australian Longitudinal Study on Women's Health (ALSWH) was used to demonstrate the breadth and depth of qualitative information that can be collected. The ALSWH has been collecting data on women's health since 1996, and represents a unique opportunity for understanding lived experiences across the life course. Methods: A multiple case study design was used to demonstrate the techniques that researchers have used to manage free-text qualitative comments collected by the ALSWH.

Results and conclusions: Eleven projects conducted using free-text comments are discussed according to the method of analysis. These methods include coding (both inductively and deductively), longitudinal analyses and software-based analyses. This work shows that free-text comments are a data resource in their own right, and have the potential to provide rich and valuable information about a wide variety of topics.

Tavener M, Mooney R, Thomson C & Loxton D.

The Australian Longitudinal Study on Women's Health: Using focus groups to inform recruitment.

Background: Recruitment and retention of participants to large-scale, longitudinal studies can be a challenge, particularly when trying to target young women. Qualitative inquiries with members of the target population can prove valuable in assisting with the development of effective recruiting techniques. Researchers in the current study made use of focus group methodology to identify how to encourage young women aged 18-23 to participate in a national cohort online survey.

Objective: Our objectives were to gain insight into how to encourage young women to participate in a large-scale, longitudinal health survey, as well as to evaluate the survey instrument and mode of administration.

Methods: The Australian Longitudinal Study on Women's Health used focus group methodology to learn how to encourage young women to participate in a large-scale, longitudinal Web-based health survey and to evaluate the survey instrument and mode of administration. Nineteen groups, involving 75 women aged 18-23 years, were held in remote, regional, and urban areas of New South Wales and Queensland.

Results: Focus groups were held in 2 stages, with discussions lasting from 19 minutes to over 1 hour. The focus groups allowed concord to be reached regarding survey promotion using social media, why personal information was needed, strategies to ensure confidentiality, how best to ask sensitive questions, and survey design for ease of completion. Recruitment into the focus groups proved difficult: the groups varied in size between 1 and 8 participants, with the majority conducted with 2 participants.

Conclusions: Intense recruitment efforts and variation in final focus group numbers highlights the "hard to reach" character of young women. However, the benefits of conducting focus group discussions as a preparatory stage to the recruitment of a large cohort for a longitudinal Web-based health survey were upheld.

van Boheeman L, Tett S, Sohl E, Rustenburg J, van Schoor N & Peeters G.

Associations between statin use and physical function in older adults from The Netherlands and Australia: Longitudinal Aging Study Amsterdam and Australian Longitudinal Study on Women's Health.

Background: Statin therapy may cause myopathy, but long-term effects on physical function are unclear.

Objective: We investigated whether statin use is associated with poorer physical function in two population-based cohorts of older adults.

Methods: Data were from 691 men and women (aged 69–102 years in 2005/2006) in the LASA (Longitudinal Aging Study Amsterdam) and 5912 women (aged 79–84 years in 2005) in the ALSWH (Australian Longitudinal Study on Women's Health). Statin use and dose were sourced from containers (LASA) and administrative databases (ALSWH). Physical function was assessed using performance tests, questionnaires on functional limitations and the SF-12 (LASA) and SF-36 (ALSWH) questionnaires. Cross-sectional (both studies) and 3-year prospective associations (ALSWH) were analysed for different statin dosage using linear and logistic regression.

Results: In total, 25 % of participants in LASA and 61 % in ALSWH used statins. In the cross-sectional models in LASA, statin users were less likely to have functional limitations (percentage of subjects with at least 1 limitation 63.9 vs. 64.2; odds ratio [OR] 0.6; 95 % confidence interval [CI] 0.3–0.9) and had better SF-12

physical component scores (mean [adjusted] 47.3 vs. 44.5; beta [B] = 2.8; 95 % CI 1.1–4.5); in ALSWH, statin users had better SF-36 physical component scores (mean [adjusted] 37.4 vs. 36.5; B = 0.9; 95 % CI 0.3–1.5) and physical functioning subscale scores (mean [adjusted] 55.1 vs. 52.6; B = 2.4; 95 % CI 1.1–3.8) than non-users. Similar associations were found for low- and high-dose users and in the prospective models. In contrast, no significant associations were found with performance tests.

Conclusions: Two databases from longitudinal population studies in older adults gave comparable results, even though different outcome measures were used. In these two large cohorts, statin use was associated with better self-perceived physical function.

Vissers L, Waller M, van der Schouw, Hebert J, Shivappa N, Schoenaker D & Mishra G.
The relationship between the dietary inflammatory index and risk of total cardiovascular disease, ischemic heart disease and cerebrovascular disease: Findings from an Australian population-based prospective cohort study of women.

Background and aims: Recently, a pro-inflammatory diet based on a dietary inflammatory index (DII) has been related to higher CVD risk in general population, but this has not been investigated among women.

Methods: We investigated the relationship between DII and risk of total CVD and CVD subgroups (myocardial infarction, ischemic heart disease, stroke and cerebrovascular disease) in a prospective cohort of 6972 Australian women aged 50–55 years at baseline in 2001. We used clinical and procedure information from inpatient hospital separation registries, information on use of health care services, and from the causes-of-death registry to ascertain CVD outcomes during 11-year follow up. The association between baseline DII score and cardiovascular endpoints was analysed through cox-regression, with correction for demographic and cardiovascular risk factors.

Results: We identified 335 incident cases of CVD and 191 cases of ischaemic heart disease (including 69 myocardial infarctions) and 59 cases of cerebrovascular disease (including 40 cases of stroke). A statistically significant higher risk of myocardial infarction was observed in analyses using DII scores as a continuous variable with a hazard ratio of 1.46 (95% confidence interval 1.12–1.89), but this was attenuated by further adjustment for other known cardiovascular risk factors. No association was found for total CVD, ischaemic heart diseases, or cerebrovascular disease.

Conclusions: There was no statistically significant association between the dietary inflammatory index and risk of total cardiovascular disease, ischemic heart disease, myocardial infarction, cerebrovascular disease or stroke in this population of mid-aged Australian women. Associations were not different for postmenopausal women.

Vo K, Forder P & Byles J.
Urinary incontinence and social function in older Australian women.

Objectives: To investigate the relationship between urinary incontinence (UI) and subsequent development of social dysfunction, using longitudinal data collected over 15 years from women aged 70 and older. Design: Longitudinal data from the Australian Longitudinal Study on Women's Health. Setting: Australia.

Participants: Women born between 1921 and 1926 (aged 70-75 in 1996, 85-90 in 2011) (N = 12,432). Measurements: UI, social dysfunction, other health and demographic factors.

Results: Generalized estimating equations were used to examine the association between social dysfunction and UI over time, adjusted for time, health, and social covariates. Social dysfunction and UI increased over time in older women. UI was associated with 30% greater odds of social dysfunction (P < .001), adjusted for time, health, and social covariates in the model with no time lag. UI was also associated with social dysfunction measured one survey period later (forward time lag) (odds ratio (OR) = 1.23, 95% confidence interval (CI) = 1.13-1.34) and one survey period earlier (reverse time lag) (OR = 1.30, 95% CI = 1.19-1.43), indicating an absence of causality. Social dysfunction was associated with living in urban areas, more health conditions, poor mental health, providing care for other people, and poor physical function. Conclusion: UI was associated with social dysfunction in older women, although the association did not appear to be causal but reflective of the women's overall level of function and general health. UI is not necessarily socially debilitating, unless a woman has other health problems.

