



UNSW
SYDNEY



33rd Colloquium on Pensions and Retirement Research



24-25 November 2025
Colombo House Theatres
UNSW Sydney

Disclaimer: All details in this program booklet are correct at the time of printing. If unavoidable changes are required, we apologise for any inconvenience. The event organisers, including CEPAR and UNSW personnel, will not accept liability for damages of any nature sustained by participants, or loss of or damage to their property as a result of this event.

Enquiries: cepar@unsw.edu.au | cepar.edu.au

The Colloquium, co-hosted by CEPAR and the School of Risk & Actuarial Studies in the UNSW Business School, with support from the American Risk and Insurance Association (ARIA), is a unique annual event, bringing together academia, government and industry to discuss the latest research on pensions, superannuation and retirement.

Colloquium Convenor

Katja Hanewald, UNSW Sydney

Colloquium Program Committee

Hazel Bateman, UNSW Sydney

David Bell, The Conexus Institute

Katja Hanewald, UNSW Sydney

Hanlin Lou, UNSW Sydney

John Piggott, UNSW Sydney

Yang Shen, UNSW Sydney

Francesco Ungolo, UNSW Sydney

To view the program online:



- scan the QR code with your phone camera
- or visit the conference website via your web browser at **cepar.edu.au/news-events/events/colloquium-2025**

Dietary Requirements: During catering breaks, please check for labels to match dietary requirements or ask a catering staff member.

Public Transport: The UNSW Kensington Campus is easily accessible via public transport. Call the Transport Infoline on 131 500 or visit transportnsw.info.

Paid casual and visitor parking is offered via the CellOPark App and 'pay by plate meters' at various locations. Further information is available at estate.unsw.edu.au/getting-here/parking-campus.

There are two major car parks on UNSW Kensington Campus:

- Barker Street Carpark – Entry via Gate 14, Barker Street.
- Botany Street Carpark – Enter via Gate 11, Botany Street.

Internet access: Visitors can access Wi-Fi across all UNSW campuses by connecting to the UNSW Guest Network. Please note, Guest Wi-Fi is not intended for existing staff or students. If you are an existing UNSW staff or student, please use the Wi-Fi for Staff and Students service. In order to connect to the guest wi-fi network please follow the following steps:

Step 1 - Navigate to Wi-Fi settings and connect to the '**UNSW Guest**' Network.

Step 2 - You will be redirected to a registration screen and be asked to provide your name and e-mail details.

For further information, please visit www.myit.unsw.edu.au/services/guests/wi-fi-guests.

Media representatives may be in attendance.

Assistance: If you require any assistance, please visit the registration desk or email cepar@unsw.edu.au.

Day 1 Program (subject to changes)

Monday, 24 November 2025				Venue
8:30-9:00	Arrival and Registration			Foyer
9:00-9:10	WELCOME AND OPENING REMARKS <i>Chair: Katja Hanewald, School of Risk & Actuarial Studies and CEPAR, UNSW Sydney</i> John Piggott, Centre for Population Ageing Research (CEPAR), UNSW Sydney Bernard Wong, School of Risk & Actuarial Studies, UNSW Sydney			Colombo A
9:10-10:35	SESSION 1: PANEL Managing Long-Term Savings in the New World Order <i>Chair: David Bell, The Conexus Institute</i> - Guy Debelle, Funds SA - John Pearce, UniSuper - Craig Thorburn, Future Fund - Susan Thorp, University of Sydney			Colombo A
10:35-11:00	Morning Tea			Foyer
11:00-13:00	SESSION 2			
	Session 2A: Drawdown Design <i>Chair: Hanlin Lou, UNSW Sydney</i> <i>Venue: Colombo A</i>	Session 2B Retirement Risk and Policy <i>Chair: Trang Le, UNSW Sydney</i> <i>Venue: Colombo B</i>	Session 2C Lifecycle Modelling <i>Chair: Yang Shen, UNSW Sydney</i> <i>Venue: Colombo C</i>	Colombo A, B, C
11:00-11:30	Are the Minimum Drawdown Requirements for Account Based Pensions Fit for Purpose? Helen Hodgson, Curtin University	The Impact of Climate Change on Social Security Systems: An Extension of the DICE Model Séverine Arnold, University of Lausanne	Principles for Retirement Modelling Ruvinda Nanayakkara, Aware Super Anthony Asher, UNSW Sydney	

11:30-12:00	Optimal Decumulation Strategy with Long-Term Care Insurance and Guaranteed Minimum Death Benefit Mengdi Hu, UNSW Sydney	Why Severe Liquidity Stress in Superannuation Is Hard to Foresee David Bell, The Conexus Institute	Liquidity Shocks, Homeownership, and Income Inequality: Impact of Early Pension Withdrawals and Reduced Deposit Hamza Hanbali, University of Melbourne	
12:00-12:30	Retirement Confidence and Sentiment and Their Impact on Retirement Outcomes: Insights from the How Australia Retires 2025 Survey Osei Wiafe, Vanguard Australia	Artificial Intelligence and Super Fund Trusteeship Scott Donald, UNSW Sydney	Increased Inequality in Financial Wealth for Retirees Kaja Kierulf, UNSW Sydney	
12:30-13:00	Bridging the Digital Advice Gap in Retirement: Aware Super's Retirement Manager and Human-Centred Design for Drawdown Decisions Young Tan, Aware Super	Transforming How Superannuation Funds Connect with Their Members Hermann Lee, Mercer Consulting Richard Dunn, Mercer Consulting	A Sequential Decision-Making Framework for Life-Cycle Retirement Pension Optimization Using Deep Reinforcement Learning Haizhou Cui, Monash University	
13:00-14:00	Lunch			Foyer
14:00-15:30	SESSION 3			
	Session 3A Gender and Wellbeing <i>Chair: Trang Le, UNSW Sydney</i>	Session 3B Housing and Retirement <i>Chair: Yuxin Zhou, UNSW Sydney</i>	Session 3C Mortality Inequality <i>Chair: Francesco Ungolo, UNSW Sydney</i>	Colombo A, B, C
14:00-14:30	The Invisible Crisis: Women, Retirement and Risk Anne-Marie Elias, UTS	Superannuation and other Financial Wealth of those Approaching Retirement: Insights from HILDA Gaoyun (Sophie) Yan, ASFA	Age-Period Modeling of Mortality Gaps: The Cases of Cancer and Circulatory Diseases Andrea Nigri, University of Foggia	

