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# Abstract Booklet

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# Parallel Session 1: Day 1- 9.00-10.20

## Members Dining Room 1- Economic Evaluation and Cost Effectiveness 1

### Economic evaluation on dental caries preventive interventions for children using a priority-setting approach in Australia

*Tan Nguyen, Monash University*
*Co-authors: Long Le, Hanny Calache, Cathy Mihalopoulos*

Background:
Patient access to new drugs for rare diseases is challenging due to high costs, limited research, and financial constraints on public funding. Globally, countries have implemented different assessment pathways to determine public funding of drugs for rare diseases, leading to inequities in drug accessibility. Understanding public preferences for these assessment processes could enhance decision-making legitimacy and acceptance.
Method:
A discrete choice experiment (DCE) was designed and administered to an adult general population in Australia. Respondents assumed the role of a government advisor and chose between two different assessments pathways described by specific attributes. A literature review and expert focus groups informed attribute selection for the DCE. Each respondent answered eight of choice tasks. Data were analysed using conditional logit, mixed logit (ML) and latent class models (LC). Willingness to wait (WTW) was estimated by calculating the ratio between attribute coefficients and time to drug access.
Results:
A total of 1,099 respondents answered the survey. There was a strong preference for incorporating evidence and stakeholder input into the assessment pathway. The ML model revealed heterogeneity in preferences, and the LC model identified three groups: Class 1 (28.1%) strongly preferred comprehensive evidence, Class 3 (20.2%) opposed long wait times, and Class 2 (52%) showed no strong preference for any attribute. Respondents were WTW for an additional 32 months for drug access in order to incorporate all types of evidence into the decision-making process, and an additional 14 months in order to involve all stakeholders.
Conclusion:
This study demonstrates that societal preferences strongly favour decision-making processes informed by comprehensive evidence and expert input. Many respondents prefer to delay reimbursement decisions until supporting evidence is established. However, generating such extensive evidence may not always be feasible due to the inherent limitations of small patient populations as in rare diseases. The lack of clear preferences among half of the respondents highlights an area for further research.

**Cost Effectiveness of the Strengthening Care for Children Trial: An economic evaluation of a GP-paediatrician integrated model of care within a stepped wedge trial**

*Heather Anderson, University of Melbourne*
*Co-authors: Li Huang, Harriet Hiscock, Raghu Lingam, Lena Sanci, Tammy Meyers Morris, Siaw-Teng Liaw, Sonia Khano, Kim Dalziel*

Objective:
To evaluate the cost-effectiveness of an integrated general practitioner (GP)-paediatrician model of care comprising co-consultations, case discussions, telephone and email support compared with standard care in general practice clinics for paediatric patients.
Methods:
The Strengthening Care for Children (SC4C) trial, was a stepped wedge randomised controlled trial conducted across 22 general practice clinics in Melbourne and Sydney between 2021- 2023. The intervention is an integrated primary care-paediatrician model of care. The trial aimed to appropriately reduce GP referral of paediatric patients to hospital Emergency Departments (ED), outpatient (OP) services, and private specialists. For this economic evaluation, costs were considered from healthcare system and societal perspectives, including the cost of GP and paediatrician time, administrative support, the cost of referrals, parent productivity, and the opportunity cost of child school absence. Effectiveness outcomes included referral rates to ED, OP clinics, and specialists. The costs and effectiveness of the SC4C model versus standard care was assessed using a mixed effects model at visit level, adjusting the fixed effect for group (intervention vs control) and a fixed effect for calendar time to account for the step-wedge trial design, as well as random effects for GP clinics, individual GPs and patients for clustering and correlation. Participating GPs conducted 50,101 paediatric consultations during the control period and 96,804 during the intervention period. The time horizon was 11 months from commencement of the intervention period and 11 months of modelled extrapolation thereafter.
Results:
GP referrals to hospital services declined during the intervention period (2.30% to 1.96%), with the greatest reduction among high-referring GPs (≥5%). Referrals to private paediatricians declined from 4.00% to 2.79%.
The additional healthcare cost per GP visit to run the SC4C model was $9.48 (95% CI 8.86, 10.11) compared with standard care. After accounting for the observed reduction in ED and private specialist use, the net cost of SC4C per GP visit was $5.20, reducing to $3.06 if 50% of the SC4C program benefit is sustained over the following 11 months. From a societal perspective, the SC4C model cost $11.35 more per GP visit than standard care, with net cost saving likely within 11 months of the intervention. The intervention was most effective amongst GPs who were high referrers (≥ 5% in the control period) and there was a net cost savings of $8.70 per GP visit amongst this group.
Conclusion:
The SC4C program can be delivered at a modest cost per visit, with small cost reductions when considering societal perspective. The most cost-effective and likely sustainable delivery is when targeting the SC4C model to high-referring GPs and to low-income populations which may be cost saving. These are likely to be the strategies of higher policy interest for Australian adoption.

**Economic evaluation of shared care models to improve survivorship care for cancer outpatients**

*Cindy Liang, Monash University*
*Co-authors: Jemimah Ride, Kim Dalziel*

Background
Most interventions targeting parental mental health during the stressful early parenthood period focus on mothers, despite evidence that fathers' mental health is also important for children's outcomes. This economic evaluation aimed to assess the cost-effectiveness of a novel psychosocial intervention targeting fathers of young children.
Methods
This economic evaluation was conducted alongside a randomised controlled trial comparing a 6-week group-based peer support intervention (Working Out Dads) with usual care. The population were fathers of children aged 0-4 years, living in Victoria Australia, who were experiencing mental health difficulties or at risk of poor mental health and suicide. Intervention costs were taken from trial records. Healthcare utilisation was obtained from administrative public sector healthcare data, augmented by a resource use questionnaire (RUQ) to capture self-reported public and private sector healthcare utilisation, plus productivity and travel costs. The base case took a public sector perspective with costs measured in 2021 Australian dollars. Outcomes were measured in quality adjusted life years (QALYs) using the Assessment of Quality of life (AQoL-8D) instrument. Mean costs and QALYs were compared at 6 months follow up to estimate the incremental cost-effectiveness ratio (ICER). Uncertainty surrounding the ICER was estimated using probabilistic sensitivity analysis. Scenario analyses were conducted from different perspectives. Furthermore, unit costs of health services were derived from the linked administrative data to provide evidence on the validity of common unit cost estimation approaches.
Results
The trial was conducted between January 2021 and January 2024. The sample consisted of 293 fathers (147 intervention, 146 usual care), with a mean age of 36.6 years. Complete case analysis shows unadjusted public health sector utilisation costs were similar between groups either using RUQ or linked data, but cost of the intervention led to significantly higher costs in the intervention group compared with usual care (incremental cost based on linked data AUD$514; 95%CI: 394, 635). QALYs were slightly higher in the intervention group; incremental QALYs 0.00805 (p-value 0.051). The bootstrapped ICER was AUD$65,920/QALY (95% CI: 31,523, -83,504) based on linked data. At a willingness-to-pay threshold of $50,000 AUD per QALY, the intervention appears unlikely to be cost-effective. Further analysis is underway, including intention to treat analysis using multiple imputation, exploration of alternative perspectives, and comparison of unit cost estimation approaches.
Conclusion
This novel intervention offers potential to address risk factors for paternal depression and suicidality. Results suggest that while fathers may benefit from the intervention, it is unlikely to be cost-effective under current conditions from a public sector perspective, providing valuable evidence to inform policy.

**Enhancing Global Cardiovascular Disease Risk Estimation with Lp(a): An Mendelian Randomisation-Informed Economic Evaluation**

*Zanfina Ademi, Monash University*
*Co-authors: Jedidiah Morton, Florian Kronenberg, Magdalena Daccord, Nicola Bedlington, Marius Geanta, Tobias Silberzahn, Zhenyue Chen, Jean-Luc Eisele, Bogi Eliasen, Mariko Harada-Shiba, Marc Rijken, Albert Wiegman, George Thanassoulis*

Objectives:
Older patients nearing the end of life in acute hospital settings are at risk of receiving non-beneficial treatments. The Intervention for Appropriate Care and Treatment (InterACT) trial aimed to improve care and treatment decisions for older people in hospitals, through implementation of a nudge intervention that identified at-risk patients and communicated their risk profiles to treating clinical teams. This study aimed to evaluate the health service costs and outcomes of the InterACT trial.
Methods:
A stepped-wedge cluster randomised trial was conducted across three large tertiary hospitals in Queensland between May 2020 and June 2021. Throughout the trial, independent clinical auditors continuously screened all patients 75 years and older admitted under 14 enrolled clinical teams. Over 7,000 patients were screened, with 60% identified as 'at-risk' of receiving non-beneficial treatment. During the intervention phase, clinical teams were notified of any at-risk patients, but no further instruction was provided. Length of stay, care type and cost data were obtained from hospital databases for all at-risk index admissions and any subsequent re-admissions. The analysis adopted a health service perspective to compare pooled hospital outcomes between the intervention versus usual care phases of the trial. Unadjusted medians and inter-quartile ranges (IQR) are reported given the right-skewed nature of the data.
Results:
The intervention cost $308,086 over the 12 month trial period; this largely comprised salary related costs of the nurse auditors who performed a combined 4,640 hours in audit and screening activities. There were 2,145 at-risk admissions identified in the intervention phase, and 2,160 in the usual care phase. Intervention admissions had a median length of stay of 6.0 days compared to 5.7 for usual care. Median admission costs were $13,024 (IQR: $7,526 to $25,524) in the intervention compared with $12,228 (IQR: $7,027 to $23,747) in usual care. Only 121 (5.7%) intervention admissions and 98 (4.6%) control admissions were classified as including a palliative care phase. Readmission rates were lower in the intervention phase, and median readmissions costs were $15,880 (IQR: $3,230 to $38,670) in intervention phase versus $20,760 (IQR: $6,091 to $50,812) in usual care.
Conclusions:
While it was hypothesised that increased awareness of a patient's risk profile would reduce the likelihood of non-beneficial treatments and in turn reduce hospital length of stay and cost, this did not occur. The failure of the intervention may have been impacted by several factors including the sensitivity of the screening tools, broader health system challenges exacerbated by COVID-19 outbreaks, and variability in implementation processes between hospitals. Our findings suggest that simple nudge-style interventions may not be adequate to impact health service resource use in complex end-of-life settings.

**Scalable Tool for Economic & Life Course Assessment Risk – Cardiovascular Disease (STELAR-CVD) Platform**

*Harvey Jia Wei Koh, Monash University*
*Co-authors: Zanfina Ademi*

Background:
Cardiovascular disease (CVD) risk prediction models are essential for informing clinical decision-making and health policy. However, many existing tools lack the computational efficiency and user friendliness needed for decision makers to conduct comprehensive health economic analyses across diverse populations.
Methods:
We developed a Python-based cardiovascular disease simulation tool that extends a well-established open-source model Health Economic Model for Primary Prevention of Cardiovascular Disease (HEM-PPCVD). The model simulates individual-level trajectories for multiple risk factors, including LDL cholesterol, systolic blood pressure, lipoprotein(a), smoking history, and diabetes status over the lifetime (ages 30-85). The tool incorporates time-weighted risk factor effects, competing risks from multiple causes of death, and state-dependent transition probabilities for myocardial infarction, stroke, and diabetes. Health economic outcomes are calculated using QALY with discrete health states, half-cycle corrections, and acute disutility. Finally, given the number of available options for treatments, a Monte-Carlo Tree Search (MCTS) is also implemented in the platform to provide the best optimized treatment for health and cost-effectiveness.
Results: The simulation engine features multiple performance optimization modes, including vectorized event processing, parallel computation, and ultra-fast memory-based analysis capable of processing sensitivity analyses with >50,000 parameter combinations. The tool supports flexible scenario modelling with customisable risk profiles, treatment effects, and intervention timing. Treatment effects are based on comprehensive clinical trial evidence. Finally, depending on the user choice/inputs, the MCTS automatically optimises and finds the most cost-effective treatment combinations.
Results:
The platform successfully generates comprehensive health economic analyses, including cumulative incidence curves, cost-effectiveness ratios, and incremental cost-utility analyses. Example applications demonstrate CVD risk reductions of 3-12% with early intervention (age 40) versus late intervention (age 60), with greater absolute benefits in higher-risk populations.
Conclusions:
This platform provides a validated, computationally efficient platform for cardiovascular disease risk prediction and health economic analysis. Its methodological transparency, performance optimisations, and exact replication of established methodologies make it suitable for clinical research, health technology assessment, and population health modelling applications.

## Members Dining Room 2- Health Behaviour

**How Food Photos and Traffic Light Labels Influence Online Food Choices: Insights from a Discrete Choice Experiment and Qausi-RCT**

*Anna Yuan Yuan Wang, Monash University*
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Importance:
With the rapid rise of online-to-offline (O2O) food delivery platforms, consumers are increasingly making food choices based on limited information, often influenced by visual appeal rather than nutritional value. The absence of clear health cues in these digital environments may contribute to the overconsumption of unhealthy foods, raising public health concerns.
Objective:
This study investigates how food photos and traffic light labeling (TLS) independently and interactively influence consumers' online food choices, aiming to understand their roles in promoting healthier decision-making in O2O platforms.
Method:
This study combined a Discrete Choice Experiment (DCE) and a qausi-RCT. A final list of attributes and their levels for the DCE was generated using a detailed iterative process. This included a literature review, six focus group with those O2O takeaway users. From this process a list of attributes was obtained. Following a three pilot studies, the final list of attributes was selected. The survey consisted 24 choice cards, each choice card with three alternatives and one non-purchase option. To ensure reliability, 1,864 aged 18-39 years adult subjects who have ordered O2O takeaways in the recent half year were randomly allocated into one of four DCE surveys. The outcome was the value of calories, fat, carbohydrate and salt of the chosen food.
Results:
The main effect of TLS is significant across all categories—calories ($F(1, 44{,}375) = 142.46$, $P < 0.001$), fat ($F(1, 44{,}375) = 1709.66$, $P < 0.001$), carbohydrate ($F(1, 44{,}375) = 2013.89$, $P < 0.001$), and salt ($F(1, 44{,}375) = 0.322$, $P = 0.012$). Interestingly, the main effect of food photos was significant only for calorie ($F(1, 44{,}375) = 6.22$, $P = 0.0126$) and carbohydrate ($F(1, 44{,}375) = 3.83$, $P = 0.05$) intake, reinforcing the idea that the visual appeal of food disproportionately impacts these two attributes. We also found that interaction between food photos and TLS significantly influences the intake of calories ($F(1, 44{,}375) = 28.61$, $P = 0.001$) and carbohydrate ($F(1, 44{,}375) = 8.28$, $P = 0.004$), but not fat or salt.
Conclusions:
This study demonstrates that TLS has a robust and consistent effect on consumer decision-making across all nutritional categories, particularly for fat and carbohydrate intake, highlighting its potential as an effective tool for promoting healthier food choices in O2O platforms. In contrast, the main effect of food photos was limited to calories and carbohydrates, suggesting that visual appeal primarily influences attributes related to energy and sugar content rather than broader nutritional value. Importantly, the interaction between food photos and TLS significantly affected choices related to calorie and carbohydrate intake, indicating that visual and nutritional cues can jointly shape online food decisions—reinforcing healthy intentions.

**When Dads Can't Get on the Beers: The Impact of COVID-19 on Parental Drinking Behaviour**

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Background:
The COVID-19 pandemic led to unprecedented lockdown measures worldwide, significantly impacting daily life. While research has explored the lockdown's broad effects on alcohol consumption, establishing causality remains challenging due to data limitations.
Among these studies, parents have received relatively little attention, even though they make up a considerable segment of the population. In Australia, 50% of households had children under 15 in 2021, amounting to roughly 9.7 million people. Parents were particularly affected by lockdowns with the closure of schools and childcare facilities. These suddenly increased caregiving and teaching responsibilities without access to usual support networks, potentially affecting their drinking behaviours.
Objectives:
This study investigates the causal effects of COVID-19 lockdowns on parents' alcohol consumption in Victoria, Australia, addressing the research gap concerning the pandemic's specific effects on parents.
Methods:
We employ a quasi-natural experimental design using data from the Victorian Adolescent Health Cohort Study (VAHCS), which began in 1992 with over 2,000 participants aged 14 and includes 11 waves up to 2020. The exogenous timing of the COVID-19 lockdowns allows us to create treatment and control groups: parents interviewed after the first lockdown are the treatment group, while those interviewed just before serve as the control group. Our empirical strategy follows a difference-in-differences estimation to determine the causal effects of lockdowns. We extrapolate detailed measures of alcohol consumption over the previous week from daily drinking diaries, and we examine various consumption patterns according to the AIHW guidelines, including intensive, binge, and risky drinking.
Key Results:
Our findings indicate a negative effect of the lockdown on binge drinking. Specifically, there is a 6.67 percentage point decrease in the likelihood of consuming four or more standard drinks in a day within the past week. This reduction is largely driven by fathers, with no significant change observed in mothers' drinking behaviours. Moreover, fathers also display a reduction in intensive drinking (over 10 standard drinks in the past week), mainly attributable to decreased alcohol consumption during weekends when social interactions are typically at their peak.
Conclusions: The lockdown measures appear to have had a positive effect on reducing binge drinking behaviours, especially among fathers, likely due to increased time at home and social life restrictions. Additionally, we show decreased probability of depression for fathers and improved relationship satisfaction reported by mothers. The findings suggest that lockdown-induced changes in social environments and routines can have beneficial effects on certain health behaviours and family dynamics, highlighting the complex and sometimes positive impacts of public health measures on different demographic groups.

**Age and gender disparities in the relationships between frequency of electronic device use and comorbid mental health problems: The mediating roles of self-efficacy and social support**

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Background:
The pervasive proliferation of electronic devices prompted concerns into the associations between their uses and comorbid mental health conditions. This study aims to examine age- and gender-specific relationships between weekly frequency of electronic devices use and mental health comorbidities in Chinese population, and to explore the mediating roles of self-efficacy and social support.
Methods:
Participants aged 12 years or more from the 2021 Psychology and Behavior Investigation of Chinese Residents, were included. Social-demographics, weekly frequency of devices use (mobile phone/computer), mental health (including anxiety, depression and stress), self-efficacy and social support were assessed using standardized scales. Random forest model was performed to examine the role the digital devices use on mental health, multinomial logistic regressions were conducted to quantify the associations and mediation analyses were conducted to explore the role of self-efficacy and social support, all analyses were conducted stratified by age groups and gender.
Results:
A total of 11,031 participants were included, 61.62% and 10.4% were the middle-aged and elderly. There were 23.58%, 18.88% and 16.91% of adolescents and the young, the middle-aged group, and the elderly reporting the presence of comorbid mental health problems. The weekly frequency of mobile phone use was identified as the second key predictor of comorbid mental health problems in adolescents and the young, and middle-aged adults. The contribution of weekly frequency of computer use was significant in all males and the elderly female. High-frequency mobile phone use was inversely associated with mental health comorbidity across all ages (the young, OR: 0.36; middle-aged group, OR: 0.38; the elderly, OR: 0.37), while low- and mid-frequency computer use positively associated with comorbidity in middle-aged (OR: 1.63 vs. 1.48) and the elderly (OR: 2.69 vs. 3.43). Subgroup analyses revealed strong negative mobile phone use frequency-comorbidity associations in in young and middle-aged males and positive low- and mid-frequency computer use -comorbidity associations in all male subgroups. Structural equation modeling revealed that there was no significantly direct effect of weekly frequency mobile phone use on comorbid mental health outcomes of both genders across all age groups, and the significantly direct effect of weekly frequency computer use was only identified in the middle-aged and the elderly males, the mediating roles of self-efficacy and social support presented age and gender variations.
Conclusions:
The frequency of electronic devices use differentially associated with mental health comorbidities across age and gender, with varying mediating role of self-efficacy and social support. Policymakers and clinicians should consider the dual-edged role of digital devices use on mental health, leveraging its benefits while mitigating risks across diverse demographic group.

**Investigating Behavioural Changes in Response to Medication Copayment Reductions in Australia**

*Thomas Plunkett, Monash University*
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Background:
In Australia, most prescription medications are subsidised under the Pharmaceutical Benefits Schemes (PBS), which has two tiers: concessional (i.e., low income patients, welfare recipients, and pensioners) and general patients. Once patient spending on medications reaches certain thresholds in a calendar year, their medications costs are reduced for the rest of that year under the PBS's Safety Net program. This study explores how individuals' medication consumption changes after reaching the safety net threshold, and whether this varies by medication type (chronic, non-chronic), concessional status, and income.
Methods:
We used a national administrative dataset containing PBS data linked with Australian Census data, for the year 2021. Using a dynamic difference-in-differences approach, we investigate how individuals' medication use changes before and after reaching the safety net, using individuals that will reach the safety net in the future as controls. Effects were then stratified by concessional status, medication type, and income.
Results:
We find that individuals fill more prescriptions after reaching the safety net, and these effects are more pronounced for concessional and lower income patients, as well as for medications for chronic conditions.
Conclusion:
Recent policy changes have focused on the cost of medications and have included lowering the safety net thresholds, resulting in more patients now becoming eligible for the safety net. It is thus more important than ever to understand how this will impact patient behaviour and which patients benefit the most. Our research shows that lower income patients respond more strongly to the decrease in medicine costs associated with reaching the safety net, suggesting that these patients may forego medications prior to reaching the threshold, due to costs. Refinements to the Safety Net program, in particular better refinement based on income, may be required to offer better coverage for those who need it most.

**How does physician exit impact people in opioid dependence treatment?**

*Francis Graham, Monash University*
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Introduction:
Consumption of opioids is associated with a variety of harms including the development of opioid use disorder (OUD). Opioid dependence treatment (ODT) is the most effective treatment for OUD. However, reliable causal evidence of ODT's broader impacts on patient's lives -- including on healthcare utilization, employment, and government service use -- remains limited.
Objectives: We seek to address these limitations by exploiting plausibly exogenous variation in ODT supply disruptions, namely physician exits from local healthcare markets, on novel administrative data observing ODT-related prescriptions linked to tax records, unemployment service use, disability service use, and healthcare records.
Data:
From 1 July 2023, the Australian government implemented a new nationally consistent payment model for ODT under the Pharmaceutical Benefits Scheme (PBS). The reforms aligned the prescription, dispensing, and reimbursement processes of ODT with other PBS-listed medicines, as opposed to the previous disparate systems run by state governments.
We link these data to administrative records provided by Australian Taxation Office (ATO), Department of Social Services (DSS), and the Medicare Benefits Scheme (MBS) using the Australian Bureau of Statistics' (ABS) Person Level Integrated Data Asset (PLIDA) platform.
Methods:
Patients in our sample receive multiple different drugs across multiple jurisdictions and treatment settings, making the assumption of constant treatment effects implausible. Moreover, prescriber exits are staggered throughout our sample. To overcome these concerns, outcomes are evaluated using the modern difference-in-differences estimators of Callaway and Sant'Anna (2021) and Borusyak et al. (2024). Where possible, we also estimate our treatment effects against multiple different treatment groups (yet treated, matched and weighted).
Results:
We first investigate the effect prescriber exit on retention in ODT services. We conceptualise retention in ODT services as necessary "first-stage" relationship that mediates longer-term health or social outcomes. In the 6 months following an exit, patients experience a 15-20% reduction in retention.
We then investigate the effect of prescriber exit on downstream healthcare utilisation using linked PBS and MBS healthcare records. We find economically meaningful reductions in healthcare spending driven not only by reduced engagement with ODT services, but also non-OUD related chronic disease medications and professional attendances. Finally, we explore what happens on the labour market using linked tax and government service use records. Analysis is ongoing and results are pending final clearance from relevant data custodians.
Conclusion
Findings will inform policymakers about the fiscal implications of disruptions in treatment continuity and guide efforts to strengthen the stability of ODT services across Australia.

## Members Dining Room 3- Economics of Mental Health 1

### My family member's health condition and my mental health: longitudinal evidence from Australia

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*Co-authors: Paul Kuwornu, Isaac Koomson, David Brain, Hannah Carter, Qing Xia, Steven McPhail, Kirsten Vallmuur*

Objectives
The biobehavioral family model posits that an individual's biobehavioral reactivity responds to his/her family's health. This study examined how an individual's mental health responds to a serious injury or illness to his/her close family member overtime.
Methods
Longitudinal cohort data of Australian adults were sourced from the Household, Income and Labour Dynamics in Australia (HILDA) survey. We employed a propensity score matching- difference in differences (PSM-DiD) identification approach to resolve selection bias (both observable and unobservable).
Results
Our findings show that those whose family members suffered any serious injury or illness (exposed group) had significantly lower mental health scores and had higher odds of being time stressed compared to the unexposed group. The mental health effects were more pronounced among females, those with low social capital (close friends) and those who are financially fragile (unable to raise an emergency fund of A$4,000 within one week). Further analyses revealed that while the mental health effects set in two years post-onset of the family member's injury or illness and persist years after, time stress starts contemporaneously and continues through to the sixth-year post-injury or illness.
Conclusions
The implications of these findings are two-fold: 1) while the burden of an injury or illness is known to go beyond the affected persons, the need to consider potential health losses to other close family members who may be indirectly affected by the illness when evaluating the impact of illness is under-recognised (for e.g., in estimating years of life lost used for disability-adjusted life years calculation). Ignoring this could lead to downward bias estimates for health losses. 2) Support packages designed to improve a person's health recoveries post-illness should account for the potential unintended health losses to close relative as ignoring these unintended effects could lead to sub-optimal outcome for society.

**Mental health treatment utilisation among transgender and gender-diverse people following gender affirming hormone therapy: Evidence from whole-of-population Australian administrative data**

*Karinna Saxby, The University of Melbourne*
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Background:
Transgender and gender- diverse (TGD) people experience poorer mental health relative to cisgender populations. Gender affirming hormone therapy (GAHT) is associated with improved mental health outcomes, but there is limited population level evidence evaluating mental healthcare utilisation.

Methods:
This study used longitudinal administrative data on mental health utilisation from 2012-2024. TGD people were identified as those receiving testosterone with a current or previous female gender marker, or those receiving oestradiol with a current or previous male gender marker. Using an event study difference-in-differences framework, we examined changes in utilisation of mental health services and mental health prescriptions (antidepressants, anxiolytics) before and after accessing GAHT, using individuals who receive GAHT in the future as controls. Effects were estimated separately by GAHT regimen (masculinising, feminising) for up to four years after initiation relative to individuals' utilisation one year prior to initiating GAHT and were additionally stratified by age of GAHT initiation (<20 years, 20-39 years, and ≥40 years).

Results:
Between 2012 and 2024, 20,592 people initiated feminising GAHT and 11,431 people initiated masculinising GAHT, with median follow-up of 4.52 and 3.8 years, respectively. Initiation of GAHT was associated with an initial increase in the use of mental health services, particularly among people accessing feminising GAHT. Following initiation, use of mental health services significantly reduced; reducing by 86% and 52% for people accessing masculinising and feminising GAHT respectively. Effects were more pronounced for younger people. After initiation, individuals accessing masculinising GAHT saw a 41% reduction in utilisation of mental health prescriptions, with effects more pronounced in young people. Conversely, individuals accessing feminising GAHT used more mental health prescriptions for up to two years after GAHT initiation, before utilisation started to reduce.

Interpretation:
Our results suggest that initiating GAHT is associated with dynamic and heterogeneous effects on mental healthcare, with overall utilisation and towards mental healthcare reducing over time. Enhancing access to GAHT for TGD individuals should be considered to reduce mental health inequalities and associated mental healthcare costs.

**The Dynamic Impact of Parental Separation on Children's Psychosocial Development: Evidence from Australia**

*Xiaoxue Dou, University of Queensland*
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Background:
The quality of parental relationships can have profound impacts on children's psychosocial development. There are growing concerns that parental separation may have detrimental effects on children's overall well-being and development. Many surveys and various statistical methods have been used to explore the association between parental separation on children's psychosocial development. However, the causal effects in this area are less documented, with studies so far not addressing endogeneity issues in the relationship.
Objective/Aim:
We aim to fill the gap by providing robust estimates on the dynamic effects of parental separation on children's psychosocial development using a difference-in-differences framework.
Method:
We use data from the Longitudinal Study of Australian Children (LSAC), an ongoing nationally representative study that commenced in 2003. The sample includes children from both urban and rural regions across all Australian states and territories. The study follows two cohorts, "B-cohort" (aged 0-1 years in 2003-04) and "K-cohort" (aged 4-5 years in 2003-04), tracking their development from childhood into adulthood. To estimate the impact of parental separation on children's psychosocial development, we use a dynamic difference-in-differences (DID) framework, comparing health outcomes of children who experienced parental separation to those who do not. Because the timing of family separation among children vary significantly in our data set, we use the estimator proposed by de Chaisemartin & D'Haultfœuille (2024). The estimator is suitable for situations where treatment timing differs and treatment lags may affect the outcome. This approach also accounts for heterogeneity in treatment intensity of trajectories.
Results:
Our findings suggest that parental separation has significant adverse effects on children's psychosocial development, particularly in terms of hyperactivity, peer problems, and prosocial behaviours. The adverse effects peak immediately after separation and gradually diminish over time, though some subgroups, such as children from lower socioeconomic backgrounds or those with less-educated parents, experience more persistent negative effects. Boys exhibit greater declines in prosocial behaviour and increased hyperactivity, whereas girls show heightened emotional distress and peer-related difficulties. Moreover, children from good parental relationships prior separation experience sustained negative impacts on overall psychological well-being. Our results underscore the importance of targeted interventions to support children during and after parental separation, particularly for vulnerable subgroups.
Conclusion:
Our findings have significant implications for policy and practice. The results underscore the necessity for targeted mental health interventions during post-separation periods, particularly for girls and children from families with lower educational attainment.

**Depression and domestic violence: Experimental evidence from a peer-delivered psychotherapy intervention**

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Introduction:
This paper provides novel long-term experimental evidence on how treating perinatal depression affects women's mental health, exposure to domestic violence, and household power dynamics in rural Pakistan. We also examine how intra-household bargaining power mediates these effects.
Experimental Design and Data:
We leverage a randomized controlled trial (RCT) launched in 2014 that assigned 1,154 pregnant women who screened positive for depression to receive cognitive behavioral therapy (CBT) from trained community peer volunteers or to a control group. The intervention was delivered in three stages over five years postpartum. We track outcomes annually for eight years (through 2022), resulting in one of the longest panels to date on psychotherapy interventions in LMICs. Outcomes span maternal mental health, domestic violence, decision-making, gender norms, and child development.
Empirical Strategy:
We estimate intention-to-treat effects using a difference-in-differences approach, interacting treatment assignment with survey wave indicators. Across all outcomes we adjust for baseline level of the outcome, imbalanced baseline covariates, union council fixed effects, and wave-specific controls, and employ inverse probability weights to account for attrition over time. All regressions are also separately estimated by relative spousal education to proxy for women's baseline bargaining power, dividing the sample into womenwith more schooling than their husbands (H<W) and women with equal or less schooling (H≥W).
Main Findings:
Results show that eight years after random assignment, women in the treatment arm are 29% less likely to meet diagnostic criteria for depression (PHQ-9 > 10), with similar declines in clinician-rated depression (SCID). However, we observe on average, an increase in reported psychological and physical violence.This pattern differs by intra-household bargaining power:
•Among women with more schooling than their husbands, the intervention yields large and sustained reductions in depression (PHQ-9 score ↓ 2.3 points; SCID ↓ 15 pp) and meaningful declines in physical and sexual violence. It also leads to lower fertility.
•Among women with equal or lower schooling than their husbands, depression is weakly affected and domestic violence increases.
Mechanisms:
We document significant differences in adherence: women with equal or less schooling attend fewer therapy sessions. We also find that agency initially improves across both groups but gains fade among less empowered women. However, treatment leads to more progressive gender norms for this group, which suggests the presence of a mismatch between couple's beliefs, which may lead to backlash.
Conclusion:
Findings underscore the need for careful targeting and complementary interventions when implementing psychosocial programs in patriarchal settings, since empowering women can backfire when existing power structures are not sufficiently addressed.

**Trajectories of children's behaviour problems and their associations with maternal mental health trajectories in Australia**

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Background
Raising children with behavioural problems can place significant emotional and psychological demands on mothers, often contributing to long-term mental health difficulties. While many studies have examined how maternal mental health influences child development, fewer have considered the reverse direction, that is, how children's behavioural difficulties may affect maternal mental health over time.
Purpose
This study aims to examine how trajectories of children's behaviour problems are associated with trajectories of maternal mental health, as measured across the child's development from early childhood to adolescence in Australia.
Method
Data from 7,484 children aged 4–15 years from both birth and kindergarten cohorts of the Longitudinal Study of Australian Children (LSAC), a nationally representative study, were used. We used group-based trajectory modelling to identify patterns in both children's behaviour (Strengths and Difficulties Questionnaire) and maternal mental health (Kessler-6). Multinomial logistic regression was used to examine associations between trajectories of child behaviour problems and trajectories of maternal mental health, adjusting for key demographic and socioeconomic covariates.
Results
Four child behaviour trajectories were identified: early high decreasing, early low increasing, consistently low, and moderate-high increasing. Three maternal mental health trajectories were found: consistently good/improving, moderate changing, and consistently poor/worsening. Compared to consistently good mental health, mothers in the moderate group had higher risk of children in early high decreasing (RRR=2.8, 95% CI 1.97–4.06), early low increasing (RRR=2.6, 95% CI 2.17–3.02), and moderate-high increasing (RRR=4.0, 95% CI 3.18–5.13). Stronger associations were found in mothers with poor/worsening mental health (RRR=6.5, 95% CI 3.87–10.80; RRR= 5.2, 95% CI 3.97–6.83; RRR =11.5, 95% CI 8.27–15.89).
Discussion
This study shows a strong association between children's behavioural problems and worsening maternal mental health over time. Mothers of children with persistent or increasing behavioural difficulties are at higher risk of moderate to poor mental health trajectories. These findings highlight the need for early identification and support for such families. Sociodemographic factors, including child gender, maternal age, and family structure, also influence these patterns and should be considered in interventions. Addressing child behaviour problems may improve both child outcomes and maternal wellbeing by disrupting these linked developmental pathways.

## Private Dining Room 1- Demand for and supply of healthcare services

### Development and testing of a casemix classification for primary health care in remote Northern Territory

*Yuejen Zhao, NT Department of Health*
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Background
Classification and costing of outputs are important for measuring the effectiveness and efficiency of health service delivery. This study aimed to develop and test a new classification of primary health care (PHC) by care type and stage of condition, and to pilot this classification by estimating average costs per visit and annual cycle of care for the Northern Territory (NT) Government managed remote clinics in Australia.
Methods
Patient and service data were gathered from the NT Department of Health Primary Care Information System (PCIS) that uses the International Classification of Primary Care version 2 plus (ICPC) for data collection. PHC financial data were extracted from the NT Government Accounting System. We defined a new framework, the Medical Benefit Groups (MBGs), to classify PHC encounters using spectrum (illness) and continuum (stage of illness and type of care) categories for each visit and annual cycle of care, and calculated the average costs associated with the conditions by activity-based costing.
Results
Seven continuum categories consolidated ICPC codes in PCIS including Prevention, Symptoms, Diagnostics, Results, Conditions, Therapeutics and Referrals. Twenty spectrum categories used ICPC alpha codes for chapters and multi-system categories (cancer, injury and infectious disease). Between 2017/18 and 2021/22, a total of 2.2 million visits and 801400 cycles of care were recorded for 51 remote clinics serving a predominantly Aboriginal population (86%). After adjusting for inflation, the average costs were estimated at $386-$455 per visit, with average costs per annual cycle of care ranging from $1079 to $1174 in 2020 Australian dollars. The average cost by MBG continuum was $1126 per cycle of care, ranging from Symptoms $1008 to Referrals $1318 annually. For MBG spectrum categories, Urology (including chronic kidney disease) was the most costly condition ($1388 per cycle of care), followed by Pregnancy ($1290) and Blood ($1171, including iron deficiency anaemia). The total annual funding averaged $4685 per person.
Conclusions
MBGs can be used to better understand PHC expenditure by type and stage of condition, whereby a detailed analysis can provide useful insights into remote Aboriginal PHC utilisation and health outcomes. This research serves as a necessary first step towards better financial management, sustainability and adequacy of health care resources for remote PHC delivery.

**Drivers of change in Australian healthcare expenditure, 2011-12 to 2022-23**

*Emily Bourke, Australian Institute of Health and Welfare*

Objectives:
Healthcare spending increases every year in Australia and accounted for over 10% of GDP in 2022-23. As populations age and non-communicable diseases become more prevalent, it is important to understand how these and other drivers of expenditure have impacted health expenditure growth, to better understand how they may drive expenditure into the future. This analysis quantified the changes in healthcare spending between 2011-12 and 2022-23 due to population size, age structure, disease prevalence, service utilization, and service price and intensity.
Methods:
Data on disease burden and healthcare spending were extracted for all health conditions, by age, sex, and area of healthcare spending from the AIHW's Australian Burden of Disease Study and Disease Expenditure database. A Das Gupta decomposition analysis was implemented to estimate the association between changes in population size, age structure, disease prevalence, service utilization, and service price and intensity to changes in health spending,
Results:
Total real health spending has increased from $170 billion in 2011-12 to $253 billion in 2022-23. Per person, this growth is from $7,684 to $9,597. The analysis to breakdown this growth is ongoing, and results will be available to present at the conference.
Conclusion: This will useful information for understanding the causes of increasing health expenditure over time, and may be useful for health system planning and expenditure projections.

**NDIS Provider Longevity and Market Dynamics: A 2013 – 2024 Survival Analysis**

*Jade Chang, The University of Sydney*
*Co-authors: Ivy Yen, Jennifer Smith-Merry*

Background
Between 2019 and 2024, the NDIS industry grew at a compound annual rate of 12.1%, reaching an estimated $48.7 billion. Despite this growth, provider exits have become more common, likely due to thin profit margins, delayed payments, workforce shortages, regulatory burdens, and policy uncertainty. This study examines trends in provider registrations, identifies key risk factors for business exit, and explores evidence of thin markets across Australia.
Methods
This study draws on unit-level NDIS provider and participant data covering the period from 2013 to 2024. Analyses included descriptive statistics to assess registration trends and NDIS budget utilisation rates by geographic remoteness (with low utilisation potentially indicating thin markets), Kaplan-Meier estimation to measure survival probabilities, and Cox regression to identify factors associated with business longevity.
Results
Provider registrations surged during the early expansion (2016–2018), peaking in Q1 2018 with 3,429 new entries. Subsequent declines in late 2019 and 2022 were likely driven by regulatory tightening following the establishment of the NDIS Quality and Safeguard Commission and the COVID-19 pandemic. A resurgence began in late 2023, with a secondary peak in Q2 2024 (2,390 new registrations), potentially driven by proposed reforms such as mandatory provider registration. By Q4 2024, total registered providers reached 53,440, though 57.2% remained inactive, suggesting a substantial lag between registration and service commencement or potential over-registration.
Among the 22,891 providers with at least one payment, 25% exited within two years, and 50% within 4.7 years. Sole traders (reference) had the highest exit risk, while incorporated (hazard ratio (HR) = 0.26) and government entities (HR = 0.29) had significantly lower hazards. Highly versatile businesses offering more than 10 service types were 94.2% less likely to exit (HR = 0.06) than single-service providers (reference). Service type also predicted longevity. Within capacity building supports, exercise physiology/personal training (HR = 1.83) and therapeutic supports (HR = 1.66) were associated with higher exit risk, while support coordination (HR = 0.36) showed greater resilience, using accommodation/tenancy as reference. All reported HRs are significant ($p < 0.05$).
Analysis of plan utilisation (Jul 2013–Dec 2024) revealed persistent geographic disparities. Very remote areas had the lowest average utilisation (0.47), followed by remote areas (0.51), with the highest rates in Major Cities (0.63), indicating systemic inequality in access and service delivery.
Conclusions
Business longevity in the NDIS markets is influenced by provider structure, service diversification, and service type. High exit rates among sole traders and specialised service providers highlight the need for targeted support, regulatory reform, and better market stewardship to promote sustainability and equitable access.