Wilson L, Pandeya N, Byles J & Mishra G.
Hot flushes and night sweats symptom profiles over a 17-year period in mid-aged women: The role of hysterectomy with ovarian conservation.

Objectives: There is limited research on hot flushes and night sweats in women with a hysterectomy with ovarian conservation. We aimed to describe the

patterns of these symptoms in a cohort of Australian women and to investigate the relationship between distinct symptom patterns and hysterectomy status.

Study design and outcome measures: Repeated-measures latent class analysis (LCA) was used to identify hot flushes and night sweats symptom patterns across seven surveys (over 17 years) in the mid-cohort of the Australian Longitudinal Study on Women's Health. Multinomial logistic regression was used to assess the associations of the symptom patterns in women with a hysterectomy with ovarian conservation (n = 1129) versus women without a hysterectomy (n = 4977).

Results: A higher proportion of women with a hysterectomy than of those without experienced a constant pattern of hot flushes (15% versus 30%) and night sweats (9% versus 19%). Women with a hysterectomy had higher odds of constant hot flushes versus minimal hot flushes (OR = 1.97, 95% CI: 1.64, 2.35) and constant versus minimal night sweats (OR = 2.09, 95% CI: 1.70, 2.55). Smoking, a 'lower level of education to non-professional occupation' pathway and body mass index (BMI) patterns of 'always obese' and 'increasingly obese' were also associated with a higher risk of constant symptoms.

Conclusions: Women who have a hysterectomy (with ovarian conservation) have a higher risk of hot flushes and night sweats that persist over an extended period.

ACCEPTED PAPERS

Bennett CJ, Truby H, Zia Z, Cain SW & Blumfield M.
Investigating the relationship between sleep and macronutrient intake in women of childbearing age.

Background/Objective: Reduced sleep is a strong and independent risk factor for weight gain and obesity. Maternal obesity preconception and throughout gestation can increase the risk of adverse pregnancy outcomes and impact on offspring health in later life. This study investigated the relationship between sleeping behaviour and macronutrient intake in childbearing aged women.

Subjects/Methods: Cross-sectional data from the Australian Longitudinal Study on Women's Health 1973–78 cohort, aged 31–36 years in 2009 (n = 8200). Subjective sleeping behaviour was reported and macronutrient intake was measured using a validated food frequency questionnaire. Latent class analysis (LCA) was used to derive sleeping patterns. Multivariate regression analysis was used to investigate the relationships between sleep and macronutrient intake.

Results: LCA identified three sleep patterns: (LC1) average sleep (~8 h) with no adverse sleep-related symptoms (n = 3570); (LC2) average sleep (~8 h) with sleeping difficulties and severe tiredness (n = 2109); and (LC3) short sleep (~6 h) with sleeping difficulties and severe tiredness (n = 915). In fully adjusted models, LC2 was inversely associated with percentage energy as protein (b = − 0.24; P = 0.01) and the protein-to-carbohydrate ratio (b = − 0.01; P<0.05). LC3 was positively associated with percentage of energy as fat (b = 0.29; P = 0.01), saturated fat (b = 0.24; P = o0.001) and monounsaturated fat (b = 0.09; P = 0.04).

Conclusions: Sleeping behaviour patterns were associated with macronutrient intake in childbearing aged women. Improved sleep patterns, together with diet and physical activity strategies, may make it easier for women to achieve a balanced diet and optimise their weight status in preparation for pregnancy.

Ekelund U, Steene-Johannessen J, Brown WJ, Fagerland MW, Owen N, Powell KE, Bauman A, Lee I-M, for the Lancet Physical Activity Series 2 Executive Committee, the Lance Sedentary Behaviour Working Group.
Physical activity attenuates the detrimental association of sitting time with mortality: A harmonised meta-analysis of data from more than one million men and women.

Background: High amounts of sedentary behaviour have been associated with increased risks for several chronic conditions and mortality. However, it is unclear whether physical activity attenuates or even eliminates the detrimental effects of prolonged sitting.

Methods: We included data from 16 studies, of which 14 were identified through a systematic review of six databases from database inception until October 2015 and two were additional unpublished studies where pertinent data were available. All study data were analysed according to a harmonised protocol, which categorized reported daily sitting time and TV-viewing time into four standardised groups each, and physical activity into quartiles. We then combined data across all studies (N=1,005,791) to analyse the joint and stratified associations of daily sitting time and physical activity with all-cause mortality, and estimated summary hazard ratios using Cox regression. We repeated these analyses using TV-viewing time instead of daily sitting time.

Findings: Daily sitting time was not associated with higher all-cause mortality rates among those in the most active quartile. Compared with the referent (<4 h of sitting per day and highest quartile of

physical activity [>35.5 MET-hour/week]), there was no increased risk of dying during follow up in those who sat for more than 8h/day but who also reported >35.5 MET-hour/week of activity (HR=1.04; 95% CI, 0.99, 1.10). In contrast, those who sat the least (<4 h/day) and were in the lowest (<2.5 MET- 3 hour/week) activity quartile had a significantly increased risk of dying during follow-up (HR=1.27, 95% CI, 1.22, 1.31). For TV viewing time, >3 hours/day was associated with higher mortality rates regardless of physical activity, except in the most active quartile, where mortality rates were significantly higher only in the >5 hours/day group. Interpretation: High levels of moderate intensity physical activity (i.e. about 60 to 75 minutes per day) appear to eliminate the increased risk of death associated with high sitting time. However, this high activity level attenuates, but does not eliminate the increased risk associated with high TV viewing time.

Field B, Cochrane T, Davey R & Kinfu Y.
Walking up to one hour per week maintains mobility as older women age: Findings from an Australian longitudinal study.
Journal of Aging and Physical Activity, 2016.

The aim of this study was to identify determinants of walking and whether walking maintained mobility among women as they transition from their mid-70s to their late 80s. We used 12 years of follow-up data (baseline 1999) from the Australian Longitudinal Study on Women's Health (n=10,322). Fifteen determinants of walking were included in the analysis and three indicators of mobility. Longitudinal data analyses techniques were employed. Thirteen of the 15 determinants were significant predictors of walking. Women in their mid-70s who walked up to one hour per week were less likely to experience loss of mobility in very old age, including reduced likelihood of using a mobility aid. Hence, older women who do no walking should be encouraged to walk to maintain their mobility and their independence as they age, particularly women in their 70s and 80s who smoke, are overweight, have arthritis or who have had a recent fall.

Meredith S, Frawley J, Adams J & Sibbritt D.
The utilization of health services and self-care by older women with sleeping problems: Results from a nationally representative sample of 9,110 women.
Journal of Aging and Health, 2016.

Objective: This research aims to investigate the health service use—including complementary and alternative medicine (CAM)—and self-care by women aged 62 to 67 with sleeping problems.

Method: In total, 9,110 participants (99.6%) responded to questions about sleeping problems, health service utilization and self-care (e.g., herbal medicines and vitamins), demographics, and chronic illnesses.

Results: In all, 48.2% (n = 4,394) women indicated that they had a sleeping problem. Women with sleeping problems consulted a general practitioner (GP) more frequently (odds ratio [OR] = 1.72; 95% confidence interval [CI] = [1.36, 2.17]; p < .005) and were more likely to be using herbal medicines (OR = 1.24; 95% CI = [1.13, 1.36]; p < .005) than women without sleeping problems.

Discussion: Health professionals, particularly GPs, may need to actively inquire with older patients in their care with sleeping problems about the use of herbal medicines, to ensure their sleeping problems are being directly and effectively treated, particularly in light of increased risks associated with sleeping problems for this age cohort.