14:30-15:00	The Cost of Not Caring Abby Bloom, UTS	Renting in Retirement: Why Rent Assistance Needs to Rise Joseph Moloney, Grattan Institute	Forecasting Mortality: Leveraging Cause-of-Death Data through Fully Connected Neural Network Dion Krisnadi, University of Lausanne	
15:00-15:30	Mapping a Dignified Retirement to Wellbeing Benedict Davis, UniSuper	Renting in Retirement: Why Rent Assistance Needs to Rise Joseph Moloney, Grattan Institute	Cause-specific Mortality Trends and Inequalities: Pre- and Post-COVID Insights Ayse Arik, UNSW Sydney	
15:30-16:00	Afternoon Tea			Foyer
16:00-17:30	SESSION 4			
	Session 4A Decumulation Strategies <i>Chair: Hanlin Lou (UNSW Sydney)</i>	Session 4B: International Pension Systems <i>Chair: Trang Le (UNSW Sydney)</i>	Session 4C: Mortality Analytics <i>Chair: Andrés Villegas (UNSW Sydney)</i>	Colombo A, B, C
16:00-16:30	Securing Australia's Retirement: It's Time to Protect Retirees from Dud Investment Options Roberta Chen, Super Consumers Australia	Sustainable and Equitable Pension Reform for Emerging Economies: An Application to Indonesia John Piggott, UNSW Sydney	Towards Fairer Retirement Outcomes: Socio-Economic Mortality Differentials and Retirement Product Implications Fei Huang, UNSW Sydney	
16:30-17:00	The Future of the 60/40 Allocation: Modelling the Performance of the 60/40 Portfolio in Retirement Bei Cui, Monash University	Counteracting the Impact of Societal Ageing on income Inequality: A Case Study of Malaysia Philip O'Keefe, UNSW Sydney	A Universe of Individual-Level Mortality Models Xiaochuan Lu, UNSW Sydney	

17:00-17:30	Ready or Not? Assessing System Preparedness for Retirement Phase Defaults in Superannuation Aidan Nguyen, Actuaries Institute	The Dynamic Evolution of China's Pension System and Future Prospects and Policy Issues Han Gao, UNSW Sydney	Impact of COVID-19 on Cohort Life Expectancy: A Counterfactual Projection Based on the Penalized Composite Link Model Francesco Ungolo, UNSW Sydney	
17:30-19:00	NETWORKING RECEPTION			<i>Foyer</i>

Day 2 Program (subject to changes)

Tuesday, 25 November 2025				Venue
8:30-9:00	Arrival and Registration			Foyer
9:00-9:05	WELCOME AND OPENING REMARKS Katja Hanewald, UNSW Sydney			Colombo A
9:05-10:35	SESSION 5: PANEL Retirement Choice Architecture <i>Chair: Hazel Bateman, UNSW Sydney</i> - Nathan Bonarius, Actuaries Institute - Katrina Ellis, Super Consumers - Joey Moloney, Grattan Institute - Geoff Warren, The Conexus Institute			Colombo A
10:35-11:00	Morning Tea			Foyer
11:00-13:00	SESSION 6			
	Session 6A Innovative Retirement Income Streams <i>Chair: Andrés Villegas, UNSW Sydney</i>	Session 6B Retirement Outcomes <i>Chair: Francesco Ungolo, UNSW Sydney)</i>	Session 6C Annuities <i>Chair: Yang Shen, UNSW Sydney</i>	Colombo A, B, C
11:00-11:30	Minimizing Payout Volatility in Longevity Risk-Sharing Pools: An Asset–Liability Matching Approach Manuel Garcia-Huitron, Nuova Longevità Research	Retirement Income Strategy Survey Findings Yolanda Li, EY	Guaranteed Income or Investment-Linked Income: A Framework to Choose the Right Retirement Income Product Philip Clark, Azuria Partners	
11:30-12:00	Designing Payout Rules under Sociodemographic Inequality in Longevity and Wealth Gayani Thalagoda, UNSW Sydney	Measuring Member Outcomes for Superannuation Funds: Retirement Adequacy and Income Stream Efficiency (RAISE) Shang Wu, Aware Super	Can Improving Longevity Literacy Motivate Interest in Life Annuities? Hanlin Lou, UNSW Sydney	

12:00-12:30	Risk-Sharing Rules for Mortality Pooling Products with Stochastic and Correlated Mortality Rates Yuxin Zhou, UNSW Sydney	Best Possible Retirement Alana Devitt, CoreData Harry Inwood, CoreData	Addressing Low Annuity Demand with Capital Taxes Md Khademul Islam Chowdhury, ANU	
12:30-13:00	Solving for Fear, Not Just Longevity: Demystifying the True Value of Innovative Retirement Income Streams Estelle Liu, AMP	Retirement Affordability: Myths, Maths and the Messy Middle Kaye Fallick, Staying Connected	Financial Advisor Views on Lifetime Annuities Anthony Asher, UNSW Sydney	
13:00-13:45	Lunch			Foyer
13:45-14:45	SESSION 7			
	Session 7A Aged Care and Fairness <i>Chair: Yuxin Zhou, UNSW Sydney</i>	Session 7B Retirement and Health <i>Chair: Trang Le, UNSW Sydney</i>	Session 7C Behaviour and Decisions <i>Chair: Hanlin Lou, UNSW Sydney</i>	Colombo A, B, C
13:45-14:15	Distributional Impact of Means-Test Reform in Residential Aged Care Hengzhe Zhao Macquarie University	Examining Differences in Bunching at Statutory Retirement Ages in Australia and the Netherlands: Exploring the Role of Firms and Executives Jan Kabatek, University of Melbourne	Eliciting Risk Preferences for Impactful Decisions in the Pension Domain Jorg Goossens, Radboud University	
14:15-14:45	Learning Fair Decisions with Factor Models: Applications to Annuity Pricing Ran Zhao, ANU	Cohort Trends in Intrinsic Capacity in Europe Meimei Chen, Macquarie University	Income Risk, Self-Control, and Valence-Dependent Updating: A Non-Bayesian Model of Precautionary Saving Behavior Jialing Lin, LMU Munich	
14:45-14:50	Short break			

14:50-15:50	SESSION 8: PLENARY Innovative Retirement Income Streams <i>Chair: Katja Hanewald, UNSW Sydney</i>	Colombo A
14:50-15:20	Innovative Retirement Income Streams - To Insure or Not to Insure? Kathryn Spragg, Australian Retirement Trust	
15:20-15:50	Optimal Hurdle Rate and Investment Policy in Lifetime Pension Pools Jean-François Bégin, Simon Fraser University	
15:50	AWARD OF PRIZE FOR BEST STUDENT PRESENTATION AND CLOSING REMARKS Katja Hanewald, UNSW Sydney	Colombo A

OPENING REMARKS

Katja Hanewald is Associate Professor and a member of the School of Risk and Actuarial Studies at UNSW Sydney, a Senior Investigator at CEPAR, and the President of the Asia-Pacific Risk and Insurance Association (APRIA). Her research focuses on longevity trends, healthy ageing, and insurance strategies for ageing populations. She has published in leading journals in insurance, actuarial science, economics, and health. Katja serves as a Co-Editor of the North American Actuarial Journal, an Editor of the Journal of Pension Economics and Finance, and is on the Editorial Boards of the Journal of Risk and Insurance and the ASTIN Bulletin. She is also the Convenor of the 33rd Colloquium on Pensions and Retirement Research.