**From referral to surgical decision, a cost and service evaluation of General Practitioner referrals to Orthopaedics at an Australian tertiary facility.**

*Darryn Marks, Bond University*
*Co-authors: Michael Thomas, Steven Stern, Sharon Mickan, James Todd, Wayne Hing*

Objectives
The efficiency of orthopaedic outpatient care preceding an offer of elective surgery, is critical to productivity and waiting times but is not well understood. Objectives were to extract from hospital systems a dataset of General Practitioner (GP) orthopaedic referrals and evaluate the cost and efficiency of orthopaedic care needed to reach a surgical decision. Specific aims for referrals were to estimate the volume, type, variability and surgical conversion rates to the level of individual GPs. At the orthopaedic service level, aims were to estimate the time, care provision and cost burden of care prior to a surgical decision.
Methods
A two-year (Jan 2019 to Dec 2020) retrospective observational cohort of all GP orthopaedic referrals was obtained via the hospital SQL server. Service and economic data was extracted until either the outpatient episode ended or 31 July 2023. Data was cleansed and analysed using R statistical software, with monetary values (health service provider and funder perspectives) inflation adjusted to June 2024. The Kaplan-Meier estimator was applied for right censoring and log-rank test used for treatment versus control survival functions with 5% significance levels. Clinical and demographic covariates were reported via the Cox proportional hazards model. Ethical approval was obtained from the health service HREC.
Results
The two-year cohort consisted of 18,901referrals, from 1806 individual GPs. GP referral variability was high, with 30% making only one referral, the top 10% each making over 30 and the top 1% referring between 100 to 238 patients each. The endpoint (surgical listing or discharge) took an expected mean of 520 days (95% CI: 513 – 527 days). 13% of referrals remained open at three years. More urgent referral categories were managed significantly faster, smaller differences existed between conditions (such as shoulder versus knee), while patient age had no significant impact. There was a large range in the number of appointments and costs of care. Estimated mean costs per referral were $786 (SE 11.89) from health service provider and $948 (SE 13.11) from funder perspectives, comprising predominantly medical labour, allied health and imaging. Non-censored mean costs per discharged referral were $1002 (SE16.19) and per surgical listing were $1402 (SE 21.37). Surgical conversion rates were low at 18.64% (95% CI: 18.03 – 19.26%) probability of a referral being listed for surgery after 3-years. The mean cost burden of achieving surgical listing increased over time.
Conclusions
The progression of GP referrals to orthopaedic surgical decision is characterised by multiple inefficiencies including variability in referral volumes from individual GPs, extended service duration and disproportionately high costs in the context of low surgical conversion rates. Many opportunities exist to improve the efficiency of orthopaedic referral and pre-operative care.

**Examining the impact of COVID-19 on Australian public hospital activity**

*Megan Gu, Independent Health and Aged Care Pricing Authority*
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Background:
The coronavirus disease 2019 (COVID-19) pandemic caused severe disruptive shocks to the provision of health care in Australia, including care delivered by public hospitals. Such shocks can have a significant impact on hospital funding and costs, particularly in the Australian system where it is heavily reliant on activity-based funding (ABF), potentially leading to short-term reductions in funding and longer-term increases in cost-weights. The eight state and territory governments own, operate and co-fund public hospitals. However, they rely on financial transfers from the Commonwealth Government to contribute to the cost of care. The Commonwealth's contribution is based on the activity delivered.
Objectives:
This study examines the impact of COVID-19 on admitted acute public hospital activity and whether the observed fall in activity data was associated with temporary lock-down periods and new COVID-19 strains. The study also examines whether the hospital admitted activity has returned to pre-COVID-19 trends.
Method:
Utilising the admitted patient care national minimum data set (APC NMDS) for the period July 2015 to June 2023, the study aggregates the episode level hospital activity data to state/territory level. The Gross Weighed Activity Unit (GWAU) summarises hospital episodes by weighted activity, taking episode complexity into account. Lockdown periods in each Australian state and territory are identified in metropolitan and regional areas. Random effects models are used to examine the national pre-COVID-19 and post-COVID-19 activity trends whilst accounting for short-term, state-based lockdown periods. Potential confounding factors such as seasonality and state/territory differences in models of care are also controlled for.
Results:
The results show that hospital activity in the year 2022-23 is back on trend when comparing to the pre-March 2020 rates of growth in admitted acute care. The results also indicate that the impact of lockdowns changed over time: lockdowns at the start of the pandemic had a much more significant negative impact on activity compared to later ones.
Conclusions:
The results of this study informed the development of the National Efficient Price Determination for 2024-25 set by the Independent Health and Aged Care Pricing Authority. The analysis was used to account for the temporary impact that the fall in activity had on the average cost of admitted hospital services and subsequent setting of prices for public hospital services for future funding years.

## Private Dining Room 2- Government policy, regulation, and public health

### Household Tap Water and Paid Work Time: Causal Evidence from Rural China

*Yiyi Zhao, The Australian National University*

Objectives
This study examines whether household access to tap (piped) water increases the time rural Chinese adults devote to paid market work and identifies the time-allocation channels—reduced housework, childcare constraints, or leisure substitution—through which any labour-supply response arises. Clarifying these mechanisms shows how basic water infrastructure contributes to Sustainable Development Goal 6.1 on universal and equitable access to safe and affordable drinking water and broader rural-development agendas.
Methods
I merge five waves of the China Family Panel Studies (2014–2022) into a panel of rural adults and estimate causal effects in two complementary ways. First, an individual fixed-effects IV approach instruments each household's tap-water status with the contemporaneous share of other households in the same village (excluding the household itself), to address endogeneity concerns. Second, a staggered difference-in-differences design exploits the phased roll-out of China's National Rural Drinking Water Safety Project (13th Five-Year Plan, 2016–2020), which created household-level variation in connection timing. All specifications control for demographic, household income and occupational factors as well as county-by-year shocks, and standard errors are clustered at the individual level.
Results
The results show that access to tap water leads to a significant increase in paid working hours among employed individuals, ranging from 2.5 to 5.4 additional hours per week depending on the specification. This effect is primarily explained by a reduction in time spent on domestic housework, which frees up time for paid work as well as modest increases in leisure activities, particularly midday naps. Subgroup analyses suggest that the benefits are especially pronounced among agricultural workers and individuals without young children at home. The effects are statistically significant for both women and men, with comparable magnitudes across genders.
Conclusions
This paper delivers the first quasi-experimental evidence that household access to tap water reshapes rural labour markets in China. Tracking both paid hours and unpaid housework–leisure trade-offs reveals that tap water is not merely a health amenity; it is a powerful time-saving technology that converts domestic work into productive work. Policy should therefore (i) embed piped-water rollouts within broader rural-employment programmes, (ii) pair new connections with affordable childcare to release the full labour potential of adults and (iii) target farm-intensive areas where the productivity pay-offs are greatest. In doing so, governments can multiply the returns to water investments and accelerate progress toward the universal, equitable drinking-water access envisioned in SDG 6.1.

**Sugary Drink Taxes and Public Health: Global Evidence on How Much Less We Drink—And How Little Weight We Lose**

*Febri Pangestu, Griffith University*
*Co-authors: Claire Hutchinson, Rachel Milte, Amanda Muller, Julie Ratcliffe*

Objectives:
Excessive sugar consumption is a major contributor to obesity and non-communicable diseases (NCDs) globally. In response, many governments have introduced taxes on sugar-sweetened beverages (SSBs) to reduce intake and improve public health outcomes. While existing evidence supports consumption declines following taxation, little is known about how these reductions translate into measurable changes in population health indicators such as body mass index (BMI). This study provides cross-national evidence on the impact of SSB taxation on consumption volumes and BMI outcomes, offering insights for public health policy design.
Methods:
We constructed a global panel dataset covering up to 191 countries, depending on data availability across outcomes, drawing from Euromonitor International, the World Health Organization, and the World Bank. Fixed-effects and dynamic panel models were used to estimate the effects of SSB taxes on consumption and BMI. To provide context, we also translated the estimated consumption reductions into predicted weight changes using a standard steady-state energy balance assumption. This allowed us to compare the predicted impact of consumption reductions with actual trends in population BMI.
Results:
Our analysis shows that SSB taxes are associated with reductions in per capita beverage consumption of 1.2 to 4.8 litres annually. When translated using a steady-state energy balance assumption (94 kJ/day per kilogram), these changes imply predicted bodyweight reductions between 63 and 250 grams. However, directly estimated effects on BMI are smaller, approximately –0.012 units (95% CI: –0.0226 to –0.0005), or roughly 35 grams, suggesting that up to 86% of the expected weight impact may be offset by other behavioural or contextual factors. These modest but significant effects remain robust across specifications and indicate partial translation of consumption gains into health outcomes.
Conclusions:
SSB taxation is a proven lever for reducing sugar intake at the population level. However, its health impact, measured through BMI, is more modest than predicted by standard energy balance assumptions. This divergence underscores the importance of understanding real-world behavioural responses, delayed physiological effects, and the structural limits of single-policy interventions. Additional limitations include the presence of very low tax rates in some jurisdictions (e.g., Nigeria), which may dilute average treatment effects. To maximise health gains, SSB taxes should be embedded in broader public health strategies that include access to healthy alternatives, public education, and marketing regulation. This study offers timely evidence to inform integrated fiscal and health policy efforts aimed at tackling the obesity epidemic.

**School Disruption, Parental Input and Early Childhood Development**

*Giovanni van Empel, Australian National University*
*Co-authors: Yijuan Chen, Jinhu Li*

Objectives:
While it is widely recognised that access to early childhood education is important in skills acquisition, little is known about the specific effects of different types of educational inputs, such as formal educational inputs received in schools and informal educational inputs from parents, on developmental outcomes during early childhood. We study the impact of formal education on child developmental outcomes by leveraging pandemic-induced school closures as an exogenous source of disruption in formal education during early childhood. We also examine the impact of school closures on the equity of child development by family socioeconomic status. Furthermore, we examine the role of parental input in shaping early childhood development in relation to formal education received in schools.
Methods:
Our empirical approach leverages the variation in the intensity of school closures across areas in Australia during the COVID pandemic. We use linked Australian administrative data on children in their first year of formal schooling from the Person-Level Integrated Data Asset (PLIDA) and employ a difference-in-differences (DID) design to estimate the impact of school disruption on children's developmental outcomes and on the equity of child development by family socioeconomic status. We measure school disruption as the total duration (in days) of partial and/or total school closures documented in the Australian sub-national Oxford Covid-19 Government Response Tracker data. We further explore the mechanisms of parental time input using the same DID design and data from waves 18 to 22 (2018–2022) of the HILDA survey.
Results:
Our main DID estimates suggest that school disruptions have negative effects on child developmental outcomes, including being overall developmentally "on track" and in the general knowledge, physical, social and emotional domains of developmental outcomes. These results are robust to a wide range of sensitivity checks, such as a triple-differences estimation comparing the school closure effect between essential and non-essential worker parents. A triple-differences estimation reveals that the inequality in child development widened due to school closures, with lower socioeconomic families falling even further behind. Using the HILDA data, we show that, in contrast to previous studies, parental time input in lower-income families in Australia exceeded that of their higher-income counterparts when faced with school closures.
Conclusions:
On the one hand, these results demonstrate the substantial benefits of the Government's income protection policies during the pandemic; on the other hand, they call for continued policy support in the post-pandemic era for families and children who have suffered from increased inequality. Our results underscore the significance of parental input in childhood development and highlight the importance of other types of parental input that are not captured by parental time.

**Does Expanding Healthcare Coverage Dilute Benefits for the Poor under Resource Constraints?**

*Pratyasha Acharya, The University of Queensland*
*Co-authors: Beverley Essue, Sumit Kane, Ajay Mahal*

Background:
Expanding healthcare coverage in resource-constrained settings in low- and middle-income countries such as India poses challenges. While exclusion errors (Type 1 errors) could be lowered with expanded population coverage and more relaxed identification requirements, inclusion of better-off households may lead less well-off to be muscled out of program benefits when resources are constrained. Conversely, targeted programs face greater risk of misidentifying eligibility and thus higher Type I errors. India has launched several state- and national-level health insurance schemes intended to support economically less well-off individuals, some more inclusive than others. Our study examines the impact on the poor of expanding public healthcare access with more relaxed eligibility requirements versus implementing finely targeted schemes under resource constraints.
Objectives:
There are three main questions: (1) What are the rates of Type I and Type II errors in beneficiary enrolment under more targeted versus more inclusive public health insurance schemes in different states? (2) How do these errors vary by economic status, specifically, the marginal versus the very poor? (3) What factors explain the likelihood of enrolment under alternative scheme designs?
Methods: We conduct a comparative analysis across four geographically diverse Indian states with differing scheme designs—more inclusive (Kerala, Rajasthan) and more targeted (MP, UP)—using the 2022–23 National Sample Survey Office (NSSO) Consumer Expenditure Survey and 2019–21 National Family Health Survey (NFHS). Type I (share of eligible households not enrolled) and Type II errors (share of enrolled households not eligible) were calculated for both identification and self-reported scheme enrolment. Households are identified by state-specific criteria, Socio-Economic Caste Census (SECC) eligibility, and consumption. Enrolment likelihood is modelled using household socioeconomic characteristics and district-level indicators of administrative capacity.
Results:
NFHS data from 695 Indian districts show strong positive correlation (0.96) between inclusive population coverage and Type I errors in scheme enrolment. However, preliminary results from SECC-mapped NSSO data offer a closer look indicating that more targeted schemes (MP, UP) exhibit higher Type I errors in identifying poor households (32%, 33%), and also high Type I errors in scheme enrolment (67%, 95%). Even inclusive states, despite better identification, show high enrolment errors (71%). In MP and Rajasthan, SECC-eligible households have 17.4% and 24.8% lower odds of enrolment. Similar trends are expected with consumption quintiles, with higher exclusion of the very poor.
Conclusion:
While broader population coverage appears to improve enrolment of the poor, both inclusive and targeted schemes face barriers in converting eligibility to enrolment, highlighting implementation gaps and limitations in self-reporting.

**The impact of community driven development on basic services : Evidence from Village Fund in Indonesia**

*Eko* Wicaksono*, Monash University*
*Co-authors: Maame Woode; Samia Badji; Anthony Harris*

Rural infrastructure development matters to help alleviating the global extreme poverty problem since half of the global poor reside in rural area. Infrastructure upgrade can lead to better accessibility which can help rural population improve their well-being and escape from vicious poverty cycle. Community driven development is a decentralize approach to rural development which allows active community participation in rural development.
This study provides evidence on the impact of a massive scale community driven development approach on local public goods provision in Indonesian setting. In 2015, Indonesian government started to rolled-out Village Fund (VF) program which distribute grant to all rural villages (Desa). The main objective of this particular grant is to improve the quality of rural infrastructures.
This study combines both village census data (Podes) and administrative data related to VF allocation and VF spending from both Ministry of Village and Ministry of Finance. These data make it possible to track every type of VF disbursement in each village and categorize the spending into several dimensions. This study employs a difference in difference strategy by exploiting the variation in village fund per capita. Since a significant portion of VF allocation is based on basic allocation (equally distributed to villages) it creates different intensity in terms of per capita allocation across village
This study documents that VF program leads to better village infrastructure quality. Higher village fund per capita is strongly associated with better village access as shown by the higher probability of having village road which can be accessed by four-wheel vehicles at any time during the year. Villages also enjoy a better communication access since they are more likely to be covered by cellular phone signal. Furthermore, better accessibility is also translated into better health care access which is represented by more feasible access to hospital and higher likelihood of community health centre provision. In addition, a substantial permanent shock to village revenue leads to improvement in other basic infrastructure especially sanitation quality. Greater per capita revenue allows villages to provide decent sanitation for household living in the village. Village with higher VF per capita are less likely to have an open defecation (no access to latrine) and those villages are more likely to have cleaner cooking fuel as well.
The results of this study imply that VF led to improvement in village access to basic services. Village infrastructure projects funded by VF is the main potential channel through which VF can have impact on village outcomes. The findings of this study imply that community driven development matters for rural development by allowing local people to be actively engaged in development projects which fits to local needs and circumstances.

## Parallel Session 2 Day 1:1.30-3.10

### Members Dining Room 1- Health Insurance

**Substitution and selection in dual public-private healthcare**

*Tiannan Gao, University of Technology Sydney*

The Australian government has introduced multiple initiatives for encouraging the purchase of private health insurance (PHI) over the past two decades. The justification for these policies has been to reduce pressure on the public healthcare system, which provides free hospital care in public hospitals. However, it is possible that private cover encourages additional health care use (moral hazard), exceeding substitution away from public care. This study estimates this substitution using multiple waves of the HILDA Survey to examine patterns in effect of PHI on hospital admissions since 2004. Given observational nature of data, it is important to address potential unobserved confounding. For example, subjective perceptions (i.e., distrust, perceived quality, or physician preference) and socioeconomic status are likely to affect patients' decisions, yet are not recorded, leading to omitted variable bias. Previous research on the Australian healthcare system has relied on various instrument variables strategies to address this endogeneity, with strong assumptions required for instruments to be valid. We apply a different approach, utilising partial identification models (bounding analysis) to assess the potential for selection bias in identifying variables that are correlated with both insurance and utilisation decisions, in the absence of randomised controlled trials or valid instrumental variables. This is to examine whether "any" causal effect of insurance exists under plausible assumptions. Our results show that assuming insurance is treated as exogenous conditional on a rich set of controls, the net effect of cover on any hospitalisation type over time is an increase of approximately 5 to 10 percentage points (ppts), and of 4 to 8 ppts for day and (over)night hospitalisations, respectively. This increase results from both increased private patient utilisation and a corresponding reduction in public hospital usage. Thus, a considerable substitution from public to private care is observed across most years, although substitution for (over)night admissions is negative in some periods, and the reduction in public admissions is insufficient to offset the increase in private admissions. Guided by the logic of selection on observables for the degree of selection due to unobservables (Altonji et al, 2005; Oster, 2019), we explore whether the expansion in overall health care use due to PHI is likely to be due to moral hazard, or unobserved confounders. These analyses suggest the expansion in healthcare use is robust. We also find that there is an underestimate of the true causal effect, but the inclusion of key health-related covariates reverses some initially negative effects to positive, consistent with the presence of moral hazard as well as favourable selection into insurance. Similar conclusions are supported by results from minimum bias and other bounding estimators that quantify how sensitive the estimates are to the unconfoundedness assumption.

**Projecting the Future of Private Health Insurance Participation in Australia: Insights for Policy Sustainability**

*Qingyue Li, Australian National University*
*Co-authors: Timothy Higgins, Aaron Bruhn, Wai-Man Liu*

Background:
Private Health Insurance (PHI) plays a key role in Australia's healthcare system by supplementing Medicare. However, participation is declining due to demographic shifts, affordability pressures, and adverse selection, raising concerns about the system's long-term sustainability.
Methods:
A dynamic microsimulation model was developed to project PHI participation. It incorporates demographic changes, income variation, family formation, and the adverse selection effect, where premium increases influence PHI decisions. Scenario analyses examined COVID-19 impacts and policy options such as adjusting the Medicare Levy Surcharge (MLS) and introducing age-based premium caps.
Results/Outcomes:
Projections indicate a continued decline in PHI participation, particularly among younger individuals. Sensitivity analyses show that wage growth and severity rates significantly influence coverage trends. The COVID-19 pandemic may have temporarily stabilised PHI uptake. Policy simulations suggest that capping premium increases for younger age groups improves affordability and participation rates, broadening the risk pool and slowing adverse selection.
Conclusion:
Current policies like MLS and Lifetime Health Cover (LHC) incentivise PHI take-up but do not fully address affordability. Directly managing premium growth through age-based caps could offer a more sustainable solution, supporting both household affordability and system resilience. Future policies should consider broader affordability measures to maintain PHI's complementary role alongside Medicare.

**Improving private health insurance choice in dual public-private markets**

*Nathan Kettlewell, University of Technology Sydney*
*Co-authors: Aleksandra Erakhtina; Hong Il Yoo*

Using an incentivised choice experiment, we measure the degree to which consumers are able to select welfare maximising private health insurance policies in a dual public-private market setting and test whether simple decision aides can improve people's choices. In this setting, the utility from insurance is primarily due to shorter waiting periods for hospital treatment. Participants' preferences for waiting times and risk are elicited and we assess their ability to select health plans consistent with their preferences. Using a sample of N=233 university students, we find strong evidence that people frequently fail to maximise utility, with participants choosing the utility maximising health plan only slightly more often than random chance. We randomise access to three decisions aides; two graphical aides, designed to make salient the probability distribution of waiting time and out-of-pocket cost in monetary terms, and one plan recommendation tool. While those in the graphical aide interventions make more consistent choices on average, the differences are not generally statistically significant different compared to baseline. To test whether these findings generalise to a more representative population, we repeat the experiment using an online sample recruited through a survey company (N=511). Preliminary analysis of those data again suggest that people frequently select plans that do not match their underlying preferences, and that decision aides only have a modest effect on choice quality.

**Crowding out effect on the private health insurance market in Indonesia**

*Nihayatul Munaa, Australian National University*
*Co-authors: Jinhu Li, Elisabeth Huynh and Giovanni van Empel*

Background: An international multicentre randomised controlled trial (RCT), the Treatment Of Booking Gestational diabetes Mellitus (TOBOGM), was recently conducted to investigate whether treatment of early gestational diabetes mellitus (GDM) improves maternal and neonatal outcomes. This study aimed to assess the cost-effectiveness of treating early GDM compared with usual healthcare.
Methods: Economic evaluation was performed alongside the RCT from Australian healthcare perspective. Pregnant women (4-19+6 weeks) diagnosed with GDM by World Health Organisation (WHO) 2013 criteria were eligible to participate. Participants were randomised (1:1) to either early immediate treatment for GDM (intervention) or to deferred or no treatment, based on repeat oral glucose tolerance test (OGTT) at 24-28 weeks (control). Control group received routine antenatal care as per local guidelines; intervention group received standard GDM treatment in addition to usual antenatal care. Primary outcome was composite of adverse neonatal outcomes (preterm birth < 37 weeks, birth trauma, birthweight ≥ 4.5 kg, respiratory distress, phototherapy requirement, stillbirth/neonatal death, or shoulder dystocia). Secondary outcome was quality-adjusted life-year (QALY) measured from EQ-5D questionnaire. Costs were calculated from participants' self-reported healthcare resource utilisation questionnaire and hospital administrative record. Data were analysed as per intention-to-treat (ITT) principle. Missing data were replaced using multiple imputations. Incremental cost-effectiveness ratio (ICER) was expressed as cost per reduction in adverse neonatal outcome, and cost per QALY. Cost-effectiveness acceptability curve (CEAC) and cost-effectiveness plane were constructed using nonparametric bootstrap method with 1000 replications to explore uncertainty surrounding ICERs.
Results: Total 802 participants were included (406 intervention, 396 controls). Compared to control group, intervention group achieved greater reduction in adverse neonatal outcomes (-5.6, 95% CI [-10.1, -1.2], p = 0.039) and gains in QALY (+0.02, 95% CI [0.01, 0.04], p = 0.022). Intervention group was associated with higher health professional consultation and medications costs, but lower hospitalisation costs. There was no significant difference in overall mean healthcare costs between the arms ($482, 95% CI: [-$281, $1245], p = 0.082). Base case ICERs ($25,129 per QALY and $86.07 per adverse neonatal outcome reduced (p<0.001)) suggest the intervention was cost-effective compared to usual care under the conventional thresholds of cost-effectiveness. The probability of cost-effectiveness varied from 63% at $50,000/QALY WTP threshold to 86% at $100,000/QALY WTP threshold.
Conclusion: The study provides empirical evidence that treatment and management of early GDM is a cost-effective option for improving maternal and neonatal outcomes.

**Bilateral Monopolies in Health Insurance Markets and the Impact of Supply-Side Outside Options**

*Dennis Petrie, Monash University*
*Co-authors: Peter Ghijben; Duncan Mortimer*

Background:
Negotiations between governments and pharmaceutical companies for pricing and coverage of on-patent medicines without close substitutes in single-payer systems often resemble a bilateral monopoly. Under standard assumptions, such negotiations occur entirely over price, with quantity fixed at the socially optimal level. However, pharmaceutical companies frequently have supply-side outside options, such as domestic private markets or internationally linked pricing arrangements, which may shift their negotiation strategies and affect access.
Objective:
To examine how outside options—particularly private market profitability and external reference pricing (ERP) policies in international markets—reshape the contract curve in bilateral monopolies and influence both the negotiated price and coverage outcomes.
Methods:
We develop a theoretical model that extends the bilateral monopoly framework to incorporate supply-side outside options. We analytically derive the effects of these options on the negotiation region and contract curve, showing conditions under which negotiations move from price to quantity. We test these insights using empirical data from Australian pricing negotiations (2010–2015), capturing pharmaceutical companies' pitch strategies and government responses across 208 submissions for 77 innovative drug-indication pairs.
Results:
The model demonstrates that a profitable local private market narrows the contract curve and strengthens the supplier's bargaining position. More notably, ERP in international markets can flatten the supply curve, especially when foreign market size is large. This can shift negotiations from price toward restricting quantity, leading to suboptimal access from a welfare perspective. Empirical evidence from Australia supports these predictions. Only 10% of first submissions were accepted, while most successful negotiations involved reduced prices, stricter patient criteria, and price-obscuring mechanisms such as secret rebates or volume-based contracts. These adjustments suggest strategic responses to protect international pricing positions.
Conclusions:
Supply-side outside options, particularly interdependent international pricing, significantly reshape pharmaceutical pricing negotiations in publicly funded health systems. ERP policies may inadvertently reduce access in smaller or lower-income countries by limiting pricing flexibility. To improve global welfare and ensure equitable access, decoupling international price interdependence—via trade negotiations, collective bargaining, or increased use of confidential agreements—should be prioritised. The findings have direct implications for pricing transparency, access to medicines, and the design of pharmaceutical policy in Australia and globally.

## Members Dining Room 2- Valuing Health States and Quality of Life

**The validity of the EQ-HWB for parents of children with health conditions; A mixed-methods study.**

*Cate Bailey, The University of Melbourne*
*Co-authors: P Kim Dalziel; Tessa Peasgood*

Objectives The EQ-HWB is a new, generic instrument developed to assess health, social care, and carer-related quality-of-life (QoL). There is emerging evidence on the EQ-HWB's performance for informal caregivers. Here, we present a mixed-methods study on the validity of the long (25-items) and short (9-items) versions of the instrument in parents of children with health conditions, using qualitative and quantitative methods.
We aimed to 1) investigate the psychometric properties of the EQ-HWB instruments compared to the CarerQol-7D and EQ-5D-5L and 2) assess items in relation to COSMIN attributes of relevance, comprehension and comprehensibility.
Methods: We conducted an online survey of parents of children with health conditions which included demographic and informal care-related questions and comparable QoL measures (CarerQol-7D and EQ-5D-5L) as well as all EQ-HWB (25 items). As a sample frame, we used participants from the Paediatric Multi-instrument Comparison Study who agreed to be contacted for further research. Analysis was conducted at the item, sum-score, and EQ-HWB-S (9 items) utility (pilot UK value-set) levels. Analyses included: response distribution by item, convergent and known-group validity with a priori expectations (Spearman's r, t-tests and one-way ANOVAs) and effect sizes (Cohen's d and eta-squared) compared to the other QoL measures. A short follow-up survey was administered 2-days later for test-retest validity.
Semi-structured, think-aloud interviews were conducted with a subset of 21 participants. We used content analysis to investigate relevance and comprehension across each item. We assessed comprehensiveness through questions on the choice of the 9 items for the EQ-HWB-S and in relation to CarerQol-7D items.
Results We obtained completed surveys at baseline (n=230) and follow-up (n=190). Item responses had a wide distribution, except for the 5 physical items (seeing, hearing, mobility, activities, and self-care) where few problems were reported. Results in the convergent validity analyses were consistent with a priori hypotheses. The EQ-HWB instruments performed well across known groups specific to caregivers such as caregiver intensity, finances, ability to work while caregiving, as well as child factors such as child's mental health and QoL. Test-retest results were promising.
In the interviews, most participants described the items as relevant, except for seeing and hearing. Items were well understood by participants. Some participants based their answers on whether they used the aids mentioned in the examples in the seeing, hearing and mobility questions. Participants found EQ-HWB-S items to be comprehensive.
Conclusions The EQ-HWB instruments performed consistently well in psychometric analyses and in interview responses. These instruments should be high value for future health economic evaluations. An Australian specific value-set would be a valuable future addition.

**Effect of Moonlighting on Subjective Wellbeing of Australians: Exploring the mediating roles of quality time with children and time stress**

*Isaac Koomson, University of Queensland*
*Co-authors: Lauren Ball; Amy Kirkegaard*

Objective: Perinatal depression is highly prevalent and associated with an increase in both direct and indirect healthcare costs. In developed countries, more than 1 in 10 mothers experience perinatal depression. We aimed to quantify the impact of depression on productivity losses over a 6-month period after giving birth.
Methods: Data was collected as part of the PIRIMID cluster randomised control trial. PIRIMID is an electronic clinical decision support system for identifying perinatal depression and facilitating treatment uptake. Postnatal depression was assessed at 8 weeks after giving birth using the Edinburgh Postnatal Depression Scale (EPDS). Women with an EPDS score of 11 or higher were considered as having postnatal depression. Productivity losses (absenteeism, presenteeism and unpaid work) were measured using the iMTA Productivity Cost Questionnaire (iPCQ), collected at 8 weeks, 4 months and 6 months after giving birth, and valued using the human capital method. Missing values were imputed using predictive mean matching with 10 nearest neighbours. The impact of depression on productivity cost was assessed using a two-part model consisting of a logit regression and a generalised linear regression model with a log link and gamma distribution, adjusted for socio-demographic factors. Rubin's rule was used to pool the model parameter estimates.
Results: There were 836 participants in the study, of which 111 were identified as having postnatal depression. Mean productivity costs over the six-month period were AU$2530 and AU$915 for women with and without depression, respectively. Depression was significantly associated with an increase in the risk of having positive productivity cost (odds ratio, 2.7; p-value < 0.001). Married women, those with a high school education, and those with unreported family income were found to be less likely to have positive productivity cost. Conditional on having positive productivity cost, depression was associated with an increase of AU$1681 in productivity cost over the six-month period, adjusted for differences in socio-demographic factors.
Conclusion: This is the first study in Australia that assessed the relationship between depression and productivity loss in women after giving birth. Postnatal depression was associated with a noticeable increase in productivity losses. Our results suggest that productivity losses should also be taken into consideration in economic evaluation of interventions for perinatal depression.

**Development and validation of a bronchiectasis child-specific quality of life instrument: The BC-QoL**

*Jack Roberts, Queensland University of Technology*
*Co-authors: Peter Newcombe, Vikas Goyal, Sanjeewa Kularatna, Steven McPhail, Anne Chang, Julie Marchant*

Background/Aims:
Quality of life (QoL), the highest prioritized outcome rated by patients and parents of children with bronchiectasis, is a patient-reported outcome measure which is increasingly considered essential when evaluating health and interventions. Yet, to date, there are no validated instrument that specifically measures QoL relating to child bronchiectasis. Research question: We aimed to develop and validate a new bronchiectasis child-specific parent-proxy QoL instrument (BC-QoL).
Methods:
A draft 44-item BC-QoL was first developed from: (a) parental responses to questions about the burden of bronchiectasis on their child, themselves, and their family; (b) clinicians' impression of parents' burden; and (c) previous child QoL instruments. This was followed by a prospective cohort study where 143 parents completed the draft BC-QoL, and other measures (cough scores, measures of child and parental QoL) over three-weeks at different phases of their child's illness (stable state, exacerbation and recovery). Responses were analysed using psychometric and clinical impact techniques to reduce the items and determine the instrument' s reliability and validity. Minimally important difference (MID) was calculated
Results:
The final 23-item BC-QoL instrument with its three domains (emotional, physical, social well-being), demonstrated high split half reliability (0.95), Cronbach' s alpha (0.97) and intraclass correlation scores (0.74, 95%CI 0.62, 0.82), and demonstrated evidence of validity and reliability in most tests. It had high and significant ($p < 0.01$) spearman correlations with measures of child and parental health and wellbeing, notably, 0.43, 0.41, 0.47 respectively with the matching emotional, social and physical domains of the PEDSQL4.0. BC-QoL's MID was 0.74-1.32.
Conclusions:
This first bronchiectasis child-specific parent-proxy QoL instrument, BC-QoL is valid, and can be used to help us better understand the burden of bronchiectasis and for clinical research to evaluate the impact and effectiveness of interventions.

**Mapping the Healthy Days instrument to the EQ-5D-5L**

*Nirmali Sivapragasam, Queensland University of Technology*
*Co-authors: David Brain, PhD, Sanjeewa Kularatna, PhD, Sameera Senanayake, PhD, Susan Clemens, MPH, Taku Endo, MBiostat, and Nicole M. White, PhD*

Objectives
The Healthy Days (HD) instrument was developed by the Centers for Disease Control and Prevention for measuring health-related quality of life. It consists of four questions measuring the number of physically and mentally unhealthy days individuals have experienced over the preceding 30 days, activity limitations due to unhealthy days and one's overall perceived general health status. The instrument has been widely used in general population surveys and clinical subgroups; however, it cannot be used to directly estimate quality-adjusted life years for cost-utility analyses. This study develops the first mapping algorithm for estimating EuroQoL 5-Dimension 5-Level (EQ-5D-5L) utilities from HD scores.
Methods
Data for the study was taken from the Queensland Preventive Health Survey (QPHS) for 2022 (N=12,491) and 2023 (N=12,679). The QPHS is an annual population telephone survey conducted among Queenslanders aged 18 years and over. The mapping algorithm was developed using a training dataset comprising a random sample of 80% of utility scores for 2022. The predictive accuracy of the models was internally validated using the remaining 20% of observations for 2022 and externally validated using data for 2023. Direct and indirect mapping functional forms were explored, including ordinary least squares (OLS), Tobit, beta-binomial (BB), minimise-majorize (MM) and ordinal logistic (ologit) regression models. Model performance was assessed based on the root mean square error (RMSE), mean absolute error (MAE), predicted means, fitting across the entire distribution, and by key demographic and health risk indicator subgroups (age, sex, BMI category, tobacco use, alcohol consumption, physical activity and fruit and vegetable consumption).
Results
All models, with the exception of MM, were very close to the observed mean utility score (0.913) in the 2022 estimation sample. The OLS, Tobit and BB models produced the lowest RMSEs (0.113, 0.113 and 0.114) and MAEs (0.064) across the five models. Similar findings were observed in the internal and external validation samples. The OLS, Tobit and BB models produced the lowest RMSEs (0.113) and MAEs (0.065) in the external validation sample. All models performed better among individuals reporting health utilities at the Q2, Q3 and Q4 quartiles, relative to Q1. The OLS, Tobit and ologit models tended to produce estimates that were closest to observed values across age, sex and health risk indicator subgroups for both validation samples.
Conclusions
To the best of our knowledge, this is the first study to develop a mapping algorithm for predicting EQ-5D-5L scores using the HD instrument. Overall, the OLS, Tobit and BB models outperformed other models producing RMSE and MAE estimates of less than 0.12 and 0.07, respectively, across estimation, internal and external validation samples. The mapping algorithms perform well and can be used to estimate health utilities when only HD data is available.

**An Empirical Comparison of the Disability Wellbeing Index and ASCOT in Disability**

*Gozde Aydin, Monash University*
*Co-authors: Samia Badji, Dennis Petrie, Anthony Harris, Gang Chen*

Objectives
Measuring wellbeing is increasingly recognised as essential for informing disability policy and service delivery. The Disability Wellbeing Index (DWI) is a new preference-based outcome measure designed to reflect what matters most to people with disabilities. This study examines the psychometric properties of the DWI and compares it to the established Adult Social Care Outcomes Toolkit (ASCOT), a widely used social care quality of life measure.
Methods
An online voluntary survey was conducted with participants of the Australian National Disability Insurance Scheme (NDIS) aged 15 years and over (n = 1,865) between July and September 2024. The survey included both DWI and ASCOT instruments (available in Plain English and Easy English versions), along with sociodemographic questions. DWI responses were scored using an Australian preference-based algorithm, while ASCOT scores were derived using the ASCOT-SCT4 scoring system with UK weights. Spearman's correlations were used to assess convergence across total scores and related domains. Descriptive statistics were used to compare score distributions. Exploratory factor analysis (EFA) was conducted to explore underlying constructs. Known-group validation was conducted, in a regression framework, regarding a series of prior-determined indicators such as self-rated health, ability to self-advocate, autonomy in free time, and who makes most decisions. To facilitate the comparison between the two instruments, standardised coefficients were used.
Results
Of the 1,865 respondents, 30% were aged 15–24 years, and 29% completed the Easy English version. Mean utility scores were 0.81 (SD = 0.15) for DWI and 0.71 (SD = 0.23) for ASCOT. Correlations between the two measures were moderate among young people (ρ = 0.61 in Easy English; ρ = 0.66 in Plain English) and strong among adults aged 25+ (ρ = 0.74 and 0.75, respectively). Item-level analyses showed the strongest alignment in domains related to social life, safety, and time use, with weaker correlations in areas such as dignity. EFA indicated substantial overlap in underlying constructs. Known-groups validity was supported for both instruments. ASCOT was more responsive to variation in who makes decisions in the respondents' life, while DWI showed greater sensitivity to health-related variation.
Conclusions
This study provides empirical support for the construct validity of both DWI and ASCOT in the disability context. While the two measures are closely aligned, they also capture distinct aspects of wellbeing in their classification system. These findings suggest that DWI and ASCOT may offer complementary insights for use in disability research, evaluation, and policy development. Further research is recommended to examine their performance across different population groups and settings.

## Members Dining Room 3- Economic Evaluation and Cost Effectiveness 2

**Artificial Intelligence (AI), Digital and Virtual Healthcare and Clinical Practice Guidelines (CPGs): Global Lessons in Evaluation, Economics and Best Practice.**

*Kathryn Antioch, Monash University*
*Co-authors: Carl Asche, Angeline Kuek, Symret Singh, Sasan Adibi*

Objectives
To undertake a systematic review of AI, digital and virtual healthcare and CPGs, identifying clinical and economic evaluation issues, best practice, and digital healthcare models to optimize treatment outcomes. We collaborate with the ISPOR Project for the Consolidated Health Economic Evaluation Reporting Standards for Digital Health Interventions (CHEERS-DHI) Working Group on economic evaluation, addressing decision-making tools, ethics and AI applications, economic implications of AI/digital health, and CPG electronic platforms.
Methods
Our PRISMA-ScR protocol is registered on the Open Science Framework, utilizing PUBMED, Medline, EMBASE (1966 to 2024). 137 journal articles were assessed against the Participants, Concept and Context criteria. Methodological rigour of CEA, CUA, CBA studies is graded using scoring criteria from the European Journal of Health Economics, CHEERS 2022 Checklist, CHEERS 2024 Checklist for AI interventions and NICE's CBA Checklist. We also assess study rigour for comparative effectiveness research, multi-criteria decision analysis, social welfare function, social return on investment, and WHO's pandemic economic framework. Grey literature is searched for CPGs/AI organisations.
Results
AI evaluations involving CPGs focused on decision making tools: machine learning, robotics for surgery/rehabilitation, disease prediction modelling, precision medicine (nutrition, psychiatry), medical imaging, biofluid markers, Magnetic Resonance Imaging, disability aids, ethics, data protection. Promising impacts were found for emergency/critical care, tele-dentistry, cancer, cardiology, pain management, COVID-19, diabetes, obstetrics, respiratory medicine, nutrition, psychiatry, and stroke. ChatGPT studies concerned addiction, healthcare research, education, practice, autoimmunity, plastic surgery, advantages, limitations, reliability and ethics. Digital/virtual health evaluations identified lessons for addiction, obesity, interplay of IT infrastructure and physicians' attitudes, Electronic Health Record best practice, health insurance data analysis, hospital waste management, diabetes, angina, COVID-19, hypertension, musculoskeletal conditions, e-prescribing, simulation-based health training and dental care risk factors. Electronic CPG platforms enable live guidelines - MAGICapp: WHO, NICE, Australia, NZ, Europe, Asia and USA.
Conclusion
The findings are assisting the ISPOR CHEERS-DHI Working Group. Technology can be leveraged for cost-effectiveness although limitations, reliability and ethics require investigation. PICOTS-ComTeC (population intervention comparator outcome timing setting communication technology context) evaluation framework enables selecting appropriate comparators for research. Digital/virtual health, and AI impact on optimal treatment outcomes through therapeutic decisions on upstream macro factors in health determinants, and downstream public health interventions via individual treatments.