Mishra GD, Pandeya N, Dobson AJ, Chung HF, Anderson D, Kuh D, Sandin S, Giles G, Bruinsma F, Hayashi K, Lee JS, Mizunuma H, Cade J, Burley V, Greenwood D, Goodman A, Kildevaeld Simonsen M, Adami H-O, Demakasos P & Weiderpass, E.
Early menarche, nulliparity, and the risk for premature and early natural menopause.
Human Reproduction, 2016.

Study question: Are parity and the timing of menarche associated with premature and early natural menopause?

Summary answer: Early menarche (≤11 years) is a risk factor for both premature menopause (final menstrual period, FMP <40 years) and early menopause (FMP 40-44 years), a risk that is amplified for nulliparous women.

What is known already: Women with either premature or early menopause face an increased risk of chronic conditions in later life and of early death. Findings from some studies suggest that early menarche and nulliparity are associated with early menopause, however overall the evidence is mixed. Much of the evidence for a direct relationship is hampered by a lack of comparability across studies, failure to adjust for confounding factors, and inadequate statistical power.

Study design, size, duration: This pooled study comprises 51,450 postmenopausal women from nine observational studies in the UK, Scandinavia, Australia, and Japan that contribute to the International collaboration for a Life Course Approach to reproductive health and Chronic disease Events (InterLACE).

Participants/materials, setting, methods: Age at

menarche (categorised as ≤11, 12, 13, 14, and 15 or more years) and parity (categorised as no children, one child, two or more children) were exposures of interest. Age at FMP was confirmed by at least 12 months of cessation of menses where this was not the result of an intervention (e.g., surgical menopause due to bilateral oophorectomy or hysterectomy) and categorised as premature menopause (FMP before age 40), early menopause (FMP 40-44 years), 45-49 years, 50-51 years, 52-53 years, and 54 or more years. We used multivariate multinomial logistic regression models to estimate relative risk ratio (RRR) and 95% confidence intervals (95%CI) for associations between menarche, parity and age at FMP adjusting for within-study correlation.

Main results and the role of chance: The median age at FMP was 50 years (interquartile range 48 to 53 years), with 2% of the women experiencing premature menopause and 7.6% early menopause. Women with early menarche (≤11 years, compared with 12-13 years) were at higher risk of premature menopause (RRR 1.80, 95% CI 1.53 to 2.12) and early menopause (1.31, 1.19 to 1.44). Nulliparity was associated with increased risk of premature menopause (2.26, 1.84 to 2.77) and early menopause (1.32, 1.09 to 1.59). Women having early menarche and nulliparity were at over five fold increased risk of premature menopause (5.64, 4.04 to 7.87) and two fold increased risk of early menopause (2.16, 1.48 to 3.15) compared with women who had menarche at ≥12 years and two or more children.

Limitations, reasons for caution: Most of the studies (except the birth cohorts) relied on retrospectively reported age at menarche which may have led to some degree of recall bias.

Wider implications of the findings: Our findings support early monitoring of women with early menarche, especially those who have no children, for preventive health interventions aimed at mitigating the risk of adverse health outcomes associated with early menopause.

Moran LJ, Brown WJ, McNaughton SA, Joham AE & Teede HJ.
Weight management practices associated with Polycystic Ovary Syndrome and their relationships with diet and physical activity.
Human Reproduction, 2016.

Study question: Do weight management practices differ in women with and without PCOS?

Summary answer: Women in the general population with self-reported PCOS are more likely to be using healthy weight management practices and alternative non-lifestyle measures for weight management than

women without PCOS.

What is known already: Lifestyle management is the first-line treatment in PCOS. However, the specific weight management practices used by women with PCOS and their effect on diet and physical activity are unclear.

Study design, size and duration: The study was a population-based observational cross-sectional study involving women in the 1973–1978 cohort (n = 7767 total; n = 556 with PCOS, n = 7211 without PCOS).

Participants/materials, setting, methods: Women with and without self-reported PCOS were included. Self-reported outcome measures included healthy lifestyle-related or alternative non-lifestyle-related (e.g. laxatives or smoking) weight management practices, dietary intake and physical activity.

Main results and the role of chance: Women with PCOS were more likely to be following both healthy [reducing meal or snack size (odds ratio (OR) 1.50, 95% CI 1.14, 1.96, P = 0.004) and reducing fat or sugar intake (OR 1.32, 95% CI 1.03, 1.69, P = 0.027) or following a low glycaemic index diet (OR 2.88, 95% CI 2.30, 3.59, P < 0.001)] and alternative [smoking (OR 1.60, 95% CI 1.02, 2.52, P = 0.043) or use of laxative, diet pills, fasting or diuretics (OR 1.45, 95% CI 1.07, 1.97, P = 0.017)] weight management practices than women without PCOS. In PCOS, the use of a range of healthy weight management practices was associated with increases in physical activity (P < 0.001), diet quality (P < 0.001), percentage protein intake (P < 0.001) and decreases in glycaemic index (P < 0.001), and percentages of fat (P = 0.001), saturated fat (P < 0.001) or fibre (P = 0.003). Use of alternative weight management practices was associated with decreases in diet quality.

Limitations, reasons for caution: Limitations include the use of self-reported data for PCOS, height, weight, diet, physical activity and weight management behaviours.

Wider implications of the findings: In PCOS, we should focus on improving healthy weight practices across both diet quality and quantity, and on assessing alternative weight practices and their potential adverse effect on dietary intake.

Pachana N, Leung J, Gardiner P & McLaughlin D.
Moderating effects of social engagement on driving cessation in older women.
International Psychogeriatrics, 2016.

Background: Driving cessation in later life is associated with depression. This study examines if social support can buffer the negative effects of driving cessation on older women's mental health.

Methods: Participants were drawn from the 1921–1926 cohort of the Australian Longitudinal Study on Women's Health (ALSWH) and included 4,075 older women (aged 76–87 years) who drove at baseline, following them for three years to assess driving cessation. The outcome variable was mental health, measured by the mental health index (MHI) of the SF-36. The explanatory variables were social support factors, including social interaction, whether the women were living alone or with others, and engagement in social activities. Control variables included age, country of birth, area of residence, ability to manage on income, marital status, and general health.

Results: Main effect results showed that poor mental health was predicted by driving cessation, low levels of social interaction, and non-engagement in social activities. There was a significant interaction effect of driving status by social activities engagement on mental health. Women who remained active in their engagement of social activities were able to maintain a good level of mental health despite driving cessation.

Conclusion: Engagement and participation in social activities can help older women who stopped driving maintain a good level of mental health.

Schoenaker D & Mishra G.
Association between age at menarche and gestational diabetes mellitus: The Australian Longitudinal Study on Women's Health.
American Journal of Epidemiology, 2016; (in press) doi:10.1093/aje/kww201.

No abstract available.

Sibbritt D, Davidson P, Peng WB, Adams J & Hickman L.
Hypertension: What are the self-care and health-care-seeking behaviours in women over time?
Journal of Human Hypertension, 2016.