John Piggott AO FASSA is Director of CEPAR at UNSW Sydney, where he is Scientia Professor of Economics. A former Australian Professorial Fellow, he has published widely on issues in retirement and pension economics and finance, and in public finance more generally; his research has appeared in the leading international economics and actuarial academic journals. From 2008-2010, John was Visiting Scholar at the Wharton School of Business, and in 2018 was awarded a Rockefeller Residency to undertake research into ageing and inequality in Asia. He has worked with various governments, in Asia and elsewhere, on pension policy. In 2019, he was appointed co-chair of the Think20 (T20) Task Force on Aging Populations during Japan's G20 Presidency and is currently a Commissioner on the US National Academy of Medicine's International Commission on Healthy Longevity. In 2020, he was appointed an Officer of the Order of Australia for contributions to population ageing research and public policy development.

Bernard Wong is Head of the School, Risk and Actuarial Studies at the University of New South Wales, Australia, which has grown to be one of the largest and most successful risk and actuarial departments in the world in both its education and research programs, including being global ranked #1 business school in risk, insurance and actuarial research. He is a Fellow of the Institute of Actuaries of Australia, a Fulbright Scholar, and obtained his PhD from the Australian National University.

His current research interests span two interrelated main areas: AI/ML enhanced actuarial methods for risk modelling, and capital modelling for risk and insurance businesses - especially under climate change, dependence, and extremes. Bernard is co-lead of the Innovations in Risk, Insurance, and Superannuation (IRIS) Knowledge Hub, a chief investigator in the UNSW Institute of Climate Risk and Response, and founding member of the Business AI Lab. His research is funded via Australian Research Council Linkage and Discovery Project schemes, and he has been recognised via the award of numerous prizes, including the Melville Practitioner Prize, Hachemeister Prize (twice) and the Taylor-Fry Silver Prize. Bernard has taught most of the courses corresponding to the professional actuarial syllabus, with a particular focus in recent years in the areas in innovations in the areas of actuarial data science, and in quantitative models of enterprise risk management. Bernard is currently on the Board of ASTIN, the non-life insurance section of the International Actuarial Association, and previously also served on the Australian Actuaries Institute Data Analytics (Data Science) Practice Committee.

SESSION 1: PANEL

MANAGING LONG-TERM SAVINGS IN THE NEW WORLD ORDER

Chair: David Bell (The Conexus Institute)

Panel Session

- Guy Debelle (Funds SA)
- John Pearce (UniSuper)
- Craig Thorburn (Future Fund)
- Susan Thorp (University of Sydney)

David Bell is founding executive director of The Conexus Institute, a philanthropically funded research think tank focused on improving retirement outcomes for Australians. David is an active researcher (industry and academic) in the areas of retirement, superannuation, investment management and governance. David completed his PhD at UNSW, with a focus on asset allocation problems related to lifecycle modelling.

David's industry career experiences include the role of chief investment officer at Mine Super (now Team Super), founder and director of his own consulting firm (St Davids Rd Advisory), and 12 years at Colonial First State Global Asset Management (now First Sentier), mainly leading the fund-of-hedge funds investment team. David was a co-founder of financial newsletter Cuffelinks (now Firstlinks), and developed, and for 12 years taught, the hedge funds elective at Macquarie University's Applied Finance Centre.

Guy Debelle is Chair of the Funds SA Board and has tremendous depth of experience in financial and economic policy, having spent 25 years at the Reserve Bank of Australia, the last 6 years of which was in the role of Deputy Governor.

His current roles outside of Funds SA include Director of the Clean Energy Finance Corporation, Tivan Ltd and the South Australian Government Financing Advisory Board, Advisor to the Investment Committee of Australian Retirement Trust, Advisor to Citidel LLC and Tudor Investment Corp, Chair of the Advisory Board of Famile Capital, and Chair of the Audit and Risk Committee at the Amy Gillett Foundation and Board Member and Policy Advisory Committee member at e61 Institute

Dr Debelle is also an Honorary Professor of the School of Economics and Public Policy at Adelaide University. Dr Debelle holds a Bachelor of Economics (Honours) from the University of Adelaide, and a PhD in Economics from the Massachusetts Institute of Technology

John Pearce joined UniSuper in 2009 and is responsible for the management of our investment functions. John has over 25 years' experience in the financial services industry both in Australia and Asia. He has held several senior positions including Chief Executive Officer and General Manager, Investments for Australia's largest asset management company Colonial First State from 2000 to 2006. From 2006 to 2008 John was the Head of Global Asset Management for Ping An, which is China's second largest insurance company. John has a degree in economics and a Masters in applied finance. He has also completed a Program for Management Development at Harvard Business School. John was appointed a non-executive director on the Treasury Corporation of Victoria Board on 14 April 2015.

Craig Thorburn joined the Future Fund after 13 years working for both the Commonwealth Treasury and Australia's sovereign debt manager, the Australian Office of Financial Management. Craig has been with the Future Fund since inception in 2006 and was a senior member of the in-house Strategy team from 2007 to 2012.

In July 2012 Craig took up the new role of Director – Emerging Markets; leading the Future Fund's efforts in better understanding the complexities of investing in Emerging Markets across all asset classes. In 2019 Craig joined the in-house Private Equity team with investment responsibilities cutting across venture, growth and buy-out sectors and with a focus on China and other emerging economies.

From September 2020 Craig is working directly to the Chief Investment Officer, with a focus on strategic portfolio and investment initiatives.

Craig has often represented the Future Fund at high level governmental interactions and continues to represent the organisation and investment forums worldwide.

Craig graduated from the Australian National University with both a Bachelor of Commerce degree and post graduate qualifications in Economics.

Susan Thorp is a Professor of Finance at the University of Sydney of Business School. She has an honours degree in Economics from the University of Sydney and a PhD in Economics from the University of New South Wales. Her research focuses on household and consumer

finance, particularly retirement savings and decumulation. Thorp uses theoretical, empirical, and experimental techniques to understand financial decision-making and has published over thirty academic papers in leading finance journals. She is also a member of the Steering Committee of the Mercer CFA Global Pensions Index and the Research Committee of the OECD/International Network on Financial Education. Thorp has led and participated in grant projects attracting over \$3 million dollars in public and industry funding.

SESSION 2A

DRAWDOWN DESIGN

Chair: Hanlin Lou (UNSW Sydney)

Venue: Colombo A

ARE THE MINIMUM DRAWDOWN REQUIREMENTS FOR ACCOUNT BASED PENSIONS FIT FOR PURPOSE?

Helen Hodgson (Curtin University)

Abstract: Australia's superannuation scheme is acknowledged as one of the best performing in the world in accumulation phase. However there are concerns that as the system matures the retirement phase is not performing as required (Mercer, 2024). In particular, retirees are not drawing down on the benefits that they have accumulated during the accumulation phase (Asher et al, 2017) resulting in

- Retirees not enjoying the standard of living that they have funded;
- Using superannuation as an estate planning vehicle to pass on benefits after the member dies; and
- Increasing the cost to the budget of superannuation tax concessions.

Superannuation account holders tend to adopt default settings, (Dobrescu et al, 2018). The default option for retirement products has become an account based pension set at the minimum drawdown level, which varies from 4% for 60 to 65 year olds increasing to 14% for retirees over the age of 95. Account balances will continue to grow in retirement if superannuation returns exceed the minimum drawdown.