**Methods to include environmental impacts in a cost-effectiveness analysis: a case-study demonstrating parallel and integrated methods in Australia**

*Rachael Morton, The University of Sydney*

Background
There is growing international interest in considering environmental impacts in health technology assessments, and several economic methods have been proposed in the literature. 'Integrated methods' fully integrate environmental impacts with clinical and financial information into a single metric. 'Parallel methods' present environmental impact data alongside established economic methods. There are limited examples of these methods in Australia. The aim of this study was to demonstrate different methods to include environmental impacts in health economic evaluations. Specifically, we demonstrated parallel and integrated methods to include greenhouse gas (GHG) emissions in a cost-effectiveness analysis of different positron emission tomography (PET)—computed tomography (CT) surveillance schedules for detecting cancer recurrence.
Methods
We used an existing decision analytic cost-effectiveness analysis (CEA) model to explore two different PET/CT surveillance schedules to detect distant recurrence in patients with resected stage III melanoma (12-monthly imaging compared to no routine imaging). The health outcome was distant recurrence correctly diagnosed and treated. Health system costs were presented in 2023 Australian dollars. GHG emissions were identified for each health activity included in imaging strategies. The base case analysis was presented as the healthcare cost per distant recurrence correctly diagnosed and treated; without environmental impacts. We demonstrated parallel methods to, (1) report greenhouse gas emissions alongside the results of the base case, (2) calculate an incremental carbon footprint effectiveness ratio (ICFER), and (3) calculate an incremental carbon footprint cost ratio (ICFCR). We demonstrated an integrated method (4) to include GHG emissions as a monetised cost alongside healthcare costs in the CEA. The results of methods (1) to (4) were compared.
Results
Preliminary results suggest 12-monthly imaging is associated with higher healthcare costs.. In the base-case analysis, the incremental cost effectiveness ratio (ICER) for 12-monthly imaging compared with no routine imaging was $34,462 per recurrence correctly diagnosed and treated. Environmental impacts were observed to be higher with 12-monthly imaging, and these will be presented at the conference. Results of the different methods (1-4) to incorporate environmental impacts, and their effects on decision making, will be presented and discussed at the conference.

**The Value of Further Research and Active Implementation: A Case Study of the Implementation Framework for Cancer Supportive Cancer Care**

*Yufan Wang, University of Queensland*
*Co-authors: Alexandra L. McCarthy, Haitham Tuffaha*

Background: Timely implementation of recommended health interventions can improve patient outcomes and cost savings to the healthcare system. Early decision-making in potential cost-effective interventions is crucial in improving research translation and resource allocation for future implementation initiatives. In Australia, the rising prevalence of cancers is putting a strain on healthcare resources. This is particularly so as increasingly curative but debilitating cancer treatments often result in substantial side-effects that require cancer survivors' further consistent engagement with the healthcare system. Exercise oncology interventions have shown promise in improving the long-term quality-of-life for cancer survivors post-treatment. However, its widespread adoption is hindered by a lack of robust cost-effectiveness evidence and a lag between evidence generation and translation in clinical practice.
Aim: This study reports the application of the Value of Implementation Framework developed by Fenwick et al. to inform decision-making about resource allocation of an exercise oncology intervention for women with gynaecological cancers post-treatment.
Method: A decision-analytic Markov model was built with a 5-year time horizon from an Australian healthcare system perspective to assess the early cost-effectiveness of the proposed intervention and estimate the expected value for further research and implementation efforts. The decision model was populated using existing literature and a Structured Expert Elicitation (SEE) was conducted with 12 healthcare professionals to bridge the paucity of empirical evidence on three crucial model parameters; QoI 1: the relative risk reduction of a cardiovascular disease event from participating in routine exercise for women with early-stage gynaecological cancer; QoI 2: the probability of the uptake of the proposed intervention for clinicians; QoI 3: the probability of the uptake of the proposed intervention for eligible patients. Estimated value of perfect information (EVPI) and perfect implementation (EVPIM) were assessed.
Results: Three beta distributions were elicited from the invited experts; QoI1(Mean: 0.362, SD: 0.15), QoI 2 (Mean: 0.457, SD: 0.218), QoI 3 (Mean: 0.446, SD: 0.203). After incorporating SEE-derived evidence in the Markov model, the base case ICER was AU $2,854 per QALY (95% CI: -10,339, 24,297). For a target population around 23,000, the population-level EVPI was AU $9,846.83, while the EVPIM reached approximately AU $95.824 million.
Conclusion: This is the first study that informs policy decisions on the value of implementation for exercise oncology intervention in Australia. Exercise intervention for this cancer population is highly cost-effective. Given the low EVPI and high EVPIM, there is limited value in investing further research in this field and investment towards national implementation of the proposed intervention is likely to be worthwhile.

**Cost-Effectiveness of Circulating Tumour-Derived Methylated DNA Markers for Stage II Colon Cancer Surveillance Post-Resection**

*Maame Esi Woode, Monash University*
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Objectives: Colorectal cancer (CRC) is the fourth most common cancer in Australia. A common treatment of CRC involves surgical resection of part of the colon and surrounding areas (including tissue and lymph nodes) affected by the disease. This is followed by a period of surveillance where tests are used monitor for disease recurrence. The most common surveillance plan includes the use of the carcinoembryonic antigen (CEA) test in combination with a physical examination, colonoscopy and CT scans. Stage II CRC patients are not typically given adjuvant chemotherapy, yet some still have disease recurrence. There is A need to understand which patients are likely to benefit from adjuvant chemotherapy and the use of non-invasive biomarkers has been proposed as a means of achieving this goal. This has called to the embedding of biomarker surveillance within the current protocols for CRC prognostication and surveillance to allow for early detection of recurrence and resection when lesions are treatable. The aim of this study is to evaluate the cost-effectiveness of this proposal.
Methods: A Markov decision analytic model was used to estimate the costs, effectiveness (measured by using quality-adjusted life years, QALYs) and the incremental cost-effectiveness of using methylated circulating tumour DNA (ctDNA) blood test for prognostic and surveillance of the recurrence of colorectal cancer after surgical resection. The model followed a hypothetical cohort of patients clinically diagnosed with stage II CRC who have undergone curative resection. Follow-up surveillance is assumed to start after the 6-week post-operative check and to continue over a period of 5 years post-resection. In the case where recurrence was detected, the patient was assumed to either go through resection or to remain alive with recurrence until they progress to palliative care. Two types of mortality were considered within the model, CRC-related mortality and all-cause mortality. Utilities, diagnostic accuracy and costs were derived from published relevant literature. The main outcome of interest was the incremental cost effectiveness ratio (ICER).
Results: Using ctDNA as a biomarker test for surveillance of CRC recurrence instead of CEA led to an ICER of AU$ 59,364 per QALY gained. Sensitivity analysis indicated that ctDNA and colonoscopy sensitivity, as well as the percentage of patients eligible for resection after CRC recurrence were important determinants of cost-effectiveness.
Conclusion: Findings indicate that the use of ctDNA biomarkers for CRC surveillance post-resection for stage II CRC can be cost-effective if the sensitivity of the biomarker test is high enough.

**Real-World Impact of Publicly Funded Atezolizumab for Advanced Small Cell Lung Cancer: Insights from the Victorian Lung Cancer Registry**

*Jing Jing Li, Monash University*
*Co-authors: Bianca Devitt, Rainier Arnolda, Dennis Petrie, Margaret Brand, John Zalcberg, Udani Himalsha and Robert Stirling*

Background
Atezolizumab combined with platinum/etoposide chemotherapy was publicly funded in Australia in March 2020 for extensive small cell lung cancer (ESCLC). We aimed to evaluate the impact on treatment patterns and overall survival (OS) outcomes following its public funding using the Victorian Lung Cancer Registry (VLCR).
Methods
Patients diagnosed with ESCLC between 2012 - 2022 in the VLCR were included. Logistic regression assessed associations between receipt of systemic treatment pre and post funding while controlling for clinical factors. OS in treated patients pre-funding in historical controls (HC), 2012-2018) and post-funding (PF) after February 2020 was assessed using Kaplan-Meir curves. Several matching approaches were used to estimate the causal effect of treatment on survival. HC patients were then weighted to match PF cohort using inverse probability weights (IPW). PF patients not treated with atezolizumab were matched to HC using coarsened exact matching and then removed from the HC.
Results
974 patients were diagnosed with SCLC, 78% received systemic treatment with no difference in treatment rates pre and post funding (p=0.49). Age, ECOG status, and early mortality (≤90 days) were similar between groups (p>0.05). After March 2020, treated patients were more likely to have ≥1 comorbidity (OR 1.8, 95% CI 1.28–2.55, p<0.001) and less likely to receive radiotherapy (HR 0.72, 95% CI 0.52–0.99, p=0.05). 204/261 (78%) of treated patients received atezolizumab and chemotherapy. After IPW, PF patients remained less likely to receive radiotherapy (41% vs 52%, p=0.01), but other baseline characteristics were balanced (p >0.2). OS in all treated patients was 9.2 months PF and 9.6 months HC (HR 0.94, 95% CI 0.75-1.20, p=0.62). PF Individuals who survived > 12 months had a lower rate of death compared to HC (HR 0.42, CI 0.22-0.81, p=0.01).
Conclusions
Public funding of atezolizumab did not increase treatment rates but may have expanded use to patients with more comorbidities and reduced radiotherapy use. OS was not significantly improved with the introduction of atezolizumab but may have reduced the rate of death in those who lived more than 12 months.

## Private Dining Room- Health Preference Research 1

### Preferences of Women for maternal healthcare services use in Central Sidama, Ethiopia: Discrete Choice Experiment

*Daniel Belay, Curtin University*

Background: Maternal healthcare services provided by skilled health professionals before, during, and after childbirth can save the lives of women and newborns. However, women in resource-limited countries have a lower uptake of these services. To improve the uptake rate and meet consumer expectations, it is important to understand client preferences. This study assessed women's stated preferences for maternal health services in Central Sidama, Ethiopia.
Methods: A multi-stage sampling technique was used to select reproductive-aged women (15-49 years) from the Central Sidama Zone, Ethiopia. The discrete choice experiment (DCE) contained six attributes: health provider attitude, availability of medication and supplies, distance, privacy, waiting times and cost of service. Each woman was randomly assigned to one of the three maternal health services: Antenatal care (ANC) service, health facility childbirth, and postnatal care (PNC) services and asked for 13 choice tasks. The preferences, the relative importance of attributes, acceptability, and sub-group analysis based on sociodemographic characteristics were assessed.
Result: Among 1641 women who were invited to the study, while 1598 women responded to all DCE choice tasks, 1628 women responded to at least one choice task. The high cost (7500 ETB, approximately US$57) was a key negative driver of choice for ANC services, health facility childbirth and PNC services. Lack of medication and supplies for ANC service (β: -1.29; SE: 0.06), health facility childbirth (β: -0.93; SE: 0.06) and PNC services (β: -1.29 SE: 0.07). Long waiting time (24 hours) for health facility childbirth (β: -1.33; SE: 0.07), followed by PNC service (β: -0.92; SE: 0.06) and ANC service (β: -0.91; SE: 0.58). The predicted uptake of maternal health services in the ideal scenario was 97.8% for health facility childbirth services, 97.9% for ANC services and 98.4% for PNC services. Urban women relatively prioritised medication availability, while rural women preferred lower costs and shorter wait times. Women with at least a secondary education have less preference for services lacking medication, requiring long travel, or long wait times, whereas less-educated women prioritise affordability.
Conclusion: The cost of service and availability of medication and supplies were the most important attributes for ANC and PNC service preferences while waiting time and cost of services were the key considerations for health facility childbirth. Sociodemographic factors such as age, residence, education, and setting interact with the preferences of women for maternal health services. The findings will serve as valuable input for policymakers and guide future research on maternal health services.

**Brushing Up on Preferences: An incentivised DCE on Transitioning the Dental Market to Medicare**

*Jack McLaughlin, Monash University*
*Co-authors: Duncan Mortimer, Lata Gangadharan*

Objective: Dental markets in many developed countries are predominantly private, while other healthcare sectors in the same systems operate under mixed public-private (MPP) models. The transition of dental care from private to MPP markets remains understudied, particularly in terms of modelling agent behaviour. Public market features—such as the potential absence of out-of-pocket costs—enable provider behaviours like altruism, which are less observable in fully private markets and can lead to different market equilibria than those predicted by standard economic theory. Although physician altruism and dual practice have been extensively examined, little research has focused on behavioural models for dentists. Patient and provider preferences are also heterogeneous, and understanding these dynamics is essential for assessing policy changes. In Australia, the inclusion of dental services in Medicare is frequently debated during election cycles. Insight into how such a shift would affect the behaviour of both providers and consumers is critical to informing this policy debate.

Methodology: We developed a between-subject, incentivised market experiment simulating the interactions between dentists and consumers in a dental care system. The experiment was implemented in oTree and conducted online with a representative Australian sample (n=1,200). Participants were randomly assigned to the role of dentist or consumer and completed series of eight choices between a suite of carefully constructed profiles, followed by a willingness-to-pay (or -accept) question for their chosen option. Choices were incentivised through a matching mechanism to encourage truthful valuation. We analysed the data using mixed multinomial logit models to identify preferences for specific attributes and conducted latent class analysis to capture heterogeneity within both groups. Additionally, we employed a novel two-step method for eliciting WTP, rather than inferring it from model coefficients as is common in DCE literature.

Results: We identified key attributes influencing dentist and consumer selection in MPP contexts and revealed distinct preference segments within each group. The analysis also highlights how dentist preferences vary between the current private market and a hypothetical MPP system (i.e., Medicare-funded dental services), offering insight into the prevalence of altruistic behaviour. Finally, we analysed WTP and WTA data to determine the most influential factors driving valuations. These findings contribute to a deeper understanding of demand and supply-side preferences in the proposed expansion of Medicare to include dental care, informing both academic literature and policy formulation.

**The Relative Importance of Key Life Domains for People with Disability: Findings from a cross-sectional survey of NDIS participants in Australia**

*Samia Badji, Monash University*
*Co-authors: Gang Chen, Dennis Petrie, Anthony Harris*

Purpose
This study investigates the relative importance for people with disability of key life domains and whether this differs between younger (15-24) and older people (25 and over).
Methods
A cross-sectional survey was conducted from 20 October to 31 December 2022 with National Disability Insurance Scheme (NDIS) participants asked to rank eight domains: Choice and control, Daily living, Relationships, Home, Health and wellbeing, Lifelong learning, Work, Social, community and civic participation. A subjective wellbeing module asked participants to rate their satisfaction and the importance of items that relate to the previous eight domains. These items ratings were then used to validate the domain rankings. Based on a random utility framework, the data were analysed based on a ranked-ordered logit model to estimate preference shares for the order of preferences across domains.
Results
Our sample consisted of 1,140 NDIS participants. While the majority ranked the domains as equally important, answers from the rating module suggested otherwise. Adjustments for these differences lead to similar results with both age cohorts ranking Health and Wellbeing, Home and Daily living as the most important domains. These were followed by Relationships, Choice and control, Social, Community & civic participation, Lifelong learning, and Work for younger people. For older people the importance order between the Choice & Control and Relationships was switched.
Conclusion
Our results revealed similarity between what younger and older people perceive as important and despite often receiving a fair share of policy attention, work was seen, on average, as the least important life domain.

**Using Discrete Choice Experiments to Enhance Economic Evaluation Modelling: The Case of Oral Contraceptive Pills Reclassification**

*Zobaida Ahmed Piu, Macquarie University*
*Co-authors: Bonny Parkinson, Yuanyuan Gu, Kompal Sinha*

Background and objectives: Ex-ante economic evaluation of policy changes often involves modelling, as it is hard to trial system-wide changes. In many models, uptake is assumed, which may limit accuracy. Policies that restrict choice also have welfare impacts, although this impact is rarely considered. Our study aimed to incorporate both behaviourally informed switch rate (or uptake) and welfare estimates together within a single economic framework and demonstrate the strength of this approach in assessing the impact of different policy configurations. We considered the reclassification of prescription-only oral contraceptive pills (OCPs) to being available over-the-counter (OTC) at pharmacies as a case study.
Methodology: A discrete choice experiment (DCE) was completed by 904 respondents using different contraceptive methods. The survey incorporated five attributes: access method, provider training, ability to discuss other health issues, annual consultation time, and cost. OTC OCP uptake and the compensating variation (CV) were estimated from the DCE results and were integrated into an established economic model. Scenario analysis was conducted on different policy configurations. The best-case scenario was when pharmacists were additionally trained on contraceptives, OCPs were subsidized, and there was privacy in the pharmacy settings for consultation.
Results: The results showed that condom users had the highest switch rate (52.8%), followed by users of less effective contraceptive methods (40.3%) and OCP users (24.2%) in the best-case scenario. Positive CVs across all groups ($155.27, $122.28, and $83.67, respectively) suggest a net welfare gain from expanded access, with condom users having the highest CV. Incorporating the estimated switch rates and CVs into the economic model, the best-case reclassification scenario produced 85.72 million quality-adjusted life years (QALYs) at a total cost of $41,378.97 million over 35 years, compared to 85.70 million QALYs and a total cost of $46,910.14 million in the originally established model. Inclusion of CV increased the cost-saving estimate by up to 27.21%, without altering health outcomes. The best-case scenario was the most cost-effective scenario.
Conclusion: The findings demonstrate the value of integrating DCE data into health policy evaluation in terms of improving the accuracy of ex-ante modelling, understanding the welfare impact of restricting choice, and identifying the most cost-effective policy configurations for policymakers. They also reinforce existing estimates of the cost-effectiveness of expanding OTC access to OCPs.

**Learning Preference Heterogeneity in Discrete Choice Experiments: A Machine Learning Approach with Unbiased Inference**

*Meimei Chen, Macquarie University*
*Co-authors: Yuanyuan Gu, Henry Cutler*

Background Discrete Choice Experiments (DCEs) are widely used in health economics to assess preferences for healthcare interventions. Modelling preference heterogeneity is essential for precision healthcare and equitable policy, but the commonly used mixed logit models rely on strong parametric assumptions and pre-specified utility functions, which may cause misspecification. While machine learning (ML) methods offer greater flexibility and have seen success in other fields, their limited interpretability and potential bias in key estimates have restricted their use in policy-relevant health economic research.
Objective We propose a econometric framework that integrates ML techniques to flexibly model unknown preference heterogeneity, while retaining the interpretability and statistical rigor needed for policy-relevant health economic inference. Specifically, our approach (i) uses ML to capture complex, non-parametric patterns of unobserved heterogeneity, (ii) enhances predictive accuracy without sacrificing interpretability of main parameters, and (iii) ensures that coefficients related to observed heterogeneity remain asymptotically unbiased and suitable for standard economic interpretation and hypothesis testing.
Methods Our approach is semiparametric: the main parameters of interest, including attribute coefficients and their interactions with key personal characteristics, are estimated directly to explore preference heterogeneity. Other interactions involving less policy-relevant characteristics are treated as nuisance parameters and estimated using ML methods. Cross-fitting is employed to eliminate ML-induced bias, and practical estimation is conducted via the method of moments using an orthogonal score function to maintain desirable asymptotic properties. We assess our framework with (i) a Monte Carlo study comparing it to mixed logit models on negative log-likelihood, coefficient bias, and prediction accuracy, and (ii) an application to a real-world DCE dataset on value-based healthcare preferences with over 20 individual characteristics. We examine heterogeneity across age, gender, and socioeconomic groups, and compare model results on individual-level parameter recovery and predictive performance.
Results Simulations show our method accurately recovers underlying preferences and achieves predictive accuracy close to the true model. In empirical analysis, our framework outperforms the mixed logit model in prediction and reveals more detailed heterogeneity. Theoretical properties of the estimator are formally established.
Conclusion We introduce an integrated ML and econometric framework for DCEs that flexibly captures complex preference heterogeneity while maintaining interpretability and unbiased estimation of key parameters. Our approach improves predictive accuracy, reveals richer heterogeneity, and strengthens the policy relevance of health economic analyses, supporting more informed and equitable decision-making.

## Private Dining Room 2- Healthy and inequality

### Exploring Mental Health Inequalities by Gender Identity and Sexual Orientation in Australia

*Hua Ma, Monash University*
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Introduction: Individuals in sexual and gender minority (SGM) groups face challenges such as social stigma, discrimination and barriers to health care which may result in worse mental health outcomes. This paper explores the mental health disparities between the SGM and non-SGM populations, and between sexual minority and transgender populations.
Method: This study uses the cross-sectional data from the National Study of Mental Health and Wellbeing 2020-2022. Self-identified SGM status was used as exposure. Outcomes include Kessler Psychological Distress Scale (K10) categories, the summary score of the World Health Organisation Disability Assessment Schedule 2.0, mental disorders, and subthreshold mental disorders. We first estimate the weighted prevalence of the mental disorders, then use multi-level logistic regressions and generalise linear models adjusted for age, income, indigenous status, marital status, country of birth, education, labour force status and accessibility and remoteness index to examine the association between SGM status and mental health outcomes.
Results: Compared to the non-SGM group, individuals who are either cisgender sexual minorities or transgender have higher odds of experiencing moderate (OR_ cis and sexual minority =1.904, se=0.261; OR_transgender=1.191, se= 0.247) or high (OR_ cis and sexual minority =3.568, SE=0.496; OR_transgender=1.823, 0.388) levels of psychological distress than low distress. The results also show that SGM populations have a higher WHODAS summary score indicating worse disability (b_cix and sexual minority=1.111, se=0.017; b_transgender=1.087, se=0.027). These two groups also have higher odds of reporting having any mental disorder or mental disorder combinations (OR_ cis and sexual minority =2.961, se=0.364; OR_transgender=2.080,se= 0.406). However, compared to non-SGM population, the cisgender and sexual minority population have lower odds of experiencing subthreshold mental disorder (OR=0.538, se=0.109).
Conclusion: Compared to the non-SGM population, SGM groups consistently present poorer mental health outcomes. What's more, the disparities appear more pronounced among cisgender sexual minority individuals than among transgender individuals. These findings suggest that policymakers should consider tailored interventions for each subgroup to effectively prevent and treat mental disorders, despite some overlapping experiences between the two groups. Additionally, the lower prevalence/odds of subthreshold mental disorders among cisgender sexual minority individuals may indicate that this group is more likely to be diagnosed with a mental disorder without progressing through a subthreshold phase. This emphasises the importance of early intervention strategies for this population.

**Inequities in Accessing the NDIS Among People with Severe Disability: A National Data Linkage Analysis**

*Firew Bobo, University of Sydney*
*Co-authors: Jade Chang, Ivy Yen, Joel Hollier, Jennifer Smith-Merry*

Background: Equitable access to support services is essential for improving outcomes among people with severe disabilities. The NDIS was introduced to provide needs-based funding; however, emerging evidence points to disparities in access. This study investigates the influence of socioeconomic and demographic factors on NDIS participation among Australians with severe or profound disabilities.
Methods: We linked 2021 Australian Census records with administrative data on NDIS participation in the Person-Level Integrated Data Asset (PLIDA). Disability status was defined using Census items consistent with the "severe or profound core-activity limitation" measure. NDIS access rates were estimated overall and stratified by sex, age group, remoteness category, and income quintile.
Results: Overall, we identified 1,464,416 people with severe or profound disability in the 2021 Census. After excluding individuals over 65, the sample included 646,903 people with severe or profound disability, of whom 45.0% had accessed NDIS supports. Men had a 7.8% higher prevalence of severe disability compared to women and were 12.0 percentage points more likely to access the NDIS. Access decreased significantly with age, creating a 58.4 percentage-point difference between the youngest (0–9 years) and oldest (60–65 years) age groups. People in very remote areas accessed NDIS 12.0 percentage points less than those in major cities. Lower-income families faced higher disability rates but had NDIS access 15.2 percentage points lower than wealthier families.
Conclusions: Substantial inequities exist in NDIS participation, disproportionately affecting women, older adults, residents of remote regions, and lower-income households. Policy measures should address barriers to scheme entry to ensure that supports align with both need and equity objectives.

**Place-based inequalities in mental healthcare utilisation and cost in Australia**

*Jonas Fooken, Macquarie University*
*Co-authors: Dandan Yu, Henry Cutler*

We study place-based inequalities in the use and cost of mental healthcare across New South Wales using data from the Person Level Integrated Data Asset (PLIDA) to determine the extent to which area remoteness was associated with disparities in the use of mental health-related pharmaceuticals and services funded through Medicare. We focus on mental health-related pharmaceuticals listed under the Pharmaceutical Benefits Scheme (PBS) and services listed under the Medicare Benefits Schedule (MBS). While prices and co-payments are regulated, the availability of healthcare and the financial burden faced by individuals may vary by remoteness of areas, where both population characteristics and access to care differ from those in major cities.

We find that the use of mental health-related pharmaceuticals and services decreases with increasing remoteness before and after controlling for socioeconomic characteristics, supply-side factors, health status, and preferences, indicating the presence of place-based inequities in mental healthcare utilisation. The differences were particularly pronounced for mental health services, as residents in inner regional, outer regional, and remote or very remote areas used approximately 9.9%, 38.7%, and 39.4% fewer mental health services than those in major cities. For pharmaceuticals, residents in inner and outer regional areas used approximately 5.0% and 16.8% fewer prescriptions, respectively, while the difference between major cities and remote or very remote areas was not statistically significant.

Although the use of mental health-related medications and services was generally lower outside major cities, the share of income spent on such care did not vary significantly by remoteness after controlling for important covariates. This suggests that affordability may be a barrier to mental healthcare for residents in more remote areas. Moreover, we find no evidence that provider supply drives observed inequities. While a greater number of mental health-related service providers was associated with higher pharmaceutical use, accounting for supply-side factors did not alter the gradient by remoteness. This points to broader structural or financial barriers beyond provider availability.

**Examining Socioeconomic Inequities in Public and Private Hospital Costs for Eating Disorders: Linked Data Analysis from Queensland, Australia**

*Moin Ahmed, University of Sydney*
*Co-authors: Morgan Sidari, Amy Hannigan, Tania Withington, Salvatore Catania, Michelle Boyd, Warren Ward, Jane Miskovic-Wheatley, Natasha Nassar, Stephen Touyz, Sarah Maguire and Michelle Cunich*

Background: Australia's universal healthcare system is intended to ensure equitable access to healthcare based on need. However, whether individuals with eating disorders (EDs) experience equity in both public and private hospital settings is yet to be assessed. This study investigates the extent, trends, and determinants of socioeconomic inequity in hospital care costs for people with EDs in Queensland (QLD), Australia.

Methods: QLD Hospital Admitted Patient Data Collection, Emergency Data Collection, and Consumer Integrated Mental Health Application data from 2013 to 2019 were utilised to investigate the inequity in healthcare costs. The outcome variables were inpatient public and private hospital admission costs, and public emergency department visit costs. We applied a horizontal inequity (HI) approach to assess inequity in hospital and emergency department visit costs, using the Socio-Economic Indexes for Areas Index of Relative Socioeconomic Advantage and Disadvantage as the socioeconomic status (SES)/ rank variable. Age, sex, duration of ED, and comorbid psychiatric and medical conditions were modelled as 'need' variables; SES, remoteness, country of birth, and marital status were treated as 'non-need' variables. Two-part regression models were estimated to need-standardise the calculation of HI indices.

Results: There was significant socioeconomic inequity in public hospital costs in 2013 and 2017, which indicates that utilisation was concentrated among individuals from higher SES for those years. HI indices for private hospital costs were positive throughout 2014 to 19, which suggests a persistent pro-rich inequity in private hospital use. On the other hand, emergency department visit costs were concentrated among individuals from lower SES during 2013 to19 in QLD. Over time, the magnitude of inequity reduced slightly (from -0.08 in 2014 to -0.05 in 2019), indicating a potential narrowing of pro-poor utilisation.

**Recent Decision-Making in Reimbursement of Medicines in Australia: Insights for a Qualitative Values Framework**

*Dominic Tilden, THEMA Consulting*
*Co-authors: Mia Ratkovic;*

Background: To improve the evaluation and listing of health interventions, the Australian Government recently undertook a review of Health Technology Assessment (HTA) policies and methods. The review aimed to enhance decision-making processes with a key recommendation including developing an explicit qualitative values framework (Recommendation 26). The framework proposed publishing explicit guidance about the elements (beyond clinical effectiveness, cost-effectiveness and financial impact) that have an impact on decision-making and how they are considered given the current guidelines lack transparency.
Objective: To analyse recent funding decisions to understand the elements (including and beyond clinical effectiveness, cost-effectiveness and financial impact) that influence decision-making for the reimbursement of new medicines on the PBS in Australia.
Methods: Public Summary Documents for PBAC decisions were used to capture different characteristics of submissions and investigate the relationship between submission elements – such as the ICER, financial impact, disease rarity and severity, number of consumer comments and previous consideration – and the likelihood of a positive recommendation for public funding. The probability of recommending a medicine for funding was estimated using multivariate probit regression models. All submissions to the PBAC between March 2020 and November 2024 (n=878) if the PBAC decision relied upon a cost-utility analysis (42%, n=367) were considered.
Results: Of the 367 cost-utility analyses, 40% were successful in receiving a positive recommendation. 44% of the cost-utility were for rare conditions, while 40% were for life-threatening conditions. A total of 191 submissions were previously considered by the PBAC (52%).
Expectedly, the ICER ($p<0.01$) and cumulative government costs ($p<0.01$) were found to be statistically significant factors influencing the listing of medicines in Australia. Interestingly however, rarity of disease ($p<0.05$), whether the drug is already PBS-listed for another indication ($p<0.01$), economic model validity ($p<0.001$) and previously considered submissions ($p<0.001$) were also found to be statistically significant factors influencing the listing of medicines in Australia. Other factors such as relevance of evidence, number of consumer comments and whether the submission was for a paediatric population were collected, however were found to be insignificant.
Conclusions: This study confirms that there are explicit elements beyond clinical effectiveness, cost-effectiveness and financial impact that impact on decision-making of medicines, including disease rarity, previous PBS-listing in another indication, and model validity. Understanding these factors directly contributes to the ongoing HTA Review by informing the framework (see Recommendation 26.e) and supporting the development of transparent value assessment frameworks that align more closely with current decision-making practices.

## Parallel Session 3: Day 2-9.00-10.20

## Members Dining Room 1- Organised Session: Integrating digital health: What digital health means for patients, providers, and payers

### Are Complex Trials Worth the Effort? A Cost-Effectiveness Analysis of an AI-Adaptive, Multi-Arm, Group-Sequential Trial of a Smartphone App for Student Mental Health

*Alicia Norman, Macquarie University*
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Background:
Complex trial designs are increasingly used to address limitations of traditional randomised controlled trials (RCTs). The Vibe Up trial evaluated 3 smartphone-based interventions (mindfulness, physical activity, and sleep hygiene) versus an active control (ecological momentary assessment) in students. An artificial intelligence (AI)-adaptive, multi-arm, group-sequential design with a bandit algorithm informed treatment allocation through sequential 'mini-trials'. Theoretically, this design can improve efficacy estimates with fewer patients. This study aimed to: 1) assess the interventions' cost-effectiveness, 2) estimate the value of conducting the Vibe Up trial ex-ante compared to a traditional RCT, and 3) estimate the reduction in uncertainty ex post compared to a traditional RCT.
Methods:
Fixed and research costs were estimated using process maps for the Vibe Up trial and traditional RCT, with time task estimates. A within-trial analysis estimated the cost-effectiveness of the interventions. App usage was logged daily. Mental healthcare resource use and productivity impacts were collected prospectively via questionnaires. Health outcomes were measured using the Depression, Anxiety and Stress Scale - 21 Items (DASS-21) and the Recovering Quality of Life 10, with QALYs estimated using the area-under-the-curve method. Missing data were imputed using mapping and multiple imputation with chained equations. Incremental cost-effectiveness ratios (ICER) were reported (cost/QALY gained). Value of information (VOI) analysis estimated the ex-ante and ex-post value of further research, with published parameter estimates informing the ex-ante analysis.
Results:
Trial recruitment was not stopped early, and so no cost savings were realised. Thus, the Vibe Up trial cost $2,444 more than a traditional RCT due to interim analysis costs. All interventions improved depression, stress and anxiety over control, and increased QALYs. Sleep hygiene and physical activity were cost-saving from healthcare and societal perspectives; mindfulness increased costs. Differences were not statistically significant. Physical activity was more likely to be cost-effective compared to the other interventions. The EVPI was high for both the Vibe Up trial and for a hypothetical traditional RCT. The ex-ante analysis is ongoing.
Conclusions:
The Vibe Up trial was more expensive than a traditional RCT, as the sample size was similar. The short follow-up and high levels of missing data contributed to uncertain cost-effectiveness estimates, resulting in high EVPI. Further research using other trials is needed to better evaluate the value of complex trial designs. This analysis provides insight into some of the issues that might arise during trial-based economic analyses, particularly with respect to aggregation, and how this could be considered alongside trial design.

**Preferences for adopting artificial intelligence in radiation therapy treatment: A discrete choice experiment**

*Milena, Lewandowska, Centre for Health Economics Research and Evaluation, University of Technology Sydney*
*Co-authors: Deborah, Street, CHERE, UTS; Rosalie, Viney, CHERE, UTS; Jackie, Yim, CHERE, UTS and Radiation Oncology, Royal North Shore Hospital; Scott, Jones, Radiation Oncology Princess Alexandra Hospital Raymond Terrace*

Objectives:
The integration of artificial intelligence (AI) in radiation therapy offers significant potential to enhance cancer care by improving diagnostic accuracy, streamlining workflows, and reducing treatment delays. However, the adoption of AI in clinical settings depends heavily on its acceptability, shaped by perceptions of accuracy, cost, efficiency, and ethical considerations. This study explores the preferences of the Australian general population regarding the features of AI systems in radiation therapy.
Methods:
A discrete choice experiment (DCE) was conducted with 533 respondents, who were representative of the Australian population. Participants were presented with hypothetical scenarios comparing AI systems described by attributes including accuracy, decision-making autonomy, impact on out-of-pocket costs, treatment timelines, and data privacy. Preferences were analysed using mixed logit and latent class models to evaluate heterogeneity and willingness-to-pay for AI system attributes.
Results:
Respondents preferred AI systems with enhanced accuracy and reduced treatment delays. Systems less likely to misclassify tissues were highly valued, while fully autonomous AI systems were less favoured compared to assistive systems requiring clinician oversight. Data privacy concerns varied, with some participants prioritizing consent-based data usage. Heterogeneity analysis revealed four distinct preference classes, highlighting trade-offs between cost, speed, and ethical considerations. Willingness-to-pay estimates underscored the importance of balancing accuracy with affordability.
Conclusions:
This study provides important information about Australian general public preferences for AI in treatment planning. The findings from this study can be used to inform future research on economic evaluations and management perspectives of AI-driven technologies in radiation therapy.

**The Economic Impact of Telemedicine Uptake on General Practitioners in Australia**

*Susan J., Mendez, University of Melbourne*
*Co-authors: Paul Amores, Australian National University; Daniel, Avdic, University of Technology Sydney; Bishal Kumar Chalise, Deakin University;*

Background:
The COVID-19 pandemic prompted rapid diffusion remotely provided telemedicine consultations that has profoundly reshaped healthcare delivery, financing, and market dynamics structures in primary care. While existing research has explored the impact of telemedicine on healthcare access and quality, few studies have addressed its impact on general practitioners' financial and economic outcomes in a system with managed competition. This study fills a critical gap in understanding telemedicine's broader implications in primary care in a market setting where doctors prices are not directly regulated. This study investigates the impact of telemedicine adoption on GP consultation patterns, billing practices, and costs to patients in Australia.
Methods:
The study uses detailed survey data from GPs (MABEL) linked to administrative records of their service provision from the Medicare Benefit Schedule (MBS) and Pharmaceutical Benefit Scheme (PBS). To address doctors' potentially endogenous decisions to adopt telemedicine, we adopt an instrumental variables approach where telemedicine uptake in each local area is instrumented by changes in physical mobility from Google mobility data.
Results:
Our findings suggest that the degree of telemedicine uptake does not change the number of services physicians provide but increases fees for both face-to-face and telemedicine consultations. While the increased costs of face-to-face consultations are largely passed on to patients in terms of higher out-of-pocket costs, the higher price of telemedicine services is mainly subsidised by the government.
Conclusions:
Telemedicine adoption influences not only service delivery models but also the economic dynamics within primary care. Our results suggest that telemedicine uptake is associated with higher prices but not necessarily higher quality or access. Further analysis is required to study the specific market channels underlying these results, including competition for patients and service differentiation.

**Budget impact analysis of remote patient monitoring for chronic disease**

*Portia Y., Cornell, Centre for the Digital Transformation of Health and the Centre for Health Policy, University of Melbourne*
*Co-authors: MR Angeles; S Robinson;*

Objectives:
Remote patient monitoring (RPM) for chronic conditions such as heart failure and lung disease is effective in improving clinical outcomes, quality of life, and is cost-effective. In Australia's rural and regional health services, costs of RPM implementation are borne by local health services, while cost offsets from foregone or shortened hospital admissions accrue to the state or federal health systems. The cost-effectiveness and budget impact of RPM may be sensitive to the program design, implementation costs, assumptions of effectiveness, and perspective of the analysis. For decision makers to accurately assess the value of investing in RPM programs, they need information about not only the expected cost-effectiveness of an investment, but the impact on local budgets. Health services have used different strategies to fund the devices, training, and data monitoring required RPM program--some rely on payments for chronic disease management, others on activity-based costing for hospital outpatient care for visit, and still others on Medicare payments for specialist care resulting from data alerts. In this research, we analyze the budget impact of a generalized, hypothetical RPM program for patients with heart failure, from the perspective of an Australian health service.
Methods:
We constructed scenario analyses from a structured desktop review of international evidence on effectiveness of RPM programs. We created a budget-impact costing tool to aid in program design and planning and reviewed assumptions through key informant interviews with hospital staff.
Results:
Even when interventions are cost-effectiveness from a health system perspective, budget neutrality from the hospital perspective may be sensitive to payment schemes such as reimbursement for data monitoring activities.
Conclusions:
Australian states may need to consider payment design to promote local investment in cost effective disease management.

## Members Dining Room 2 Organised Session: Value of population-wide genomic risk assessment for risk-based cancer screening: evidence from discrete choice experiments (DCEs) and linked health economic simulation models

### Community preferences for population-wide genomic risk stratification (using polygenic risk scores) and risk-tailored cancer screening

*Julia Steinberg, The University of Sydney*
*Co-authors: Amber Salisbury, Richard Norman, Amelia K. Smit, Cynthia Low, Michael Caruana, Karen Canfell, Anne E. Cust, Louisa Collins, Alison Pearce*

Background:
Genomic testing (for "polygenic risk scores") can provide information on individuals' risk of cancer, presenting an opportunity for risk-tailored cancer screening. Potential programs consist of several stages: decision to take the genomic test, risk assessment (test itself and return of results), and subsequent cancer screening. Public preferences for program features at each stage can influence a program's uptake, and therefore effectiveness.
Aims:
(1) To quantify Australian general population preferences for features of genomics-informed risk tailored screening; (2) To assess heterogeneity of preferences.
Methods:
Three online discrete choice experiments (DCEs) were conducted focusing separately on each stage of the process. General population participants recruited through an online panel were presented with 12 choice tasks, each displaying two alternatives. For the DCEs around risk assessment and screening, a two-stage optout was also included. Results were analysed using conditional logit, mixed logit and latent class models, as well as willingness to pay (WTP) and uptake rates.
Results:
For the initial genomic test (n=821), few attributes were significant, with the strongest preference for comprehensive tests including multiple cancers and other serious diseases ($p<0.01$), rather than a single-cancer test.
For risk assessment (n=801), participants preferred more comprehensive testing, results including advice on non-genomic risk factors, and genomic analysis by a government health department (vs. international company). Some preferences were particularly strong, with WTP of $168 for a comprehensive multi-disease test (versus single-cancer test), and $140 to avoid opting out of testing. Those with negative attitudes towards genomics were more likely to opt-out ($p<0.01$) and indicate concerns about genomic data storage ($p<0.05$).
At the screening stage (n=921), participants showed strong preferences for more comprehensive testing ($p<0.001$). Preferences regarding how genomic test results should influence screening recommendations varied according to genomic knowledge, attitudes, and income.
Conclusions:
This study suggests the public would be interested in genomic risk assessment, with strong preferences for more comprehensive tests. This study examined conceptual preferences around cancer screening; further research could examine how presenting cancer-specific information (e.g. on screening harms) influences preferences for risk-based screening strategies.