The aim of this study was to estimate the prevalence and incidence of hypertension in women, and describe their self-care and health-seeking behaviours. This research was conducted as part of the Australian Longitudinal Study on Women's Health, a study comprising a nationally representative sample of Australian women in three age groups. The focus of this research is 14 099 women born in 1946–1951, who have been surveyed six times (1996–2010). Student t-tests were used to compare women who did or did not have hypertension by their health-care utilization. Longitudinal analyses were conducted using a Poisson generalized estimating equation model. The

incidence of hypertension among this cohort during 1996 to 2010 ranged from 400 to 597 participants per survey, resulting in an increase in prevalence of hypertension from 20.9% in 1996 to 41.3% in 2010. For all survey periods, women with hypertension had a significantly higher average number of visits to doctors and allied health practitioners compared with women without hypertension (P<0.005). The use of complementary medicine (practitioners and self-prescribed treatments) by women with hypertension was significantly lower compared to women without hypertension (P<0.005). Over time, conventional health-care utilization was higher for women with hypertension compared with women without hypertension (adjusted RR=1.18; 95% CI: 1.14, 1.22; P<0.0001). Our findings show that women with hypertension are using a range of conventional and complementary and alternative medicine: with hypertensive women using more conventional medicine and less complementary and alternative medicine than non-hypertensive women. As such, health-care providers should communicate with their patients regarding their use of complementary and alternative medicine in their efforts to provide safe, effective and coordinate care.

Tooth L & Mishra G.
Factors associated with educational mobility in mid-age Australian women.
Maturitas, 2016.

The educational mobility of mid-age women is rarely studied. We analysed the baseline socio-economic position (SEP) and health factors associated with obtaining further education in 4113 mid-age Australian women between 1996 and 2010 (aged 45-50 at baseline, 62-67 at follow-up) from a population-based study. Women either unemployed or working part-time at baseline had higher odds of a stable low and middle education over time (ORs ranging from 1.61 to 3.86) versus educational mobility. Apart from obesity, characteristics that may signal an unhealthy lifestyle in early mid-life were not useful indicators of women's future educational mobility.

CONFERENCE PRESENTATIONS

In 2016, ALSWH data were used in over 80 conference presentations

Anderson D, Chung HF, Seib C & Mishra GD.
Obesity and vasomotor symptoms during menopause: Results from a pooled analysis.
International Council on Women's Health Issues Congress, Baltimore, Maryland, USA, 6 - 9 November 2016.

Arriaga M, Laaksonen MA, Hull P, Canfell K, MacInnis R, Banks E, Graham G, Mitchell P, Cumming R, Adelstein B-A, Byles J, Magliano DJ, Shaw J, Taylor A, Price K, Hirani V, Vajdic CM.
Population-level relevance of lifestyle-related risk factors for pancreatic cancer (poster presentation).
Sydney Cancer Conference, Sydney, NSW, 22 – 23 September 2016.

Bennett CJ, Truby H, Zia Z, Cain SW & Blumfield M.
Sleeping patterns are associated with the dietary intakes of childbearing aged women.
Dietitians Association of Australia 33rd National Conference, Melbourne, VIC, 19-21 May 2016.

Brady S, Hussain S, Brown W, Heritier S, Billah B, Wang Y, Teede H, Urquhart D & Cicuttini F.
Relationships between weight, physical activity and back pain in young adult women (Poster presentation).
European League Against Rheumatism (EULAR) Annual Congress of Rheumatology, London, UK, 8-11 June 2016.

Brady S, Hussain S, Brown W, Heritier S, Billah B, Wang Y, Teede H, Urquhart D & Cicuttini F.
Relationships between weight, physical activity and back pain in young adult women.
Osteoarthritis Research Society International (OARSI) 2016 World Congress, Amsterdam, Netherlands, 31 March - 03 April 2016.

Brady S, Hussan S, Brown W, Heritier S, Billah B, Wang Y, Teede H, Urquhart D & Cicuttini F.
Predictors of back pain in middle aged women: Data from the Australian Longitudinal Study on Women's Health (Poster presentation).
Osteoarthritis Research Society International (OARSI) 2016 World Congress, Amsterdam, Netherlands, 31 March - 03 April 2016.

Brady S, Hussain S, Brown W, Heritier S, Wang Y, Teede H, Urquhart D & Cicuttini F.
Predictors of back pain in middle aged women: Data from the Australian Longitudinal Study on Women's Health (Poster presentation).
European League Against Rheumatism (EULAR) Annual Congress of Rheumatology, London, UK, 8-11 June 2016.

Brady S, Hussain S, Brown W, Heritier S, Billah B, Wang Y, Teede H, Urquhart D & Cicuttini F.
Relationships between weight, physical activity and back pain in young adult women. Poster presentation).
Australian Rheumatology Association Annual Scientific Meeting, Darwin, NT, 30 April - 3 May, 2016.

Brady S, Hussain S, Brown W, Heritier S, Billah B, Wang Y, Teede H, Urquhart D & Cicuttini F.
Predictors of back pain in middle aged women: Data from the Australian Longitudinal Study on Women's Health (Poster presentation).
Australian Rheumatology Association Annual Scientific Meeting, Darwin, NT, 30 April - 3 May, 2016.

Brown R.
Cancer risk and diagnosis among Australian women of diverse sexuality.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Butt, O.
Diabetes is associated with poor mental health and wellbeing in mid and older aged Australian women: A longitudinal study.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Byles J & Powers J.
Plenary: "From Womb to Tomb": A lifetime of longitudinal data.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Byles J.
Symposium - House and home: Built environment for ageing well.
International Federation on Ageing - 13th Global Conference on Ageing, Brisbane, QLD, 21-23 June 2016.

Byles J.
Capitalising on longitudinal data to evaluate aged care.
Australian Association of Gerontology National Conference, Canberra, 2-4 November 2016.

Chojenta C.
The impact of poor mental health on health care costs in the perinatal period.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Chojenta C. T
he impact of poor mental health on health care costs in the perinatal period.
International Marce Society Conference, Melbourne, VIC, 27-29 September 2016.

Coles J, Anderson A & Loxton D.
Breastfeeding duration after Childhood Sexual Abuse: Results from ALSWH 1973-78 Cohort.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Chung HF, Pandeya N & Mishra GD.
Vasomotor symptoms and psychological symptoms of depression during menopause: Results from a pooled analysis.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Chung HF, Pandeya N, Anderson D & Mishra GD.
Vasomotor symptoms and psychological symptoms of depression during menopause: Results from a pooled analysis.
International Council on Women's Health Issues (ICOWHI) Congress, Baltimore, Maryland, USA, 6 - 9 November 2016.

Coles, J.
Breastfeeding duration after Childhood Sexual Abuse: Results from the ALSWH 1973-78 cohort.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Collins C.
Change in diet quality in relation to weight change in mid-age Australian women.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Cramer H.
Associations between yoga/meditation use, body satisfaction and weight control: Results of a national cross-sectional survey of 8009 Australian women.
PHAA 44th Annual Conference and the 20th Chronic Diseases Network Conference, Alice Springs, NT, 18-21 September 2016.

Curryer C.
A view of home: the housing and social circumstances of childless women in later life.
The University of Newcastle, School of Humanities and Social Sciences Research Higher Degree Symposium, Newcastle, NSW, 1 June 2016.

Curryer C.
'Remember, I live with my mother': The housing circumstances of women baby boomers in Australia.
15th National Conference of Emerging Researchers in Ageing, Canberra, ACT, 31 October - 01 November 2016.

De Luca, K.
Three subgroups of pain phenotypes in 227 older, community dwelling women with arthritis: A cross sectional study.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Fitzgerald, D.
Data management in the ALSWH – managing complex and large longitudinal health data.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Dolja-Gore X.
Are Australian women with poor mental health receiving counselling services and how effective are they? (Poster presentation).
National Centre for Longitudinal Data: Longitudinal Data Conference 2016, Canberra, ACT, 25 - 27 October 2016.

Eftekhari P.
Medical service utilization among Australian older women with asthma.
15th National Conference of Emerging Researchers in Ageing, Canberra, ACT, 31 October - 01 November 2016.