This project will review the drawdown phase to examine whether the current drawdown rates are still appropriate and consistent with the Objective of Superannuation: to preserve savings to deliver income for a dignified retirement, alongside government support, in an equitable and sustainable way. A range of actuarial modelling techniques will be applied to:

- test the current target returns of superannuation funds against the minimum drawdowns to understand the effect on account balances of retirees;
- calculate the minimum drawdown that would be appropriate to effectively exhaust superannuation prior to death; and
- test the outcomes of these revised minimum drawdowns.

Based on the outcome of this modelling a new legal and policy proposal will be developed to better match the investment returns of superannuation to the required drawdown levels.

Bio: Helen Hodgson is an expert in Taxation, based at Curtin Law School. Her research is in the areas where tax and social policy intersect: superannuation; housing and inequality. She has contributed to policy review in the areas of superannuation and the tax - transfer system, specifically examining these systems through a gender lens. Helen's areas of teaching at Curtin Law School include superannuation, capital gains tax and the taxation of

trusts and companies. She was also a Member of the Legislative Council in Western Australia between 1997 and 2001. Helen has supervised HDR students completing projects and theses in Superannuation, Taxation and Gender Studies. Helen understands the policy process through her experience as a Member of Parliament. This has been applied in a practical way through her engagement with women's policy development through her role as Chair of the Social Policy Committee of the National Foundation for Australian Women. She has co-authored submissions to Government on the gender effects of government policy including tax, superannuation, housing, family violence and the machinery of government. Helen writes regularly for The Conversation and is also experienced at communicating with policy makers through her practical experience in policy analysis and commentary.

OPTIMAL DECUMULATION STRATEGY WITH LONG-TERM CARE INSURANCE AND GUARANTEED MINIMUM DEATH BENEFIT

Mengdie Hu (UNSW Sydney)

Abstract: The shift from defined benefit (DB) to defined contribution (DC) pension systems has transferred the burden of retirement planning to individuals, increasing their exposure to longevity, health, and market risks. This transition has also led to more precautionary saving, as retirees become more conservative in fully consuming their wealth. To address these compound challenges, this study proposes an integrated decumulation strategy following the purchase of long-term care insurance (LTCI) and guaranteed minimum death benefit (GMDB) at the time of retirement. This strategy incorporates regime-switching financial markets, a target volatility investment strategy, and a dynamic withdrawal rule based on life expectancy. The LTCI helps mitigate late-life healthcare costs, while the GMDB supports bequest motives and allows retirees to consume their wealth more confidently. Moreover, the regime-switching model captures dynamic market behavior and volatility clustering, and the target-volatility investment strategy smooths the wealth dynamics and limits extreme losses. Notably, the dynamic withdrawal rule provides a realistic mechanism for income smoothing without requiring life annuities.

These elements are unified within a stochastic control framework that accounts for health state transitions and irreversible insurance choices. A grid search is performed over different allocated weights of LTCI and GMDB to identify optimal regions under a value function that accounts for the expected present value of total withdrawals, the terminal wealth, long-term care costs, and payments from LTCI and GMDB. Sensitivity analyses explore the impact of targeted volatility levels, initial wealth, and consumption rules, comparing fixed withdrawal strategies with dynamic consumption approaches. Based on real market data for pricing, our results show that combining market-sensitive asset allocation with structured withdrawals and insurance instruments enhances retirement income sustainability. Furthermore, we find that the use of a target-volatility strategy significantly increases the chance of accumulating a safety buffer, which helps smooth post-retirement consumption and mitigate adverse financial shocks.

Bio: Mengdie Hu is currently pursuing her master's degree in actuarial studies at the University of New South Wales. She previously earned her bachelor's degree in actuarial science from Xi'an Jiaotong-Liverpool University, where she ranked first in her major for two consecutive academic years and received the IFoA Foundation CSEA Scholarship. Her research interests include insurance product design, macroeconomic forecasting, and asset pricing models. Mengdie has participated in several research projects and worked as a research assistant in both China and Australia.

RETIREMENT CONFIDENCE AND SENTIMENT AND THEIR IMPACT ON RETIREMENT OUTCOMES: INSIGHTS FROM THE HOW AUSTRALIA RETIRES 2025 SURVEY

Osei Wiafe (Vanguard Australia)

Abstract: This study seeks to enhance our understanding of retirement confidence and the underlying factors influencing retirement sentiment in Australia. It further explores how improvements in retirement sentiment may contribute to better retirement outcomes. Utilizing data from the How Australia Retires 2025 survey—a nationally representative sample of 1,800 Australians—we employ ordinary least squares (OLS), logistic regression, and multinomial logit models to examine three key research areas. Preliminary findings are outlined below.

1. Australians continue to have concerning gaps in their financial and retirement literacy.
 - a. We find low levels of financial literacy particularly in younger generations, with women scoring lower in financial literacy than men across all age groups.
 - b. Retirement literacy is also low. Many Australians, including those at retirement age, struggle to understand key aspects of the retirement system.
 - c. Most Australians aren't confident in their understanding of financial products and in making financial decisions more generally.
2. More Australians are retiring with mortgage debt, which is a worrying trend
 - a. Australians are entering the housing market later in life, and with larger mortgages than previous generations.
 - b. Australians with mortgage debt in retirement are more likely to report low confidence and negative sentiment about their retirement.
 - c. Many Australians are looking to use their super to pay off mortgage debt in retirement, significantly reducing what remains for meeting other income needs in retirement.
3. Working-age Australians have different expectations of retirement compared to current retirees
 - a. Working-age Australians expect to work into their late 60s and expect to need significantly more income in retirement than the amounts current retirees spend.
 - b. The expectations that working-age Australians have about part-time work in retirement do not reflect the experiences of current retirees.
 - c. There is a “sentiment gap” - retirement evokes negative emotions for many working Australians, while most retirees view retirement positively.
 - d. We analyse actions that are associated with an increased positive retirement sentiment, and how these lead to improved retirement outcomes

Bio: Osei Wiafe is an Investment Strategist in Vanguard's Investment Strategy Group, conducting research in retirement and investor behaviour in Australian and U.S. Prior to joining Vanguard, he was Retirement Product Manager at Australian Retirement Trust, where he was responsible for the design and management of the fund's retirement product

and service offerings. Before joining the super industry, Osei worked as a Research Fellow at Griffith University. He has several academic publications and industry whitepapers and articles. He is currently an adjunct Research Fellow at the Griffith Centre for Personal Finance and Superannuation (GCPFS), Griffith University and an affiliate of the ARC Centre of Excellence in Population Ageing Research (CEPAR). His expertise is in the areas of asset allocation, superannuation, investment and retirement product design. Osei has a PhD in Finance from Queensland University of Technology and a BSc in Actuarial Science from Kwame Nkrumah University of Science and Technology in Ghana.

BRIDGING THE DIGITAL ADVICE GAP IN RETIREMENT: AWARE SUPER'S RETIREMENT MANAGER AND HUMAN-CENTRED DESIGN FOR DRAWDOWN DECISIONS

Young Tan (Aware Super)

Abstract: While digital tools have evolved to support superannuation accumulation, a significant gap exists in providing comprehensive digital advice for the retirement phase. This presentation introduces Aware Super's "Retirement Manager", a new tool designed to address the complex challenges faced by retirees navigating drawdown decisions.