**Risk in Preferences for breast cancer genomic risk screening and subsequent prevention protocols**

*Cun Liu, The University of Melbourne*
*Co-authors: Dean Regier, Ilias Goranitis on behalf of the INTREPID study team*

Background:
Over the last decade, advances in genomic technologies and research have significantly enhanced our understanding of cancer susceptibility genes. In many health-care systems, clinical genetic testing for pathogenic variants associated with cancer is offered based on family history. However, most high-risk individuals remain unidentified. Population-based genomic cancer risk screening provides a transformative opportunity for cancer prevention, early detection, and targeted management. Understanding patient preferences for genomic risk screening is critical for enabling high value health care. DCEs are an established approach to elicit individual preferences, values and priorities for informing the evaluation and implementation of health technologies and services. A growing evidence-base now highlights that cancer screening choices are conditioned on behavioural and psychological factors, primarily related to risk attitudes and perception of risk, for example based on their family cancer experiences. The objective of this study is to explore different methods to 1) demonstrate how to best incorporate risk attitudes and perceptions in preference elicitation and choice modelling using breast cancer as an exemplar; 2) investigate how individuals perceive and value information related to their breast cancer risks in a population genomic risk screening program; 3) how much do people value the opportunities to initiate prevention protocols based on their risk levels?
Methods:
Fourteen focus groups were conducted to identify and develop the choice attributes and attribute-levels. Two DCE surveys were developed to elicit preference and values of population genomic risk screening and subsequent prevention protocols for individuals at different levels of breast cancer risk. Bayesian D-efficient designs with status quo alternative are used. Measures of risk attitudes and perceptions include: perceived cancer risk; cancer worry; health risk attitudes; consideration of future consequences scale; attitudes toward uncertainty. Alternative behavioral frameworks will be incorporated to accommodate risk attitudes and perceptions in choice modelling. The DCE surveys will be administrated to nationally representative samples of the Australian public (n=10000). Data collection is expected to be completed by July 2025 and primary data analysis will be completed by August 2025.
Result:
The study will derive empirical estimates of willingness-to-pay and uptake and assess how the values vary based on individual's cancer risk and risk preferences. This study will provide quantitative evidence on how risks attitudes and perceptions influence decisions to take up genomic screening programs and subsequent prevention protocols, and how this information can be used to optimize design and outcomes of such programs.

**Incorporating individual level preferences into cost-effectiveness analysis of population genomic risk screening: a discrete event simulation**

*Mackenzie Bourke, University of Melbourne*
*Co-authors: Fanny Franchini, Kim Dalziel, Li Huang, Melissa Southey, Roger Milne, Cun Liu, Ilias Goranitis*

Background:
Population genomic risk screening aims to identify people at clinically actionable increased genetic risk of developing disease and minimise impact through prevention and early detection. It has demonstrated cost-effectiveness across several contexts and cancers including breast, ovarian, colorectal, and prostate, with a growing evidence base. The success of future implementation of population-based genomic screening for cancer risk depends on uptake rates for screening, preventative strategies and therapies, and follow-up surveillance. Individual-level preferences will impact behaviour and subsequently the costs and effectiveness of screening programs. However, existing cost-effectiveness literature in this space considers preferences inconsistently and at the population level, rather than the individual level.
Objectives:
This project has 2 main objectives i) to estimate the cost-effectiveness of the implementation of population genomic screening, for breast, ovarian and prostate cancer and ii) to understand how incorporating individual-level preferences for genomic screening - rather than population-based averages - affects the structure, assumptions, and outcomes of cost-effectiveness models.
Methods:
A discrete event simulation model was created to simulate the life course of a population of Australian adults. Real world linked data from the PRIMCAT research project was used to populate inputs related to cancer development and progression. Screening for pathogenic variants in 3 high-penetrance cancer susceptibility genes (BRCA1, BRCA2 and PALB2) and its impact on 3 cancers (breast, ovarian, and prostate) were considered. Data from stated preference studies were captured and used to simulate individual-level preferences based on stochastically generated sociodemographic variables consistent with the Australian general population. Cost and effectiveness outcomes were compared when the model applied the individually generated preferences and population-based preferences for screening and uptake of risk-reducing interventions.
Results:
The project will generate cost-effectiveness, and uncertainty estimates for the implementation of population-based genomic risk screening for breast, ovarian and prostate cancer in Australia. It will also quantify the structural impact of considering preferences for genomic medicine at the level of the individual compared to the population. The inclusion of individual-preference heterogeneity for screening will enable the exploration of optimisation strategies for cost-effectiveness.

## Members Dining Room 3 Organised Session: Advancing Health Economic Modelling and HTA for Cancer Innovation: Real-World Data, Genomics, and Personalised Care

### Longitudinal Analysis of Health State Utility Scores in Australian Cancer Populations

*Fan He, University of Melbourne*
*Co-authors: Fanny Franchini; Yat Hang To; Hadi A. Khorshidi; Gang Chen*

Objectives:
Health state utilities (HSUs) for Australian cancer patients have been inadequately reported, limiting the accuracy of Australia-based health economic and health-related quality of-life (QoL) studies. This study investigated Australian-specific HSUs stratified by cancer types, stages, morphologies, and treatments, and HSUs related determinants.
Methods:
HSUs were calculated using the cancer-specific QLU-C10D measure, derived from the EORTC QLQ-C30 data collected in the "Cancer 2015" study. This population-based prospective cohort study collected baseline and follow-up QoL measurements from cancer patients in Victoria, Australia. This study employed joint modelling of stepwise mixed-effects linear models and survival models for analysing repeated QoL measurements for the five most common cancer types. This approach accounted for mortality and longitudinal measurements, incorporating demographic, disease, and treatment factors.
Results:
Among patients with reported baseline QLU-C10D scores, 511(22.9%) were diagnosed with breast cancer (means ± standard deviations: 0.77 ± 0.20), 338(15.1%) with prostate cancer (0.89 ± 0.14), 328(14.7%) with head and neck cancer (HNC) (0.75 ± 0.22), 249(11.1%) with colorectal cancer (CRC) (0.71 ± 0.23), 176(7.9%) with lung cancer (0.61 ± 0.24).
The median number of follow-up visits was 5, ranging from 0 to 11, with an average interval of approximately 300 days between visits. Multivariate joint regression analysis of repeat QoL measurements showed that, compared to stage 1, higher cancer stages were significantly associated with lower HSUs (all p-values < 0.05) in breast (Stage 2: β = -0.03, Stage 3: β = -0.06, Stage 4: β = -0.12), prostate (Stage 3: β = -0.09, Stage 4: β = -0.17), and CRC (Stage 4: β = -0.15), after adjusting for patient characteristics and treatments. When all five cancer types were combined, for Stage 1 and 2 cancers, compared to no treatment, patients receiving local (β = -0.03), local and systemic (β = -0.03), and palliative care (β = -0.07) had significantly lower HSUs. For Stage 3 cancer, compared to no treatment, patients receiving local (β = -0.04), local and systemic (β = -0.05), and palliative care (β = -0.18) also had significantly lower HSUs. For Stage 4 cancer, compared to no treatment, patients receiving systemic treatment (β = 0.06) had significantly higher HSUs, while those receiving palliative care (β = -0.15) had significantly lower HSUs. Other significant determinants identified included marital status, speaking other languages, comorbidity status, and cancer recurrence across various subgroups.
Conclusions:
HSUs among Australian cancer populations varied based on cancer stage and treatment. This study provided HSUs for different cancer populations, establishing a foundation for future health economic and QoL studies in Australian cancer populations.

**Genomic testing and Health Services Pattern Recognition for Economic Evaluation of Cancer Care**

*Hadi A. Khorshidi, University of Melbourne*
*Co-authors: Fanny Franchini; Gang Chen*

Objectives:
Finding the value of genomic testing in cancer care continuum for health economics purposes is challenging. This study aims to identify and investigate the association between health services patterns and genomic testing pathways for cancer patients. This study addresses whether these identified patterns and pathways are meaningfully associated with each other. On top of that, it addresses whether we can estimate the total medication cost using these patterns and pathways.
Methods:
We used Cancer 2015 database for this study. Cancer 2015 is a longitudinal and prospective study to establish the feasibility of providing a population-based (about 3,000 patients) genomics cohort in Victoria. The database contains clinical, molecular pathology, health service use and outcomes date for patients diagnosed with solid cancers. It also includes datasets for diagnosis, genomics, cancer history information, outcomes from follow-ups, and health services from Medicare Benefits Schedule (MBS), Pharmaceutical Benefits Scheme (PBS) and Quality of Life (QoL) surveys. It covers 26 cancer tumour types. In this study we focused on five common cancer types including lung, breast, colorectal, prostate and melanoma.
We used data pre-processing techniques to transfer data in a way to extract health service utilisation, genomic tests and medication cost. We calculated cost of medication using MBS and PBS data. To identify patterns, we aggregated data across separate datasets such as genomics, diagnosis, cancer history, MBS and PBS. We used data science and machine learning techniques (such as clustering) for identifying frequent health service patterns and genomic testing pathways as well as conducting the mapping.
Results:
The sunburst charts have been created for each cancer type to visualise the sequence of genomic tests and reveal their frequencies. For example, for the lung cancer patients, TP35 was the most frequent biomarker in the first line of testing, and for 1.6% of patients had more than 70 sequences of genomic testing. The monthly average of health service use for each cancer type has been calculated and visualised. Similarly, the total cost has been calculated for each cancer type and density plots has been created. Then, the monthly heat map plots have shown patterns of health service use amongst patients. For example, for lung cancer patients, a group used Cardiovascular medicines frequently in their first month, while another group used AntiNeoplastic drugs more often. We observed these patterns change over time for patient groups that can be mapped by the conduct of genomic testing.
Conclusions:
This study demonstrated the feasibility of identifying health service patterns and genomic testing pathways for economic evaluation of cancer diagnosis and treatment episodes.

**Predicting Patient Eligibility for Novel Colorectal Cancer Therapies: An Integrated Modelling Approach to Support Early Health Technology Assessment in Australia**

*Fanny Franchini, University of Melbourne*
*Co-authors: Koen Degeling; Jennifer Soon; Yat Hang To; Gang Chen; Maarten IJzerman*

Objective:
Early health technology assessment (HTA) requires accurate estimates of treatment-eligible patient populations to inform reimbursement decisions and healthcare planning. We integrated horizon scanning outputs with the PRIMCAT-CRC discrete event simulation model to predict patient eligibility for four novel targeted colorectal cancer (CRC) therapies, demonstrating a framework for supporting early HTA in Australia.
Methods:
Our horizon scanning study (2021) identified therapies approaching Australian market entry. We integrated these findings with PRIMCAT-CRC, a validated discrete event simulation capturing individual patient trajectories through CRC diagnosis, treatment, and progression. We estimated treatment-eligible populations for four therapies: 1) encorafenib for BRAF V600E-mutant metastatic CRC in 1st-line; 2) trastuzumab deruxtecan (T-DXd) for HER2-positive in 2nd/3rd-line; 3) tucatinib plus trastuzumab for HER2-positive/RAS wild-type in 2nd/3rd-line; and 4) larotrectinib for NTRK fusion-positive in 2nd/3rd-line settings. To capture uncertainty, we developed multiple implementation scenarios reflecting real-world complexities including varying biomarker testing rates (50-100%), clinician uptake patterns (30-70%), and gradual implementation timelines. For each therapy, we modelled 3-5 scenarios incorporating different combinations of testing accessibility, clinical adoption rates, and biomarker prevalence estimates. The integrated model simulated incident Australian CRC cohorts from 2022-2025, estimating eligible patients while accounting for disease stage distribution, biomarker prevalence, testing patterns, and treatment sequencing.
Results:
The integrated modelling forecast that under realistic Australian implementation scenarios, novel therapies would be eligible for: encorafenib 254 patients in first-line (1.3% of first-line treatments), T-DXd 241 patients (1.3% of second/third-line treatments), tucatinib 227 patients (1.3% of second/third-line treatments), and larotrectinib 86 patients (0.5% of second/third-line treatments) over 2022-2025. Biomarker testing expansion was a key driver of therapy utilisation, with HER2 testing rates modelled to increase from 10% to 70% at second-line and clinical uptake varying from 30-60%. Under optimal testing conditions, patient estimates approximately doubled for most therapies, highlighting the critical role of testing uptake.
Conclusion:
Integrating horizon scanning with discrete event simulation provides a robust framework for predicting treatment-eligible populations during early HTA. This approach captures real-world implementation complexities including biomarker testing limitations, gradual clinical adoption, and treatment sequencing constraints.

**Health Economic Evaluation of Genomic Risk Stratification for Managing Localised Prostate Cancer Overtreatment in Australia: Model Conceptualisation and Current Challenges**

*Juntao Lyu, University of Melbourne*
*Co-authors: Gang Chen; Niall Corcoran; Hadi A. Khorshidi*

Objectives:
Prostate cancer healthcare costs in Australia are estimated to reach AUD 597.3 million by 2025, placing substantial financial pressure on the healthcare system. Over 60% of patients diagnosed with prostate cancer are in low or intermediate-risk groups, often receiving radical treatments despite minimal oncological benefit. Emerging evidence indicates that genomic risk stratification can optimise treatment recommendations. Among four major tissue-based genomic biomarker tests, the Decipher Genomic Classifier demonstrated significant predictive power and risk reclassification outcomes. However, it has not been subjected to economic evaluation for optimizing treatment decisions at the time of diagnosis. This study assesses the cost-effectiveness of integrating genomic-based risk stratification into clinical decision-making for prostate cancer management in Australia.
Methods:
A systematic evidence synthesis was conducted to: (1) delineate current clinical pathways for prostate cancer management, (2) synthesise evidence on the clinical impact of genomic risk stratification, and (3) identify existing health economic analysis strategies and associated challenges. A conceptual model was developed to integrate emerging evidence on the impact of genomic risk stratification into prostate cancer management, enabling the evaluation of its cost-effectiveness and potential clinical utility.
Results:
Four health economic evaluation studies were found that assessed three different types of genomic tests in prostate cancer risk stratification before undertaking radical treatment, excluding the Decipher test. These studies predominantly relied on Markov state-transition models, which did not incorporate up-to-date risk reclassification outcomes, the impact of treatment decisions, and the associated patient outcomes. To address these limitations, we developed a discrete event simulation model that integrates emerging clinical evidence and captures disease progression characteristics following genomic risk stratification. The model simulates two risk stratification arms: genomic risk stratification and standard of care risk categories. Patient outcomes will be extrapolated through the key management stages and events, including active surveillance, prostatectomy, radiation therapy, salvage therapy, treatment complications, metastasis, and death. The model tracks the time point and duration for each event to calculate the associated health utilities and costs for cost-effectiveness assessment.
Conclusions:
A discrete event simulation model can better capture the clinical and economic benefits of genomic risk stratification in prostate cancer management. However, several challenges remain for developing a comprehensive and robust health economic evaluation.

## Private Dining Room 1 Aged care, ageing and dementia

### The Impact of Pension Eligibility on Mortality: Evidence from Australia

*Fang Han, University of Sydney*
*Co-authors: Kadir Atalay, Rebecca Edwards*

Population aging presents considerable challenges for both individual and societal well-being across the globe. In Australia, the proportion of older adults has doubled over the last fifty years, reaching 17% in 2022 due to increased life expectancy and low fertility rates. This demographic shift places a greater burden on social security systems, escalating government expenditures on pensions and healthcare. In response, over the past quarter-century, most developed countries have raised the pension eligibility age to extend working lives. While the impact of pension eligibility on labour supply, financial well-being, and other economic outcomes has been well-studied, there is limited evidence regarding the health consequences, particularly objective health outcomes.

This paper aims to bridge this gap, by using administrative data to analyse the impact of eligibility for a first-pillar pension program on elderly mortality. We leverage a novel administrative dataset - Person Level Integrated Data Asset - including detailed information about causes of death, socioeconomic characteristics, and healthcare usage, to offer an in-depth analysis of the factors influencing mortality rates among the elderly as they become eligible for the Age Pension. Significant pension reforms during our observation period enable us to identify the causal impact of pension eligibility on mortality.

Although our findings align with previous studies that show no impact of pension eligibility on all-cause mortality, we do observe a statistically significant impact on specific causes of death. Our regression discontinuity (RD) design reveals that, upon reaching pension eligibility age, the incidence of cancer-related deaths increases in women, while the occurrence of fatal heart attacks decreases. These effects are strongest for socio-economically advantaged women. The increase cancer death is mainly driven by those with breast cancer, and we find that most of these deaths have one of two main direct causes: cancer metastasis or acute respiratory system diseases. For men, reaching pension age is associated with an increase in deaths due to diabetes and transport accidents. These effects are more pronounced in low socioeconomic status (SES) groups. Our data reveal that the direct cause of diabetes-related deaths—a long-term condition—in our data is heart attacks. Our findings are robust to several sensitivity analyses.

Our results suggest there is a mortality impact of transitioning to pension eligibility age. This highlights the need for support from government and other institutions at retirement transitioning process, particularly for elders with chronic diseases.

**The Economics of Targeted Aging: An Application to Australia**

*Son Nghiem, University of Queensland*
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Introduction

As in many other countries, life expectancy in Australia has steadily increased over time. This demographic shift brings both benefits, such as prolonged participation in the labour force and extended consumption, and costs, including greater demand for healthcare and aged care services. Despite these opposing forces, the overall economic implications of population aging in Australia remain unclear. This study applies the economic value of the targeting aging framework to estimate the economic value of aging in Australia.

Methods

The analysis is grounded in an economic model, in which individuals are assumed to maximise expected lifetime utility, comprising health, consumption, and leisure time. The WTP for health improvements of an individual at a given age is defined as the sum of the product of the utility derived from health and the expected remaining survival time. National-level WTP is obtained by aggregating individual-level estimates across the population.

A statistical simulation approach is employed, incorporating both economic and biological parameters sourced from the literature and assumptions. Key biological parameters include the division of life into three periods—childhood and education (ages 0–19), working age (20–64), and retirement (65+)—and mortality modelled using a Gompertz distribution. Economic parameters include a 2% time discount rate, a maximum of 400 working hours per year, and a subsistence consumption level of AUD $600.

Data

The primary data sources include the Australian Bureau of Statistics (e.g., population by age and sex, life tables), the Global Burden of Disease database (e.g., mortality, disability, real GDP per capita), and the Office of Impact Analysis (the statistical value of life).

Results

The WTP per capita for slowed aging in Australia increases over time as life expectancy rises. By 2020, the average Australian was willing to pay approximately US $160,000 for one additional year of life—around three times the GDP per capita (US $55,000). The aggregate national WTP for extending life by one year reached US$ $4 trillion in 2020, roughly three times Australia's GDP of US$ 1.3 trillion. Among health conditions, the highest per capita WTP was observed for diabetes and kidney diseases, followed by cardiovascular diseases.

Conclusion

Australia is currently in the contracting phase of its population structure. The high willingness-to-pay (WTP) for life extension indicates that Australians place a substantial value on longevity, equivalent to approximately three times the per capita GDP for an additional year of life. However, the question of whether such investments in longevity are economically feasible for the country remains unresolved and warrants further exploration.

**Hospitalisations and emergency department presentations: Evidence from residents of residential aged care in Australia**

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Background:
As Australians continue to live longer, there has been a steady rise in the number of years in ill-health for the older population due to growing incidence of chronic conditions. These demographic and morbidity changes have led to soaring health care services use and costs and present enormous challenge to the future financial sustainability of the health care sector. Increasingly, residential aged care (RAC) residency is seen as an important avenue for reducing mainstream health care use of older adults. The challenge of prior literature has been to express firm conclusions on causality due to the issue of endogeneity caused by selection bias into RAC residency.
Objectives:
We examined the causal impact of entry to RAC and the mechanisms around how RAC residency reduces health care use.
Methodology:
The study employed longitudinal data from the Sax's Institute's 45&Up Survey linked to administrative data on emergency department (ED) presentations, hospitalisations and mortality from the New South Wales Department of Health over a 15-year period from 2005-2019. Health care use is measured by hospitalisations and ED presentations. The identification strategy uses the timing of RAC entry as an event date to examine the heterogeneous treatment effects of RAC residency on hospitalisations and ED presentations in a dynamic differences-in-difference analysis framework. We address endogeneity to obtain causal estimates by matching individuals in the treatment and control groups on the paramount determinants of RAC entry namely age, health and functional status. Several individual, cohort and overall average treatment effects on the treated (ATETs) are estimated and the evolution of ATETs with time visualized in event study plots.
Findings:
RAC residency leads to a reduction in hospitalisations and ED presentations. The results are heterogeneous across age, gender, living area, marital status and type of hospital services used. We posit three driving mechanisms for this effect namely prevention, management and substitution. Particularly, RAC support services result in a higher threshold for seeking health care relative to someone in their own home. Also, personal care services delivered at RAC results in declining occurrences of physical events like falls and fractures and medication emergencies which help to reduce avoidable health care use. Moreover, timely delivery of services at RAC helps to manage illnesses such that residents are referred to hospitals only when their issues cannot be sufficiently and safely handled at RAC residency. Furthermore, some health care services provisioned at RAC substitutes for mainstream health care.
Conclusions:
Improving care and support services at RAC will go a long way towards reducing mainstream health care services use. However, due to the heterogenous impact of RAC residency on health care use effective policies should target groups of individuals and types of hospital services used.

**Medicare mental health service use among older adults with depression in Australian residential aged care facilities**

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Objective:
Depression poses a major health challenge in Australian residential aged care facilities (RACFs) affecting 40-60% of residents. However, little is known about the utilisation of mental health services to manage depression in this setting. Therefore, this study aimed to assess Medicare subsidised mental health service use and associated factors among older adults in RACFs, nested within the ELders AT Ease (ELATE) cluster randomised controlled trial. ELATE is a 16-session cognitive behavior therapy intervention, delivered by supervised mental health trainees in collaboration with RACF staff and residents' families.
Methods:
This observational study analysed ELATE trial and Medicare Benefits Schedule (MBS) claims data from 177 residents across 69 RACFs. Participants, aged ≥65 years with significant depressive symptoms (Patient Health Questionnaire-2 score ≥3), were randomised to receive ELATE or usual care. The primary outcome measure for this study was MBS mental health service utilisation defined using specific MBS item numbers. Bivariate analyses were conducted to compare baseline characteristics between MBS mental health service users and non-users. Descriptive statistics were used to summarise mental health service use. Logistic regression models identified factors associated with mental health service use. Missing data were handled through multiple imputation.
Results:
Of 177 residents, 69 (39%) accessed one or more MBS mental health services, with a mean (SD) of 1.8 (2.28) claims per person between 2021 and 2024. Only 124 (1%) of 10,730 MBS claims were for mental health services. Of these 124 claims, the majority were for GP appointments (56%), with smaller percentages for allied health (27%), and psychiatrist services (17%). Better sleep quality (aOR 2.72, 95% CI 1.06–7.00; p=0.038) and greater depression severity (aOR 1.10, 95% CI 1.01–1.21; p=0.025) were associated with increased mental health service use, while lower anxiety (aOR 0.93, 95% CI 0.87–0.99; p=0.029) and poorer quality of life (aOR 0.36, 95% CI 0.14–0.97; p=0.044) were associated with reduced mental health service use. Other factors including age, gender, cognitive status, education, facility size, and ELATE enrolment were not significantly associated with MBS mental health service use.
Conclusions:
Despite high mental health needs, MBS mental health service use among a population of RACF residents with identified depressive symptoms remains low. These findings highlight a need for targeted policy reforms to promote better access to mental health services and integration of tailored interventions such as ELATE to reduce depressive symptoms among residents and improve quality of life. Such reforms could yield significant economic benefits by reducing costs associated with complex care needs, medications overuse, and hospitalisations.

**Causal association between systolic blood pressure and quality-adjusted life years: a mendelian randomisation study**

*Tamrat Befekadu Abebe,Monash University*
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Objectives:
To estimate the lifetime causal association of systolic blood pressure (SBP) with quality-adjusted life years (QALYs).
Methods:
Mendelian randomisation (MR) was used to estimate the causal effect of SBP on QALYs. Genetic variants associated with SBP (181 single-nucleotide polymorphisms (SNPs)) were identified from a genome-wide association study (GWAS) and used as instrumental variables. SBP was used as the exposure variable and QALYs as the outcome variable. The UK Biobank was used to source sociodemographic, clinical and genetic data. Our study included 502,151 participants, of whom 288,182 met the inclusion criteria. Participants were followed from the recruitment period (2006 – 2010) until October 31, 2022 or death, whichever came first. Health-related quality-of-life data were sourced from a previously published study. The polygenic risk score (PRS) was constructed by summing the effects of the 181 SNPs on SBP, each weighted by its effect size derived from the GWAS meta-analysis. Individual-level MR was performed using two-stage least square regression (2SLS) to estimate the causal association of SBP with QALYs. We regressed the exposure variable on the PRS for SBP at the first stage, followed by regressing the outcome variable on the predicted SBP from the first stage. A number of sensitivity analyses were done to test the robustness of the estimate, including Two-sample MR (Inverse-variance weighted MR, MR Egger, Weighted Median and Weighted Mode). Multivariable MR (MVMR) was also performed to estimate the direct effect of SBP on QALYs by including diastolic blood pressure (DBP) as a mediator exposure variable. The outcomes of the analyses were presented as annual percentage change in QALYs per 10 mmHg increase in SBP over an average year of follow-up.
Results:
Participants' baseline median age was 58 (interquartile range (IQR) 50 to 63) years, median SBP 136.5 (IQR 125.0 to 149.5) mmHg, and a median follow-up of 13.8 (IQR 13.1 to 14.4) years. By the end of the follow-up time, 25,088 (8.71%) of the participants died. The median QALYs were 0.87 (IQR 0.74 to 0.97).
The 2SLS analysis demonstrated that for every 10 mmHg increase in SBP, QALYs declined by 1.17% (95% CI -1.46% to -0.88%). Sensitivity analyses showed a consistent direction of effect. However, there was high heterogeneity (Cochran's Q = 436.13, p value <0.0001) with I2 = 57.4% (95% CI 49.8% to 63.8%) in the association of genetic variants with QALYs. From MVMR, the direct effect of SBP on QALYs conditioned on DBP was a 0.78% (95% CI -1.49% to -0.06%) reduction in QALYs for every 10 mmHg increase in SBP.
Conclusions:
Increased SBP was observed to be associated with reduced QALYs. This finding consolidates our previous knowledge on the effect of SBP on clinical cardiovascular outcomes. MR can be useful in health economics to estimate the impact of exposures on QALYs with reduced confounding or reverse causation bias.

**Costing the implementation of a hospital avoidance program in residential aged care homes.**

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Objectives
There is a lack of pragmatic approaches that standardise the cost estimation of implementation strategies. An instrument for data collection and cost estimation of implementation strategies (Cost-IS) was recently developed. This study aimed to use Cost-IS to cost the implementation of a multi-component hospital avoidance program aimed at upskilling RAC staff to identify and manage early signs of resident deterioration.
Methods
The Costing Implementation Strategies (Cost-IS) instrument was used to collate and synthesise implementation costs across trial phases and sites. Implementation costs included labour costs associated with implementation activities including context assessments and ongoing facilitation efforts. Non-labour cost items included the cost of the Clinical Facilitator packs and external facilitator travel to sites (estimated separately to nurse educator travel, which was included in implementation costs). Implementation resource use was prospectively documented by the study team in detailed field notes, meeting minutes and activity logs. In addition, internal facilitators completed regular 'check-in forms' that documented the time spent on facilitation activities at their site.
Labour costs were valued from publicly available salary rates, while non-labour costs were valued using purchase prices. Data were compiled and analysed descriptively at the RAC home level using MS Excel. Implementation costs were additionally mapped to the Expert Recommendations for Implementing Change (ERIC) framework.
Results
Mean implementation costs were $9,481 per site, of which $8,056 (85%) were labour resources. The internal site facilitator roles accounted for the largest proportion of costs (65%). Facilitation was the costliest implementation strategy adopted, accounting for 87% of total implementation costs. The remaining 13% of implementation costs were attributed to the initial context assessment visits that were conducted at each site. Implementation costs extended beyond the initial 'implementation establishment' phase into the intervention exposure.
Conclusions
The use of Cost-IS assist in the costing of implementation strategies in stepped wedge cluster randomised trial. Challenges during this process included separating implementation from intervention costs and research-related costs. The dependence on existing documentation for case study implementation contributed to this challenge as well as other challenges including key data inputs being unavailable, and aggregate documentation of some resources. Nonetheless, Cost-IS was shown to be an innovative method for rigour, pragmatism and relevance.

**Costing incident management systems: the price of safety**

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Background:
Health systems in high income countries use incident management systems (IMSs) to collect incident data when patients are harmed (adverse events). These data are used to investigate what happened and why and to develop interventions to reduce further harm to patients. Despite sophisticated IMSs being in place, in the past decade, rates of adverse events have remained at approximately 5 (range 4.8 to 5.4) per 100 hospital admissions in Australia.(1) The rate of adverse events resulting in serious harm to patients is unchanged from two decades ago.(2) Incidents are not uncommon with > 200,000 per year reported in NSW, and 130,000 in the Queensland public health systems.(3) There are no Australian costing data available but extrapolating from UK data, the opportunity cost in staff time of managing incidents in NSW alone is estimated at $123M annually.(4) Our aim was to undertake the first costing analysis of the IMS process for high harm (harm score 1 and 2) and low harm (harm score 3 and 4) incidents in the Australian acute care sector.
Methods:
We interviewed 21 health service staff from seven hospitals across the Australian Capital Territory, Victoria, New South Wales, and Queensland to create activity maps of the IMS process (four high harm, three low harm). These maps captured the different processes within the IMS pathways and included the time and staff grades involved at each step. We used 2024-2025 pay rates and on-costs for each state in our activity-based costing analysis. We included steps in the pathway that were common to all incidents but excluded the remediation steps as they were incident specific. We conducted a sensitivity analysis and assessment of the costs per incident and at hospital level.
Results:
Preliminary results show that the IMS process in ACT for a high harm incident was estimated to cost $18,188.97. The ‘Review incident’ stage of this process cost $16,921.04 and ‘Feedback to patient/family’ cost $1,210.24. In Victoria, the IMS high harm process totalled an estimated $29,134.38, with review of the incident costing $25,275.79 and feedback to patient/family $3,853.86. Approximately 170,000 low harm incidents were reported in NSW in 2024. The estimated cost of the IMS process for these incidents was $147.51 per incident, and $505,579.08 per week and $26,288,348.21 per year.
Conclusions:
Our preliminary findings demonstrate that IMSs processes consume significant resources relating to the involvement of clinical governance staff, senior clinicians, and hospital management.

**Cost-effectiveness of mass drug administration for control of scabies: evidence from the Big Skin Health Intervention Fiji Trial (Big SHIFT)**

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Objectives
The World Health Organization (WHO) recommends individual and household case management along with two-dose ivermectin-based mass drug administration (MDA) to control scabies in endemic areas (where prevalence is 10% or higher). This study aimed to evaluate the cost-effectiveness of two-dose ivermectin-based MDA for control of scabies in Fiji, compared to usual care, using data collected alongside a before-after trial.
Methods
The Big Skin Health Intervention Fiji Trial (Big SHIFT) carried out facility-based surveillance for scabies and skin and soft tissue infections (SSTIs) in the Northern Division of Fiji, an area with high prevalence of scabies, for 12 months before and after a division-wide two-dose ivermectin-based MDA. Prevalence of scabies prior to, and 12 months following MDA was estimated via a population survey. A decision analytic model was built to evaluate the cost-effectiveness of MDA from a health system perspective. Model input parameters were informed by data from Big SHIFT on the cost of MDA and healthcare presentations, and changes in the prevalence of scabies. Disability weights from the Global Burden of Disease study were used to estimate disability-adjusted life years (DALYs). A one-year time horizon was used to align with the Big SHIFT study, with a longer time horizon considered in sensitivity analysis. One-way and probabilistic sensitivity analyses were conducted. Incremental Cost-Effectiveness Ratios (ICERs) were compared to 0.5 and 1x gross domestic product (GDP) based thresholds, which align with opportunity-cost based estimates for Fiji.
Results
MDA resulted in prevalence of scabies decreasing from 14.2% to 7.7%, corresponding to approximately 176 DALYs averted per 100,000. The cost of delivering two doses of ivermectin was estimated at US$627,193 and resulted in $79,621 in savings to the health system due to reduced healthcare presentations. The base case ICER was $1,585/DALY averted, indicating that MDA is cost-effective, with an ICER falling below 30% of Fiji's GDP per capita ($5,670). Results were most sensitive to the starting prevalence of scabies, cost of ivermectin, disability weight associated with scabies, and proportion of SSTIs that were considered related to scabies. Results were least sensitive to the unit cost of healthcare presentations. The scabies MDA was achieved as part of an existing lymphatic filariasis (LF) program although the health gains associated with reduced LF were not captured. In the case of a non-integrated MDA, the ICER would increase by 30%, but still remain below half of GDP/capita.
Conclusion
This study is the first cost-effectiveness analysis of WHO-recommended MDA for scabies control. Our findings provide evidence that MDA is cost-effective in the northern division of Fiji. Results may be extended to other a highly endemic settings in the Pacific. Longer-term data are essential to understand the duration of protection and how often MDA is needed.

## Members Dining Room 1 Organised Session: Building the Case for Equity: Australian Applications of Distributional Cost-Effectiveness Analysis

### Distributional cost-effectiveness analysis of antenatal lifestyle interventions to reduce the incidence of gestational diabetes

*Melanie Lloyd, Monash University*
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Objectives:
Antenatal lifestyle interventions are effective in reducing adverse outcomes associated with excess gestational weight gain, such as gestational diabetes. While strong cost-effectiveness has also been demonstrated, the cost of implementation at scale is potentially a barrier to uptake. It is unclear whether risk-targeted implementation will provide fair access to antenatal lifestyle interventions for disadvantaged socioeconomic sub-groups. We applied distributional cost effectiveness analysis to estimate the population net health benefit (NHB) and distributional health impact among socioeconomic sub-groups of alternative approaches for implementing antenatal lifestyle interventions into routine practice in Australia.
Methods:
Differences in the distributions of health within population sub-groups defined by Index of Relative Socioeconomic Advantage and Disadvantage were compared for current standard care (no routine antenatal lifestyle intervention) versus subsidised provision of the antenatal lifestyle intervention to: 1) all pregnant women, 2) only women with a body mass index (BMI) ≥25kg/m2, 3) only women aged ≥30 years, or 4) only women giving birth within the public health system. A previously published cost-utility analysis was extended to model the distributional impact of the different implementation strategies on disease incidence (gestational and type-2 diabetes), direct healthcare costs, opportunity costs, mortality and quality-adjusted life years (QALYs). Data were obtained from national statistics, registries and the literature, with costs measured in Australian dollars (AU$) at 2025 prices with 3% annual discounting. Value judgements regarding aversion to health inequity were captured using the Atkinson index. Sensitivity analyses were conducted to explore the impact of uncertainty across key parameters.
Results:
At an opportunity cost threshold of AU$31157, all implementation strategies improved both overall population health and equity. Routine provision to only women with a BMI≥25 was the most cost-effective strategy and generated the highest population NHB (incremental gain 1153 QALYs), while provision only within the public health system had the greatest improvement in health equity (incremental equally distributed equivalent health minus incremental NHB: 828 QALYs equity gain). Sensitivity analyses did not materially change these findings.
Conclusions:
Routine provision of antenatal lifestyle interventions to reduce the incidence of gestational diabetes is likely to improve both overall health and health equity within the Australian population. If targeted preliminary implementation is desirable due to budget constraints, subsidised routine provision to women with a BMI≥25 will generate the highest population NHB, while implementation in the public health system will offer the largest gain in population health equity.

**Dynamic DCEA for Genomic Breast Cancer Screening: Evaluating Cost-Effectiveness and Health Inequality Over Time**

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Background and objectives:
Distributional Cost-Effectiveness Analysis (DCEA) extends conventional cost-effectiveness analysis by explicitly incorporating health inequality into the evaluation framework, offering policymakers insight into the trade-offs between efficiency and equity. However, traditional DCEA approaches are typically static, capturing inequality at a single time point. This study develops and applies a novel Dynamic DCEA (D-DCEA) framework to evaluate both the cost-effectiveness and temporal evolution of health equity impacts from population-wide genomic breast cancer screening in Australia. The study explores how the timing of intervention and demographic change affect both overall health gains and the distribution of those gains across socioeconomic and demographic subgroups.
Methods:
We developed a dynamic decision-analytic model comparing lifetime costs and QALYs associated with genomic versus family history-based breast cancer screening among Australian women. The D-DCEA incorporated rolling birth cohorts aligned with calendar years, allowing longitudinal tracking of screening policy impacts on equity. At each annual cycle, the model recalculated distributional equity metrics, including the Atkinson index and Equally Distributed Equivalent Health (EDEH), to quantify evolving health inequality. Socioeconomic status (SES) quintiles were defined using the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The model also dynamically stratified individuals by rural/urban residence and Aboriginality, enabling disaggregated analysis of equity outcomes over time. Scenario analyses examined different screening start ages and uptake patterns, assessing their efficiency-equity trade-offs.
Results:
Early screening initiation (e.g., age 30) was both cost-saving (ICER: AUD –8,331/QALY) and equity-enhancing, with reductions in the Atkinson index and increases in EDEH across SES and population subgroups over time. Delayed implementation reduced cost-effectiveness and slowed or reversed equity gains. Modelling real-time demographic change demonstrated that timing and targeting of screening substantially influence the persistence and scale of health equity benefits, especially for rural and Aboriginal communities.
Conclusions:
D-DCEA extends existing DCEA methods by embedding temporal and demographic dynamics into the assessment of health inequality, offering a more policy-relevant evaluation of interventions. This framework enables the real-time monitoring of health equity impacts and informs more equitable and timely public health strategies. It is particularly suited to diverse and ageing populations where demographic change and delayed interventions can amplify disparities.

**Preliminary results for a distributional cost-effectiveness analysis of respiratory syncytial virus (RSV) vaccination for older Australian adults**

*Kishor K Paul, University of New South Wales*
*Co-authors: Monica Torres; Sophy Shih; Richard T Gray; James G Wood; Allen Nazareno; Stephen Jan; Anthony T Newall*

Background:
Cost-effectiveness analysis guides funding decisions aimed at maximizing health outcomes in Australia and elsewhere. Given the health disparities between socio-economic groups, these assessments should also consider equity. This study aimed to conduct an equity-informed economic evaluation of respiratory syncytial virus (RSV) vaccination in those aged over 60 years in Australia.
Methods:
We applied a Distributional Cost-Effectiveness Analysis (DCEA) framework to assess the cost-effectiveness and equity impact of RSV vaccination across five socio-economic quintiles. These quintiles were defined using the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD). A static multi-cohort Markov model using monthly cycles was developed to simulate the health outcomes, costs, and Quality-Adjusted Life Years (QALYs) under both vaccination and no-vaccination scenarios for each quintile. We estimated, based on literature, the differences in hospitalisation probabilities as well as disparities in vaccine uptake across IRSAD quintiles for Australia. We initially simulated the economic model for 5-year time horizon for the Arexvy RSV vaccine assuming a maximum duration of protection of 24 months in the base case (Abrysvo vaccine results were also generated but not presented in this abstract). Based on the model outputs, we aim to estimate the distribution of net health benefits attributable to the RSV vaccination program across the IRSAD quintiles and compare these with the baseline no-vaccination distribution.
Results:
Preliminary results in the base-case scenario over a five-year period estimated that RSV vaccination averted 62,632 symptomatic RSV infections – with 39,264 fewer people requiring medical attention as well as reductions in general practitioner (10,950) and emergency department visits (5,796), hospitalisations (6,404), ICU admissions (212), and deaths (310), compared to the no-vaccination scenario. The most substantial health benefits were estimated for the most disadvantaged areas (IRSAD quintile 1), which accounted for 18% (1,992) of the reduction in GP visits, 37% (2,126) of ED visits, 36% (2,290) of hospitalisations, 36% (77) of ICU admissions, and 36% (113) of deaths. In contrast, the least disadvantaged areas (IRSAD quintile 5) experienced smaller relative reductions, with 19% (2,132) of GP visits, 8% (459) of ED visits, 8% (508) of hospitalisations, 8% (17) of ICU admissions, and 8% (24) of deaths averted.
Conclusions:
We predict substantial healthcare benefit from RSV vaccination of older adults in Australia. Due to higher estimated risk of RSV hospitalisation in the most disadvantaged areas, our modelling suggests greater health benefits to these populations. Further conclusions to be presented.