Gomersall, S.
Weight gain, overweight and obesity: A review of the determinants and health outcomes from the 1973-78 cohort of the Australian Longitudinal Study on Women's Health.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Harris M.
Mental health: it's not just about mental health.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Heesch K, van Gellecum YR, Burton N, van Uffelen JGZ & Brown WJ.
Physical activity and quality of life in older women with depressive symptoms.
World Active Ageing Conference, Melbourne, VIC, 28 June - 1 July 2016.

Holder C.
A look at the consistent reporting of Intimate Partner Violence in young Australian women.
ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Holowko N, Jones M, Tooth L, Koupil I & Mishra G.
The combined effect of education and reproductive history on weight trajectory of young women: An Australian longitudinal study (Poster presentation).
13th International Congress on Obesity, Vancouver, Canada, 1-5 May 2016.

Holowko N, Jones M, Tooth L, Koupil I, Mishra G.
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Joham, A.
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Kanesarajah J.
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Lee C.
Longitudinal relationship trajectories of young Australian women: Are they associated with physical and mental health?
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Lee C.
Women's health in context. Keynote address.
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Loxton D.
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Loxton D.
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Lucke J.
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Madigan C.
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Mishra G.
The Australian Longitudinal Study on Women's Health (ALSWH): Advantages and challenges of linking longitudinal survey data with medical administrative databases.
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Parkinson L.
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Patterson AJ, Powers J, Collins CE, Chalmers K, Loxton D & Brown WJ.
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Rao, A.
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Reilly N, Loxton D, Forder P, Harris S, Chojenta C, Milgrom J & Austin MP.
Prevention and early intervention for perinatal mental health: An evaluation of outcomes for women who give birth in Australia.
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Schofield M J, Ong, B, & Khan.
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Schoenaker D, Soedamah-Muthu S & Mishra G.
To what extent does pre-pregnancy body mass index explain the relationship between a Mediterranean diet and gestational diabetes? (Poster presentation)
Australasian Diabetes in Pregnancy Society (ADIPS) Annual Scientific Meeting, Gold Coast, QLD, 26 – 27 August, 2016.

Schoenaker D, Soedamah-Muthu S & Mishra G.
Early age at menarche is associated with higher risk of developing gestational diabetes (Poster presentation).
Australasian Diabetes in Pregnancy Society (ADIPS) Annual Scientific Meeting, Gold Coast, QLD, 26 – 27 August, 2016.

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What is the mediating effect of body mass index on the relationships between a Mediterranean diet and maternal pregnancy complications?
Australasian Epidemiological Association (AEA) 23rd Annual Scientific Meeting, Canberra, ACT, 14 - 16 September 2016.

Spencer E.

Language and ageing in healthy late-age adults: What can longitudinal computerised analysis tell us about discourse skills over time?

16th International Clinical Linguistics and Phonetics Conference, Halifax, Canada, 15-18 June 2016.

Sultana NK, Earnest A, Moran LJ, Loxton D, Teede HJ, & Joham AE.

Longitudinal BMI trajectories and gestational diabetes: Relationships in women with and without Polycystic Ovary Syndrome.

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Sultana NK, Earnest A, Moran LJ, Loxton D, Teede HJ, & Joham AE.

Role of obesity in the development of gestational diabetes mellitus in women with and without Polycystic Ovary Syndrome.

Joint Scientific Meeting of The Australian and New Zealand Obesity Society National Conference, Brisbane, Australia, 19-21 October 2016.

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Taft A.

Predictors of psychosocial pregnancy terminations over time: Secondary analysis of the 1973-78 cohort of ALSWH.

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Tavener M.

Plenary: Exploring salutary factors influencing women's health. Optimising health: Salutogenic approaches to health practice, policy, research and education.

University of Canberra. Canberra, ACT, 26 - 27 October 2016.

Thomas J.

Diabetes is associated with poor mental health and wellbeing in mid- and older-aged Australian women: A longitudinal study.

ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Waller M.

Prevalence of dementia among Australian women aged over 70: Application of capture-recapture methodology on data from multiple sources.

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SEMINARS & WORKSHOPS

Byles J.
"You can't have home care if you don't have a home" - a look at the intersection between housing and aged care in later life.
Australian Association of Gerontology Webinar Series, 3 July 2016.

Byles J and Mishra G.
Ageing and aged care: Findings from the Australian Longitudinal Study on Women's Health.
Aged Care Policy Branch, Department of Health, Canberra, 22 July 2016.

Byles J.
Symposium: A woman's work is never done":
A life course approach to women, work and caring.
University of Tasmania, 4 October 2016.

Byles J.
Public Lecture: Generational changes in health and wellbeing over the last 20 years.
Department of Health, State Government Office, WA, Tuesday 18 October 2016.

Fitzgerald D, Mishra G & Waller M.
ALSWH Data User Training Workshop
National Centre for Longitudinal Data: Longitudinal Data Conference 2016, Canberra, ACT, 25 - 27 October 2016.

Flehr A.
A psychobiological model of persistent pain: A mixed-methods investigation into the relationship of traumatic experience with persistent pain, the underlying psychobiological functional mechanisms to persistent pain, and the benefits of mind-body integrative therapies for the treatment of persistent pain.
Monash University Mid-Candidature Review, Clayton, VIC, 10 May 2016.

Holowko N.
Thesis overview and results from the five studies included.
SIMSAM Lund Workshop, Lund, Sweden, 18 - 19 April 2016.

Kanesarajah J.
The relationship between SF-6D utility scores and demographic and lifestyle factors across the life-course.
The University of Queensland, School of Public Health Seminar series, Brisbane, QLD, 24 May 2016.

Laaksonen MA.
Using big data in health to reduce the burden of cancer.
Universitas21 workshop Big data at the heart of 21st Century Research, Edinburgh, UK, 29 – 30 September 2016.

Loxton D & Thompson C.
Recruiting participants in the 21st Century.
Preconference Workshop. ALSWH Scientific Meeting 2016, Newcastle, NSW, 4 - 5 May 2016.

Loxton D.
Maternal wellbeing.
Australian Government Department of Health, Canberra, 2016.

Loxton D, Chojenta C & Townsend N.
Using social media to engage participants in research. Using Social Media in Public Health Research: Experiences, Challenges and Opportunities workshop.
Judith Lumley Research Centre, La Trobe University, Melbourne, 21 September 2016.

Lucke J, Loxton D & Mishra G.
'Menarche to Menopause' - Reproductive health across the lifespan. (Hunter Medical Research Institute Public Seminar).
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Parkinson L.
Arthritis and pain in older women: Findings from Australian Longitudinal Study on Women's Health.
University of Otago Seminar, Dunedin, New Zealand, 23 September 2016.

Mishra G and Byles J.
Workshop on Longitudinal Data to Inform Health Decision Making.
Department of Health, Canberra, 25 August 2016.

Peeters G.

Effects of pre-surgery mental health on long-term outcomes of hip or knee replacement surgery in women.

Seminar Series - Leeds Musculoskeletal Biomedical Research Unit, University of Leeds, Leeds, United Kingdom, 22nd September 2016.

Peeters G.

Effects of pre-surgery mental health on long-term outcomes of hip or knee replacement surgery in women.

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Schoenaker D.

Pre-pregnancy dietary patterns and risk of maternal pregnancy complications.

Seminar at the University of Adelaide, Robinson Research Institute, Health of Pregnant Mothers and Babies Research Group, Adelaide, SA, February 2016.