The retirement phase presents unique complexities that traditional digital solutions struggle to address. Fund members face critical decisions about how much to withdraw while balancing longevity risk, market volatility, and changing life circumstances. Common member problems include drawing too little (leading to unnecessary lifestyle restrictions), drawing too much (risking depletion), and overall lack of confidence in retirement income strategies.

Retirement Manager employs several innovative features to address these challenges. The tool incorporates intelligent nudges to guide members into drawing down sustainably whilst maximising their lifestyle, educational content tailored to individual circumstances, and an inbuilt triage system that identifies when human intervention is needed. A key innovation is the Income Confidence Score, a new measure that takes into account investment risks' impact on not being able to achieve the target income and the risk of running out of super, complemented by personalised action plans.

Central to the tool's development was human-centred design principles, recognising that effective retirement guidance requires seamless integration between digital capabilities and human support. The design process involved extensive member research to understand pain points, cognitive limitations, and decision-making preferences during the drawdown phase.

Implementation presented significant challenges including regulatory compliance, integration with existing fund systems, and ensuring the tool remained accessible across diverse member demographics and technological capabilities. The presentation will explore these implementation hurdles and the solutions developed.

This work builds on our previous research presented at the 30th Colloquium on accumulation-phase tools, completing our comprehensive approach to supporting members throughout their superannuation journey from accumulation through to retirement drawdown.

Bio: Young Tan is an Investment and Retirement Actuary in the Investment team at Aware Super, where he's passionate about helping members achieve better retirement outcomes. His role focuses on investment and retirement strategy, with particular emphasis on lifetime income products, decumulation strategies, and measuring member retirement outcomes.

Young also helps shape Aware Super's digital tools, making retirement planning more intuitive and empowering for members. Prior to Aware Super, during his time as Manager of Actuarial and Research at UniSuper, Young had the opportunity to develop UniSuper's first retirement income strategy and built comprehensive in-house capabilities for retirement adequacy studies and member projections. He started his career at Russell Investments, providing actuarial and strategic advice to superannuation funds. Young has presented papers at conferences on pooled income product solutions and serves as a member of the Actuaries Institute's Superannuation Projections and Disclosures Sub-Committee.

SESSION 2B

RETIREMENT RISK AND POLICY

Chair: Trang Le (UNSW Sydney)

Venue: Colombo B

THE IMPACT OF CLIMATE CHANGE ON SOCIAL SECURITY SYSTEMS: AN EXTENSION OF THE DICE MODEL

Séverine Arnold (University of Lausanne)

Abstract: This research introduces an Integrated Assessment Model (IAM) designed to evaluate the potential impacts of climate change on social security systems, focusing on retirement plans. To achieve this, we extend the Dynamic Integrated Climate-Economy (DICE) model to incorporate intergenerational consumption and saving dynamics, allowing for a more comprehensive representation of a social security system. Using the existing socio-economic narratives outlined by the Shared Socioeconomic Pathways (SSPs), we calculate optimal consumption and saving allocations for both active and retired populations, alongside the associated Social Cost of Carbon. We use these reference paths to evaluate the adequacy and equity of global contribution rates and their effectiveness in ensuring the sustainability of retirement systems under different SSP scenarios. Our findings indicate that, even within a deterministic framework, the SamuelsonAaron decision rule is not suitable for selecting the best financial system for retirement plans. This is mainly because it fails to address the potential resource depletion caused by factors such as climate change and population aging.

Bio: Séverine Arnold is Professor in Actuarial Science at the University of Lausanne, Switzerland. Besides a PhD in Actuarial Science, she has a Certificate in Population Study from the University of Geneva, Switzerland. Her research focuses on longevity risk/mortality modeling, with a particular interest in cause-specific mortality rates, and on social security financial systems and inclusive insurance. With the University of York and Liverpool, she is currently building a Consortium of Excellence for the 17 Goals (C-17), that will serve as the premier hub for Academia, Industry, NGOs and Governments from all over the world to promote and achieve the United Nations Sustainable Development Goals. Drawing its strength from Actuarial Science and related disciplines, the Consortium will become an international driver of transformative research, of research-infused innovative learning and training as well as of modern policy, aimed to facilitate the UN's 2030 Agenda for a better world. In addition to teaching and research, she was involved in social security projects with the International Labour Organization, is the Chair of the International Actuarial Association (IAA) Life Section Research Committee, a member of the IAA Mortality Virtual Forum and a member of the Social Security Sub-Committee of the AAE (Actuarial Association of Europe). She also represents the Confederation in the Swiss Occupational Pension Supervisory Commission. More recently, she started to collaborate with the International Labour Organization on projects related to inclusive insurance.

WHY SEVERE LIQUIDITY STRESS IN SUPERANNUATION IS HARD TO FORESEE

David Bell (The Connexus Institute)

Abstract: Liquidity management and potential for liquidity stress in the Australian superannuation (super) sector has recently been under the focus of APRA and the RBA, with the IMF also raising some concerns. Against this background, we outline why it is improbable that severe liquidity stress would emerge from the super industry that has significant and sustained impacts on the Australian economy and/or financial markets. The basic argument is that the confluence of events required for liquidity issues within super to escalate to a systemic level is quite unlikely. We demonstrate by focusing on the series of ‘stage-gates’ that the system needs to pass through before reaching a crisis state, the cumulative probability of which seems very low. Two key considerations are the ability of super funds to sell their liquid assets to meet liquidity demands, the consequence of which would be out-shape portfolios; and the likelihood that the authorities would most probably take action to avert a systemic event. Extending the framework to individual super funds suggests a higher probability of a fund encountering significant liquidity stresses that causes significant harm to its members, albeit unlikely to manifest into a systemic event.

Bio: David Bell is founding executive director of The Connexus Institute, a philanthropically funded research think tank focused on improving retirement outcomes for Australians. David is an active researcher (industry and academic) in the areas of retirement, superannuation, investment management and governance. David completed his PhD at UNSW, with a focus on asset allocation problems related to lifecycle modelling. David’s industry career experiences include the role of chief investment officer at Mine Super (now Team Super), founder and director of his own consulting firm (St Davids Rd Advisory), and 12 years at Colonial First State Global Asset Management (now First Sentier), mainly leading the fund-of-hedge funds investment team. David was a co-founder of financial newsletter Cuffelinks (now Firstlinks), and developed, and for 12 years taught, the hedge funds elective at Macquarie University’s Applied Finance Centre.

ARTIFICIAL INTELLIGENCE AND SUPER FUND TRUSTEESHIP

Scott Donald (UNSW Sydney)

Abstract: A well-trained artificial intelligence (‘AI’) model offers resource-strapped superannuation fund trustees the prospect of fast, efficient and rigorous decision-making. But there are operational and legal risks – AI models are opaque and prone to hallucination and hidden bias. Not all the decisions a trustee is called upon to make are therefore suited to AI. So what might super fund trustees properly use AI to do? And what might be beyond the pale? This paper considers the legal and practical issues facing the trustees of superannuation funds who may be contemplating employing AI in the various aspects of administering their funds.