**Equity impacts of pneumococcal vaccination schedules for Indigenous populations in Australia: a distributional cost-effectiveness analysis**

*Marie-Anne Boujaoude, The University of Melbourne*
*Co-authors: Nefel Tellioglu; Yingying Wang; Sean Taylor; Trish Campbell; Sean Taylor; Nancy Devlin; Kim Dalziel; Jodie McVernon; Natalie Carvalho*

Objectives:
Reducing health inequality remains a central priority in Australian health policy, particularly in addressing persistent disparities affecting Indigenous Australians. Yet, equity impacts are rarely quantified in standard economic evaluations used to support funding decisions. Distributional Cost-Effectiveness Analysis (DCEA) is a method developed to quantify both total health benefits and their distribution across population subgroups. This study presents a practical application of DCEA to evaluate the equity impact of pneumococcal conjugate vaccine schedules in Australia. It also demonstrates how DCEA provides distinct insights compared to subgroup analysis.
Methods:
We extend an agent-based dynamic transmission model of pneumococcal carriage and disease in Australia, to conduct a DCEA. The model,stratified by Indigenous status and calibrated using local epidemiological data, captures both direct and indirect effects of pneumococcal vaccination strategies. Clinical outputs from the model, including invasive pneumococcal disease, community acquired pneumonia and age-specific deaths, are used as inputs into the economic model and costed using National Hospital Cost Data Collection and Medicare Benefits Schedule pricing. We compare the current vaccination schedule for pneumococcal vaccines, that differentiates between Indigenous and non-Indigenous Australians, to a hypothetical uniform vaccination schedule irrespective of Indigenous status, to quantify the equity impacts of the current schedule. We also compare the equity impact of implementing strategies that could improve vaccine uptake among Indigenous Australians. After estimating the baseline health distribution and the health opportunity cost, the net health benefits, and pre-, and post-intervention equally distributed equivalent health are calculated to estimate population equity impact.
Results:
The transmission model has been calibrated to hospitalisation and carriage data from Australia and reflects sequential introduction of pneumococcal vaccines in Australia at historic coverage rates, across both Australian Indigenous and non-Indigenous population groups. Using modelled outputs from the dynamic transmission model, Quality-Adjusted Life Years gained, costs, and net health benefits, for each of the three vaccination policies are estimated. Equity adjusted outcomes, EDEH, will be calculated based on the recently produced societal health inequality aversion for Australia ($\varepsilon = 17.73$), reflecting societal preferences for reducing health inequality, with sensitivity analyses varying key input parameters. Health equity impact will be estimated.
Conclusions:
To our knowledge, this is the first study that demonstrates the application of an Australian Indigenous-focused DCEA in the Australian vaccine policy context. This proof-of-concept analysis offers insights into how equity-relevant evidence supporting immunisation policies can inform decisions alongside economic evidence.

## Members Dining Room 2- Organised Session: Challenges in the economic evaluation of newborn screening - local policy and research case studies

### Economic evaluation of newborn bloodspot screening for sickle cell disease to inform public funding decision-making

*Arlene Vogan, University of Adelaide*
*Co-authors: Joanne Milverton; P Allani; Drew Carter; Skye Newton; J Parsons; Camille Schubert.*

Background:
The Medical Services Advisory Committee (MSAC) considered an application requesting the addition of sickle cell disease (SCD) and beta-(β-) thalassaemia to the newborn bloodspot screening (NBS) program. Six methods of screening were considered, which varied in terms of cost and extent of hemoglobinopathies able to be detected.
Methods:
The comparator was no NBS for SCD and β-thalassaemia; this included some cases identified prior to symptom development due to targeted testing of at-risk parents and babies. Direct evidence for screening to health outcomes was identified for SCD from countries with high SCD prevalence. This suggested that early diagnosis would allow pneumococcal vaccination and increased awareness about symptoms, however the changes in management and improvements in health outcomes reported were small and had low applicability to the Australian context due to the relative strength of the Australian healthcare system. The evidence for β-thalassaemia was scarce.
A cost-effectiveness analysis was conducted using a decision-tree analytic. This was structured to accommodate alternate screening strategies and target conditions being screened (e.g. SCD alone, or SCD and β-thalassaemia). Due to limitations of the evidence available to translate the changes in management into patient-relevant outcomes beyond an early diagnosis, the outcome reported was cost per additional early diagnosis.
Findings:
The key challenges identified related primarily to the rarity of the conditions being screened, the impact of immigration on prevalence and the limited applicability of evidence. Additional challenges related to the cost of screening, which varied depending on the number of newborns screened, whether instruments could be used to identify other target condition(s) and whether implementation costs should be considered. The decision problem being addressed, including which condition(s) should be considered as target conditions and what screening strategies should be explored, added additional complexity. Finally, interpretation of the different diagnoses across target conditions being screened under the outcome of cost per additional early diagnosis may be a further challenge for decision makers.
Conclusions:
MSAC supported the addition of SCD to the NBS program following the provision of unpublished registry data which demonstrated that screening would lead to an earlier diagnosis in a substantial proportion of SCD cases in Australia, and that early diagnosis would lead to improved health outcomes. MSAC considered that screening was acceptably cost-effective up to a cost of $8.23 per first-tier screen (including fixed costs to add to the capacity of screening), which had an ICER of $46,523 per additional early diagnosis of SCD. β-thalassemia and other haemoglobinopathies were considered as non-target conditions which may be detected from NBS..

**Economic evaluation of newborn bloodspot screening for X-linked adrenoleukodystrophy to inform public funding decision-making**

*Bonny Parkinson, Macquarie University*
*Co-authors: E Seil; R Song; R Rezwanul; Alicia Norman; Ainsley Newson; V Jeet; Henry Cutler*

Background:
The Medical Services Advisory Committee (MSAC) evaluated the addition of X-linked adrenoleukodystrophy (X-ALD) to Australia's newborn bloodspot screening (NBS) program in 2023. X-ALD is a rare X-linked metabolic disorder with variable expressivity and incomplete penetrance, particularly affecting males with progressive neurological symptoms. Early diagnosis enables timely monitoring and intervention (e.g. haematopoietic stem cell transplantation [HSCT]), which may improve survival but risks severe adverse events. Screening also raises concerns about over-monitoring in those who may never develop symptoms, and psychological harms from a positive result.
Methods:
The MSAC compared no screening to nine strategies involving combinations of flow injection analysis tandem mass spectrometry (FIA-MS/MS), high-performance liquid chromatography mass spectrometry (HPLC-MS/MS), ABCD1 genetic testing, and an X-counter test to identify males. Each approach varied in test accuracy, cost, implementation complexity, and ethical acceptability.
The economic evaluation used a linked-evidence approach. A decision tree modelled prevalence, uptake and test accuracy, which was linked to a microsimulation model. The model accounted for heterogeneity in phenotypic expression (cerebral ALD, adrenal insufficiency [AI] and/or adrenomyeloneuropathy [AMN]), sex differences, age of onset, and disease progression. Health benefits were based on retrospective cohort studies comparing early vs late HSCT, most with moderate-to-high risk of bias. No quality-of-life or survival data were available for AI or AMN. Results were reported as cost per positive diagnosis and cost per quality-adjusted life year (QALY) gained. Cascade testing of family members was also evaluated using a decision tree.
Findings:
Strategy I (FIA-MS/MS + HPLC-MS/MS) had the lowest cost per positive diagnosis ($50,829), followed by Strategy IV ($51,502), which added genetic testing. Strategies with an X-counter were more cost-effective but considered unethical and impractical. Assuming 99.5% specificity for FIA-MS/MS, Strategy II (FIA-MS/MS + genetic testing) had an ICER of $116,226/QALY gained, with other strategies lower. Due to the rarity of X-ALD (1 in 6,200–15,000), results were highly uncertain and required millions of simulations to stabilise. Cascade testing had an ICER of $8,789/positive diagnosis, but were sensitive to uptake rates and counselling costs.
Conclusions:
Despite the uncertainties, MSAC considered screening acceptably cost-effective. This case highlights key challenges of evaluating NBS of rare diseases: linked evidence, variable expressivity and penetrance, uncertain health outcomes, and limited cascade testing data. It underscores the importance of post-implementation data collection—potentially via a national registry—to monitor real-world outcomes and support future assessments.

**Why Economic Evaluation for Including Prader-Willi Syndrome in Newborn Screening Is Challenging: Data, Rarity, and Healthcare System Complexity**

*Mohammed Alshawsh, Monash University;*
*Co-authors: Sheena Arora, University of Technology Sydney; David Godler, Monash University*

Background:
Prader-Willi syndrome (PWS) is a rare but serious genetic disorder not currently included in Australian Newborn Bloodspot Screening (NBS) programs. Emerging evidence suggests early diagnosis may improve health outcomes. This presentation explores challenges in evaluating the evidence for PWS alignment with NBS criteria, particularly around economic evaluation for rare disorders like PWS.
Methods:
We reviewed existing evidence relating to the nine criteria detailed in the Australian Newborn Bloodspot Screening Framework. In doing so we reviewed evidence relating to the condition, benefits associated with screening, treatments for PWS and economic evaluations.
Key challenges identified:
No published economic evaluations relating to PWS screening were identified in the literature. Economic analyses are hindered by limited cost-effectiveness data. A 2021 Australian study which estimated mean annual PWS care costs at AU$57,576 provides valuable baseline data, but lacks comprehensive lifetime modelling. Challenges include: small patient cohorts due to rarity; lack of figures for diagnostic rates in rural settings; difficulties modelling lifetime costs for rare disorders; absence of control groups for unscreened individuals; difficulty capturing intangible costs (e.g., caregiver burden, lost productivity); and limited data on intervention effectiveness across PWS genetic subtypes. Australia's healthcare system supports PWS diagnosis via genetic testing (e.g., DNA methylation, SNP arrays) and multidisciplinary care available, including growth hormone therapy subsidized by the Pharmaceutical Benefits Scheme. However, data gaps exist in quantifying transition from paediatric to adult services access disparities in rural areas. This creates uncertainty in modelling long-term service utilisation and associated costs.
Conclusion:
Economic evaluation of rare disease screening like PWS requires innovative methodological approaches addressing small population sizes, heterogeneous outcomes, and limited comparative data. Future research should focus on rare disease-specific economic frameworks and longitudinal cohorts to support evidence-based policy decisions.

**Economic modelling of equity impacts of newborn bloodspot screening for sickle cell disease**

*Anagha Killedar, University of Sydney;*
*Co-authors: Joanne Scarfe; Kylie Mason; Martin Howell; Kirsten Howard; Sarah Norris*

Background:
MSAC recently undertook an economic evaluation of newborn bloodspot screening for sickle cell disease (SCD; see paper 1 in this sessions). Although that evaluation included consideration of targeted screening in babies judged to be at higher risk of SCD due to their ancestry, it did not explicitly consider possible equity impacts associated with screening for this condition. The aim of this study is to develop an economic model of newborn bloodspot screening (NBS) for SCD to explore directly the impacts of different equity parameters on the cost-effectiveness of NBS for this condition.
Methods:
A decision analytic model with Markov microsimulation for SCD was constructed, informed by clinical expertise and published literature. The base case model incorporates healthcare costs and mortality. Equity impacts are examined by using individual-level simulation to project the distribution of costs and benefits of NBS for SCD across a birth cohort over a lifetime horizon. The analysis accounts for disparities in access to healthcare for SCD cases detected via NBS to reflect reported issues with families of African or Middle-Eastern ancestry being unable to access publicly-funded healthcare in Australia due to their residency status. Preliminary analyses have varied assumptions regarding the split between (i) uptake of fully publicly-funded healthcare, (ii) uptake of fully privately-funded healthcare, and (ii) no uptake of healthcare. Cost-effectiveness is calculated using standard approaches.
Findings:
Preliminary findings show that universal newborn screening for SCD has the potential to reduce ethnic inequalities in mortality but this may result in increased out of pocket costs in affected families.
Conclusions:
This case study demonstrates the different and potentially conflicting types of equity impacts that can arise from population-wide newborn screening of rare conditions. Further work is needed to determine the appropriate approach to presenting these results to inform decision-making.

## Members Dining Room 3 Organised Session: Advancing Health Economics with Machine Learning: Emerging Methods for Evidence and Policy

### Evaluating the cost-effectiveness of lung cancer screening strategies incorporating new therapies

*Sarun Srikhom, University of Melbourne*
*Co-authors: An Duy Tran*

Background:
Individual-level data is crucial in health economic research because it enables a deeper understanding of the relationship among patient characteristics, health outcomes, and health resource use while accounting for heterogeneity. However, access to such data is often limited by privacy, legal or cost barriers. In type 1 diabetes, no studies have produced comprehensive synthetic data that contains a wide range of demographic and clinical variables, along with event histories. Such data are valuable for studying the distributions of and the relationships between risk factors of adverse events in real-word settings, and for use as inputs for the cost-effectiveness patient-level models.
Aim:
We aimed to generate and evaluate synthetic cohorts of individuals with type 1 diabetes using several statistical and deep learning approaches. The goal is to produce a synthetic dataset that best resembles the structure and dependencies of variables in the real-world data.
Methods:
We used a real-world dataset from the Swedish National Diabetes Register containing 46 demographic, clinical, and event history variables from 27,841 individuals with type 1 diabetes. We compared seven data synthesis methods, including sampling from empirical joint distributions (SEJD), sampling from conditional distributions (SCD; parametric or non-parametric), Copulas, Vine Copulas, and Bayesian networks, Tabular Variational Autoencoder (TVAE), and Conditional Tabular Generative Adversarial Network (CTGAN). We assessed model goodness-of-fit using Kullback-Leibler divergence, pairwise correlation difference, support coverage, log-cluster metric and cross-classification metrics to evaluate similarity between synthetic and original datasets.
Results:
SEJD and non-parametric SCD methods outperformed others across most evaluation criteria for all variable types. These methods generated data that closely resembled the real-world data in terms of marginal distributions and dependency structures. For example, the range of differences in pairwise correlation coefficients among variables between the synthetic and real-world datasets was narrower for SEJD (-0.0155 to 0.0171) compared to Copula method (-0.2796 to 0.3126). While parametric SCD and deep learning approaches produced data with slightly lower similarity, particularly for categorical and count variables, they were nearly as effective as SEJD and non-parametric SCD in preserving dependencies among continuous variables.
Conclusions:
SEJD and non-parametric SCD methods are well-suited for creating synthetic cohorts with a high proportion of categorial and count variables, such as those used in cost-effectiveness patient-level models in type 1 diabetes. Our study contributes to overcoming data access barriers by identifying effective methods for generating patient-level data from real-world data for health economic modelling in diabetes, while ensuring patient privacy is protected.

**Using Machine Learning Methods to Predict Global Maternal Mortality Ratios**

*Rosalita Rosenberg, Australian National University*
*Co-authors: Minh Bui; Nhung Nghiem*

Background:
The United Nations Sustainable Development Goals (SDG) outline the international community's aspiration to reduce the global maternity mortality ratio (MMR) to below 70 maternal deaths per 100,000 live births by 2030. However, as of 2023, the average global ratio at 197 deaths per 100,000 live births remained significantly above the target. Only a small subset of countries is projected to meet the SDG. The World Health Organization (WHO) has highlighted how limited access to accurate, complete maternal mortality data hinders effective interventions, especially as countries with the highest MMRs tend to have the most missing data.
Aims:
This study aimed to (1) use machine learning (ML) methods to predict the maternal mortality ratios (MMR) of different demographic groups, (2) assess the performance of a range of ML models, and (3) identify variables with strong predictive power.
Methods:
We merged data from the World Bank's Gender Data Portal and the WHO's Health Inequality Data Repository that was collected between 2000 and 2019. The merged dataset contains 50,115 observations, and variables including country, income level, sex, age, and healthy life expectancy at birth, as well as a variety of other socioeconomic, environmental and health-related indicators. We tested different combinations of the following pre-processing and imputation techniques: iterative thresholding, standardisation, k-Nearest Neighbours, Miss Forest, polynomial imputation, and correlation-based imputation. The imputed and processed datasets were used to train Random Forest, LightGBM, XGBoost, and AdaBoost models, as well as kNN-Regressors, Support Vector Machines, Multi-Layer Perceptron Networks and Recurrent Neural Networks. Through refining the models, we are investigating the relative strengths of different pre-processing and imputation techniques, as well as model and hyperparameter choices.
Results:
Models were evaluated using their mean average percentage error (MAPE) score, which is the average difference between the prediction and ground truth value as a percentage of the ground truth. Our higher performing models had MAPE scores below 0.3, meaning that, on average, their predictions differed from the true MMR value by no more than 30% of the true MMR. All models had MAPE scores below 1.0. Currently, the KNN Regressor and ensemble-based machine learning models have the lowest MAPE scores and best performance, potentially due to their ability to capture patterns between similar samples.
Conclusions:
This study provides a tool for policy makers and public health practitioners to obtain MMR estimates across a range of years, countries, and demographic groups, allowing them to craft effective public health interventions. It also provides a methodological framework for training ML models to predict similarly critical public health metrics.

**Use of Machine Learning to Assist a Literature Review: a Case Study in Cancer**

*Sabine Deij, University of Melbourne*
*Co-authors: Karen Trapani; Kaung Mon Winn; Gang Chen*

Background and Aim:
The limited number of published studies validating machine learning (ML) tools in health economics may hinder their broader application. One such tool is Research Screener (RS), a commercial application that employs ML and natural language processing to semi-automate abstract screening. RS uses a set of seed references and references flagged through manual screening to iteratively rank the references by likelihood that they are relevant to the research. With each round of manually screening, the ML model learns from the researchers' choices and revises the ranking. Screening rounds should initially see an increase in number of relevant references flagged, followed by a downward trend in number of references flagged per round as the number of unidentified relevant references diminishes. Abstract screening is halted when either all references have been screened, or an a-priori threshold, or stopping rule, is reached where the researcher is confident that they have flagged all relevant references. We present a case study using RS to help screen a large number of abstracts to find studies using validated patient-reported experience measures (PREMs) in cancer care.
Methods:
A scoping review identified around 90 validated PREMs used in at least one study to survey patients diagnosed with cancer about their experience of their care. A search across seven databases for each PREM identified roughly 90,000 references in total. After de-duplication and removal of references that did not meet criteria of original research articles in peer-reviewed journals, around 60,000 references for screening were pooled into a single data set. Seed references, to train the model, were identified by manually screening references found for a randomly selected subset of PREMs. Although not required by RS, the research team randomly assigned half the manually screened references that were eligible for inclusion in the study to a seed set and the other half to be used for validation. Abstracts were independently screened by two reviewers. The team's stopping rule was based on 1) number of consecutive rounds without any flagged references following rounds of decreasing trend, 2) all validation references having been flagged, and 3) a proportion of total number of references having been screened. Conflict resolution was then conducted in RS before the relevant references were exported and full-text review conducted manually.
Results and Discussion:
Strengths of the approach are time saved screening and mitigating the risk of screener fatigue. Choosing a commercial application provided methodological support to a complex project while using a set of references to inform the stopping rule and validate the screening outcome provided assurance that screening was done effectively. A limitation was the time required to prepare the data for screening as RS requires abstracts which were missing for a significant proportion of references.

**Causal Inference in Health: What Can Economists and Machine Learning Scientists Learn from Each Other?**

*Nhung Nghiem, Australian National University*
*Co-authors: Sarun Srikhom; Pattarawadee Srimuang; An Duy Tran*

Background:
Causal inference plays a crucial role in health economics because it allows researchers and policymakers to determine the true effects of health interventions, policies, and treatments, beyond mere correlations. Health economists typically rely on theory-driven models grounded in established econometric methods to identify causal relationship. In contrast, machine learning (ML) scientists traditionally focus on uncovering patterns in datasets to build predictive models. However, recent advances have adapted ML techniques to estimate causal effects, particularly in the context of analysing complex, high-dimensional data where traditional methods may struggle.
Aims:
We aimed to (1) explore and compare the contexts in which econometric and ML techniques were employed for causal inference in healthcare, and (2) provide recommendations on how ML scientists might incorporate econometric tools to enhance the interpretability of their models in health-related applications.
Methods:
We conducted a scoping review of economic and machine learning studies that employed causal inference methods in healthcare. The literature search was conducted in May 2025 using the Scopus database and relevant terms such as “cause inference”, “econometrics” and “machine learning”. We included English-language studies published between 2000 and 2025. The studies were compared across various aspects, including research topics, research questions, data sources, analytical methods, models, tools, outcomes, geographic focus, software used, technical complexity, instrument variables (a variable that helps reveal causal effects), reporting results, and quality of the study.
Results:
Our search identified over 1200 records. After screening the abstracts and full-text papers, 25 studies met our inclusion criteria. We found that econometrics focused more on policy evaluation and healthcare spending, while ML focused more on treatment effects and personalised medicine. Causal inference using econometrics was more advanced in term of formulating problems, making assumptions, and using established tools. In contrast, ML models were more real-time data focus, more practical, and still evolving. We made some specific recommendations for health economists and ML scientists in learning from each other.
Conclusions:
In the era of big data, fostering greater collaboration between health economists and ML scientists would be highly beneficial. Machine learning can provide insights from complex datasets, uncover novel causal risk factors, and enhance the development of more robust economic models in healthcare. At the same time, health economists offer valuable expertise to ML scientists through their deep understanding of identification strategies, structural models, and theory-driven assumptions. Their focus on confounding, instrument validity, and model specification can enhance the rigor and interpretability of ML-based causal inference.

## Private Dining Room 1 Economics of Mental Health 2

### Mining Masculinity: The Long-Term Effects of the Gold Rush on Mental Health and Help-Seeking Behaviour

*Gyeore Cha, Monash University*
*Co-authors: Nicole Black, Johannes Kunz, Dennis Petrie*

Objective:
Resource extraction booms significantly reshape local demographics and social norms, often triggering large male-dominated migration. This study explores the long-term impact of the Victorian Gold Rush (1851-1899) on present-day mental health outcomes and healthcare utilisation. We hypothesise that masculine norms formed through intense male-male competition and demographic imbalances during the Gold Rush persist and influence men's mental health and help-seeking behaviour today.
Methods:
This study employs a natural experimental design using geographic variation in historical gold mining occurrences in Victoria (1851–1899) to identify Gold Rush and non-Gold Rush areas. Adults aged 18-65 in these areas are compared using an intention-to-treat framework to assess long-term impacts on mental health outcomes and healthcare use. Historical mining data from GeoVic and demographic records from the Historical Census and Colonial Data Archive (HCCDA) are linked with individual-level administrative data from the Person Level Integrated Data Asset (PLIDA), including Medicare claims and mortality records. To explore underlying mechanisms, we apply Principal Component Analysis to Conformity to Masculine Norms Inventory (CMNI) responses from the Ten to Men (TTM) study (2012–2022), linked to Medicare claims data, to identify specific masculinity dimensions related to mental healthcare use.
Results:
We find significant long-term impacts of the Gold Rush on present-day mental health outcomes and mental healthcare use among men, but not among women. Men in Gold Rush regions experience, on average, 5.3 additional deaths of despair per 100,000 individuals compared to non-Gold Rush areas. However, men in Gold Rush regions have a 1.5 and 1.1 percentage point lower probability of obtaining a GP Mental Health Treatment Plan (MHTP) and visiting a psychologist, respectively. Using TTM data, we find dimensions of masculinity norms related to “Dominance and Power”, are strongly associated with lower use of both GP MHTPs and psychological therapy. We provide evidence for the persistence of dominant masculine norms in Gold Rush regions, as reflected in Victorian crime data showing higher rates of assault and sexual violence by 13.4% and 14.5%, respectively.
Conclusion:
Our study demonstrates that persistent cultural barriers shaped by masculinity norms formed during intense historical male-male competition of the Victorian Gold Rush continue to influence men’s mental health outcomes and mental healthcare engagement. These findings underscore how sociocultural factors shape help-seeking behaviours and highlight the need for culturally sensitive health policies and interventions tailored to men’s mental health needs. Recognising and addressing these deep-rooted cultural norms is key to reducing barriers to care and improving health outcomes among men.

**Disaster Exposure During Pregnancy and Maternal Mental Health: Evidence from HILDA Longitudinal Dataset**

*Minnat Seema, Griffith University*
*Co-authors: Joshua Byrnes; Clifford Afoakwah*

Background:
Natural disasters can significantly affect psychological well-being, yet little is known about their impact on maternal mental health during pregnancy. This study investigates whether exposure to natural disasters during pregnancy is associated with poorer mental health outcomes and explores how socio-demographic characteristics may modify this relationship.
Methods:
We used data from Waves 9–22 (2009–2022) of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The analytic sample included pregnant women aged 15 and above, categorised by disaster exposure, defined as damage to their home from weather-related events in the previous 12 months. Mental health was measured using the Mental Health Inventory-5 (MHI-5). A fixed-effects linear regression model was employed to assess within-individual associations between disaster exposure and maternal mental health, controlling for time-invariant confounders. Effect modification by rurality, employment, and long-term illness was also explored.
Results:
Across all models, disaster exposure during pregnancy was associated with a small but consistent decline in MHI-5 scores ($\beta \approx = -1.8$). Long-term illness was the covariate significantly associated with poorer mental health ($\beta \approx +4.1$, $p < 0.01$). Socio-demographic stratifications suggested nuanced patterns: women with higher education and socio-economic status also exhibited mental health declines, challenging assumptions of their relative resilience.
Conclusion:
The consistent pattern of poorer maternal mental health among disaster-exposed pregnant women highlights the potential psychological burden disasters may impose during a highly sensitive period. These findings underscore the critical importance of integrating maternal mental health considerations into disaster preparedness, response, and recovery frameworks. Special attention is needed for women with chronic health conditions and those facing social or economic disadvantage. By adopting equity-focused approaches, policymakers and health systems can better support pregnant populations in disaster-prone regions and mitigate long-term impacts on maternal and child well-being.

**Health Utility and Economic Costs Associated with Loneliness Among Adolescents: Longitudinal Evidence from Australia**

*Muhammad Fikru Rizal, Monash University*
*Co-authors: Lidia Engel, Long Le, Michelle Lim, Cathy Mihalopoulos*

Background:
Adolescents report the highest rates of loneliness globally, particularly in high-income countries. While loneliness is increasingly recognised as a major public health concern, evidence on its implications for health utility and economic costs among young people remains limited.
Methods:
We analysed data from two waves of the Longitudinal Study of Australian Children (LSAC), focusing on waves where key variables were available. This included observations from ages 12 to 17, drawn from both Cohort B (born 2003 - 2004) and Cohort K (born 1999 - 2000). Loneliness was measured via child-reported responses to the statement "I felt lonely" in the past two weeks, with response options of "Not true," "Sometimes," or "True." Outcomes included health utility measured by the CHU9D (child-reported) and economic costs, including parent-reported service use for children, child-reported school absenteeism, and biennially aggregated Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme (PBS) reimbursements. We used pooled ordinary least squares (OLS) and first-difference estimators, which account for unobserved individual heterogeneity, to assess associations between loneliness and each outcome, progressively adjusting for demographic, socioeconomic, and health-related characteristics. The effective sample size ranged from 9,167 to 12,426 person-waves depending on outcome and regression specification.
Results:
In pooled OLS models adjusted for age, sex, cohort, and state fixed effects, adolescents who reported feeling lonely ("True" vs "Not true") were more likely to use health services, particularly psychological or behavioural therapy. They also had higher MBS claims, higher likelihood of frequent school absences (more than six times in the past six months, with or without parental permission), and significantly lower health utility. Differences in PBS reimbursements were not statistically significant. First-difference models confirmed significant associations with three outcomes: greater likelihood of frequent school absences (those with parental permission), higher MBS claims, and lower CHU9D scores. These associations remained robust after adjusting for baseline health, birth weight z-score, chronic conditions, household income, primary caregiver's education, language spoken at home, Indigenous status, number of siblings, and Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) quintile (at SA2 level). Although the magnitude of associations were attenuated, the key relationships remained statistically significant.
Conclusion:
Adolescent loneliness is associated with reduced health-related quality of life and increased use of publicly funded healthcare. Its association with frequent school absences may also result in potential productivity losses for parents. These findings highlight the importance of early interventions to reduce loneliness and mitigate its health and economic consequences.

**Antidepressant initiation and labour-market trajectories: Evidence from linked Australian administrative data**

*Ali Furkan Kalay, Macquarie University*
*Co-authors: Henry Cutler, Jonas Fooken*

Background and Objectives
Antidepressant use is prevalent in Australia, with approximately one in seven adults using these medications each year. Despite this widespread use, the broader economic consequences, particularly the effect on labour market participation and income, remain underexplored. This study investigates whether initiating antidepressant treatment influences labour market trajectories, focusing on employment and earnings. The research aims to clarify if antidepressants, beyond having a clinical effect, support labour force attachment and income.
Data and Methods
The analysis leverages population-scale linked administrative data from the Person Level Integrated Data Asset (PLIDA) which includes Pharmaceutical Benefits Scheme dispensing and personal income tax records. PLIDA provides longitudinal data (2010–2022) for Australian adults aged 18–64, capturing precise dispense dates, information on commencement and termination of employment, and annual income data.
Difference-in-differences (DID) methods will be used to compare labour market outcomes of individuals who differ in the time that they initiate treatment and control for demographics, prior healthcare utilisation, and local labour market conditions. To address potential endogeneity, such as the influence of job changes on treatment initiation, event-study analyses will examine pre-treatment trends.
Results
Results will be reported after undergoing the vetting process required by the Australian Bureau of Statistics for findings that are requested for exportation following the analysis of PLIDA data.
Contribution
This research will provide novel, population-wide evidence on how initiating pharmacological treatment for depression impacts labour market outcomes. By carefully addressing methodological challenges like selection bias and reverse causality, the findings will identify a causal effect of pharmacological mental health treatment on economic well-being.

## Private Dining Room 2 Economic Evaluation and Cost-Effectiveness 4

### Use and effectiveness of general practitioner management plans and team care arrangements for patients with Type 2 diabetes

*Esa Chen, Monash University*
*Co-authors: Jean Spinks, Andrew Donald, Dennis Petrie*

Introduction
General practitioner management plans (GPMPs) and team care arrangements (TCAs) are funding mechanisms that support multidisciplinary collaborative care for patients with chronic conditions. Coordinated by general practitioners (GPs), GPMPs/TCAs enable patients to receive Medicare-subsidised allied health care, with additional group services available for people with Type 2 diabetes (T2D). While GPMP/TCAs are widely used, there is little evidence on whether they improve the management of chronic conditions, including diabetes.
Method
A difference-in-differences analysis was used to compare visits of patients with T2D who received and those who did not receive any GPMP/TCA following an HbA1c test result between 2020-2024 using Patron general practice-based data from Victoria and Queensland. Disease management was compared using HbA1c levels in the 12 months before and after receiving a GPMP/TCA. Trends over time in clinic visits and prescriptions were also analysed for intervention and control patients.
Results
4118 patients received a new GPMP/TCA, compared with 6610 patients (26,605 visits) who did not receive a GPMP/TCA following an HbA1c test result in the same time period. The patients who received compared to those who didn't receive a GPMP/TCA were similar in terms of sex (43% female vs 42% female) and mean age (61.1 vs 65.4 years). In the intervention group, mean HbA1c level was 7.65% before and 7.33% after, compared to 7.42% before and 7.29% after in the control group. There was an increase in visits and prescriptions for T2D medications in both groups.
Conclusion
People with T2D who received a GPMP/TCA were more likely to have a higher HbA1c level, suggesting that the services are being targeted to people who likely need more support to manage their diabetes. After a GPMP/TCA, service use and prescribing of T2D medications increased to similar or higher levels compared to the group who did not receive the intervention.

**Are Updated COVID-19 Vaccines Still Relevant for all Adult Age Groups? An Economic Evaluation of the Monovalent XBB.1.5 Vaccine in Australia**

*Charles Okafor, University of Queensland*
*Co-authors: Syed Keramat; Namal Balasooriya; Echezona Dioji*

Objective
There is a progressive decline in the relative effectiveness of updated COVID-19 vaccines. Surveillance reports in Australia have also shown a wide variation in the disease severity and mortality across age groups. This study aimed to perform a cost-utility analysis of the monovalent XBB.1.5 vaccine relative to no updated booster vaccine between September 2023 and August 2024.
Methods
A cost-utility analysis was performed using a Markov model from the healthcare system perspective for three different age groups (18 – 64; 65 – 74; and ≥ 75 years). Costs and outcomes with the monovalent XBB.1.5 vaccine were compared to no updated booster dose for one year. Health outcomes were expressed as Quality-adjusted life-years (QALY), while costs were presented in 2023 Australian dollars. Aggregate distributional cost-effectiveness analysis and sensitivity analyses were performed. The willingness-to-pay threshold was set at AU$50,000/QALY.
Results
The updated vaccine was dominant for the 18 – 64 years group, and cost-effective for the 65 – 74 years group (incremental cost-effectiveness ratio [ICER] = AU$10,786/QALY), and ≥ 75 years group (ICER = AU$36,531/QALY) relative to no updated booster vaccine. The major determinants of the ICER was the vaccine uptake rate. There was inequality in health benefits between the older First Nations versus non-indigenous Australians. The results were robust to simultaneous changes in the parameters' values.
Conclusion
The monovalent XBB.1.5 vaccine is cost-effective and still relevant for all adult age groups in Australia. Based on current evidence, the study findings support the promotion of booster vaccination for Australian adults.

**The social and economic impact of bulk-billing incentives in Australia**

*Zeke Findlay, Australian National University*
*Co-authors: Matthew Lilley, Ashley Craig*

Objective
Bulk-billing incentives seek to ensure that out-of-pocket costs do not block access to a GP, and to direct public money toward the groups most at risk of financial and health disadvantage. We study a November 2023 reform which tripled the incentive (to a baseline of A$20.65) for children less than 16 years old and Commonwealth concession-card holders. Our aims are four-fold: (1) quantify the causal effect on GP bulk-billing rates, gap-fees and visit frequency; (2) estimate the distribution of the fiscal transfer between patients and providers; (3) assess whether the subsidy reduced price-related forgone care, thereby improving effective access; and (4) draw lessons for the equity, efficiency and sustainability of the Government's planned 2025 universal expansion.
Method
Our final estimates will exploit the Medicare Quarterly Statistics data and Population-Level Integrated Data Asset (PLIDA), linking person-level Medicare Benefits Schedule (MBS) claims (2013 – 2024) to the Medicare Consumer Directory and DOMINO Centrelink files for demographics and concession status. Children 0–15 years and concession-card holders form the treated cohort; individuals 16–64 years without concessions form the primary control, with additional analysis restricting attention to patients in narrower age bands around eligibility. We perform secondary analysis which additionally exploits geographic-based differences in the increase in subsidies. A difference-in-differences design is implemented at the consultation level with: (i) logistic and LPM models for bulk-billing; (ii) linear models for log gap-fees and visit counts; (iii) practice-clustered standard errors; and (iv) dynamic event-study estimation to estimate the evolution of effects over time and examine pre-policy parallel trends. Incidence calculations translate elasticities into dollars of taxpayer cost per dollar of patient benefit.
Results
Preliminary estimates using publicly available data indicate that the increased bulk billing incentives raised bulk-billing by a tightly estimated 4.1 pp from an 83.5% baseline and lowered average patient gap-fees by 0.14 log points ( A$0.87). One extra bulk-billed visit was induced for every 20.1 existing visits, implying a taxpayer outlay of ~A$296 per switch. Incidence analysis assigns approximately 90% of the transfer to GP income. Supply-side responses in consultation volumes were statistically indistinct from zero. The increase in bulk-billing rates were larger in regional areas which attracted a larger increase in subsidies than metropolitan areas, but this aside, were smaller in low-income areas than high-income areas on account of the latter's lower baseline rates of bulk-billing.
Conclusion
While the policy modestly improved affordability for eligible patients, most funds were directed to inframarginal consultations, limiting efficiency. When bulk-billing is already high, unconditional incentives are an expensive route to greater access.

**Health economic evaluations alongside Adaptive Platform Trials: A systematic review.**

*Karen Jing Yi Lee, The University of Melbourne*
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Objectives:
Adaptive platform trials (APTs) present an unprecedented opportunity to enhance trial efficiency and accelerate decision-making. The design enables the evaluation of multiple interventions in an overarching patient population, with ability to introduce or terminate treatments early without compromising trial integrity. It utilises a master protocol that documents pre-specified adaptations, centralises trial governance, and house resources to be shared across the platform. Limited evidence exists on how health economic evaluation studies are planned or conducted alongside APTs for pragmatic translation and informing resource allocation. This systematic review identifies and synthesises published evidence on the planning and conduct of economic evaluation alongside APTs.
Methods:
Eligible studies are identified from 7 electronic bibliographic databases, 3 clinical registries, 8 reviews, and 2 trial alliances (MEDLINE, Embase, Cochrane Trials, EconLit, CINAHL, Web of Science, Scopus, ClinicalTrials.gov, ANZCTR, and WHO ICTRP) until November 2024. Non-prematurely discontinued APTs with planned or conducted economic evaluations, and accessible core protocols, were included. Data were extracted from core protocols and health economic analysis plan (HEAP). The economic evaluation methods were narratively synthesised, with strengths and limitations appraised.
Results:
18 of the 97 APTs identified had planned or conducted economic evaluations. 15 APTs with economic evaluation plans or information were included, including 3 with economic evaluation results published. The economic evaluations were primarily planned for individual domains within the platform, and designed as a secondary objective or outcome of the APT. Economic evaluations were planned for either all interventions in a domain, or clinically effective interventions only. Long-term data collection at platform level, such as data linkage, for improved collective efficiency, were observed in 5 APTs. QALYs were used as the effectiveness outcome for 14 APTs. None planned to conduct economic evaluations during interim analyses to inform adaptations within the platform. Value of information was conducted in 1 and planned in 2 for the purpose of informing future data collection priorities.
Conclusions:
Our review finds that economic evaluations are included in only approximately 20% of existing APTs. The varying levels of details reported in the HEAP reflects the lack of standardised protocols and reporting guidelines for economic evaluations within APTs. The singular governance structure enables economic evaluation methods to be designed at a platform level, allowing for accommodation of uncertainties. Health economics methods are mostly utilised in APTs to assess interventions, and to evaluate the value of additional research. As more results become available, this systematic review can be updated to synthesise the economic evaluation methodologies used in APTs and inform best practice.

## Parallel Session 5 Day 2: 1.20-3.00

### Members Dining Room 1 Demand for and supply of healthcare 2

**Quality, Safety, and Disparity of an AI Chatbot in Managing Chronic Diseases: Simulated Patient Experiments**

*Yafei Si, The University of Melbourne*

Primary care providers in developing settings are less accessible, affordable, and qualified, contributing significantly to the high rates of underdiagnosis and poor management of chronic conditions and health disparities. The rapid development of AI solutions reveals opportunities to address these urgent challenges.

This study evaluates the quality, safety, and disparity of medical consultations using a freely accessible and most popular large language model (LLM), ERNIE Bot, in China. Using the method of simulated patients and experimental designs, we manipulated six patient traits among 384 patient-AI trials. Under standardized conditions, the performance was benchmarked against primary care providers and two other LLMs (ChatGPT-4o and DeepSeek R1).

We find that ERNIE Bot reached a diagnostic accuracy of 77.3% (95% CI: 73.1% to 81.5%), correct drug prescriptions of 94.3% (95% CI: 91.9% to 96.6%), but prescribed high rates of unnecessary medical tests (91.9%, 95% CI: 89.2% to 94.7%) and unnecessary medications (57.8%, 95% CI: 52.9% to 62.8%). Disparities were observed based on patient age and household economic status, with older and wealthier patients receiving more intensive care. Compared to human physicians, ERNIE Bot, ChatGPT, and DeepSeek demonstrated higher diagnostic accuracy but a greater tendency toward overprescription.

The results suggest the great potential of ERNIE Bot in empowering quality, accessibility, and affordability of healthcare provision in developing contexts and to help address underdiagnosis and poor management of chronic diseases. However, our findings also highlight critical risks related to safety and amplification of sociodemographic disparities. To ensure responsible and ethical use, future deployment must be accompanied by proactive stakeholder engagement, equity-centred model design, and real-world validation.