Schoenaker D.

The mediating effect of BMI on the relationship between diet and gestational diabetes.

University of Queensland, School of Public Health Seminar Series, Herston, QLD, 19 July 2016.

William J.

Maternal health system costs of adverse birth outcomes, Oral presentation for thesis.

Thesis Presentation, Australian National University, Canberra, ACT, 28 January 2016.

Social inequalities in body weight trajectory among young women: The role of reproductive events

Candidate: Natalie Holowko

Degree: PhD

University: The University of Queensland

Supervisors: Professor Gita Mishra, Professor Ilona Koupil, Associate Professor Leigh Tooth and Dr Mark Jones

Background and aims: In 2014-15, 63% of Australian adults (27% of children) were overweight or obese. Reproduction is often implicated in explaining weight gain among women, with pregnancy influencing the offspring's body weight in the short and long term. Among women in high-income countries, low socioeconomic position (SEP) is associated with increased weight in early to mid-adulthood, with SEP differences in weight reportedly increasing among younger female cohorts. This thesis reported on social differences in body weight among women while accounting for reproductive history.

Methods: Two large data sources were used: The 1973-78 cohort of the Australian Longitudinal Study on Women's Health (ALSWH) - a prospective cohort study of Australian citizens/permanent residents - and data from Swedish registers. The ALSWH 1973-78 cohort were surveyed at baseline in 1996 (aged 18-23 years; n=14,247) and at three- to four-year intervals thereafter (Survey Five, 2009; 31-36 years; n=8,200: Survey Six, 2012; 34-39 years; n=8,010: and Survey Seven; 2015; n=6,901).

Accurate and reliable information on pre-pregnancy BMI and gestational weight gain are seldom available and were not collected from the ALSWH cohort. This data is important for investigating weight increases in relation to reproduction, so data from a nationally representative sample of 163,352 women from Swedish registers were used to investigate social patterning of these outcomes. Education was the main measure of SEP used to investigate social patterning of:

- Body weight change over 13 years
- Age at first birth, birth-to-pregnancy intervals, and parity

- Initiation of and sustaining breastfeeding for at least six months
- Pre-pregnancy BMI and gestational weight gain
- Whether social differences in weight over 16 years persist after accounting for reproductive history.

Traditional and advanced statistical methods were used, including: exploratory and novel graphical analysis, linear and logistic regression, linear mixed-effects models, and multiple imputation to account for missing data.

Main findings: ALSWH women with a high education (15 years or more) weighed 60.5kg at baseline and gained 10.4kg over the 13-year follow-up period, while women with a lower education (less than 15 years) were ~2.5kg heavier at baseline and gained an additional ~3.5kg. Compared to women who remained with a low education (12 years or less), those who went on to achieve a high education had a similar weight trajectory to those highly educated at baseline.

Social differences were found in reproductive characteristics associated with body weight:

Timing of births

While ~14% of parous women had their first birth before 24 years of age, socially disadvantaged women were significantly more likely to do so; this included women with 12 years or less (OR 6.9) and less than 15 years (OR 3.7) education, women who did not know their parent's education level (OR 4.6), and women living in rural (OR 1.8) or remote (OR 2.1) areas

Socially disadvantaged women were more likely to have a longer than recommended (18-27 months) birth-to-pregnancy interval

Breastfeeding

- Low educated women (12 years or less education) had increased odds of not breastfeeding their first (OR 1.9) or subsequent children (second child OR 1.6, third child OR1.5) and to not sustain breastfeeding for at least six months (first child OR 2.2, second or third child OR 1.7).

Pre-pregnancy BMI and gestational weight gain

- Compared to women with 13 or more years education (post-secondary), Swedish women with a low/intermediate education were more likely to start the first or second pregnancy at an unhealthy weight status (underweight, overweight, or obese) (OR ranging from 1.1 to 2.5).

- Among women with a healthy weight status, having a low/intermediate education was associated with increased odds of excessive gestational weight gain in the first (OR 1.4/1.2) and second (OR 1.2/1.1) pregnancy.

- Compared to post-secondary educated women, lower educated women had the largest BMI increase between pregnancies (an additional 0.5-0.11kg/m2).

These inequalities were greatest among women with excessive gestational weight gain in the first pregnancy (p <0.0001).

Reproduction contributed to social inequalities in weight gain; despite reproductive history not have a large effect on body weight, and educational differences in body weight persisting:

- Having a first birth was associated with increased weight unattributed to other factors. This was most pronounced among those giving birth before 26 years of age (2.1kg), compared to 26-32 years (1.2kg) or more than 32 years (0.7kg)

- Regardless of age at first birth, multiparous women were generally lighter than primiparous women at each follow-up

Conclusion: Reproduction contributes to social inequalities in weight among women; having a first birth <26 years of age was associated with increased weight, particularly among women who did not have additional children. Given the social differences in reproductive characteristics presented, assisting women to achieve optimal timing of reproduction, a healthy pre-pregnancy BMI, adequate gestational weight gain, and breastfeeding their children where possible, may assist in reducing future health risks. However, educational differences in body weight persisted after accounting for reproduction, suggesting a need to also explore alternative mechanisms generating social differences in weight, including early-life factors influencing both education and weight outcomes.

Women's reproductive health and nutrition

Candidate: Ellie Gresham

Degree: PhD

University: The University of Newcastle

Supervisors: Professor Julie Byles and Dr Alexis Hure

The importance of maternal nutrition on adverse perinatal outcomes has been clearly demonstrated in animal studies, however the evidence in human populations is more variable. Although the effect size of dietary interventions may be small it is incredibly important at a population level. Worldwide there is an increasing prevalence of adverse perinatal outcomes such as gestational hypertension, gestational diabetes, preterm birth and low birth weight. There is a need to optimise maternal dietary intake to reduce the burden of adverse perinatal outcomes and improve long term quality of life, whilst reducing morbidity, mortality and health care costs. The primary purpose of this thesis was to

examine the role of maternal diet (preconception and pregnancy) in the prevention of adverse reproductive outcomes that may occur during pregnancy, birth, or thereafter focusing on the dietary predictors.

Three important research methods were undertaken to meet the aims of this thesis:

1. A systematic review and meta-analysis of randomised controlled trials.

2. A reliability and agreement study using data linkage

3. A population-based observational study using longitudinal data.

A brief overview of each study is provided here.

1. *Systematic review and meta-analysis of randomised controlled trials*

A large and comprehensive systematic review and meta-analysis provided evidence that dietary intervention during pregnancy is effective in reducing blood pressure (both systolic and diastolic), increasing birth weight and length, and reducing the incidence of preterm birth, and low birth weight. Food and fortified food products and dietary interventions conducted in low-income countries and among underweight or nutritionally at-risk populations showed the most promising effects. This research demonstrates the need for additional high-quality randomised controlled trials that test different dietary interventions to identify maternal diet intakes that optimize maternal, neonatal and infant outcomes among different populations.

2. *Reliability and agreement study using data linkage*

Women from the 1973-78 cohort of the Australian Study on Women's Health provided the sampling frame for the remaining analyses contained within this thesis. An agreement study compared women's self-reported gestational hypertension, gestational diabetes, preterm birth and low birth weight in the Australian Longitudinal Study on Women's Health, against the Perinatal Data Collection (N=1,914 women; N=3,811 children). This determined the accuracy of the self-reported data which are important for future research on the reproductive health of women in the Australian cohort. The study demonstrated that women accurately self-report perinatal outcomes (≥87 % agreement), meaning the data can be used with a high degree of confidence. Reporting perinatal outcomes per child offers a higher degree of accuracy than reporting by mother at 'ever' or 'first-report'.