Bio: Scott Donald is an Associate Professor in the School of Private and Commercial Law. Scott joined the Faculty in 2010 after a successful career in the funds management industry advising governments, superannuation funds, insurance companies and fund managers on investment strategy, governance and regulation. Scott teaches corporations, trusts and superannuation law at both undergraduate and post-graduate level. He regularly presents at academic, professional and industry conferences in Australia and overseas and publishes in both the academic and professional press on research related to financial services regulation, governance and superannuation policy.

TRANSFORMING HOW SUPERANNUATION FUNDS CONNECT WITH THEIR MEMBERS

Heman Lee (Mercer Consulting)

Abstract: Member engagement in superannuation is at a relatively immature state. Compared to industries such as the e-commerce sector (where retailers use sophisticated algorithms to analyse customer behaviours and preferences to offer personalised product recommendations) or the digital content sector (where platforms use adaptive learning algorithms to adjust the difficulty and type of content presented to individuals), most superannuation funds simply provide a range of materials to their members on their websites with communications sent to members limited basis. Improving the ways in which superannuation funds engage with their members is critical as Australia continues to age. Given the default nature of Australia's superannuation system, most individuals join and stay in the system without ever having to make a decision or engage in the accumulation phase. This means that many members come to retirement without having thought about their superannuation, causing significant cognitive load that can lead to suboptimal decisions being made. For funds, this often means that members leave the fund at the point of retirement, representing a material sustainability issue. Therefore, as more members approach and enter retirement, uplifting the level and quality of engagement will both aid funds in retaining members and improve the retirement outcomes of those members.

In this paper, we seek to set out best practice principles for member engagement in superannuation, along with a roadmap for funds to follow. We consider the current state of the market and a review of tangential industries from which inspiration can be drawn. Our goal is to illustrate how funds can plan and develop their engagement practices for the future, leveraging data and technology and considering the legislative landscape, to improve member outcomes.

Bios: Herman Lee is an Associate in Mercer's Investments business, based in Melbourne. Herman joined Mercer in 2021, and in his role as an Actuarial Consultant, works with clients across the superannuation industry to develop solutions and provide insights on a range of matters, with a key focus on product, strategy and retirement incomes. He also supports senior consultants in providing actuarial advice on long service leave and annual leave liabilities, and defined benefit superannuation plans. Herman has extensive experience in working with superannuation data and leads the modelling and analysis for Mercer's annual Shaping Super report. He has also co-authored a number of thought leadership papers for Mercer. Herman holds a Bachelor of Commerce (Actuarial Studies) from the University of Melbourne and is a Fellow of the Institute of Actuaries of Australia.

Richard Dunn is a Principal in Mercer's Investments business, based in Sydney. Richard works with clients across the superannuation industry and the endowments and foundations client base to provide insights on policy developments and deliver consulting advice across investment and actuarial matters. Richard brings a strong skill set in developing market aware thought leadership which is tailored to the individual needs of clients and the evolving market. Prior to joining Mercer in September 2022, Richard worked for Deloitte following its acquisition of Rice Warner where he had worked for seven years leading strategy and research projects across the Australian financial services landscape. For this work Richard was awarded several prizes including the Melville Prize and the Andrew Prescott Prize. Beyond his role with Mercer, Richard leads the Investment Management and Finance and Education Faculty at the Actuaries Institute which is responsible for educating the next generation of investment actuaries. Richard holds a combined Bachelor of Commerce and Bachelor of Science (Advanced Mathematics) (Honours) from the University of New South Wales. He is a Fellow of the Actuaries Institute of Australia.

SESSION 2C

LIFECYCLE MODELLING

Chair: Yang Shen (UNSW Sydney)

Venue: Colombo C

PRINCIPLES FOR RETIREMENT MODELLING

Ruvinda Nanayakkara (Aware Super) and Anthony Asher (UNSW Sydney)

Abstract: Financial advice about saving for, and spending in, retirement requires mathematical modelling. ASIC's Moneysmart website contains such models to help consumers navigate these financial decisions, and similar models are also offered by superannuation funds and are used by financial planners. The models fall within the actuarial domain in that they involve making demographic assumptions, such as mortality and disability, and economic assumptions, such as inflation rates and investment returns, and require a knowledge of insurance and superannuation markets and regulation. In order to offer some guidance to developers of these models, The Actuaries Institute issued a Technical Paper: Good Practice Principles for Retirement Modelling, in February 2022 and that technical paper is currently being revised to include a checklist.

The developers of retirement models have to find a balance between 'simplicity' and 'accuracy'. The models in use are often simplified in order to seem more accessible, but at the cost of being potentially misleading. Members of the working group tasked with updating the technical paper recognise that model users do not need to be provided with excessive detail, but believe that users will potentially be misled if the models do not:

- consider the whole household with all its significant assets, liabilities, income and expenses – including welfare benefits
- communicate both the size and incidence of risks year by year – especially considering the variability of the (joint) lifespan and using appropriate mortality projections
- facilitating annual reviews to allow for changes to behaviour
- provide an easily accessible, standardised summary of the main assumptions and outcomes

The technical paper spells out these principles in more detail, and suggests ways in which they might be incorporated. The main change proposed is the addition of a checklist of 43 items that can be used by providers and regulators to assess that models fulfill the principles.

Bios: Ruvinda (Ravi) Nanayakkara is the Actuarial Practice Lead and fund actuary at Aware Super. He is a Fellow of the Institute of Actuaries of Australia. Ravi is responsible for the models that are utilised by Aware Super to provide super forecasts and digital advice to the fund's 1.2 million members. Prior to joining Aware Super, Ravi held a similar role at Spirit Super, developing the models used by the fund to advise their members. Ravi is an active member of the Superannuation Projection and Disclosure sub-committee at Actuaries Institute and the chair of the working group enhancing the Technical paper : Good practice principles for Retirement Modelling.

Anthony Asher is an actuary and part-time Associate Professor at the UNSW Business School. His working life has been divided between university teaching and a variety of professional roles including Chief Actuary of a life insurer, consultant actuary, and with APRA. Within the Actuaries Institute he is currently a member Risk and Audit Committee. He is well known in the profession for his interest in ethics in professional life, particularly the social impact of actuarial work. He is also on the board of Fresh Hope Communities, which operates aged care facilities and retirement villages in NSW, and of PPS Mutual,

which administers and distributes life and disability insurance designed for graduate professionals. The design of post-retirement products and advice is the focus of his current research, which extends his publications in the fields of regulation, investments and insurance.

LIQUIDITY SHOCKS, HOMEOWNERSHIP, AND INCOME INEQUALITY: IMPACT OF EARLY PENSION WITHDRAWALS AND REDUCED DEPOSIT

Hamza Hanbali (University of Melbourne)

Abstract: We analyze two policies that affect housing demand: one that allows access to pension savings (EW) and one that reduces the deposit amount (RD). These are analyzed in an equal affordability market and a supply constrained market. Using a custom model that incorporates the effect of demand on housing prices, we find that the policies are at best ineffective or at worst harmful in terms of housing affordability. In particular, the RD policy significantly increases inequality by relaxing constraints for higher-income households in a supply constrained market. Constraining the policies accessibility based on an income criteria does not significantly increases the effectiveness of the policy.