**A Missed Diagnosis is a Missed Opportunity: Upfront Screening for Immunodeficiency in Invasive Pneumococcal Disease**

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*Co-authors: Sandy Clarke-Errey, Abigail Cheung, Jim Buttery, Julia Clark, Andrew Harrison, Samar Ojaimi, Brendan McMullan, Theresa Cole, Zanfina Ademi, Amanda Gwee*

Background:
Evidence suggests that children presenting with invasive pneumococcal disease (IPD) may have underlying immunodeficiencies, now classified as inborn errors of immunity (IEI).
Our original prospective audit demonstrated a detection rate of 12% for IEIs in a highly vaccinated cohort of children presenting with IPD, with numbers needed to investigate (NNI) as low as 1 in 7 for sepsis, and 1 in 8 for meningitis. Unfortunately, despite pre-existing strong recommendations for a baseline set of investigations for screening, rates of screening were suboptimal.
Objectives: This study aims to evaluate the cost of screening children for IEIs in two specific presentations of IPD, pneumococcal sepsis and meningitis. This study also conducts a budget impact analysis to estimate 10-year costs of screening to the Australian healthcare system based on three potential scenarios around screening rates.
Methods:
Individual line-list data from our original, published prospective audit was used to calculate the costs of screening or not screening for each of these children, using prices for tests as ascribed by the Medicare Benefits Schedule (MBS) and non-MBS (out-of-pocket) prices as quoted by the RCH Melbourne.
Individual data was then averaged and utilised to calculate the costs of screening all eligible children to the healthcare system over 10-years (2024- 2033). The 10-year case burden of IPD was predicted using figures within the national public dataset (National Communicable Disease Surveillance System- NNDSS). Assumptions (based on our prospective audit) were made around the proportions of children who had signs of sepsis associated with bacteraemia; and the proportion of children with an IEI predisposing to IPD.
Two scenarios were outlined for screening rates: base case reflecting screening rates completed in our prospective audit and scenario 1 where the same proportion of children were screened with no further IEI cases found.
Results:
The mean cost range (in $AUD) to detect a child with an IEI for sepsis was between $3,630 (95% CI: $2,178, $10,891) [base case] and $4,853 ($2,912, $14,560) [scenario 1]; and for meningitis between $6,092 ($3,342, $16,482) [base case] and $7,417 ($4,069, $20,067) [scenario 1]. With these cost estimates and outlined assumptions, the projected 10-year total mean costs for screening were between $215,080 ($137,356, $324,736) [base case] and $287,527 ($183,624, $434,121) [scenario 1] for sepsis; and between $132,500 ($77,459, $173,416) [base case] and $161,317 (94,307, $211,136) [scenario 1] for meningitis.
Conclusions:
Despite significant upfront costs associated with screening all eligible children with IPD, there would be long-term savings to the healthcare system. Due to recurrent infections, the cost of undiagnosed IEI to the US healthcare system is approximately $65,043 AUD per patient. This is significantly higher than the cost of implementing a minimum set of investigations to screen for IEI.

**Causal Impact of a Team-based Primary Care System in Singapore on Health Outcomes and Healthcare Utilization**

*Kelvin Bryan Tan, Ministry of Heath, Singapore*
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Background and Objectives:
A novel Team-based care model (Teamlet) was introduced in 2014 within Singapore polyclinics to address gaps in care continuity and care comprehensiveness for patients with chronic conditions. Patients were enrolled to smaller teams comprising two family physicians, one nurse and one care coordinator, to enable a coordinated team-based approach. This study assesses the causal impact of Teamlet, focusing on clinical parameters, care adherence and healthcare utilization.
Methods:
We conducted a retrospective cohort study using the Ministry of Health's administrative and clinical data from 2011–2021. The treatment group were enrolled in Teamlet from 2014–2016, while the control group were chronic patients who received usual care in polyclinics as of 2021. To reduce selection bias, treated and control group were matched with Coarsened Exact Matching based on demographic, clinical, and healthcare utilisation variables.
We used a difference-in-differences (DiD) specification to estimate the causal impact of Teamlet on key outcomes, and counterfactual trendlines were derived from the trends for the Teamlet group and the estimated treatment effects in each period. Pre-treatment trends were assessed to ensure the validity of the DiD approach. Missing biomarker values were imputed using the K-Nearest Neighbours algorithm, and the share of missing values was small (< 15% across all biomarkers).
Results:
Teamlet led to modest improvements in clinical parameters over the study period, with average reductions in HbA1c (-0.1%-points [-0.13, -0.08]), systolic blood pressure (-1 mmHg [-1.16, 0.84]) and LDL-cholesterol (-0.03 mmol/L [-0.04, -0.02]) compared to the counterfactual levels. Teamlet also increased adherence to diabetes screening protocols, with a 10%-points and 4%-points annual average increases in foot and eye screenings respectively.
Teamlet care was cost saving on average, as total healthcare costs were SGD $2,186 or USD $1,682 lower per patient over six years [-$2,643, -$1,730], despite higher polyclinic costs (SGD $479 [$451, $507] per patient). This reduction was largely driven by inpatient hospitalisation savings (SGD $2,432 [-$2,850, -$2,014]) due to fewer inpatient episodes and shorter hospital stays, alongside smaller savings in Specialist Outpatient Clinics (SGD $130 [-$160, -$101]) and Emergency Department (SGD $49 [-$67, -$32]) costs.
Conclusion:
Restructuring polyclinic workforces into smaller, collaborative care teams improved care adherence and reduced high-cost healthcare utilization, with modest improvements in clinical parameters. Our results support a support the scalability of team-based care models in high-volume primary care settings.

**Hospital Mergers and Subsequent Quality: Do Good Matches Matter?**

*Eric Sun, Stanford University*

Objective.
Increasing consolidation has been a hallmark of the United States healthcare landscape over the last decade, with ongoing merger activity between hospitals and healthcare provider groups. In general, studies suggest that these mergers are associated with price increases but are ambiguous as to the impact of quality. In particular, an overlooked facet is the extent to which quality differences between the merging hospitals before the merger can impact quality after the merger-for example, if a “good” hospital buys a “bad” hospital, are the impacts on quality post-merger different than if both hospitals are “good?” In this study, we examined the extent to which pre-merger differences in quality impact post-merger changes in quality.
Methods.
We obtained data on hospital mergers between 2016 and 2020 from Levin and Associates, who produce an annual report of hospital mergers derived from press releases and hospital financial reports. We then merged these data with hospital quality ratings provided by Medicare, the public insurer for the elderly in the United States. These ratings range from one (worst) to five (best) stars, and are based on several quality metrics such as hospital complication and readmission rates. We then calculated the difference in the star ratings between the buying and selling hospital at the time of merger, and estimate the impact of this difference on post-merger quality trajectories, after adjusting for adjustable hospital characteristics such as bed size and presence of training programs for medical residents.
Results.
Our sample consisted of 184 mergers between 2016 and 2020. For 66 mergers (36%) there was no difference in pre-merger quality ratings between the buyer and seller, while for 77 mergers (42%) the two hospitals differed by 1 star pre-merger and for an additional 41 mergers (22%) the two hospitals differed by at least 2 stars. After adjusting for observable characteristics, we found that pre-merger quality differences were associated post-merger quality differences for hospitals that were sold. In particular, each one star increase in quality between the buying and selling hospital was associated with a 0.11 increase (95%CI 0.003-0.208) in quality for the selling hospital following the merger. However, pre-merger quality differences were not associated with changes in post-merger quality in the case of the buying hospitals.
Conclusions.
Our results suggest that pre-merger differences in quality between two merging hospitals are associated with post-merger changes in quality for the selling hospital but nor for the buying hospital. These results have important implications with regards to the economic analysis of hospital mergers.

**Effect of Urgent Care Centres on Emergency Department attendance and timeliness**

*Peter Bristow, University of Queensland*
*Co-authors: Sabrina Lenzen, Luke Connelly*

The ability of Emergency Departments (EDs) to provide timely care to patients continues to worsen in developed countries around the world (Javidan et al., 2021). In Australia, the Australian Institute of Health and Welfare (2023) reports the number of ED attendances being seen within the clinically recommended time has fallen from 71% in 2018-19 to 65% in 2022-23. Recently, the Commonwealth Government have opened urgent care centres (UCC), with the stated aim of reducing ED waiting times, at a projected cost of $760M over five years. States have established similar centres. The program logic of these programs is to divert and substitute an UCC visit for ED attendance for appropriate patients. Bulk-billing is used to partially fund the UCCs.

Objective:

We aim to examine the effect of the opening of publicly funded, UCCs on attendance and waiting times at the nearest, and all EDs within the UCC's local government area (LGA); and on the number of GP services, Medicare bulk-billed services, and the rate of bulk-billing in the surrounding LGA.

Method:

Using publicly available data we estimate the effect of the opening of 54 UCCs in NSW and Qld by three Difference-in-Differences (DID) estimators, and a generalised synthetic control method (SCM). We examine the estimates' robustness to variation of pre-existing ("parallel") trends, with the "honestdid" method described by Rambachan and Roth (2023), before drawing causal inferences. We use an intention to treat analysis and determine the time of treatment initiation from public announcements of UCC opening.

Results:

We find a statistically significant fall of up to 300 ED attendances per quarter after the treatment (UCC openings) compared to not-yet treated or never treated sites (2.6% of the mean attendance before UCCs opened). However, using the honestdid method, we cannot exclude baseline variation as an explanation for the change. The generalised SCM estimates, which do not rely on the assumption of parallel trends, however, also show a significant fall of similar magnitude. Rates of being seen within time recommended rise by up to 1.6% compared to controls, but again this finding is not robust to baseline variation, nor present with SCM.

Surprisingly, since the intervention aimed to see more patients in the GP sector, after opening our results show a significant decline in GP and bulk- billed attendances of approximately 10,000 per quarter compared to controls, using the DID estimators, but not with SCM. However, again, this decline is not robust to baseline variation. The rate of bulk-billing does not change significantly.

Conclusion:

Our analysis of the effect of the opening of 55 UCCs suggest the centres do not result definitively in more rapid care at EDs, and that the total patients seen in general practice including the UCCs do not increase. This suggests the recently announced expansion of the program will not achieve its stated aims , despite the significant expenditure.

**Geographic Inequities in Access and Timeliness of Peripheral Arterial Disease Interventions Across Australian States**

*Oh Sung Choy, Townsville University Hospital*
*Co-authors: Yew Toh Wong*

Objectives:
This study aimed to quantify state-level disparities in both the receipt and timeliness of peripheral arterial disease (PAD) procedures in Australia, and to characterize variations in intervention rates per capita.
Methods:
We conducted a retrospective cohort analysis of 29 370 adult PAD interventions recorded in the ANZSVS audit between 2021 and 2023. State of treatment (ACT, NSW, QLD, SA, TAS, WA, NT) was the primary exposure. To assess receipt of care, we used multivariable logistic regression—adjusting for age, sex, key comorbidities (smoking, ischaemic heart disease, diabetes, hypertension, renal impairment) and insurance status—to estimate odds of intervention for claudication, rest pain and ulcer/gangrene by state (reference: ACT). Timeliness was evaluated by categorizing preoperative delay (0, 1, 2–7, 8–15, > 15 days) and modeling the likelihood of waiting more than seven days across jurisdictions. Intervention rates per 100 000 population were compared using Poisson regression with ABS population denominators.
Results:
Relative to the ACT, patients in Tasmania and Western Australia exhibited more than double the odds of undergoing interventions for claudication (OR 2.17 and OR 2.64 respectively; $p < 0.001$), whereas Northern Territory patients had 36 percent lower odds (OR 0.64; $p < 0.001$). Comparable state-specific patterns emerged for rest pain and ulcer/gangrene. The Northern Territory also showed the highest proportion of patients experiencing delays greater than seven days, while New South Wales and Queensland achieved the shortest admission-to-procedure intervals. Intervention rates per 100 000 population were significantly elevated in NSW, QLD, SA, TAS and WA compared with ACT (all $p < 0.01$) and were significantly lower in NT ($p = 0.0056$).
Conclusions:
Marked state-level inequities in both access to and timeliness of PAD interventions exist across Australia. Tasmania and Western Australia deliver substantially more procedures per capita than the ACT, whereas the Northern Territory lags in both procedural volume and speed of care. These findings underscore the need for targeted regional strategies to promote equitable PAD management nationwide.

**Costs and Resource use of Point-of-care versus Commercial Virtual Surgical Planning in Jaw Reconstruction: A Propensity Score and Regression Analysis**

*Namal Balasooriya, Griffith University*

Background:
Virtual surgical planning (VSP) enhances surgical precision in jaw reconstruction. Point of care workflows have been developed in an attempt to mitigate the significant costs of VSP whilst maintaining the associated benefits. However, the true cost and resource use implications of point-of-care versus commercial VSP remain inconclusive.
Objective:
To compare the cost and resource utilisation between point-of-care and commercial VSP in patients undergoing maxillary or mandibular reconstruction using a robust causal inference framework.
Methodology:
The analysis was conducted on 64 patients who underwent jaw reconstruction at Chris O'Brien Lifehouse Hospital. Costs were estimated using a detailed micro-costing approach from the hospital provider perspective. To control for baseline imbalances, propensity score matching was performed. Key covariates included ASA classification, vasculopathy, site (maxilla vs. mandible), neck dissection, and tracheostomy. Post-matching balance was assessed using standardised mean differences and visual diagnostics. Sensitivity analysis using genetic matching was also conducted. Regression adjustment was applied post-matching to improve the estimate.
Results:
After matching, both groups had balanced covariates (n = 18 per group). The commercial VSP group had significantly higher mean total operating room costs (AUD 39,522 vs. AUD 30,490), including VSP costs (AUD 18,760 vs. AUD 8,925) and operating room non-disposable equipment costs (AUD 2,705 vs. AUD 2,305). This was despite the point-of-care group having longer operation (582 vs. 506 minutes) and anaesthetic durations (653 vs. 589 minutes). These differences were statistically significant ($p < 0.05$). Sensitivity analysis using genetic matching confirmed the robustness of these findings, with similar effect estimates and matched sample sizes. Regression estimates confirmed these results, even after controlling for patients SES and health status.
Conclusion:
Despite point-of-care VSP being linked with longer surgical durations, commercial VSP remains significantly more expensive overall.

**Healthcare Costs among children with Cerebral Palsy: Analysis from the Goals, Activity, Motor Enrichment (GAME) Trial**

*Yuling Ke, The University of Sydney*

Background
Cerebral palsy (CP) can place a substantial financial burden on both the health and social care system and is currently funded through the National Disability Insurance Scheme. A prospective costing analysis of an early physiotherapy intervention, called Goals, Activity, Motor Enrichment (GAME), was undertaken alongside a randomised clinical trial. It was hypothesised GAME could save downstream health system costs.
Aim
This study aimed to investigate and compare healthcare use and costs between the GAME intervention and standard care groups at 18 months after randomization, stratified by confirmed diagnosis or suspicion of CP.
Methods
Healthcare use and costs were collected and measured using trial records and linked Medicare claims, obtained from the Australian Institute of Health and Welfare. Healthcare use was grouped into categories. For costs incurred after one year, a discount rate of 5% was applied. Non-parametric Kruskal-Wallis tests were used to analyze the difference in healthcare use and costs between randomized groups. The general linear model with gamma distribution was used to analyze the difference in healthcare costs between intervention and standard care groups adjusted for socio-demographic characteristics of the families. All costs were reported in 2023 Australian dollars.
Results
The mean per patient Medicare healthcare expenditures at 18 months were AU$2,783 (SD: $2,031) for standard care (n=134); and AU$2,569 (SD: $2,146) for those receiving the GAME intervention (n=136). The highest category of healthcare use was visited to general practitioners (99% in both standard care and intervention groups). There were no significant differences in healthcare costs between intervention and standard care groups (p=0.29). Children with suspected but not diagnosed CP, incurred half (49%) of the healthcare costs of children with confirmed CP.
Conclusion
The GAME intervention produced a small but non-significant reduction in health system expenditure. Children with a CP diagnosis incurred substantially higher costs than those with suspected but unconfirmed CP. Analysis of out-of-pocket costs for families with a child with CP, is necessary to determine the effectiveness of government disability support packages.

**Health Service Utilisation and Costs of Telehealth versus Face-to-Face Visits Among Women with Asthma: Evidence from the Australian Longitudinal Study on Women's Health and Linked Administrative Data**

*Aisha Towhari, University of Newcastle*
*Co-authors: Xenia Dolja-Gore, Christine Paul, Victoria McCreanor, Penny Reeves*

Objectives
Despite Australia's universal healthcare system, asthma continues to disproportionately affect individuals from socioeconomically disadvantaged and geographically remote areas. Telehealth may offer a scalable solution to improve access and health outcomes. This study evaluates the introduction of telehealth services in 2011 to improve equitable access to asthma care, enhance asthma control, and reduce healthcare costs among women in New South Wales (NSW), Australia.
Methods
Our study used the Australian Longitudinal Study on Women's Health (ALSWH) data linked to the Australian health administrative datasets to identify first known diagnosis of asthma among women from the 1973–78 birth cohort. Women were classified into face-to-face (f2f) or hybrid (f2f and telehealth) care models across pre-, during and post-pandemic periods (2012–2023) by linking surveys to Medicare Benefits Schedule (MBS) data. For economic evaluation: health service utilisation and costs were examined across Socio-Economic Indexes for Areas (SEIFA) and the Accessibility/Remoteness Index of Australia (ARIA+) using MBS items. A cost-consequence analysis will assess incremental costs for both healthcare utilisation and health outcomes across care models.
Results
Approximately 32% of women self-reported an asthma diagnosis at least once in the ALSWH surveys, with a mean age at diagnosis of 17 years. In NSW, face-to-face non-referred GP services for all women in the cohort dropped from 20,929 in 2019 to 15,998 in 2020 (?23.6%), with partial recovery by 2023 (16,598). Corresponding costs decreased from $1.07 million (2019) to $843,062 (2020), rising to $958,084 in 2023. Telehealth services, negligible before 2020, increased to 5,562 in 2020, peaked at 6,303 in 2021, and declined to 4,386 in 2023 (?30.4% from peak). Costs followed a similar pattern, peaking at $267,017 in 2021 and decreasing to $180,399 by 2023. By 2023, 44% of women continued to use hybrid care in the post-pandemic phase. The average number of face-to-face services per woman declined from 6.6 in 2019 to 5.37 in 2023, while the use of telehealth services rose from 0 to 1.42 services per woman over the same period.
Conclusions
As of 2023, face-to-face visits remain below pre-pandemic levels, while telehealth use has declined from its 2021 peak, indicating a shift toward hybrid care. Ongoing analysis of linked administrative data will inform the sustainability and value of telehealth in chronic disease management.

**Worsened Disparity in Financial Protection for Households Managing Non-Communicable Diseases in Nigeria: A Causal Analysis through the Pandemic**

*Adelakun Odunyemi, Murdoch University*
*Co-authors: A/Professor Khurshid Alam; Professor Hamid Sohrabi*

Background:
Non-communicable diseases (NCDs) impose significant financial burdens on households in low- and middle-income countries. Nigeria's health system vulnerabilities, compounded by COVID-19, may have worsened financial protection gaps for NCD-affected households.
Objectives:
We seek to estimate the differential gap and impact of the pandemic on NCD-affected households compared to non-NCD households and evaluate the effectiveness of the post-pandemic interventions in Nigeria.
Methods:
We analysed nationally representative panel data from Nigeria's General Household Survey Panel (Waves 4 and 5, 2018-2024) covering 4,682 households. We used inverse probability-weighted difference-in-differences analysis to estimate pandemic impacts on catastrophic health expenditure (CHE) and impoverishment among NCD versus non-NCD households, applying WHO Europe capacity-to-pay methods.
Results:
Pre-pandemic NCD households experienced higher CHE rates (30.23% vs. 12.21%) and out-of-pocket expenditures nearly triple those of non-NCD households. Post-pandemic, these disparities worsened significantly. Our causal analysis revealed an 11.9 percentage point differential increase in CHE risk for NCD households ($p<0.01$) and a 5.9 percentage point increase in impoverishment ($p<0.05$). Safety net coverage declined from 11.61% to 4.31% for NCD households, while health insurance enrolment remained below 4%.
Conclusions:
The pandemic created lasting financial protection gaps for NCD households in Nigeria. Recovery policies require targeted interventions, including automatic health insurance enrollment, NCD-specific benefit packages, and strengthened social protection systems to address persistent vulnerabilities in chronic disease financing.

**Self-reported doctor visits: Can calendar anchoring improve recall accuracy?**

*Li Huang, University of Melbourne*
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Objectives
Health care utilisation is a common input in health economic analyses, often measured through self-reported surveys or diaries. However, self-report of doctor visits over a short recall period is known to be subject to telescoping bias, where respondents include recall of events outside the designated timeframe, leading to an overestimation of healthcare use. Few studies have explored methods to improve recall accuracy. This study investigates whether incorporating a calendar as a visual anchor within a questionnaire can help mitigate telescoping bias and improve recall accuracy.
Methods
This study used an experimental design and was nested in a multicentre kidney trial. Participants from 22 Australian centres were randomised at hospital level to receive one of two versions of a self-report questionnaire. Participants in the control group were asked how many times they had consulted a general practitioner (GP) in the preceding 2 weeks. Participants in the intervention arm (calendar group) received a version of questionnaire that included an additional calendar of a 14-day frame which matched the recall period of interest as a visual anchor for the recall dates. The questionnaires were first collected at the trial's 12-week follow up which corresponded to the end of the intervention phase and repeated at 92 weeks and 2 years. Participants were invited to consent to Medicare data linkage which provided an alternative 'gold standard' measure of the number of GP visits made. The number of Medicare recorded GP visits were retrieved and summarised for the same 14-day patient frames. Error measures were computed and compared for self-report versus Medicare records, which include positive errors (telescoping), negative errors (omission), and total errors.
Results
A total of 239 participants had both self-reported GP visits and Medicare data linkage available from one or more of the three follow-ups (92% of the available participants). We observed that the average number of self-reported GP visits was 66%-75% higher than the corresponding Medicare records for the control group, while for the calendar group it was 9%-33% higher. The proportions of positive errors (telescoping) were higher in the control group compared with the calendar group in the 12 weeks (12%, P=0.04) and the 2 years surveys (14%, P=0.03). In the 92 weeks survey however, positive errors were similar for the control group compared with the calendar group (2%, P=0.73). Minimal difference in negative errors (omission) was observed across all three follow-up surveys.
Conclusions
The calendar method as a visual anchor shows promise for enhancing accuracy of self-report within surveys over a short recall period. The findings of this study may inform survey design and improve accuracy of reporting for studies necessitating short self-report periods. The results may also provide a starting point towards estimating adjustment factors to account for known telescoping bias.

**The Effect of the CDBS on Children's Dental Care Use: Quasi-Experimental Evidence from Australian Longitudinal Data**

*Nadeera Senavirathna, University of Southern Queensland*
*Co-authors: Rasheda Khanam, Enamul Kabir*

Background of the study
Dental care system in Australia is a mixed healthcare model with the combination of both publicly and privately operated services. Individuals purchase private health insurance or use their out-of-pocket money to partly or fully cover expenses related to privately operated dental care services. Public dental care services, on the other hand, are delivered through public hospitals and subsidized programs. The Child Dental Benefit Schedule (CDBS) is a subsidized program implemented in 2014 to improve access to dental services for children in low-income families.
Objective of the study
This study aims to evaluate the causal impact of the Child Dental Benefits Schedule (CDBS) on dental care use of children in Australia.
Methodology
The main data set for this study is from the Longitudinal Study of Australian Children (LSAC) linked with Medicare data. To estimate the causality of CDBS on dental care use of children, regression discontinuity design (RDD) was employed. Moreover, due to the existence of imperfect compliers, this study employed the fuzzy regression discontinuity design to assess the causality of the CDBS on child dental care use. The treatment assignment is not strictly determined by a single threshold but by two conditions: the child's age and the family's receipt of a government payment including Family Tax Benefit A (FTB A).
Findings and conclusion
Preliminary findings suggest dental care use of children from eligible families has increased after the introduction of CDBS. But there are variations in the magnitude of effect based on their geographical location. Findings highlight the importance of addressing both financial and structural barriers in designing child related public health interventions.

**Productivity index for paid and unpaid work: Australian population norms**

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Objectives:
Work is a major part of an individual's life and the societal economy. Health conditions can adversely affect productivity, thus quantifying the impact of disease on work productivity is important. This study aimed to establish population norms for the paid and unpaid work productivity index in Australia.
Methods:
Data on paid and unpaid work time and absenteeism were obtained from the Household, Income and Labour Dynamics in Australia (HILDA) Survey and data on presenteeism were obtained from the Australian Workplace Barometer (AWB) Survey. The productivity index was estimated by dividing the actual number of working hours by the typical number of working hours, ranging from 0 (completely unproductive) to 1 (completely productive). Actual working hours were calculated by subtracting hours lost due to absenteeism and presenteeism from the typical working hours. Among the employed, the productivity index was first estimated separately for paid and unpaid work, and then the weighted productivity index was estimated by applying equal weights to both. Among the non-employed, the weighted productivity index was equal to the productivity index for unpaid work.
Results:
The productivity index was 0.832 (men 0.847; women 0.815) for paid work and 0.831 (men 0.847; women 0.814) for unpaid work among employed individuals. The productivity index was 0.829 (men 0.847; women 0.815) among non-employed individuals. The population productivity index for both employed and not employed was 0.831 (men 0.847; women 0.815).
Conclusions:
The estimated population norms for the productivity index in Australia provide a baseline for assessing the productivity-related burden of specific diseases and identifying variations across subpopulations. By incorporating both paid and unpaid work, the index can offer a more comprehensive picture of disease burden and its differential impacts. These norms can further inform health technology assessments and guide healthcare resource allocation to enhance productivity.

**In-Utero Heat Exposure and Child Development**

*Sundar Ponnusamy, Deakin University*
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Introduction:
Child cognitive development is a key driver of long-term economic and developmental outcomes. Early-life nutrition shapes physical growth, brain development, and later educational attainment. Investments in child health and education enhance individual well-being and promote national development (Jensen 2000; Li et al. 2012; Castello-Climent and Mukhopadhyay 2013). Female educational attainment is linked to reduced teen fertility and child malnutrition (Keats 2018; DeCicca and Krashinsky 2020), lower infant mortality (Grepin and Bharadwaj 2015), and lower HIV incidence (Alsan and Cutler 2013).
Pakistan ranks 150th on the Human Capital Index (UNDP 2018) and has the world's second-largest out-of-school population, with 44% of children aged 5–16 not enrolled (UNICEF 2018). Gender gaps widen at higher levels: only 10.7% of males and 6.56% of females aged 20–40 have completed tertiary education (PSLM 2020). Malnutrition remains high—40.2% of children under five are stunted, 17.7% wasted, and 28.9% underweight (NNS 2018)—undermining early development and learning.
This study examines the effects of early-life temperature shocks during the 1,000-day critical window (in utero and the first two years of life) on child physical and cognitive outcomes. Using micro-level data from Pakistan, we analyze impacts on stunting, malnutrition, and test performance in math and reading. Given the potential for gendered responses to household shocks (Bjorkman-Nyqvist 2013; Marchetta et al. 2019), we also assess heterogeneity by gender and age.
Data and Methodology:
We use data on physical development (ages 0–4) from the Multiple Indicator Cluster Surveys and cognitive outcomes and schooling status (ages 5–16) from the Annual Status of Education Report (2012–2016). Temperature data are sourced from Willmott and Matsuura (2020), providing monthly gridded global records. District-level yearly temperatures are computed, standardized against long-run averages, and categorized to identify extreme heat or cold shocks (above/below 2 SD). We implement a difference-in-differences framework to estimate the causal effects of early-life heat exposure.
Findings:
Children born in extreme heat years are significantly more likely to be stunted and malnourished. Those exposed in utero also show lower test scores in arithmetic and verbal assessments. Evidence of adverse effects on employment outcomes among 16–30-year-olds suggests that these shocks have lasting impacts. Both boys and girls are similarly affected. Results remain robust to alternative specifications, including controls for early-life rainfall, current weather, and fixed effects.
Conclusion:
This study provides new evidence on both the short- and long-term effects of early-life climate shocks in a developing country context. With rising climate risks in Pakistan, in-utero shocks may have lasting effects, underscoring the need for timely investment in maternal and child health.

**The Health Impacts of the Opening of Cancer Treatment Centres**

*Dan Liu, University of Technology Syndey*
*Co-authors: Serena Yu, Mei Ling Yap, Philip Haywood*

Geographic access to healthcare has long been a policy concern, particularly in a geographically vast country like Australia. In this study, we examine the causal impact of the opening on cancer care. This is an area of healthcare where patients receive urgent, high value treatment, and unlike related studies, where patients and their carers must travel for extended and repeated care. We use survey-linked administrative data to implement a difference-in-differences approach. We calculate credibly causal effects of the openings of cancer treatment centres on outcomes. These outcomes include patient out-of-pocket costs, waiting times, as well as whether patients received the treatment at all. We find that the openings have a significant causal effect on treatment decisions. Our results suggest that geographic access to radiotherapy helps explain large variation in utilisation rates and should continue to be a policy priority in countries with significant rural populations.

## Private Dining Room 1 Health Preference Research 2

**Optimising Cancer Survivorship services based on patient preferences: A latent class analysis of a discrete choice experiment**

*Blake Angell, The George Institute for Global Health*
*Co-Authors: Eric Fong, Molly K Barnhart, Leon Botes, Stella Mulder, Stephen Jan, Monica Tang, Boon Chua*

Introduction:
As cancer survival rates increase, many survivors face ongoing physical and psychological challenges related to their disease and treatment. Cancer survivorship centres can provide specialised, centralised care to support recovery and long-term well-being. However, in a context of limited resources and competing priorities, there is uncertainty about how best to design these services. This study aimed to assess patient preferences to inform the development of a cancer survivorship centre.
Methods:
A discrete choice experiment was conducted, using attributes identified through a literature review, qualitative interviews, and expert consultation. Six key attributes were included: (1) focus of care (adverse effects, lifestyle, or social support), (2) delivery method (in-person or phone/video), (3) frequency of services, (4) individual vs group sessions, (5) out-of-pocket costs, and (6) inclusion of peer support services led by health professionals. A d-efficient design was used to generate hypothetical scenarios, and a survey was distributed via REDCap to cancer survivors attending a cancer centre in Eastern Sydney. Each participant completed 12 choice sets, selecting between two service configurations or opting for 'Neither'. Data were analysed using mixed multinomial logistic regression and latent class analysis.
Results:
A total of 144 cancer survivors completed the survey. Most attributes significantly influenced preferences. On average, respondents evaluated each scenario independently rather than defaulting to always choosing or opting out. Participants showed a strong preference for services focused on managing adverse treatment effects (?=0.76, 95% CI: 0.54–0.97) and lifestyle and wellness support (?=0.57, 95% CI: 0.38–0.77), as well as services delivered in person (?=0.26, 95% CI: 0.13–0.40). Cost was a major driver of preference, with coefficients for $0, $25, $100, and $200 services at ?=1.03, 1.02, -0.53, and -1.52, respectively. Surprisingly, less frequent services were preferred; weekly sessions were associated with a negative preference (?=-0.33, 95% CI: -0.63 to -0.16).
Latent class analysis revealed three participant groups:
1.Uninterested (23%) – unlikely to attend any service, regardless of its design.
2.Potential (32%) – generally open to attending but preferred less frequent, targeted services.
3.Willing (45%) – actively evaluated options and were most influenced by cost.
Conclusion:
Cancer survivors in this study expressed strong interest in survivorship services, especially those focused on managing treatment-related adverse effects and lifestyle support. However, preferences varied significantly across the sample. To maximise service uptake and value, developers should prioritise affordable, targeted care with flexible delivery options.

**Development of a DCE to identify priorities of nurse managers for workplace mental health strategies**

*Jemimah Ride, Monash University*
*Co-authors: Christine La Bond, Claire de Oliveira, Elisabeth Huynh, Qin Zhou, Rebecca Jarden, Rowena Jacobs*

Background:
Working conditions are a major influence on mental health, with significant productivity costs, yet many workplaces do not implement effective mental health strategies. Incentivising mid-level managers to prioritise employee mental health when allocating resources such as staff time may offer a new way forward. We hypothesise that mental health strategies are undermined, in part, by managers prioritising aspects of team functioning such as short-term performance targets over mental health. We need to know how managers value mental health compared to other aspects of team functioning to design effective incentives.
We will use a discrete choice experiment (DCE) to identify managers' priorities and trade-offs across aspects of team functioning, applied in hospital nurses and midwives - a workforce with high levels of stress, burnout, and related problems of retention and performance. As this is a new context for a DCE with no established approach to the depiction of choices, we need to understand the nurse manager perspective to ensure that the hypothetical choices are meaningful and vivid to participants. The aim of the current study is to develop and pre-test choice scenarios, attributes, and levels that are realistic to nurse managers.
Methods:
We consulted industry and research experts, reviewed the literature, and conducted semi-structured qualitative interviews with 14 hospital nurse managers in Australia in late 2024. Transcripts were analysed using a mixed deductive and inductive approach, incorporating predetermined themes of mental health and other team outcomes, plus emergent themes. Using these inputs, we developed the list of attributes and their levels to be used in the DCE, and framing of the choice scenario. We conducted think-aloud interviews to understand how these were understood and processed by nurse unit managers, and piloted the DCE to inform refinement of the survey prior to full data collection.
Results:
In the qualitative interviews, impacts of team mental health on patient care and team functioning were a stronger focus than mental health per se. The term 'mental wellbeing' was preferred to 'mental health'. Participants were familiar with trade-offs between investing in team wellbeing and meeting performance targets, administrative requirements, patient care, or the manager's own stress or personal time. Most reported a high level of autonomy in allocating staff time, but were constrained by financial resources and performance targets from making choices that prioritised team mental health. They reported that senior management focus on budgets, targets, and sick leave. Think aloud interviews and piloting are in progress at the time of submission and their analysis will be complete by the time of presentation.
Conclusion:
The DCE will be informed by this study and used to explore incentive structures that could encourage managers to place a higher weight on mental health in allocating team resources.

**Preferences for neurodevelopmental screening modalities for children: A labelled discrete choice experiment using partial choice set design**

*Pahki Sharma, Queensland University of Technology*
*Co-authors: Sanjeewa Kularatna, Bridget Abell, Steven McPhail, Sameera Senanayake*

Objectives:
Access to health services is a significant barrier in neurodevelopmental follow-up care. Various ways or modalities including virtual care models could be considered to bridge this gap. While studies have explored the implementation of different virtual neurodevelopmental follow-up modalities individually, an examination of families' preferred characteristics across these approaches is lacking. Subsequently, this study aims to elicit families' preferences for various modalities of accessing neurodevelopmental screening (e.g., face-to-face and virtual) for their children.
Methods:
We used a Discrete Choice Experiment (DCE) to elicit families' preferences. We collected data from families of children below five years of age. The DCE process included four stages. In stage 1, we identified alternatives (screening modes), attributes, and levels using literature review and expert advice. The finalised alternatives were video conferencing, telephone consultation, mobile application, online portal, and face-to-face. The finalised attributes were screening test administrator, technical literacy required, duration, and feedback about results. In stage 2, we generated choice tasks using a Bayesian d-efficient design. To reduce respondents' cognitive load, we used a partial choice set design that presented three out of five alternatives per choice task. These choice tasks were compiled into a survey that also included demographic questions. We conducted pre- and pilot tests to ensure survey comprehension and to obtain priors. Stage 3 involved administering the DCE survey online. We received 502 responses. In stage 4, analysis was conducted using a panel mixed multinomial logit model (MMNL). We accounted for systematic and non-systematic heterogeneity using panel MMNL with covariates and panel latent class model.
Results:
Families preferred face-to-face screening compared to all virtual options. Across all alternatives, families consistently preferred shorter durations, automated feedback, and administration of the screening test together by both parents and clinicians. For all virtual modalities, technical literacy did not significantly influence preferences. Systematic heterogeneity showed that unemployed and retired individuals disliked video conferencing and online portals, and younger parents preferred mobile applications. Non-systematic heterogeneity indicated that some families (25% of the sample in Class 3) had a strong positive preference for mobile applications and online portals.
Conclusion:
While virtual options may improve accessibility, they may not fully replace face-to-face neurodevelopmental screening for many families. However, some families may be open to transitioning to virtual care, particularly via mobile applications and online portals. More work is required to explore each virtual screening option individually and the possibility to target these specifically to provide families with their preferred way of receiving care.

**Social preferences for value-based healthcare investment: what do people value most?**

*Henry Cutler, Macquarie University*
*Co-authors: Mona Aghdaee, Olukorede Abiona, Yuanyuan Gu, Dandan Yu*

Background:
Healthcare spending in high income countries can be wasteful. System managers and payers have turned towards value-based healthcare (VBHC) to reduce financial waste. In NSW, the Ministry of Health employs an explicit VBHC policy but provides no description on how value should be assessed. Understanding what society values in a VBHC system is critical for aligning healthcare resource decisions with patient preferences to reduce waste.
Objectives: Our study sought to identify and measure social preferences that underpin resource allocation decisions in VBHC. It was conducted within a broader framework for using formal priority setting and resource allocation tools, which is being increasingly employed in decision making at the meso level. We measured how social preferences for VBHC criteria varied across respondent characteristics, to help decision makers make value based trade-offs within a VBHC system.
Methods:
We combined semi-structured interviews with 20 local health network executives and a Discrete Choice Experiment (DCE) administered to 1,000 nationally representative public respondents in Australia. DCE attributes were drawn from the interviews and criteria from NSW Health VBHC framework. Two experiments were created using a D-efficient factorial design, with participants randomly allocated to each block. Data were analysed using the mixed logit (MIXL) model. A latent class logit model was estimated with relative attribute importance compared across different classes. The posterior probability of class memberships was regressed against individual characteristics using the fractional logit model.
Results:
Our results suggest that all VBHC attributes are valued, but on average, respondents valued health outcomes the most, followed by the likelihood of achieving the desired health outcome and care efficiency. 'Provider experience' had the least impact on respondent choices. Respondent characteristics significantly impacted choices, along with experience using the healthcare system in the last 12 months. One class of respondents was defined by strong preferences for better patient experience and outcomes, while another class was defined by strong preferences for care efficiency. Younger respondents devalued long waiting times less compared to older respondents. Preference heterogeneity was influenced by comorbidities and age.
Conclusions:
Low value placed on provider experience is not surprising as respondents are assumed to maximise their welfare within the choices they make. The importance placed on efficiency by respondents suggests a potential concern with healthcare system waste. Heterogenous preferences suggests using one social preference set for priority decision making in VBHC may not optimise welfare or lead to care valued by some patients for all interventions.

**Patient Willingness to Use Alternative Antibiotic Prescribing Strategies in Singapore Primary Care: A Discrete Choice Experiment**

*Elisabeth Schaffer, National University of Singapore, Saw Swee Hock School of Public Health*
*Co-authors: Peter Ong Yong Sheng, Sky Koh Wei Chee, Sameera Senanayake, Hui Jin Toh, Sanjeewa Kularatna, Victor Loh Weng Keong, Hwee Lin Wee*

Objectives:
Overuse of antibiotics accelerates the growth of antimicrobial resistance (AMR), a public health problem that is increasing morbidity, mortality, and healthcare costs worldwide. Delayed prescribing, screening for bacterial inflammation, and patient education could help limit demand for antibiotics in primary care. We investigated patient willingness to use alternative prescribing strategies for respiratory tract infection (RTI) in Singapore.
Methods:
We conducted a discrete choice experiment (DCE) to elicit preferences for the following strategy attributes: approach to start antibiotics, days before starting antibiotics, collection mode, treatment duration, side effects risk, and out-of-pocket costs. Before beginning the DCE, respondents were randomized to one of three texts containing basic information (BI), AMR education (AE), or AMR education and a social norm nudge (AE-SN). Preferences estimated with a mixed logit model were used to predict strategy uptake.
Results:
In total, 1060 respondents completed the DCE (mean [SD] age, 50.9 [13.9] years; 85.5% Chinese; 58.3% female). Data analysis was limited to 533 who reported that they would visit their primary care provider when experiencing moderate RTI symptoms. When opting out of an antibiotic prescription is the only other alternative, we predicted that 58.4% of respondents would choose an immediate prescription. In a scenario that included a strategy that requires 2 days to monitor symptoms before starting antibiotics (i.e., all other prescribing attribute levels held constant), we predicted that 33.1% would choose an immediate prescription, 31.0% would choose the delayed prescription, and 35.9% would opt out. Predicted uptake of the delayed prescription did not differ significantly for respondents who received BI compared to AE (29.2 vs. 30.2%, P-value=0.707) or AE-SN (29.2 vs. 33.6%, P-value=0.083). Predicted uptake of the delayed prescription increased 12.0 percentage points when only 1 day was required to monitor symptoms. In a scenario that included a “test first” strategy based on a $20 finger-prick test to determine antibiotic need with same-day prescription for positive testers, we predicted that 26.0% would choose an immediate prescription, 40.0% would test first, and 34.0% would opt out. Compared to respondents who received BI, predicted uptake of the test first strategy was significantly higher for those who received AE (33.8 vs. 46.8%, P-value<0.001) and AE-SN (33.8 vs. 40.1%, P-value=0.030). Predicted uptake of the test first strategy increased 6.6 percentage points when the test cost was reduced to $0.
Conclusions:
Our results suggest that many patients are willing to use delayed prescribing and rapid testing when presented as alternatives to immediate antibiotics. Strategy tailoring and patient education could improve uptake. These strategies could also reduce opt-out behavior. Further research is warranted to assess real-world impact and cost-effectiveness.