3. *Population-based observational study using longitudinal data*

Analysis of data from the 1973-78 cohort of the Australian Longitudinal Study on Women's Health was then conducted to determine whether diet quality before or during pregnancy predicted adverse perinatal outcomes for the mother or child. This study focused on 1,907 women with biologically plausible dietary intakes. Women were classified as preconception or pregnant when completing the Dietary Questionnaire for Epidemiological Studies, a validated 74-item food frequency questionnaire. Diet quality was calculated using the Australian Recommended Food Score modified for pregnancy. Associations between pre-pregnancy and pregnancy diet quality scores and subsequent pregnancy outcomes were assessed. Findings from this analysis indicate that high diet quality scores are associated with a lower risk of a woman developing gestational hypertension or delivering a low birth weight child.

In conclusion, the study findings presented in this thesis provide evidence that elements of maternal diet (preconception and pregnancy) influence the development of adverse reproductive outcomes that may occur during pregnancy, at birth, or thereafter. However, a gap remains in the literature for more high-quality randomised controlled trials to elicit the exact link between diet and maternal-child health, even if by meta-analysis.

The magnitude, long-term trend and lifestyle risk factors of dysmenorrhea and premenstrual syndrome

Candidate: Hong Ju

Degree: PhD

University: The University of Queensland

Supervisors: Professor Gita Mishra and Dr Mark Jones

Background and aim: Dysmenorrhea (painful menstruation) and premenstrual syndrome (PMS) are the two most prevalent menstrual disorders affecting women of reproductive age. It is estimated that overall up to 85% of menstruating women suffer from one or more of these conditions. Moderate to severe forms of the conditions can significantly impact on the quality-of-life of women and cause considerable economic loss. Despite their potential public health significance, uncertainty remains in regard to the long-term trend and potential lifestyle risk factors for both conditions. This is mainly due to the cross-sectional design and retrospective data collection of the underlying studies. There is also a lack of studies which have followed the same group of women long enough to examine the variation of symptoms over time, and to relate these with changes of potential time-varying risk factors.

This thesis examines the prevalence, long-term trends and the potential modifiable lifestyle risk factors of dysmenorrhea and PMS in Australian women, with the aim of contributing to the evidence base for preventative health policy-making.

Methods: This thesis used self-reported data from women born in 1973–78 who participated in the Australian Longitudinal Study on Women's Health. The 1973–78 cohort includes 14,247 women aged 18–23 years at baseline (1996) who have been surveyed every three years since 2000 (Survey 2), with the last survey conducted in 2012. For the purpose of this research, data from Surveys 2–6 were used. Applying various statistical methods, including t-test, χ^2 test, frequency over time, lasagne plot, latent class analysis, regression analysis including multi nominal logistic regression, generalised estimating equations, and generalised linear mixed model, this research mainly examined 1) the prevalence, variability, trend and trajectories of dysmenorrhea and PMS; and 2) the associations between a number of potential modifiable lifestyle risk factors and dysmenorrhea or PMS. In addition, exploratory analyses were performed to assess the impact of the conditions on self-reported quality-of- life. Sensitivity analyses were performed when necessary, including multiple imputations for missing data, to investigate the robustness and reliability of the estimates.

Findings: Over the 13-year follow-up period, dysmenorrhea and PMS affected 21% to 26%, and 33% to 41%, respectively, of the women. Substantial variation in symptom status was observed for both conditions at the individual level over time, with the majority of women reporting experiencing the conditions intermittently. Four population subgroups with unique symptom trajectories were identified for both conditions – for dysmenorrhea, after adjusting for oral contraceptive pill use and pregnancy and/or giving birth in the past 12 months, these subgroups were: normative (38.3%), low (28.0%), recovering (17.2%) and chronic (16.5%). For PMS, subgroups were: normative (22.1%), late onset (21.9%), recovering (26.5%) and chronic (29.5%). Women in the chronic groups were those who had high probability of reporting the respective conditions consistently over time. Among women reporting dysmenorrhea or PMS, self-reported quality-of-life,

Obesity is a large and growing problem in Australia and many countries. The health and economic consequences associated with obesity can lead to increased costs and reduced welfare for society as a whole, and also tend to disproportionately affect those who are already socioeconomically disadvantaged. Research into the underlying economic determinants and consequences of obesity is important for developing evidence-based policy to address these issues.

This thesis investigated some of the determinants and consequences of obesity in Australia from an economic perspective. First, it examined the influence of labour force participation, employment hours and wage rates on the probability of weight gain and obesity. A number of Australian datasets, including the Australian Longitudinal Study on Women's Health, were used and econometric techniques were employed. One of the findings suggested there was a positive impact of longer work hours on weight gain, especially among women.

Second, this thesis investigated the health care cost implications of childhood overweight and obesity. One of the findings in this analysis suggests that overweight children at aged 4-5 have significantly higher publicly funded health care costs, suggesting that early prevention of childhood obesity in children as young as 4 or 5 years may have significant economic implications. as measured by the 36-item Short Form Health Survey (SF-36) questionnaire, was significantly worse than among women not reporting dysmenorrhea or PMS. Compared with women without dysmenorrhea, women with dysmenorrhea reported worse physical and mental health; whereas PMS predominantly impacted negatively on the mental health of affected women. After adjusting for potential confounders, moderate associations were demonstrated between the conditions and a number of health risks:

Smoking was associated with higher risk of dysmenorrhea using latent class analysis combined with multinominal logistic regression. Compared with never smokers, baseline smokers were at 40% higher odds of being in the chronic trajectory group. The odds were even higher, 60%, among women with an earlier age of smoking initiation (<14 years).

A dose-response association was observed between illicit drug use and PMS, with illicit drug use in the last 12 months and multiple drug use showing a higher risk of reporting PMS. Compared with never drug use, multiple drug use in the last 12 months showed 30% higher odds of reporting PMS in the generalised estimating equations model. A 40% higher odds ratio was revealed for drug users who first used illicit drugs before age 15 years.

A U-shaped relationship was demonstrated between body mass index (BMI) and dysmenorrhea in the generalised estimating equations model. Compared with women with a normal BMI, underweight and obese women showed a higher risk of reporting dysmenorrhea (34% and 22% respectively). The risk of dysmenorrhea disappeared among obese women when they lost weight and acquired a healthier body weight.

Conclusion: Dysmenorrhea and PMS are common in Australian women with a stable prevalence at the population level but exhibiting great variation among individuals over time. Four subgroups with unique trajectories were identified for each condition in this group of Australian women. Repeatedly over time, approximately one in every six women was likely to experience dysmenorrhea, and nearly one in three PMS. Moderate associations were demonstrated between smoking and dysmenorrhea and between illicit drug use and PMS, with a higher risk demonstrated for early age at first use of the substance. Both underweight and obesity also showed moderately increased risk for dysmenorrhea.

The results may have some potential public health importance in supporting interventions to prevent substance use, especially early use, and to maintain a healthy body weight. However, this research was unable to establish causality and the nature of these associations needs further clarification in future studies.

Mental health system costs of adverse birth outcomes

Candidate: Jananie Williams

Degree: PhD

University: Australian National University

Supervisors: Professor Michael Martin and Professor Deborah Loxton

This thesis identified the risk factors of maternal health system costs, with a focus on the cost of women who experienced adverse birth outcomes.