Bio: I am senior lecturer in Actuarial Science at the University of Melbourne since August 2024. My research interests include risk management and risk measurement, pricing, and dependence modeling. I am interested in studying issues related to insurance and pension, as well as reconciling consumer welfare and providers' financial sustainability or solvency. I hold a Bachelors degree in Mathematics from Universite Pierre et Marie Curie (Paris, France) and a Masters degree in Actuarial Science from Universite Catholique de Louvain (Louvain-la-Neuve, Belgium). I am a member of the Institute of Actuaries in Belgium. I worked for a short period as an actuary in the risk management department of the insurer AXA Belgium. In 2019, I completed a PhD in Actuarial Science at KU Leuven (Leuven, Belgium), and joined Monash University in 2020 as a Lecturer.

INCREASED INEQUALITY IN FINANCIAL WEALTH FOR RETIREES

Kaja Kierulf (UNSW Sydney)

Abstract: Inequality in financial wealth for retirees increased in the U.S. between 1989 and 2019.

This paper analyzes how three channels contribute to the increase in inequality. First, defined contribution plans and individual retirement accounts were introduced into the economy. Second, inequality in wages increased. Third, life expectancy increased and heterogeneity in life expectancy increased.

I calibrate a life cycle model with heterogeneous agents to match the U.S. economy. The retirement plans have different features and tax benefits, and a worker's ability to take advantage of these features depends on their type of retirement plan. The distribution of retirement plans, wage inequality, and life expectancy change exogenously over time in the baseline economy.

To measure each channel's contribution to the increase in inequality, each channel is allowed to change over time or is fixed at a constant level, allowing the model to measure the difference in inequality in financial wealth for retirees.

Bio: I study the increase in wealth inequality for retirees in the U.S. over the past few decades. I also Study human capital accumulation and optimal taxation.

A SEQUENTIAL DECISION-MAKING FRAMEWORK FOR LIFE-CYCLE RETIREMENT PENSION OPTIMIZATION USING DEEP REINFORCEMENT LEARNING

Haizhou Cui (Monash University)

Abstract: The inherent uncertainty of defined-contribution pension schemes makes it difficult to achieve optimal, stable, and reliable pension management for retirees, especially in the face of changing individual risk preferences and dynamic economic conditions. This study proposes a utility-based life-cycle model that incorporates key decision-making variables such as consumption, investment, bequests, pension entitlements, and reverse mortgage loans. The model's central feature is a sequential decision-making framework that accounts for time-inconsistent risk preferences and expectations while also allowing the model to adapt its decision strategies to various dynamic economic scenarios. These factors, which are important in life-cycle decision-making, have received little attention in previous research. To solve the complex optimisation problem posed in this dynamic framework, the model framework leverages a deep reinforcement learning algorithm, which produces superior results and can effectively handle the high-dimensional decision space. The model is created and tested with Australian data in a realistic macroeconomic and financial environment. Simulation results demonstrate the robustness and usefulness of the proposed sequential decision-making approach for dynamic retirement planning.

Bio: Haizhou Cui is a current Ph.D student from Department of Econometrics and Business Statistics, Monash Business School, Monash University. He has pursued his master's degree from the School of Economics, University of Sydney with Distinction in grades and Highly Distinction in thesis. His research interest lies in using reinforcement learning, deep learning algorithms to solve the problems in finance, actuarial science and operational research. For instance, he is now working on the project that develops a utility-based life-cycle model of pension within a sequential decision-making framework, and uses deep reinforcement learning algorithms to help people find the optimal personalized drawdown strategies.

SESSION 3A

GENDER AND WELLBEING

Chair: Trang Le (UNSW Sydney)

Venue: Colombo A

THE INVISIBLE CRISIS: WOMEN, RETIREMENT AND RISK

Anne-Marie Elias (UTS)

Abstract: Australia's retirement income system is increasingly failing to provide financial security to single, renting women. Despite lifetimes of work, care, and contribution, many face retirement with inadequate superannuation, housing instability, and limited income support. Rising housing costs, insecure tenure, and the mismatch between superannuation design and modern work patterns are placing even middle-class women at growing risk, challenging assumptions that financial independence is assured through education or stable employment. This is an intergenerational crisis, with younger women in casualised or caring roles unlikely to accumulate sufficient retirement wealth under current policy settings. This paper introduces the Longevity Retirement Security Index (LRSI), a predictive tool designed to identify individuals and cohorts at elevated retirement risk up to 30 years in advance. The tool builds on foundations laid out by Rice Warner's large-scale analysis of anonymised member statement data (2013-2017), which revealed key insights into contributions, drawdowns, investment behaviour, and cohort-specific vulnerabilities. Although curtailed due to compliance constraints, the program informs the LRSI's technical and ethical framework. By transforming retirement planning from crisis management to prevention, the

LRSI offers pathways toward equitable retirement outcomes. The tool enables evidence-based policy design, facilitates targeted support interventions, and provides superannuation funds with actionable insights for product innovation. Implementation requires sustained collaboration between government, industry, academia, and community organizations. As demographic pressures intensify and traditional support structures erode, innovative approaches like the LRSI become essential for ensuring all Australians, particularly vulnerable women, can approach retirement with dignity and financial security. This research demonstrates how advanced analytics can revolutionize social policy responses to complex, long-term societal challenges.

Bio: Anne-Marie Elias is a policy strategist and longevity economy specialist with over 30 years of experience across government, industry, and the social sector. She is the co founder of PrimeLife Partners, a pioneering initiative building Australia's first Longevity Economy ecosystem. Anne-Marie has led major reforms in ageing policy, innovation, and social impact investment, and is a Fellow in Innovation & Entrepreneurship at the University of Technology Sydney. Her work spans the development of the ADAPT 45+ Data Tool, the Longevity 2030 A global crisis and opportunity white paper, roundtables on housing, care, and financial security. Anne-Marie is a former senior adviser on ageing, innovation, and digital policy, and has held executive roles in government, startups, and impact ventures. She is preparing to undertake a PhD at UTS focused on developing a gender-responsive Longevity Retirement Security Index to address retirement insecurity for older women.

THE COST OF NOT CARING

Abby Bloom (UTS)

Abstract: Current models of retirement do not adequately take account of the real-life circumstances of Australian women in their role as principal caregivers of ageing parent and other loved ones. Much analysis has focussed on the "superannuation gap" between Australian men and women, and at least one government-initiated policy measure has been enacted to compensate women by awarding superannuation on their maternity leave. Almost no research has been done on the extent to which unpaid caregiving (caring for ageing parents and other loved ones) damages the retirement prospects financially and in terms of wellbeing as women approach retirement age and are working while caring.

Overseas research has showed convincingly that caring has both direct financial as well as indirect costs to the caregiver. However, the commonly used assumptions about retirement do not address these costs.

Our findings support US research that shows that women who are trying to work while caring, especially those who are older and are quietly battling to stay full-time employed during the most financially, logistically and psychologically intense stage of care - as parents age beyond 80 and 85.