**Estimating the cost of serious infection-related hospitalisations in multiple myeloma using Australian administrative data**

*Rainier Arnolda, Monash University*
*Co-authors: Sara Carrillo De Albornoz, Aleece MacPhail, Adam Irving, Laura Fanning, Erica Wood, Zoe McQuilten, Andrew Spencer & Dennis Petrie*

Aim:
To estimate the excess cost of serious infection-related hospitalisations in Australian patients with multiple myeloma (MM), and to explore factors that influence costs.
Method:
Retrospective analysis of linked longitudinal data from the Victorian Admitted Episode Data, Victorian Cancer Registry, Victorian Death Index and Victorian Cost Data Collection. Our cohort included MM patients hospitalised between July 2016 and June 2022. Cost analysis was performed from a hospital perspective, including only public Victorian hospitals.
Serious infections were defined as multi-day infection-related hospitalisations. We estimated monthly excess costs using generalised linear regression models (GLMs). We considered six different GLMs using three distribution families (Gaussian, Poisson, Gamma) and two link functions (identity and natural log). The model with the best fit was selected using the Modified Park's test and the Pregibon link test. A GLM with gamma distribution and identity link was used to estimate the excess cost of infection-related costs and chronic kidney disease (CKD stages III-V) controlling for age, sex, Charlson Comorbidity Index (CCI), time from diagnosis, anticancer treatment, and immunoglobulin replacement therapy (IgRT). Cluster standard errors were used to account for multiple observations per patient. All costs were adjusted to 2024 Australian dollars (AU$) using the consumer price index for medical and hospital services published by the Australian Bureau of Statistics.
Results:
We included 6,216 MM patients hospitalised between July 2016 and June 2022, of whom 58.2% were male, 62.5% were older than 65 years; 66.5% had mild comorbidities (CCI scores between 0-2).
The costs associated with a serious infection amounted to AU$27,653 per patient per 6 months. The costs associated with death were AU$12,988 per patient for the final 6 months of life. The costs associated with one month of anticancer treatment and IgRT were AU$2,714 and AU$3,187 per patient, respectively. IgRT and anticancer treatment included product and administrative costs. The costs associated with one year of continuous monthly administration of IgRT were AU$38,249 per patient.
The excess cost associated with co-morbid CKD hospital admissions was AU$1,287 per patient per month. The total cost associated with co-morbid CKD and serious infection-associated hospital admission in the month of the index infection admission and over the following 6 months, amounted to AU$31,686 per patient.
Conclusion:
Infection-related, co-morbid CKD hospitalisations and IgRT for MM patients all incur a substantial economic burden. Given the high economic burden, these data suggest the need for a review of current infection management and prevention strategies for MM patients.

**A micro-costing study of the proteome of human cancer (ProCan®)**

*Xin Zhan, University of Sydney*

Background
Cancer is one of the leading causes of death worldwide, significantly burdening global healthcare and economies. The Proteome of Human Cancer (ProCan®), initially funded by the Australian Cancer Research Foundation, proposed a new approach to cancer diagnosis and treatment. ProCan aims to build a comprehensive proteomic database to aid clinical diagnosis and targeted treatment. A micro-costing analysis was undertaken alongside the database building.
Aim
The primary aim of this study was to perform a detailed micro-costing analysis of the ProCan experimental program conducted from 2017 to 2024. We cost the process of analysing the protein signatures, starting from the time the lab received the cancer sample to the time the lab reported the sequence of the proteome. The specific objectives are: (1) to investigate the activities in the ProCan workflow that incurred the costs; (2) to determine the costs at each activity; (3) to estimate the total cumulative cost incurred over the eight years.
Methods
Data were collected at Children's Medical Research Institute, Sydney, Australia through structured interviews with laboratory managers and a review of financial accounts. Cost calculations were performed based on the proportion of time allocated to each activity. The percentage distribution of resource usage was determined through time-tracking methods, allowing for an accurate estimation of costs per intervention. These values were subsequently extrapolated to annual cost estimations, ensuring a comprehensive financial overview of ProCan. All cost estimations in this study were based on 2024 Australian costs. Sensitivity analysis was not conducted, as the primary focus was on establishing baseline costs of ProCan using the most recent financial data available.
Results
Four activities were included in our micro-costing: (1) sample preparation, (2) sample scanning, (3) data analysis, and (4) downstream analysis. Over the eight years, the average annual cost per cancer sample was $2,385 ($1,833- $2,934). Cost fluctuations were observed across different years, with the highest cost recorded in the year 2018 ($4,164) and the lowest in the year 2023 ($1,935). These variations were primarily driven by changes in costs related to downstream analysis (50%) and data acquisition (20%). Specifically, downstream analysis costs $1,235 per sample, and data acquisition costs $479 per sample. The downstream analysis was primarily driven by staff costs ($956) while the data acquisition was primarily driven by equipment purchases ($302).
Conclusion
Our micro-costing analysis showed downstream analysis and data acquisition were the main cost drivers of the process of analysing protein signatures. These findings could be used for resource allocation, budget planning and cost-effectiveness analysis of proteomic versus immunohistochemistry in analysing protein signatures for cancer research.

**Access to early palliative care for decedents from cancer: An analysis of rates and outcomes for more than 50,000 Victorians.**

*Chris Schilling, University of Melbourne*
*Co-authors: Olivia Wawryk, Anna Collins, Vijaya Sundararajan, Brian Le, Jennifer Philip*

Objectives:
To document the access to early palliative care for people who die of cancer in Victoria, and to understand the impact of early palliative care on the quality of end-of-life.
Design:
Retrospective, population-based, cohort study. Data was sourced from the Victorian Cancer Registry, linked to inpatient and non-admitted health service use and emergency data in the 12 months prior to death.
Setting and participants:
Victorians who died from cancer between January 2018 to January 2023.
Main outcome measures:
Rates of palliative care and early palliative care provision, defined as at least 90 days before death; quality of end-of-life metrics in patients receiving early vs late palliative.
Results:
We analysed 53,305 deaths across the study period. Palliative care was provided in 72.6 per cent of cases. This reduces to 32.7 per cent receiving early palliative care. Early palliative care was associated with a lower likelihood of chemotherapy, two or more emergency department visits, two or more acute visits and an acute stay of more than 14 days in the last 30 days of life; and a higher likelihood of having an advance care plan at death and dying outside an acute hospital bed.
Conclusion:
Our study reveals that while overall nearly three quarters of people who die from cancer will access palliative care, the rates of early palliative care are around 30 per cent and falling. When palliative care is delivered early, end-of-life care is improved. This disparity between low rates of early palliative care and improved outcomes for those who receive it sets out an important call for action.

**The effect of a cancer diagnosis on chronic disease management in patients with pre-existing chronic conditions**

*Jackie, Roseleur, Flinders University*
*Co-authors: Laura Edney, Jonathan Karnon*

Background
Cancer remains a major public health concern in Australia, with an estimated 162,000 Australians diagnosed in 2022 and over 1.2 million diagnosed in their lifetimes. Many cancer patients already have chronic conditions such as high blood pressure (BP) and dyslipidaemia at the time of cancer diagnosis. As advances in cancer research and treatment improve survival rates and quality of life, competing risks for death from other chronic conditions become increasingly important. Moreover, pre-existing comorbidities influence cancer care, including treatment choice, adherence, side effects, survival, quality of life and healthcare costs. This overlap highlights the need to understand chronic condition management to improve patient outcomes.
Methods
We used the Data Linkage to Enhance Cancer Care (DaLECC) dataset, which links cancer registry records for all South Australian patients diagnosed between 2011 and 2020 (n=102,019) with statewide South Australian and Commonwealth health service data, including up to 10 years of data preceding cancer diagnosis. The study cohort consisted of patients diagnosed between April 2014 and December 2018 who were prevalent users of BP-lowering and lipid-modifying agents, defined as having at least two prescriptions dispensed in the 12 months before the index date (cancer diagnosis month) and medication on hand within 30 days of diagnosis. To reduce the potential impact of palliative and end-of-life care on adherence estimates, we included only those who survived three years post-diagnosis. The primary outcome was adherence to BP-lowering and lipid-modifying agents. We used Pharmaceutical Benefits Scheme (PBS) data to calculate adherence using the Proportion of Days Covered (PDC) method. As PBS data do not contain prescribed daily doses, we applied three methods to estimate the prescribed daily dose.
Results
The analysis included 14,209 individuals dispensed BP-lowering medications and 10,099 individuals dispensed lipid-modifying medications. Baseline adherence in the year before cancer diagnosis was high, ranging from 87.6% to 91.2%. Within three years of diagnosis, adherence declined by 8.6% to 20.0%, varying by medication class. Preliminary analysis indicates that greater declines were associated with older age and certain cancer types, particularly colorectal and lung cancer. While remoteness and area-level socioeconomic disadvantage were not associated with reduced adherence, a patient's concession status was. Further analysis will examine the role of healthcare utilisation, continuity of care, and time to treatment in adherence patterns.
Conclusions
A cancer diagnosis is associated with reduced adherence to medications for pre-existing conditions. This study identifies patient groups—older individuals, those with certain cancer types, and concession card holders—who may be at greater risk. Findings can guide targeted interventions to support chronic disease management after cancer diagnosis.

**Economic burden of chronic lymphocytic lymphoma in Australia**

*Lan Gao, Deakin University*

Background:
Chronic lymphocytic leukaemia (CLL) is the most prevalent form of adult leukaemia in Australia. Over the past decade, the introduction of targeted therapies—such as Bruton's tyrosine kinase (BTK) inhibitors and BCL-2 inhibitors—has significantly transformed treatment paradigms, offering improved clinical outcomes. However, these advances come with substantial costs. This study aimed to estimate the economic burden of CLL in the era of targeted therapies compared with the earlier chemoimmunotherapy (CIT) era, within the context of the Australian healthcare system.
Methods:
A model-based cost-effectiveness analysis was conducted from the Australian healthcare system perspective. A Markov model was developed to simulate a cohort of 10,000 CLL patients aged 70 years at diagnosis over a 15-year horizon. The model compared healthcare costs and quality-adjusted life years (QALYs) associated with CIT versus targeted therapies reimbursed under the Pharmaceutical Benefits Scheme (PBS). Transition probabilities were informed by national-level survival data from the Australian Cancer Database. Both costs and health outcomes were discounted at 5% per annum. Sensitivity analyses were undertaken to assess the robustness of the results.
Results:
Targeted therapies were associated with a substantial increase in direct healthcare costs and QALY gains compared to CIT. Average lifetime costs and QALYs were $34,448 and 4.614 in the CIT era, and $545,775 and 7.995 in the targeted therapy era, respectively. For comparison, the general Australian population aged 70 years has an estimated QALY of 10.566. Deterministic sensitivity analysis identified the cost of BTK inhibitors, discount rate, treatment effectiveness, and age at diagnosis as major drivers of cost-effectiveness.
Conclusion:
While targeted therapies for CLL provide notable clinical benefits, they also place a considerable financial burden on the healthcare system. Continued monitoring of real-world outcomes and drug pricing will be crucial to ensure sustainable and equitable access. This study highlights the importance of leveraging national registry data to support evidence-based policy and resource allocation in oncology.

# Poster sessions

## Members Dining Room 2 Rapid Fire Oral Sessions

You can access the abstract for the session by clicking on the abstract title or going to the poster section.

| # | Title and presenter |
|---|---|
| 1 | Understanding Sleep Health Decision-Making for Older Adults and People Living with Dementia: A Qualitative Study to Inform Discrete Choice Experiments<br>**Aisling McEvoy** |
| 2 | Could free contraception actually be…free? Making the economic case for universal contraception in Australia<br>**Arlen Keen (presented by Kirsten Black)** |
| 3 | Early-life resilience to climate-related exposures: A systematic review of effect modification by public health interventions<br>**Chamunorwa Nyamuranga** |
| 7 | A Review of Fire Prevention and Preparedness Programs<br>**Fahmida Rahman (presented by Nargess Ghassempour)** |
| 9 | Investigating Income Comparison Attitudes in China: A Discrete Choice Experiment Approach<br>**Han Cheng** |
| 11 | The Price of Unsafe Food: A Systematic Review of Economic Losses Due to Foodborne Disease<br>**Joelle Hajal** |
| 13 | A critical systematic review of methodologies and modelling approaches in the treatment of hyperlipidaemia.<br>**Karl Vivoda** |
| 17 | Implications of Functional Limitations among Adults on Education and Work Participation of Children in India<br>**Marie Ishida** |
| 18 | Assessing the Health and Economic Burden of Food-borne and Respiratory-borne Diseases in New South Wales: A Linked Data Protocol<br>**Nargess Ghassempour** |
| 22 | Direct Non-medical and Indirect Costs of Breast Cancer from The Perspective of Patients Visiting a Tertiary Hospital in Indonesia<br>**Rizka Prita Yuliani** |
| 23 | Tobacco Costs of Illness Studies in Australia: A Systematic Review<br>**Sarah Hakeem** |
| 24 | Cost-Effectiveness Analysis of Cognitive Behaviour Therapy for Post-Traumatic Stress Disorder in Australian Emergency Service Workers: An Economic Evaluation<br>**Shari Stathis** |
| 25 | Health-related quality of life of children and adolescents with anxiety: results from an Australian population-based longitudinal study<br>**Sithara Wanni Arachchige Dona** |
| 27 | Association between Out-of-pocket Health Expenditures and Low Birth Weight in Eastern Ethiopia. A Generalized Structural Equation Modelling (GSEM)<br>**Tadesse Tolossa Daba** |
| 28 | How do the tensions between medical professionalism and financial incentives play out under case-based payment reform in China<br>**Xiaoying Zhu** |

## Poster Viewing Day 1 and Day 2 (Corridor Leading to King's Hall)

### Poster 1: Understanding Sleep Health Decision-Making for Older Adults and People Living with Dementia: A Qualitative Study to Inform Discrete Choice Experiments

*Aisling McEvoy, Monash University*
*Co-Authors: Jemimah Ride, Aili Langford, Emily Reeve, Justin Turner*

Objectives:
This study aims to explore the factors influencing decision-making about sleep health in three groups: community-dwelling people living with dementia with sleeping difficulties; their carers; and individuals over 65 experiencing sleep difficulties. A secondary objective is to identify attributes and levels to inform the development of a Discrete Choice Experiment (DCE) to explore preferences for sleep health interventions within these populations.
Methods:
Employing a qualitative research design, semi-structured interviews were conducted with participants across the three populations. Eligibility criteria included being able to communicate in English and: aged 18 or older, and care(d) for someone with dementia; over the age of 18, have a diagnosis of dementia, have had or currently have sleeping problems, and be living in the community OR; aged 65 or older, and have previously or currently experienced sleeping problems. The interviews explored current sleep habits and concerns, coping mechanisms, and factors influencing choices regarding sleep-related healthcare. They were conducted with individuals or dyads (of people living with dementia and their carer), according to participant preference. Interviews were transcribed using Zoom, and checked for accuracy. Inductive thematic analysis was used to extract themes and decision-making criteria. Analysis was completed in NVivo (version 15).
Results:
Nineteen interviews with 20 participants were conducted, including people living with dementia or cognitive impairment (n = 8), carers (n = 4), and older adults (n = 8). Preliminary analysis indicates that attributes such as intervention efficacy (reduction in times waking each night, falling asleep faster), adverse effect profiles (increased falls risk, reduced cognition), and autonomy in decision-making influence choices for sleep health. Participants emphasised the importance of interventions that align with the routines and habits of individuals. The adverse effect of worsened cognition generated varied responses from the participants. Some have noted that an increased risk of cognitive deficits would be a deterrent for treatment, whereas others have shown a willingness to trial a treatment if it was effective for helping their sleep issue as they see sleep impairment as a cognitive risk.
Conclusions:
Determining similarities and differences in attribute priority in this population is relevant and novel. Since previous studies of sleep preference interventions have not included people living with dementia, our key themes may ground future DCEs in the lived experiences and perspectives of the target populations. This will produce more accurate and relevant data on preferences for sleep health interventions among individuals with dementia, their carers, and older adults. It will also provide insights into attribute selection in people living with dementia to inform future DCE design.

**Poster 2: Could free contraception actually be…free? Making the economic case for universal contraception in Australia**

*Arlen Keen, The Royal Australian and New Zealand College of Obstetricians and Gynaecologists*

Objective:
Free, publicly-funded, universally-accessible contraception is starting to appear in comparable jurisdictions to Australia. The Royal Australian and New Zealand College of Obstetricians and Gynaecologists proposes to contemplate whether the adoption of universal free contraception access in Australia is economically feasible, analysing potential cost neutrality through healthcare savings from reduced unplanned pregnancies. Following Canada's recent policy implementation, we assess whether a similar program could be economically viable in the Australian context while addressing issues of equity and choice in reproductive healthcare access.
Method:
Free contraception in Australia is a thought experiment at this point in time. More economic modelling is required. However, we know that Australia and Canada share roughly equivalent rates of unplanned pregnancy (about 40% of pregnancies in both countries are unplanned). Canada has modelled the cost of unplanned pregnancies in its economy, and we should expect this to be broadly replicable in Australia since the countries are very similar demographically and in general social outlook. We know the cost of the program in Canada and can make projections about equivalent cost in Australia. There is other international data on the ROI of contraception.
Results:
Canadian modelling demonstrates that approximately 40% of pregnancies are unplanned, representing significant direct healthcare costs (estimated at $352 million AUD annually) without accounting for wider social and economic impacts. International evidence suggests return-on-investment ratios between $7 USD and £9 for every dollar spent on contraception programs. While the Canadian program is projected to cost $2.09 billion AUD over five years (including diabetes medications, making the actual spend on contraception hard to determine), we would expect spending in the Australian context to be less because there is already public spending subsidy to cover many different types of contraceptive medications on the Pharmaceutical Benefits Scheme. The cost structure suggests program sustainability through healthcare savings from prevented unplanned pregnancies.
Conclusions:
Free contraception represents a potentially cost-neutral policy intervention when considering direct healthcare savings alone. Current cost barriers often force individuals to choose contraceptive methods based on affordability rather than suitability, potentially increasing failure rates and unplanned pregnancies. Beyond economic considerations, universal contraception access addresses significant equity issues in reproductive healthcare. Implementation challenges exist but appear surmountable given Australia's healthcare system structure. Can we make the contention that a suitably designed program for free, publicly-funded contraception could cost Australian society no more than what is currently spent when including the direct and indirect costs of unplanned pregnancies?

**Poster 3: Early-life resilience to climate-related exposures: A systematic review of effect modification by public health interventions**

*Chamunorwa Nyamuranga, Curtin University*
*Co-authors: Sylvester Dodzi Nyadanu, Lucas Hertzog, Delight Murigo, Marshall Makate*

Objectives:
This systematic review examines whether public health interventions moderate associations between in-utero exposure to ambient air pollution, wildfire smoke or extreme heat and adverse child outcomes. Accumulating evidence links in-utero exposure to these stressors to adverse birth outcomes, infant mortality, respiratory and neurodevelopmental outcomes. However, the magnitude and consistency of associations vary across settings and populations. Interventions may influence exposure levels, healthcare access or vulnerability during critical developmental windows. Findings may inform adaptive maternal and child health strategies.
Methods:
We systematically searched nine databases (MEDLINE, Scopus, Web of Science, Global Health, Maternity and Infant Care, PubMed, CINAHL, EconLit) from the start of each database to April 2025 for English-language peer-reviewed empirical evidence without geographic limits. The population included pregnant women and their offspring aged 0-10 years. Eligible studies quantitatively evaluated whether public health interventions occurring at the individual, household, community, system or policy level modify the association between in-utero exposure and child outcomes. Outcomes included adverse birth, mortality, respiratory and neurodevelopmental outcomes. Intervention types included healthcare services (e.g prenatal and perinatal care); system-level (e.g community health worker programs, cash transfers for pregnant women); nutritional/behavioural supports (e.g maternal diet, micronutrient supplements, breastfeeding); and exposure-reduction (e.g air conditioning, air filtration, greenness). The systematic review was conducted informed by the recommendations for the conduct of systematic reviews in toxicology and environmental health research (COSTER), and the findings reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. An adapted Office of Health Assessment and Translation (OHAT) tool was used for quality appraisal.
Preliminary results (work in progress):
Twenty-seven studies met the inclusion criteria, mostly from high-income countries (n=16) and low- and middle-income countries (n=11). Most studies assessed ambient air pollution (n=18), extreme heat (n=7), or both (n=2); none examined wildfire smoke. Interventions included in the review are community healthcare programs (n=2), prenatal care (n=1), exclusive breastfeeding (n=1), maternal prenatal nutrient intake and supplements (n=9), cash transfers (n=1), air conditioning (n=1) and greenness (n=12). Outcomes evaluated included adverse birth outcomes (n=17), respiratory conditions (n=5), neurodevelopmental (n=4) and infant mortality (n=1). Preliminary findings from most studies indicate that public health interventions may attenuate the adverse effects of in-utero exposure on child outcomes.

**Poster 4: Lessons from veterinary health systems**

*Charon Lessing, Auckland University of Technology*

A review of the literature reveals a limited focus on the role of economic evaluations in veterinary healthcare outside of therapeutic interventions, yet the impact of 'pet' insurance dominates vet-pet owner decision-making particularly with respect to companion animals.

As human health systems look to private-public partnership and other innovative funding strategies as a means of managing health budgets, could there be lessons learned from veterinary health systems?

This poster presents the findings of a scoping review of health systems and health economics research in New Zealand, Australia and similar OECD countries, comparing and contrasting the financial systems in place, and highlighting areas for future research and collaboration.

**Poster 5: Eating As Treatment: Economic Evaluation**

*Connor Ballinger, Hunter Medical Research Institute*
*Co-authors: Anthea Bill, Xenia Dolja-Gore, Ben Britton*

Background:
Patients undergoing (chemo-) radiotherapy (RT) for head and neck cancer (HNC) experience poor nutrition, mental health, quality of life (QoL), and survival outcomes. The Eating as Treatment (EAT) intervention trains dietitians to adopt cognitive-behavioural practices in their consultations with HNC patients to mitigate malnutrition. Clinical outcomes from a stepped-wedge trial of EAT and associated five-year survival analysis have been published previously.
Aim:
To conduct a cost-utility analysis of the EAT intervention and model long-term survival outcomes.
Methods:
HNC patients were recruited in five Australian hospitals between 2013 and 2016 according to a stepped-wedge, cluster-randomised control design. Costs associated with patient treatment within the 18-week trial period were calculated, including dietitian training, unplanned hospital admissions, and surgical procedures to mitigate malnutrition. Patient quality of life (QoL) was derived from responses to the EORTC QLQ-C30 at baseline and three follow-ups. Incremental costs and quality-adjusted life-years (QALYs) were calculated using raw means and marginal means from linear mixed models (LMMs), and uncertainty was assessed using a nonparametric bootstrap. The net monetary benefit (NMB) and return on investment (ROI) summary measures were estimated. Survival data were extrapolated to 15 years within an excess hazard framework using parametric models, including restricted cubic splines.
Results:
During the trial period, the intervention was associated with an adjusted mean difference of -$3,410 [-$12,610, $5,791] in patient costs and an adjusted mean increase of 0.010 [-0.010, 0.030] in patient QALYs, resulting in an NMB of $3,704, a 97% probability of cost-effectiveness, and a return on investment of $13.32, based on the hospital savings produced. The intervention was also associated with improved modelled overall survival, with a 15-year modelled survival difference of 15 [-2, 33] percentage points and incremental restricted mean survival time (RMST) of 1.5 [-0.4, 3.4] years.
Conclusion:
This study finds that EAT likely provide some benefits in terms of reduced patient costs, marginally increased QALYs, and improved survival outcomes.

**Poster 6: A Systematic Review of the Impact of Pay-for-Performance on the Prevention and Management of Non-Communicable Diseases**

*Dedih Suandi, The George Institute for Global Health - UNSW Sydney*
*Co-authors: Prisca Arfines, Blake Angell, Anna Palagyi, Stephen Jan, Arif Budiman*

Background:
There is a growing body of evidence exploring the use of pay-for-performance (P4P) for managing non-communicable diseases (NCDs) globally. However, its effectiveness in improving service delivery and patient outcomes remains inconclusive. This review sought to explore the impact of P4P initiatives across all NCDs and in different health care settings.
Objective:
To systematically review the quantitative literature on the impact of P4P on patient outcomes, service delivery and economic outcomes in the care of NCDs.
Method:
Six databases and the grey literature were searched for randomised controlled trials or quasi-experimental studies examining the impact of P4P on patient, service delivery and economic outcomes related to NCD care globally and published between 2014?2024.
Results:
The search yielded 2,679 references, with 73 studies included in the final review. Most studies were conducted in HICs, including Taiwan (28), the United States (14), the United Kingdom (12), Canada (10), Switzerland (3), Australia (2), Sweden (2), and South Korea (1). Only one study came from a low- or middle-income country (LMIC), China. Included studies focused on P4P in the management of type 2 diabetes (28), mental disorders (11), multiple NCDs (11), hypertension (5), chronic kidney disease (5), cardiovascular disease (4), stroke (3), chronic obstructive pulmonary disease (2), asthma and cancer (1 study each). Key outcomes reported included: mortality (13 studies);clinical outcomes (12); quality of care (34); and cost-effectiveness (9).
Of those studies reporting mortality outcomes, 11 (85%) reported that P4P had the potential to reduce mortality risk. Eight of 12 studies (75%) reporting clinical outcomes found that P4P improved outcomes such as HbA1c and blood pressure. However, one study found increased blood pressure and there were no significant improvements in cholesterol levels. Six studies reporting care quality outcomes (6/34, 18%) found that introducing financial incentives improved care quality, while their removal led to decline in quality measures. Additionally, P4P enhanced care comprehensiveness (8/34, 24%), improved provider compliance (6/34, 18%) and care continuity (3/34, 11%). Of the nine studies examining cost-effectiveness of P4P initiatives, four (44%) found significant associations between P4P and improved quality-adjusted life years, however, five (56%) found increased health system costs or no savings. Patients enrolled in P4P initiatives had up to 65% lower risk of complications and up to 15% lower risk of all-cause hospitalizations.
Conclusion:
This review found substantial evidence showing that P4P could be an effective way to improve mortality, clinical outcomes and quality of care in the management of NCDs. Despite this, large evidence gaps remain, including limited insight into cost-effectiveness and a lack of research exploring the impact of P4P for NCD management in lower-resourced health systems, including LMICs.

**Poster 7: A Review of Fire Prevention and Preparedness Programs**

*Fahmida Rahman, Western Sydney University*
*Co-Authors: Nargess Ghassempour and Kathy Tannous*

Fires – including wildfires and structural fires – pose major environmental and public health hazards worldwide. In 2023-24, Australia reported 95,525 fire incidents, including around 18,000 structure fires, 40,000 landscape fires (bush and grass) and 38,000 other fires, resulting in 2,000 injuries requiring hospitalization, 131 deaths, and AU$ 1.3 billion in building and contents insurance claims. This review explores global fire prevention and preparedness strategies for residential fires and wildfires, synthesizing literature published between 2008 and 2024. Drawing on studies from diverse geographical contexts and populations, the review identifies key interventions, the settings in which they were implemented (for instance, homes, schools, workshops), and the range of providers involved (for example, agencies, government, and community organisations).
The review underscores the importance of context-specific approaches to fire prevention and preparedness, highlighting how the effectiveness of interventions may be influenced by who delivers them. Understanding the diversity of strategies – such as educational campaigns, material preparation (for instance, fuel clearance), and household emergency planning – is crucial for informing collaborative, community-based efforts to improve resilience.
Methodologically, the review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline with a structured screening process and systematic data extraction. Findings are categorized by intervention type, delivery location, and provider, offering a comprehensive picture of current practice.
The review contributes to the evidence-based fire policy and practice, with implications for government, service providers, and researchers. It also reflects on evolving concepts of preparedness and more integrated approaches to enhance community safety.

**Poster 8: Understanding patient preferences for medication delivery across and within acute and chronic conditions: A systematic literature review**

*Glen Henson, University of Tasmania*
*Co-authors: Jessica Roydhouse, Glen Henson, Thi Thu Ngan Dinh, Thi Ly Tran, Brendan Mulhern, and Julie Campbell*

Background:
Patient preference studies have been used to identify the aspects of medical products that are important to patients with chronic or acute conditions. Related work has often used discrete-choice experiments (DCEs) or similar experimental methods to elicit these preferences. This systematic review aimed to summarise and synthesise the patient preferences literature as it relates to modes and frequencies of treatment administration.
Methods:
Strategies based on existing, validated search filters were applied to several databases (MEDLINE, Embase, Scopus, EconLit, and Health Preference Research). Additional references were obtained through citation searching. All English-language peer-reviewed studies that involved patients, quantitatively elicited preferences, and compared different modes or frequencies of administration, were eligible for inclusion. Data extraction was performed by two teams of reviewers in Covidence. To determine whether mode or frequency of administration (referred to as process attributes) were relatively important in each study, a heuristic was used. This heuristic defined high importance as either attribute being ranked first or second in relative importance. Information relating to study methodologies was also extracted. To evaluate study quality, the Purpose, Respondents, Explanation, Findings, Significance (PREFS) checklist (0 – 5, five indicates high quality) was utilised.
Results:
Our search strategy yielded 14,588 articles. 11,305 were non-duplicates and underwent title and abstract screening. Of these 754 were selected for full-text screening, with 147 entering the study. 76% (n = 112) of the included studies involved a DCE. Process attributes were ranked first or second by importance in a substantial minority of studies (n = 44, 30%). This was more likely to occur when attributes pertaining to efficacy or safety were not considered. Oral (rather than subcutaneous or intravenous) and less frequent administration was usually preferred; however, this differed in select sociodemographic and clinical subgroups. Overall, mean study quality was calculated at 3.53 on the PREFS scale (SD 0.72). Relatedly, guideline usage was common (57%), piloting frequently conducted (70%), and both literature reviews (78%) and qualitative methods (51%) involving patients often informed experiment attribute selection and development. However, we observed few instances of patient-researcher co-design.
Conclusions:
Process attributes were among the two of greatest importance in a substantial minority of studies. Patients tended to assign greater relative importance to process attributes in the absence of efficacy and safety attributes. This emphasises that to accurately present the relative importance of treatment attributes, studies must consider all meaningful characteristics. Though study quality was assessed as reasonably high, we recommend increased usage of qualitative methods and patient-engagement in experimental design.

**Poster 9: Investigating Income Comparison Attitudes in China: A Discrete Choice Experiment Approach**

*Han Cheng, Macquarie University*
*Co-authors: Kompal Sinha, Ben Wang, Yuanyuan Gu*

This study investigates income comparison attitudes in China as a mechanism through which income inequality affects individual well-being. Although research widely links income inequality to poorer health outcomes, there is limited focus on how attitudes toward income comparisons contribute to this relationship. Income comparison—where individuals assess their income relative to others—often leads to lower life satisfaction and well-being, with these effects intensified by high inequality. Using a discrete choice experiment (DCE) and hybrid choice model (HCM), this research explores income comparison attitudes within a Chinese context marked by significant inequality and rapid social change. This study's novel methodological approach provides a nuanced understanding of how these attitudes influence well-being amid economic disparity. The findings highlight pathways through which income inequality affects health, offering insights for policies aimed at mitigating the well-being impacts associated with economic inequality in China.

**Poster 10: Impact of the 2015 Extended Medicare Safety Net (EMSN) Policy Change on Cancer Patients**

*Isaac Ponku, University of Technology Sydney*
*Co-authors: Peyman Firouzi Naeim, Maryam Naghsh Nejad and Jane Hall*

Objectives:
In January 2015, the Australian government implemented a major policy reform to the Extended Medicare Safety Net (EMSN), significantly increasing the annual out-of-pocket (OOP) expenditure threshold for the general population. This change aimed to contain growing government expenditure resulting from escalating physician fees, while still offering some protection to concession card holders. Given the potential of increased OOP costs to influence patients' health-seeking behaviour, this study evaluates the impact of the 2015 EMSN reform on primary and hospital-based care utilization—specifically, general practice, specialists, inpatient admissions and emergency department (ED) presentations—among cancer patients in New South Wales (NSW), Australia.
Method:
This study employs a Difference-in-Differences (DiD) and event study design using linked administrative data from 2009 to 2020. The sample includes 41,000 individuals diagnosed with cancers in Australia. The treatment group consists of cancer patients from the general population who were subject to the higher EMSN threshold post-2015, while the control group comprises cancer patients who held concession cards and remained eligible for lower thresholds. By comparing trends in healthcare visits before and after the policy change between these groups, the study identifies the differential impact of increased OOP costs on healthcare utilization.
Intended Contributions:
The findings from the study will highlight the importance of monitoring unintended consequences of cost-containment policies, especially among high-need populations such as cancer patients.

**Poster 11: The Price of Unsafe Food: A Systematic Review of Economic Losses Due to Foodborne Disease**

*Joelle Hajal, Western Sydney University*
*Co-authors: W. Kathy Tannous, Vitali Sintchenko, Maria Estela Varua, Kingsley E Agho, Fahmida Saadia Rahman, Nargess Ghassempour*

Introduction:
Each year, an estimated 420,000 deaths and 600 million cases of illness occur due to foodborne diseases worldwide and straining healthcare systems, businesses, and national economies. From medical expenses and productivity losses to the costs of outbreaks, recalls, and long-term health impacts, foodborne illnesses represent an underestimated financial strain across both high-income and low-income nations. This systematic review synthesizes existing literature on the direct and indirect costs of foodborne diseases, highlighting disparities in economic assessments and gaps in reporting.
Objective:
This study aims to provide a systematic review of the costs of foodborne diseases associated with healthcare services use (emergency department, hospital outpatient clinic care, ambulance), costs to the individual (pain and suffering, reduced working hours and income, as bystanders), cost to business agents (restaurant, insurance company), and costs to the government (tax revenue loss, welfare payments).
Method:
Nine databases, MedLine, EMBASE, CINAHL, EconLit, Scopus, SocINDEX, APA PsychInfo, Business Source Complete, and Web of Science, were systematically searched using a variety of subheadings and free text terms. The search covered publications till 31st of March 2025. In addition, grey literature was reviewed for the same period. The study selection was conducted in two stages using Covidence software. Data extraction was performed using Research Electronic Data Capture (REDCap) software. Two reviewers will independently assess the quality of the finally included studies applying a risk of bias tool designed to address the specific objective of the review.
Results:
The review searched all nine selected databases, merged the results using EndNote, and removed duplicate studies. Of 31,873 studies, a total number of 6073 duplicates were removed. The rest of 25,800 studies were uploaded to Covidence. Covidence removed 40 studies due to duplication with 25760 studies that had to review the title and abstract. Two reviewers screened the title and abstract of 25760 studies.
Conclusion:
The findings of this systematic review provide the most conclusive evidence to date on the societal, economic cost of foodborne disease to individuals, business agents and government. Understanding the true financial toll of foodborne illnesses is essential for improving public health strategies and reducing preventable economic losses.

**Poster 12: Income gaps associated with multiple sclerosis: A global scoping review that includes gender-based disparities when considering health and employment.**

*Julie Campbell, Menzies Institute for Medical Research, University of Tasmania*
*Co-authors: Paul Blacklow, Ingrid van der Mei, Mark Jablonski, Angela Land, Bruce Taylor, Glen Henson, Martin Hensher, Paul Scuffham, Laura Laslett, Mustafa Kamal*

Objectives:
Employment is strongly associated with health outcomes and overall well-being. Multiple sclerosis (MS) is a high health and economic burden disease. A critical component of the economic burden is the impact on income for people with MS who often experience having lower incomes than those without MS. The double-burden of income disparity for females and marginalised groups with MS is also relatively unknown. Since MS is commonly diagnosed between career-building ages of 20-40, resulting career disruptions frequently diminish or reverse positive outcomes of employment. Our scoping review summarised and synthesised global literature on gender-based income gaps for people with MS, evaluating the robustness of methodologies and reported findings. To contextualise, we also explored income differences between people with and without MS while also considering health and employment factors.
Methods:
Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses-Scoping Review guidelines (PRISMA-ScR), we searched EMBASE, MEDLINE, Scopus, and Web of Science databases. For studies that met our eligibility criteria, data was extracted using a pre-determined data extraction form. We then employed narrative synthesis and quantitative summary statistics for analysis of extracted data. In the absence of systematic quality appraisal in this area (including directions/checklists), we developed and adopted a novel 10 element checklist for quality appraisal of our eligible studies.
Results:
From 4478 initial records, 24 studies met our inclusion criteria. Most studies originated from high-income Northern European countries (70.8%) and featured solely longitudinal (58.3%) rather than cross-sectional study designs (37.5%). Income definitions were often unclear (54.2%), with omitted components (25%) and inconsistent reporting on zero/negative incomes (66.7%). All studies defined gender as biological sex, rather than self-determined gender. While most studies indicated a negative relationship between MS and income, some reported positive or mixed findings. Swedish studies consistently showed a male income advantage for people with MS, but the combined impact of sex and MS on income remained inconclusive. Statistical rigour was compromised by insufficient control for socioeconomic variables, including occupation. Six of 12 mean/median based studies lacked matched controls, and 2 of 12 regression-based analyses omitted or failed to disclose control variables. The wide variance in covariate usage (2-6 in matching, 2-13 in regression) highlighted further inconsistency. Most studies rated as medium quality.
Conclusion:
Lack of statistical rigour undermined the ability of existing research to draw robust conclusions about gender income disparities. Based on our findings, particularly methodological gaps and areas for quality improvement, we are conducting research using Australian MS Longitudinal Study (AMSLS) data to address these gaps.

**Poster 13: A critical systematic review of methodologies and modelling approaches in the treatment of hyperlipidaemia.**

*Karl Vivoda, Monash University*
*Co-authors: Tamrat Abebe, Sheridan Rodda, Harvey Koh, Zanfina Ademi*

Background
Health economic modelling is essential for decision-makers and society, providing insights to enhance disease understanding and treatment strategies. Hyperlipidaemia is a complex condition influenced by multiple risk factors and requiring sophisticated treatments. Given its high prevalence and significant societal impact, ensuring accuracy and reliability in modelling approaches is crucial.
Objective
This invited systematic review by Pharmacoeconomics in Modelling Best practice: A collection of systematic critical reviews of modelling approaches in specific disease areas edited by Jamie Caro examines modelling methodologies of hyperlipidaemia treatments and explores potential improvements to enhance future research and decision making.
Methods
A systematic literature search was conducted in MEDLINE and Embase between 31st August 1987 and 1st May 2025 to identify health economic models related to hyperlipidaemia treatments. Screening was performed by two independent reviewers, supplemented by ASReview an AI tool to refine article selection. Full-text inclusion and data extraction will follow the Philips checklist, ensuring a comprehensive assessment of methodological quality, with findings presented through a narrative synthesis. This study is registered in PROSPERO (CRD420251043922).
Results
The review will outline unique cost-effectiveness models of dyslipidaemia, with a focus on patient and cohort level models. It will assess parameter uncertainty and the application of sensitivity analyses to address these concerns. Moreover, structural uncertainty will be assessed. Model validity will be assessed through the Philips checklist. Additional considerations include validation across conceptual frameworks, data integrity, computational modelling, and operational feasibility. We will highlight how model validation was conducted and summarise each model's performance. In addition, we will assess and report the model's methodological quality, focussing on their structural design and data modelling approaches. The results will be ready and presented at the Australian Health Economics Society Conference.
Conclusions
This review seeks to determine how current hyperlipidaemia treatment models inform key decision-making processes and identify opportunities for refinement. The goal is to ensure that both healthcare payers and society derive meaningful benefits from the research and insights provided by these models.