The cost risk factors were analysed for hospital and out-of-hospital health systems separately. Multivariate modelling techniques, including Classification and Regression Trees and Generalised Linear Mixed Models were employed on a large dataset from the Australian Longitudinal Study for Women's Health, linked with numerous administrative datasets (including the NSW Admitted Patients Data Collection, the NSW Perinatal Data Collection and Medicare Data).

The results show that adverse births are a statistically significant risk factor of maternal health system costs in the delivery and postnatal periods. Other significant cost risk factors are mode of delivery, use of In Vitro Fertilisation treatments, specialist and general practitioner use, private health insurance status, diabetes, smoking, area of residence and numerous mental health factors (including anxiety and postnatal depression).

Mental health policy is identified as a priority area for further consideration, with policy recommendations including universal and improved mental health screening during the perinatal period and early intervention for women who are most at risk of perinatal mental health disorders.

Predictors and outcomes of the use of mental health services: An analysis of observational data

Candidate: Xenia Dolja-Gore

Degree: PhD

University: The University of Newcastle

Supervisors: Professor Deborah Loxton, Professor Julie Byles and Professor Cate D'Este

Mental illness is among one of the leading contributors to disease burden and has been ranked in the top ten public health concerns by the World Health Organisation. Global rates of depression in 2002 accounted for 4.5% of the total burden of disease with women more likely than men to be diagnosed. Treatment is a major component of recovery, with the most common treatment for mental illness being psychotherapy services and anti-depressant medications.

The Better Access Scheme (BAS) initiative was introduced in 2006 under Medicare, Australia's universal healthcare system. The aim of the scheme was to provide affordable and accessible services for patients diagnosed with mental illness. The BAS provides general practitioner referral pathways

for treatment therapies, which include subsidised services from allied mental health care practitioners, clinical psychologists, occupational therapists and psychiatrists.

The primary purpose of this thesis was to determine factors that predict use of the mental health services provided under Australia's Better Access Scheme. The thesis investigated the utilisation of the BAS treatment therapies and their impact on the Australian people, specifically, women with mental health conditions.

This research provides an in-depth analysis, based on the Anderson-Newman model framework, of the differing social, economic and health characteristics of women with mental health conditions. This

research also examines the characteristics of those who do and do not use the treatment therapies, and identifies inequalities in usage of the BAS services. Finally, this thesis demonstrates the mental health outcomes for people using BAS services. Analyses included in the thesis utilise two large population-based datasets linked to administrative medical claims data to enable extensive quantitative analyses, including complex modelling that allows for observational data to be interpreted in a similar manner to that usually reserved for randomised control trials (e.g. analyses using propensity score methods). This thesis provides a comprehensive understanding of the mental health care needs and service uptake and outcomes of the Australian people.

Workforce participation patterns over the life course and the association with chronic diseases – A gendered approach

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'Population ageing' raises many challenges for governments, such as continued and prolonged workforce participation of men and women over their life course. This research aimed to:

i. identify and compare workforce participation patterns of men and women over the life course

ii. investigate the associations between workforce participation patterns, early life factors and adult life factors   over the life course

iii. explore longitudinal associations between chronic diseases and workforce patterns, while considering the influence of various health and socio-demographic factors.

 Three different data sources – the '45 and Up Study', the Australian 'Life History and Health Survey' and the 'Australian Longitudinal Study on Women's Health' were used. Latent class analysis (LCA), LCA with classify-analyse approach, logistic regression and multinomial regression were used in five different studies to identify and explore patterns of workforce participation and its different associations over the life course, with a gendered perspective.

Findings from the studies indicate that workforce participation patterns over the life course are very different for men and women. While men were found to be mostly engaged in full time paid work, women were more likely to work part time. Also, many men may decrease work after age 55, and many women had lower workforce participation over the life course. Young women without children had work patterns were very similar to men – majority working full time. Chronic diseases (diabetes, asthma, depression and arthritis) and other early and adult life factors were associated with work patterns, however these associations varied by gender, and dependent on how men and women respond to their long term health issues and various circumstances affecting them over the life course. Therefore, it is important to consider the role of gender in shaping workforce patterns and their association with chronic diseases over the life course.

The profile of pain in older women with arthritis

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Arthritis covers a diverse group of diseases commonly involving degeneration and inflammation of the joints. It is very common, estimated to affect 18.5% of the Australian population, or approximately 3.9 million people. Although pain is the most prevalent presenting symptom in the very debilitating condition of arthritis, it has been insufficiently researched and therefore is not well understood, nor well managed in clinical practice. Traditionally, pain in arthritis has been attributed to peripheral, local tissue injury and the mechanism of nociceptive pain. However, the understanding of the experience of pain in arthritis is being increasingly broadened to include the complex interactions between nociceptive and neuropathic mechanisms. Recently, the Osteoarthritis Research Society International (OARSI) and the US Food and Drug Administration (FDA) have called for research to define the disease state of arthritis, and this includes the identification and evaluation of different types of pain in arthritis. This thesis explored the experience and impact of pain in arthritis, focusing on the multi-dimensional nature of pain in older women with arthritis.

This thesis by publication includes a series of four papers. Paper 1 is a systematic review of the literature on how the experience of pain is measured in older, community dwelling people with osteoarthritis. The paper concluded that the most commonly used measures of pain do not effectively assess the multi-dimensional nature of the experience of pain in osteoarthritis, nor have the majority of epidemiological studies in arthritis captured the multi-dimensional nature of the experience of pain in osteoarthritis.

A substudy of the Australian Longitudinal Study on Women's Health, 'The Profile of Pain in Older Women with Arthritis' was then undertaken to better assess the multi-dimensional nature of the experience of pain in arthritis. Paper 2 outlines the protocol for this substudy, and discusses the appropriateness of eleven measures of health, pain and arthritis used to explore the experience and impact of pain in arthritis.

Using data generated from the substudy, Paper 3 reported that neuropathic-like pain in arthritis is common and is associated with greater disability and poorer quality of life. Furthermore, women who have arthritis and neuropathic-like pain have significantly more severe pain, a heightened pain experience and more fatigue. Abnormal sensory changes, higher pain catastrophizing and using more medications are significantly associated with neuropathic-like pain.

Paper 4 identified three subgroups of older, community dwelling women with arthritis with very different, very distinct profiles of pain - 39.5% of women had uni-dimensional pain, 38.6% had moderate multi-dimensional pain and 21.9% had severe multi-dimensional pain. Once profiles were identified, women with moderate and severe multi-dimensional pain profiles were at a significantly greater risk of poorer physical and mental health related quality of life.

The papers presented provide a significant and important contribution to the field of arthritis and pain, by providing preliminary evidence on the identification and evaluation of different types of pain in arthritis. The next challenge is in the study of the treatment of pain mechanisms in arthritis. This area of research has great promise to improve pain management and decrease the significant socio-economic burden associated with arthritis.

ENQUIRIES

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Data Archiving

The Australian Longitudinal Study on Women's Health has a policy to archive ALSWH data with the Australian Data Archive (ADA) at the Australian National University on an annual basis. To date, data have been archived for Surveys 1, 2, 3, 4, 5 and 6 of the 1973-78 and 1921-26 cohorts, along with the six month follow-up surveys for the 1921-26 cohort. Data from Surveys 1, 2, 3, 4, 5, 6 and 7 have been archived for the 1946-51 cohort, along with data from Surveys 1, 2 and 3 of the 1989-95 cohort.

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A detailed description of the background, aims, themes, methods, representativeness of the sample and progress of the study is given on the project web page. Copies of surveys are also available on the website, along with contact details for the research team, abstracts of all papers published, papers accepted for publication, and conference presentations.

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