**Poster 14: Life-cycle Implications of Latent Health Type Learning**

*Kazuki Tomioka, Australian National University*

Life-cycle models that feature health risk and latent health type implicitly assumes that agents are equipped with the knowledge about their type. In this paper, we study the life-cycle decisions and welfare implications of a relaxation to this assumption by allowing agents to be uncertain about their type, but allow them to resolve their type uncertainty via Bayesian updating of beliefs. We develop type learning mechanism and document its properties. Then, we embed the type learning mechanism to life-cycle model that feature health risk to study the quantitative implications on the life-cycle profiles and welfare of agents facing type uncertainty. When the model is solved numerically using the estimated type-dependent transition probabilities of U.S. high school graduates, our simulation results show that: (i) most agents concentrate their beliefs towards true type within their lifetime, (ii) agents are able to resolve type uncertainty on average by approximately 80\% based on a measure of conditional entropy and (iii) type uncertainty has life-cycle consequences that affect agents asymmetrically dependent on their type. Overall, our welfare analyses indicate that lack of knowledge about their type is costly for agents.

**Poster 15: Costs of expedited transfer following out-of-hospital cardiac arrest compared with standard transfer: results from a randomised trial**

*Kyumin Jang, The University of Sydney*
*Co-authors: Rachael L. Morton, Mark Dennis, Brian Burns, Cecilia Taing, Nicola Barrie, Xin Zhan, Anh D Tran on behalf of the EVIDENCE Study Investigators*

Recent findings from the EVIDENCE trial of expedited ambulance transfer following out-of-hospital cardiac arrest, versus standard transfer, showed no significant difference in survival with a favourable neurological outcome. It is unclear whether the health system costs differ between the two strategies, and whether arrests that occur outside of specialised hospital service hours are more or less expensive.

A prospective costing analysis was undertaken from a health system perspective, alongside the EVIDENCE trial conducted across Greater Sydney, Australia. Healthcare use reflected all medical interventions for patients from ambulance pickup in the community to hospital discharge or death. Unit costs were sourced from trial records and valued using Australian-Refined Diagnosis-Related Groups Version 11, National Efficient Prices, and NSW cost of care standards, indexed to 2024 Australian dollars. Mean total and per-participant healthcare use and costs were reported by trial allocation, with differences assessed using the non-parametric Kruskal-Wallis test to handle skewed data.

All 197 randomised patients were included in the costing analysis, 102 patients in the expedited transfer group, and 95 patients in the standard transfer group. The mean age was 55 years, with 82% males. Mean hospital length of stay was 17 days (SD= 26) for expedited versus 15 days (SD= 23) for the standard transfer group; 17 days (SD= 28) for arrivals during the extracorporeal cardiopulmonary resuscitation (ECPR) service hours group, and 14 days (SD= 19) outside hours group.

Mean costs were $60,197 for the expedited transfer group and $63,136 for the standard transfer group. The difference in mean costs (-$2,940) was not significant (95%CI: -$32,551 to $38,430). Mean costs were significantly higher during specialised service hours when ECPR was undertaken ($83,761) compared with outside ECPR hours ($45,719), with a mean difference of $38,041 (95%CI: $1,294 to $74,789).

There were twelve established extracorporeal membrane oxygenation (ECMO) procedures being undertaken for expedited (n= 7) and standard transfer groups (n= 5). The differences in ECMO costs ($1,813) were not significant (95%CI: -$10,968 to $7,343). Nine ECMOs were performed during ECPR service hours, while one ECMO was undertaken outside ECPR service hours. The difference in ECMO use (0.09) was statistically significant (95%CI: 0.02 to 0.15). The difference in ECMO cost between inside and outside ECPR hours ($10,791) was statistically significant (95%CI: $1,085 to $20,112). Ward and ICU admissions were the main drivers of total costs, contributing 24% to 42% of total costs, respectively.

Expedited transfers did not incur significant additional costs compared with standard transfers. Patients who were transferred during ECPR hours had significantly higher costs than those who were transferred outside ECPR hours.

**Poster 16: Systematic review of health economic analyses involving the use of 3D-printed implants in orthopaedic surgery**

*Liam Fernando-Canavan, The University of Melbourne*
*Co-Authors: Leonardo Grossi, Claudia Di Bella, Kim Dalziel, Richard de Steiger, An Duy Tran*

Objective
3D-printed implants (3DPI) for orthopaedic surgery can be customised by size and shape to fit individual patient anatomy and reconstruct bony defects where conventional implants cannot. However, these novel implants are more costly than traditional options. Given the finite nature of healthcare resources, it is crucial to assess whether such technologies represent value for money. To date, no economic evaluation of 3DPI has been conducted in Australia. To inform future assessment, we systematically reviewed the literature to identify existing health economic evidence on the use of 3DPI in orthopaedic surgery.
Methods
We searched MedLine, Embase, Cochrane Library, and Web of Science from inception to 23 October 2024 to identify economic evaluations, costing studies, or studies reporting preference-weighted HRQoL in patients undergoing orthopaedic surgery with 3DPI. All records were independently screened by two reviewers. We used standard health economic checklists to assess economic evaluations and the Newcastle-Ottawa Scale for cohort studies on costs and HRQoL. Extracted data included study design, patient characteristics (e.g., demographics, affected joint or limb, type of surgery), type of implants, utility instrument, costs, utilities, QALYs and ICERs. Descriptive statistics were used to summarise existing evidence.
Results
Of the 1,246 studies found from the searches, 10 were included after full-text screening. Half of included studies assessed 3DPI for spinal bone surgery. The remaining studies focused on the hip joint (three studies), ankle joint (one study), and distal radius bone (one study). Six studies reported preference-weighted HRQoL using EQ-5D. Two studies measuring costs also measured HRQoL using SF-36; however, neither study derived a utility score using SF-6D. Half of included studies reported no costs data. Only two studies completed health economic modelling; one study performed a cost analysis of a 3D-printed spine implant using a decision tree, and another study used a Markov model to conduct a cost-utility analysis of a 3D-printed hip implant from the perspective of a public healthcare provider. Both studies concluded the 3DPIs under investigation were cost-effective compared to a conventional non-3DPI; however, the quality of these studies was poor and moderate, respectively.
Conclusions
The current literature provides limited evidence to support economic evaluations of the use of 3DPIs in orthopaedic surgery. Only one published study has modelled long-term cost-effectiveness of a 3DPI. In addition, the available data on cost and HRQoL are insufficient and lack the robustness to inform future economic evaluations. The potential health benefits associated with 3DPI in orthopaedic surgery are yet to be adequately weighed against their additional costs to inform health care resource allocation decisions.

**Poster 17: Implications of Functional Limitations among Adults on Education and Work Participation of Children in India**

*Marie Ishida, Nossal Institute for Global Health, The University of Melbourne*
*Co-authors: Ajay Mahal, Sumit Kane, Teralynn Ludwick, Victoria Fan*

Objectives:
In low- and middle-income countries, early onset of morbidities along with population ageing generates increasing household needs for health care and social support. In the absence of affordable and accessible sources of caregiving, the financial and physical burden of caregiving will largely be borne by members of the household in which a person with functional limitation lives. The reliance on this family-based care could adversely affect schooling outcomes of children via two major pathways – through serving as a young carer (direct pathway) and through reduced financial and parental resource allocation to children's educational activities and/or increased pressure on them to enter the workforce (indirect pathway). This paper investigates the relationship between the increase in care needs in the households and the work and schooling outcomes among children in India.
Methods:
Data from two rounds of the longitudinal India Human Development Survey (IHDS) for 2004-5 (baseline) and 2011-2 (end line) with 3523 children aged 6-14 years at baseline was used. Two implications of two sources of increased care needs during the two survey rounds were assessed (i) when an individual aged 60 years and above in the household developed difficulty in performing ADLs; and (ii) when a parent of children in the household developed difficulty in performing ADLs. Work and schooling outcomes were measured through work participation, financial investments in education, school participation, and indicators of educational attainment (years of schooling and English proficiency). Difference-in-difference methods were used on sample of households that were matched in baseline characteristics.
Results:
About 6.8% of children belonged to households that had an individual 60 years and over who developed ADL limitations between the two survey rounds; the corresponding figure for children whose parents developed ADL limitations was 1.0%. Education expenditure per school-aged child in the households dropped among non-poor households when parents developed ADL limitations; but remained unchanged among poor households. Schooling outcomes of children were generally not influenced by increased care needs of elderly in the household. But when a parent developed ADL limitations, rates of school attendance and English proficiency declined among children, with larger effects observed for poor households. Work participation among children increased when their parents or elderly members in the households developed ADL limitations, with effects more pronounced among poor households.
Conclusions:
As population ages, the role of family caregivers will be increasingly critical in India and potentially putting greater pressure to young members in poor households. These findings underscore the need for policy interventions and targeted support programs to mitigate the educational disadvantages faced by children particularly from socioeconomically vulnerable households.

**Poster 18: Assessing the Health and Economic Burden of Food-borne and Respiratory-borne Diseases in New South Wales: A Linked Data Protocol**

*Nargess Ghassempour, Western Sydney University*
*Co-authors: W. Kathy Tannous, Jen Kok, Prof. Vitali Sintchenko, Kingsley E Agho, Maria Estela Varua, Joelle Hajal*

Introduction:
Foodborne and respiratory-borne diseases are leading causes of global morbidity, mortality, and economic strain. In Australia, they affect millions annually, but the true extent of the health system's burden and associated costs remains underestimated, particularly regarding long-term sequelae and indirect societal losses. Data integration is essential to support evidence-based public health policy, especially considering recent pandemic experiences.
Objectives:
This study aims to estimate the health and economic burden of food-borne and respiratory-borne diseases in New South Wales between 2005 and 2023. Specific objectives include describing disease occurrence and distribution, assessing health service utilisation and outcomes, identifying risk factors and local hotspots, and estimating direct and indirect costs along the disease course.
Methods:
This is a retrospective population-based cohort study using linked administrative datasets, including NSW Notifiable Conditions Information Management System (NCIMS), NSW Ambulance records, NSW Emergency Department Data Collections (EDDC), NSW Admitted Patient Data Collection (APDC), NSW Outpatient Non-Admitted Patient Data Collection (NAPDC), NSW Registry of Births, Deaths and Marriages (RBDM), and Cause of Death Unit Record File (COD URF). The Centre for Health Record Linkage (CHeReL) will create privacy-preserving linkages, enabling person-level longitudinal tracking across healthcare services. Descriptive and inferential statistical tests will compare disease burden and outcome based on demographic and clinical characteristics. Economic costs will be approximated by using AR-DRG pricing, national emergency department costing systems, and indirect cost estimates (e.g. lost productivity), comparing pre, during, and post COVID time periods.
Results:
While data analysis is forthcoming, the study is expected to provide the first overall health economic picture of food-borne and respiratory-borne diseases in NSW. It will quantify disease incidence, healthcare utilisation (ambulance, ED, inpatient, and outpatient), mortality, and episode and per capita costs. These estimates will support a better understanding of the long-term disease burden, unveil gaps in the provision of services, and point to high-risk groups and geographic hotspots. Findings will guide public health preparedness and resource prioritisation for prevention, response, and system strengthening activities.
Conclusion:
This study addresses essential knowledge gaps in the burden of infectious diseases in Australia. Using person-level linked data, this study will support improved public health practices, guide policy interventions, and inform investment planning to alleviate disease burden and bolster population resilience.

**Poster 19: Global Economic Evaluation and Access Disparities of Lu-PSMA Radioligand Therapy for mCRPC Following Docetaxel: A Multinational Analysis**

*Nayyereh Ayati, Centre for Health Economics, Monash Business School*
*Co-authors: Jing Jing Li, Andrew Scott*

Objectives:
To evaluate the cost-effectiveness of Lutetium-177 PSMA (Lu-PSMA) therapy compared to cabazitaxel in patients with metastatic castration-resistant prostate cancer (mCRPC) following progression on docetaxel, across high-, middle-, and low-income countries. The study also quantifies global gaps between Lu-PSMA supply and clinical need, using international radiopharmaceutical production data.
Methods:
A partitioned survival multi-state Markov model was developed incorporating overall survival and progression-free survival data from the TheraP trial. The model was populated with country-specific treatment and disease management costs for nine countries: Australia, Germany, India, Jordan, Netherlands, Philippines, South Africa, Thailand, and the United States. Country-specific costs of Lu-PSMA varied depending on local pricing and formulation types (Lu-PSMA-617 vs. Lu-PSMA-I&T). Eligible patient populations were estimated using global incidence data and epidemiological projections. A global gap analysis was conducted by comparing estimated treatment needs with actual radiopharmaceutical utilisation data from the International Atomic Energy Agency, visualised through geospatial mapping.
Results:
The incremental cost-effectiveness ratios (ICERs) of Lu-PSMA therapy varied widely, from dominance in India to over USD 100,000 per QALY in the United States. Most countries, particularly LMICs, demonstrated ICERs below USD 50,000 per QALY, suggesting favourable cost-effectiveness driven by lower costs and widespread use of Lu-PSMA-I&T. Nonetheless, less than 5% of eligible patients in LMICs currently access treatment. A substantial supply-demand mismatch was identified, with the gap projected to widen if Lu-PSMA moves earlier in the treatment algorithm.
Conclusions:
Lu-PSMA therapy is cost-effective in diverse global settings, particularly in LMICs. However, pronounced disparities in access and radiopharmaceutical production threaten equitable implementation. Global investment and infrastructure development are needed to meet rising demand and address the unmet clinical need.

**Poster 20: Tobacco smoking-attributable burden of disease in the adult Northern Territory population, 2014-18**

*Ramakrishna Chondur, Department of Health, Northern Territory*

Introduction
Tobacco smoking is an important preventable cause of death and disease in Australia. Smoking rates are higher in the Northern Territory (NT), among Aboriginal peoples living in remote areas. Understanding smoking-attributable mortality and burden of disease in NT population is important for building awareness and implementing targeted public health strategies.
Objective
To estimate the impact of tobacco smoking on mortality and the morbidity in the NT Aboriginal and non-Aboriginal populations aged 30 years and above between 2014 and 2018.
Participants
Non-Aboriginal and Aboriginal and Torres Strait Islander adults (>30 years) who were selected.
Methods
We used the NT Burden of Disease study (2014–2018) results and Global Burden of Disease (GBD) methods to estimate smoking-attributable deaths and smoking-attributable burden of disease for the NT Aboriginal and non-Aboriginal adult populations. The smoking prevalence data were based on 2018-19 National Aboriginal and Torres Strait Islander Heath Survey and 2016 National Drugs Strategy Household Survey.
Results
Smoking was attributable to 18.3% of the total deaths for NT adults aged 30 years and above with 23.7% in Aboriginal and 13.9% in the non-Aboriginal population. Smoking explained 19.5% and 10.6% of total disability adjusted life years among the NT Aboriginal and non-Aboriginal populations respectively. The top three smoking attributable burden of diseases for the Aboriginal population were ischemic heart disease, diabetes and chronic obstructive pulmonary disease. In the non-Aboriginal population, lung cancer, chronic obstructive pulmonary disease and back pain were the leading causes of smoking attributable burden. Leading causes of smoking-related mortality in the Aboriginal population were ischemic heart disease, diabetes, chronic obstructive pulmonary disease, lung cancer and diabetes, while in non-Aboriginal population the most common causes were lung cancer, chronic obstructive pulmonary disease, ischemic heart disease, and Alzheimer's disease.
Conclusions
Tobacco smoking was associated with a higher burden of disease among the Aboriginal population than the non-Aboriginal population. Our study quantifies the disproportionate impact of tobacco smoking within the Aboriginal population and the NT as a whole compared to the rest of Australia.

**Poster 21: Monitoring excess mortality during the COVID-19 pandemic in the Northern Territory, Australia**

*Renu Unnikrishnan, Department of Health, Northern Territory*

Aim
This study aims to assess whether there was any excess mortality among the Aboriginal and non-Aboriginal populations in the Northern Territory (NT) during the COVID-19 pandemic. Nationally and internationally, there was substantial excess mortality due to the coronavirus disease (COVID-19). It is unclear if there were excess deaths during COVID-19 in the NT among Aboriginal and non-Aboriginal populations.
Methods
A time-series analysis using death data (1997-2023) was applied to develop an excess mortality surveillance model (using Auto-Regressive Integrated Moving Average (ARIMA)) for the NT population. The death data were forecasted from 2020 to 2023, by keeping 2019 as base year for projection to ascertain the expected number of deaths. The model with the best fit was ARIMA (0,1,1). Univariate time series models with 95% and 99% projection intervals have been used for assessing the expected death for the four years starting from 2020. Excess mortality was calculated by comparing expected deaths with actual deaths. Excess mortality was calculated separately for Aboriginal and non-Aboriginal populations.
Results
The NT had a mean of 1220 deaths per year during the last 4 years, from 2020 to 2023, whereas the mean number of deaths for the same period before COVID was 1072. The total COVID-19 recorded deaths in the NT till the end of 2023 was 110. In 2022 there was a statistically significant excess mortality of 193 ($P<0.01$), compared with 82 recorded COVID-19 deaths. Excess mortality was significant for both the Aboriginal (N=91) and non-Aboriginal (N=102) populations in 2022. Even though some months had significant excess mortality among both Aboriginal and non-Aboriginal populations, the recorded COVID deaths were not high in these months.
Conclusion
Excess mortality was significant among Aboriginal and non-Aboriginal populations in the NT in 2022 during the COVID-19 pandemic. This was associated with the peak of COVID-19 fatalities. The ARIMA model demonstrates deviations from expected deaths and helps understand the pandemic's impact on the NT. While there were excess deaths in 2022, the lack of significant deaths in most of the months suggest public health success in reducing pandemic related shocks on the NT health system. The analysis demonstrates the true mortality burden of the pandemic on the lives of Territorian Australians and underscores the importance of excess mortality as a key indicator for public health monitoring and planning. This study helps in examining the potential undercounting of deaths caused by the pandemic and will guide policy and public health response measures.

**Poster 22: Direct Non-medical and Indirect Costs of Breast Cancer from The Perspective of Patients Visiting a Tertiary Hospital in Indonesia**

*Rizka Prita Yuliani, Monash University*
*Co-authors: Dwi Endarti, Fathul Muin, Tri Murti Andayani, Tuangrat Phodha, Zanfina Ademi Delaney*

Objective:
This study aimed to explore burdens of costs from patients' perspective among breast cancer survivors visiting a tertiary hospital in Yogyakarta Province, Indonesia.
Methods:
A cross-sectional, descriptive study was conducted from August to October 2024 using interview method to breast cancer survivors visiting Dr. Sardjito Hospital, a tertiary referral hospital. Data were collected through structured interviews using a validated questionnaire adapted from previous studies examined direct non-medical expenses and indirect costs measured via the human capital approach. Costs were recalled over a 3-month period and presented in both Indonesian Rupiah (IDR) and U.S. Dollars (USD) for the year 2024. Indirect costs were estimated using both real income loss and GDP per capita approaches. Descriptive statistics were used for analysis, and differences in mean costs across groups were assessed using the Kruskal–Wallis and Mann–Whitney U tests, with significance set at p?<?0.05.
Result:
A total of 125 breast cancer patients participated in this study, with a relatively balanced distribution across cancer stages I to IV. Over the 3-month period, there were total of 1,998 visits, mainly for follow-up (61.42%), followed by chemotherapy (30.18%), radiotherapy (6.79%) and surgery (1.61%). The mean cost per visit for direct non-medical expenses was IDR 183,965 (SD: 217,602), contributing 64.60% of the total cost, while the mean indirect cost using the real income approach was IDR 100,990 (SD: 101,478), contributing 35.40%. Higher direct non-medical costs were observed among patients living farther from the hospital due to greater transportation and logistical expenses. Indirect costs were higher among younger ($p<0.05$) based on the Mann-Whitney U test) and working patients, reflecting greater income loss from missed work (based on the Kruskal-Wallis test ($p<0.05$). Cancer stage and patient occupation were both significantly associated with indirect costs based on the Kruskal-Wallis test ($p<0.05$), where higher costs were observed among patients with advanced-stage cancer and those who were employed, likely due to increased caregiving needs and greater productivity losses.
Conclusion:
This study highlights the substantial economic burden faced by breast cancer survivors, particularly in terms direct non-medical and indirect costs. Policy interventions should focus on improving transportation assistance, providing financial aid for caregivers, enhancing early detection programs, and exploring decentralized treatment models to reduce hospital visit frequency.

**Poster 23: Tobacco Costs of Illness Studies in Australia: A Systematic Review**

*Sarah Hakeem, Griffith University*
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Objectives:
To identify studies reporting the tobacco costs of illness and health risks in Australia, and to analyse the economic approaches used to quantify the direct and indirect costs and health risks such as healthcare, disease burden, productivity, second-hand exposure, and other health conditions costs and risks attributable to tobacco use.
Methodology:
Systematic Review following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA) 2020 statement guidelines are designed to review, screen and report results of literature review. Twelve databases including grey literature were searched for the studies published between 2000 and April 2025 in English. The study developed a review protocol based on the research objectives including the studies reporting cost of illness or risk factor of tobacco use both in monetary and non-monetary terms and included all tobacco using population of Australia.
Results:
From 1035 identified studies, the study reviewed 733 abstracts and examined fifty-three full-text articles with thirty-seven studies deemed eligible. Of these, ten studies estimated the tobacco costs of illness in monetary term primarily focusing premature mortality, healthcare and productivity losses (02 global, 05 national and 03 state level). The remaining twenty-seven studies assessed tobacco use as potential risk for various diseases and health conditions in non-monetary term (06 global, 13 national and 8 state-level) most commonly highlighting cancer risks, followed by cardiovascular diseases. Despite diversified economic approaches and outcome, studies reported substantial economic costs of tobacco use in Australia.
Conclusion:
Existing studies on tobacco cost of illness and tobacco use as risk factor for several diseases and health conditions use various economic methodologies. Despite differences in approaches and health measures studies indicated that the tobacco use imposed substantial economic burden.

**Poster 24: Cost-Effectiveness Analysis of Cognitive Behaviour Therapy for Post-Traumatic Stress Disorder in Australian Emergency Service Workers: An Economic Evaluation**

*Shari Stathis, Macquarie University Centre for the Health Economy (MUCHE)*
*Henry Cutler; Bonny Parkinson; Richard Bryant; Varinder Jeet*

Objectives:
Emergency service work (ESW) is high risk for post-traumatic stress disorder (PTSD). Cognitive behaviour therapy (CBT), especially ESW-specific programs can help. This study assessed the cost-effectiveness of CBT for PTSD in ESWs, versus a waitlist control.
Methods:
A cohort-based Markov model estimated the impact of CBT on PTSD severity, quality of life, and healthcare costs (2024 Australian dollars) from the Australian healthcare system perspective over two years. CBT efficacy was based on trial data (CBT: N=166; waitlist: N=41) using the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders score post Clinician Administered PTSD Scale assessment. Other inputs were obtained from insurance data, clinical expert opinion, and the literature. Outcomes included Quality Adjusted Life Years (QALYs), costs, and the incremental cost-effectiveness ratio (ICER) with a 5% annual discount rate. Sensitivity analyses tested the robustness.
Results:
CBT reduced the proportion of patients with severe PTSD from 79% at baseline to 15% while increasing the proportion with no PTSD from 1% to 37% at 24 months. In contrast, the waitlist control group showed a smaller reduction in severe PTSD (to 56%) and only a modest increase in recovery to no PTSD (8%). This resulted in 0.12 additional QALYs at an added cost of $3,568. Consequently, CBT had an ICER of $29,520 per QALY gained compared with the waitlist control group. At a willingness to pay threshold of $60,000/QALY gained, specialised CBT had a 100% probability of being cost-effective. Univariate sensitivity analysis found that the results were sensitive to the proportion of patients with severe PTSD at baseline.
Conclusions:
Our study is the first economic evaluation specifically designed to assess the cost-effectiveness of CBT in reducing PTSD severity among Australian ESWs. CBT is likely to improve outcomes for ESW with PTSD and is likely to be considered by Australian decision-makers. Our study sourced clinical data directly from a specialised trauma centre clinic combined with costing data from insurance claims and relevant literature unlike previous Australian PTSD publications that relied on broader Australian mental health surveys. This study has several limitations, including the absence of randomisation, potential exposure of the control group to other treatments, insurance claim costs reflecting broader healthcare use, and utility values from veterans with PTSD that may not reflect the target population.

**Poster 25: Health-related quality of life of children and adolescents with anxiety: results from an Australian population-based longitudinal study**

*Sithara Wanni Arachchige Dona, Deakin University*
*Co-authors: Monique Seymour; Ha Le; Lisa Gold*

Objectives:
Anxiety ranks as one of the most prevalent and frequent psychiatric disorders worldwide. Anxiety in children and adolescents can have short and long-term consequences, affecting their mental and physical health, social skills, and academic performance. Given the limited evidence on longitudinal individual-level data, the evidence on the long-term impact on health-related quality of life (HRQoL) is scarce. This study aimed to assess the association between anxiety and HRQoL among adolescents aged 12 to 17 years in Australia.
Method:
We applied mixed-effects models on combined data from waves 5-7 (K-cohort) and 7-8 (B-cohort) of nationally representative 'Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC)'. Both univariate regression and multivariable analyses were conducted to verify the covariates selected based on the literature. Overall HRQoL and its domains were measured using the Paediatric Quality of Life Inventory (PedsQL). The primary exposure was symptoms of anxiety measured using the continuous Spence Children's Anxiety Scale (SCAS) and, as sensitivity analysis, SCAS as binary clinical anxiety/normal anxiety status based on validated cut-off points. A Spence Anxiety score has been self-reported for all children (n=7,337) from aged 12 years. Longitudinal sample weights for the wave 5 (K-cohort) and 7 (B-cohort) were used to account for sample attrition.
Results:
Over a five-year period, 1101 adolescents (6.44%) identified as experiencing clinical anxiety. Higher anxiety scores were associated with worse total HRQoL (coefficient -0.41, 95% CI -0.47 to -0.34), adjusting for demographic, health, and family-related covariates. A similar direction was identified in all HRQoL domains, including emotional (-.75, 95% CI -.82, -.67), social (-.46, 95%CI -.54, -.38), school domains (-.46, 95% CI -.55, -.38), and physical (-.22, 95% CI -.30, -.15). Adolescents with clinical anxiety reported significantly lower HRQoL than those without clinical anxiety, with a mean difference of 4.72 (95% CI -5.81, -.38). Low socio-economic status, child comorbidities, Indigenous status, and parental illness were associated with lower HRQoL; while greater family cohesion and positive co-parenting behaviour predicted better HRQoL.
Conclusion:
Anxiety, including elevated anxiety symptoms and those meeting clinical thresholds, was significantly associated with reduced HRQoL among Australian adolescents aged 12 to 17 years, affecting both overall wellbeing and specific functional domains. Our results emphasise the importance of addressing adolescent anxiety early and consistently while supporting families and tackling broader social inequities. Integrated efforts through both public health policy and school-based programs should prioritise adolescent mental health and family wellbeing to promote better HRQoL outcomes for young people.

**Poster 26: Development of an economic evaluation model for the evaluation of eHealth-Enhanced Chronic Care (eCCM) interventions**

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*Kim-Huong Nguyen, Tracey Comans, Namal Balasooriya, Anish Menon*

Background
Chronic conditions, particularly type 2 diabetes mellitus (T2DM), poses a significant burden on healthcare systems. The Chronic Care Model (CCM) is widely used to manage these conditions, and integrating eHealth innovations can enhance outcomes and efficiency. However, the complexity of these interventions, data limitations, and the need to measure outcomes beyond health benefits make it challenging to develop robust and replicable economic evaluation frameworks. This study aims to develop a model to evaluate the cost-effectiveness of eHealth-enhanced CCM, addressing the uncertainties and variability of these interventions.
Objective
To identify challenges in developing economic evaluation models for digital health interventions and develop an R-based model that assesses the cost-effectiveness of eHealth-enhanced CCM, considering the variability and specificity of digital health interventions.
Methods
We are developing a model using R-Studio that relies on UKPDS Outcome Model 2 (UKPDS OM2) and discrete event simulation (DES) to project long-term health and economic outcomes for adults with T2DM receiving eHealth enhanced CCM versus standard care. First, we will use UKPDS OM2 to simulate missing and uncollected data from trials. Next, DES will be employed to tracks individual events and their consequences in continuous time, allowing for more complex dependencies, depending on which treatment arms they follow. DES Model inputs will include costs, utilities, transition probabilities, and intervention effects (e.g., HbA1c reduction, complication rates), sourced from literature, clinical trials, real-world data, and estimates from the UKPDS OM2 simulations. The analysis will span 20 years, using a health system perspective, with deterministic and probabilistic sensitivity analyses to explore parameter uncertainty and generalizability.
Expected Results
The study will provide a clear framework for developing cost-effectiveness models to evaluate eHealth-enhanced CCM interventions. Using a combination of UKPDS OM2 and DES, will allow analysts to create replicable models while offering greater flexibility. The study will recommend how to account for intervention variability, patient population uncertainty, healthcare contexts, and missing data. A unified model for evaluating innovative interventions will enhance the flexibility and robustness of economic evaluations, particularly for digital health.

**Poster 27: Association between Out-of-pocket Health Expenditures and Low Birth Weight in Eastern Ethiopia. A Generalized Structural Equation Modeling (GSEM)**

*Tadesse Tolossa Daba, Deakin University*
*Co-authors: Lisa Gold, Eric HY Lau, Merga Dheresa, Julie Abimanyi-Ochom*

Background:
The inception of free maternity service in many developing countries has reduced a significant number of maternal and neonatal deaths. However, persistent out-of-pocket (OOP) payment and a poor healthcare financing system significantly affects the maternal service utilisation of pregnant women. This study aimed to assess the association between out-of-pocket (OOP) payment and low birthweight (LBW) in Eastern Ethiopia.
Method: A prospective cohort study followed pregnant women for ten months to see the incidence of LBW. The cost of ANC and other follow-up variables was collected during pregnancy. Direct medical and non-medical costs were summed up to give OOP expenditures. Face to face interview was used to collect baseline and follow-up variables. Poisson regression with robust variance estimate was used to assess the independent predictors of LBW. Adjusted risk ratios (RR) with 95% confidence intervals were computed, and statistical significance was declared at p-value <0.05 in the final model. The direct, indirect, and total effects of OOP and mediators on LBW were explored using a Generalized Structural Equation Modeling (GSEM).
Result: A total of 385 women were followed for 10 months, yielding a response rate of 97.4%. The overall OOP expenditure was 23.4 USD for women who gave birth to an LBW baby, compared to 20.3 USD for those without an LBW baby. The study found that 10.9% of women had LBW neonates. After controlling for confounding factors, OOP expenditure (aRR = 3.17, 95% CI: 1.26, 8.01), poor household wealth status (aRR=3.04, 95%CI: 1.07, 8.62), incomplete ANC (aRR = 2.10, 95% CI: 1.07, 4.14), prenatal depression (aRR=2.39, 95%CI: 1.41, 4.07) and lack of BPCR (aRR=2.08, 95%CI: 1.06, 4.08) increased the risk of LBW. In GSEM, OOP had direct (?=0.97, p-value<0.05), indirect effect on LBW through ANC (?=1.06, p-value<0.05) and prenatal depression (?=1.26, p-value<0.05) and a significant total effect on LBW with ANC (? =2.03, p-value<0.05), prenatal depression (? =2.24, p-value<0.05) and BPCR (? =1.44, p-value<0.05).
Conclusion: There was a significant positive correlation between OOP payment and LBW, but partly mediated by prenatal depression and ANC completion. Therefore, policies aimed at reducing LBW should prioritize strengthening ANC services and implementing early screening and treatment programs for prenatal depression, particularly among financially vulnerable women.

**Poster 28: How do the tensions between medical professionalism and financial incentives play out under case-based payment reform in China**

*Xiaoying Zhu, University of Melbourne*
*Co-Authors: Daniel Strachan, Tiara Marthias, Ajay Mahal, Shenglan Tang, Barbara McPake*

Background:
To address rapidly increasing healthcare expenditures of social health insurance, the Chinese government has recently introduced provider payment reform, transitioning from a fee-for-service model to a case-based payment system. The case-based payment method transfers the risks associated with healthcare expenditures from the payer to the provider, incentivising them to control costs. While existing studies have provided statistical evidence for some changes in healthcare practices following the payment method reforms, evidence for how providers understand the reforms and respond to them in their decision-making processes remains limited.
Objective:
Our study aims to investigate how hospital-based physicians have responded to the case-based payment system reform in China and examine how these influential factors are considered in clinical decision-making.
Methods: Qualitative in-depth interviews with physicians were conducted in Nanjing, China in 2024. 22 physicians working in hospital inpatient departments were purposively sampled for interview while ensuring representation across different medical specialties and career stages. Thematic analysis was conducted on the verbatim transcriptions of digital recordings of face-to-face, semi-structured interviews with the informed consent of participants.
Results:
We find that physicians simultaneously serve as agents for health insurance authority, hospitals and patients, with their service delivery decisions shaped by awareness of the principles that underpin these priorities. Five tensions were identified across these agency relationships: optimal care and cost control pressure; institutional policy and professional autonomy; immediate gains and future sustainability; professional development and financial returns; and information asymmetry and relationship risk. These tensions have brought out stress reported by physicians attributed to concerns for vulnerable patients, potential for strained patient relationships, and perceptions of needing to expand their role and skillsets from physician to accountant.
The tensions physicians experienced, and their preferred response tendencies were significantly shaped by hospital incentive mechanisms. Specifically, when hospitals implement direct insurance payment-related income incentives, physicians show strong awareness of hospital profit considerations, leading to unintended behaviours such as treatment delays for secondary health issues, selective patient admission, unbundled medical procedures and strategic coding practices. However, mediating factors such as physicians' ethical considerations, risk aversion, professional values, and the design of monitoring schemes, influence how these impacts play out.
Conclusions:
We conclude that designing incentives that align principal and agent objectives and incorporating organisational mediation are needed to improve healthcare efficiency under the new payment reform.

**Poster 29: The cost-effectiveness of treatment strategies for depression in Ethiopia: a multiple cohort Markov model analysis**

*Yared Belete Belay, Monash University*
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Objectives:
This study aimed to evaluate the cost-effectiveness of delivering treatment interventions for major depression among Ethiopian adults aged 18 to 64 years.
Methods:
A multiple cohort Markov model was developed to simulate how population cohorts move between three health states over time: healthy, depression and dead. Three drug interventions (TCAs, SSRIs, and SNRIs), one non-pharmacological therapy (psychotherapy) and one combination therapy (drug plus psychotherapy) were compared to a common comparator, a partial null scenario. We modelled interventions for Ethiopians aged 18 to 64 years with major depression in 2021 (n = 2,431,898). The study employed a cost-utility analysis framework to estimate the incremental cost-effectiveness ratios (ICERs), expressed as a cost per quality-adjusted life year (QALY). The model was run over a 10-year period, adopted a health sector perspective to estimate population-level costs and benefits with a 3% annual discount rate. Uncertainty analysis was conducted using a Monte Carlo simulation with 3,000 iterations.
Results:
Psychotherapy was associated with incremental cost of US$17million(M) (95%CI: US$9M to US$26M) and QALY gains of 11,857 (95% CI: 125 to 35,227). In comparison, antidepressants, such as SNRIs, had a higher cost of US$236M (95% CI: US$132M to US$353M) with QALY gains of 15,369 (95% CI: -304 to 50,059). Combination therapy was associated with the highest health benefit (40,755 QALYs [95% CI: -210 to 124,928]), and incurred an incremental cost of US$162M (95% CI: US$89M to US$244M). The ICER for psychotherapy was US$1,419 per QALY gained (95% CI: US$344 to US$22,433/QALY), suggesting cost-effectiveness when adopting a one–times GDP per capita per QALY threshold. In contrast, combination therapy had an ICER of US$3,973/QALY (95% CI: Dominated to $63,677/QALY), indicating cost-effectiveness at a threshold of three–¬¬¬times GDP per capita per QALY. Conversely, drug therapies did not appear to be cost-effective.
Conclusions:
Psychotherapy is a cost-effective intervention in Ethiopia, while combination therapy is an alternative cost-effective option. However, access to psychotherapy and combination therapy in Ethiopia is currently restricted to hospitals and the private sector, largely due to a shortage of trained professionals such as clinical psychologists. To address this gap, policymakers should explore cost-effective strategies to expand the availability of psychotherapy services.

**Poster 30: Transitioning Maternity Services for Women from Refugee Backgrounds to Midwifery Models of Care: Cost-Effectiveness Evidence from Australian Refugee Midwifery Group Practice**

*Yordanos Yeshitila, Deakin University*
*Co-authors: Lisa Gold, Lan Gao, Elisha Riggs, Julie Abimanyi-Ochom, Linda Sweet, Ha N.D Le*

Background and aim:
Globally, approximately 13.4 million babies were born prematurely in 2020, highlighting the widespread scale and importance of addressing preterm birth, especially within vulnerable populations such as refugee-background women. We aimed to assess the cost-effectiveness of refugee midwifery group practice (RMGP) from a healthcare system perspective, which has been proven effective in improving perinatal outcomes, including preterm birth.
Methods:
We developed a decision model using TreeAge Pro Healthcare 2024. To inform the model parameters, we reviewed data from the Australian RMGP along with relevant complementary sources, and further estimates were derived from epidemiological evidence reported in published literature. Costs were estimated using the Medicare Benefit Scheme and the Australian Refined Diagnostic Group. We calculated incremental cost-effectiveness ratios per preterm birth averted and conducted sensitivity analyses to assess the robustness of the results to variations in key model parameters. Additionally, a scenario analysis explored the improved implementation of the RMGP intervention, assuming consistent engagement of interpreters and social workers throughout perinatal care, as well as broader regional or national expansion of the intervention.
Results:
In the base-case scenario, RMGP costs $10,506.89 per woman compared to $11,047 for standard care and averts 0.93 PTBs compared to 0.90 PTBs (ICER: – $16,370 per PTB, 95% CI dominant to -14394). In the improved implementation scenario, RMGP costs $11,492 per woman, compared to $11,588, and averts 0.94 PTBs, compared to 0.90 PTBs (ICER: -$2,396 per PTB, 95% CI dominant to -$ 362). In tornado analyses, ICER sensitivity varied primarily with the effectiveness of RMGP and program costs (base case) and SOC effectiveness and program costs (extended scenario). Importantly, ICER remained below AU$50,000 in all plausible parameter variations.
Conclusion:
In both baseline and improved implementation scenarios, the RMGP model yields better outcomes at a lower cost per woman than standard care, demonstrating overall cost savings and fewer preterm births, and representing a dominant and cost-effective maternal healthcare intervention with clear policy implications.

**Poster 31: Adverse childhood experiences and problematic Internet use or cyberbullying: a systematic review and meta-analysis of international studies**

*Zixuan Cao, Xi'an Jiaotong Universtity*

Background
Exposure to adverse childhood experiences (ACEs) entailed physical and psychological health consequences such as the risk of problematic behaviors related to Internet. The reported relationships between ACEs and Problematic Internet use (PIU) or cyberbullying (CB) varied considerably across existing studies. This study aims to synthesize the relationships between ACEs and their dimensions, and PIU or CB (including cyberbullying perpetration [CP] and cyberbullying victimization [CV]) reported by existing studies and identify potential moderating factors.
Methods
We searched 5 databases (PubMed, Embase, EBSCO, ProQuest, and Web of Science) for the potential papers from their respective date of inception until February 1, 2025. The pooled Pearson's correlation coefficient (r) and its 95% confidence interval (CI) was calculated using random effects model. Subgroup analyses and meta-regression were performed to explore the source of heterogeneity.
Results
A total of 72 international studies (10 cohort and 62 cross-sectional studies) covering 154085 individuals from 12 countries were included. The pooled correlation was small between ACEs and PIU (r=0.21, 95% CI [0.18, 0.23]) and CV (r = 0.26, 95% CI [0.23, 0.29]), moderate between ACEs and CP (r=0.52, 95% CI [0.07, 0.96]). Among the identified 11 specific types of ACEs, emotional abuse had the greatest positive correlation with PIU, Physical abuse with CP, and sexual abuse with CV. Subgroup analyses showed associations between ACEs and PIU presenting statistical differences between groups by geographical regions, countries by income levels, types of PIU, measurements and sampling methods. Sample size and population played as moderating roles in the relationships between ACEs and CP, and sample size in the relationships between ACEs and CV.
Conclusions
This systematic review and meta-analysis provided consolidate evidence using data of international studies suggesting a small positive association between ACEs and PIU or CV, and a moderate association between ACEs with CP, with specific moderators identified. With the widespread use of Internet and the increasing prevalence of related problematic behaviors, health management, social support and intervention programs should be tailored and implemented, targeting vulnerable individuals like the ones with ACEs.