This research builds on the work of Viviana Zelizer, Anne-Marie Slaughter, Ai-jen Poo, the AARP and especially Coe et. al., who found that on average out-of-pocket expenditures by family caregivers are at least US\$7000 per annum; foregone wages and related costs are on average \$24,000 per annum; but total costs to the caregiver in terms of wellbeing and health status, neglected by policymaker and governments, amount to a median of \$180,000 over a 2-year period (Coe et al).

Bio: Abby Bloom is a highly experienced company director, chair and risk and audit specialist, researcher, author, innovator and company founder in the health, medtech, longevity and disability sectors. She currently chairs the Australian Composites Manufacturing Cooperative Research Centre (ACM CRC). ACM CRC is an industry-led

innovation research program that supports universities to work with industry partners to apply novel composite materials, automated manufacture and digital enablement including sensing to solve complex problems ranging from rocket nose cones to hydrogen transport, hypersonic flight, marine repair and high-end carbon wheels. Abby is also a director of the New South Wales Smart Sensing Network and the Australian Computer Society (NSW Branch). She is an Adjunct Professor in the UTS Business School, a mentor to many innovative entrepreneurs as well as students, and the author of numerous articles and publications on innovation and health. She is a frequent speaker and moderator in high-profile events concerning digital solutions in health, ageing, longevity women and retirement. Formerly a director of Sydney Water Corporation, Western Sydney Local Health District and The Children's Hospitals, as well as the State Insurance Regulatory Authority (Workers Comp, CTP and Home building insurance), she has been an accredited independent member and chair of numerous audit and risk committees of NSW Government portfolios. She is currently an independent member of NSW Government's Audit and Risk Committee for the portfolio including Creative Industries, Liquor and Gaming and Greyhound Racing. Abby began her career as a Senior Policy Adviser in charge of global health, water and sanitation in the US Agency for International Development (USAID). She has worked as an adviser to 20 governments globally through organisations including UNICEF, The World Bank, the International Finance Corporation and governments including Germany, Australia and the USA. After working as an executive in the New South Wales hospital system, she advised Australian federal and state governments on strategy and policy before commencing a full-time career as a company director combined with her innovation activities. Social impact roles include leading a not-for-profit community sport club, and independent director roles on the boards of NSW Gymnastics and Ballet Without Borders. Abby completed her undergraduate and Masters in Public Health degrees at Yale University, and was awarded a Masters degree from Northwestern University and a PhD in Medicine (Public Health) from the University of Sydney. A graduate and Fellow of the AICD, she was a member of the AICD's Chair's Mentoring Program. Abby is passionate about the application of technology to improve human and industrial productivity, care, social connections, mental and physical wellbeing and the skills our young people will need for the workforce of the future.

MAPPING A DIGNIFIED RETIREMENT TO WELLBEING

Benedict Davies (UniSuper)

Abstract: In 2024, the Australian Parliament enshrined an objective of superannuation that requires policy-makers to demonstrate how any future changes to superannuation law are consistent with the legislated objective to:

...preserve savings to deliver income for a dignified retirement, alongside government support, in an equitable and sustainable way

SUPERANNUATION (OBJECTIVE) ACT 2024 (NO. 129, 2024).

The primary law does not define 'dignified'; that is left to the supporting materials which defines 'dignified' as a standard of financial security and wellbeing in retirement which allows the person to participate economically and socially in their community. The objective is not intended to change the operation or interpretation of existing superannuation law, prudential standards or governing rules of superannuation entities, what it does do is put a focus on financial security and wellbeing outcomes. This opens up a new area for research and policy evaluation.

Firstly, this paper will investigate how to operationalise two key concepts: 'financial security' and 'wellbeing'. Financial security has both objective and subjective measures while

wellbeing is commonly operationalised as subjective wellbeing (SWB), sometimes called happiness or life satisfaction. This paper will investigate whether using SWB follows the logic of the objective of superannuation that treats 'dignified' as a subjective concept that allows individuals to apply their own values and judgements about what a dignified retirement is to them.

Secondly, this paper will map the links between retirement income to financial security and wellbeing.

Finally, this paper will look at new techniques from wellbeing research and evaluation that could be used when researching retirement questions.

Bio: Benedict Davies is a Principal Policy Advisor at UniSuper. He has 25 years' experience across the superannuation, retirement and ageing sectors. He also has experience as a senior ministerial adviser on superannuation policy. Benedict has degrees in economics, philosophy, tax policy and health economics. Recently, he completed a course at the London School of Economics on Happiness and Policy reflecting his interest in multidisciplinary research from economics, psychology, behavioural public policy & philosophy.

SESSION 3B

HOUSING AND RETIREMENT

Chair: Yuxin Zhou (UNSW Sydney)

Venue: Colombo B

SUPERANNUATION AND OTHER FINANCIAL WEALTH OF THOSE APPROACHING RETIREMENT: INSIGHTS FROM HILDA

Gaoyun (Sophie) Yan (ASFA)

Abstract: Ensuring adequate retirement income is a central concern for individuals, policymakers, industry, and researchers alike. Governments, academia, and industry are actively working to develop strategies that provide Australians with better retirement income solutions. This study uses the HILDA survey to examine the composition of superannuation and other forms of wealth among Australians approaching retirement (aged 60 - 64) in 2022. We provide an overview of the total household wealth picture and highlight differences across key subgroups, including gender, marital status, homeownership, and CALD background, to identify populations with potential vulnerabilities. To explore how retirement wealth patterns are evolving, we compare these findings with younger cohorts (aged 40 - 44), projecting how the next generation of retirees may differ in wealth composition and retirement readiness. By providing a comprehensive, data-driven view of wealth at retirement, this analysis aims to inform policymakers, industry stakeholders, and researchers about current disparities and future trends, supporting the design of more effective and equitable retirement income solutions.

Bio: Gaoyun (Sophie) Yan is a health economist specialising in ageing, retirement income, aged care, and policy evaluation. She has worked in both academia and now at ASFA, the industry's peak body, where she brings academic training into the industry context. Sophie focuses on providing data-driven evidence to inform policy debates, while maintaining her academic curiosity and engagement in research.

WHO DRAWS ON HOUSING WEALTH IN RETIREMENT? EVIDENCE FROM A PUBLIC REVERSE MORTGAGE PROGRAM IN AUSTRALIA

Yunxiao (Chelle) Wang (UNSW Sydney)

Abstract: Home equity is a major component of retirement wealth in Australia, yet remains underutilized as a source of income. The Home Equity Access Scheme (HEAS), a government-provided reverse mortgage program, offers concessional borrowing against housing wealth, with a fixed interest rate of 3.95%, substantially lower than commercial alternatives. After major reforms since 2019, the scheme has seen substantial growth, but participation still remains relatively low. This paper addresses the underuse of the Home Equity Access Scheme (HEAS) by analyzing who participates, who does not but could benefit, and what barriers explain this gap. Our aim is not only to understand patterns of non-participation, but also to provide actionable recommendations to help address them. Using nationally linked administrative microdata from 2019 to 2024, we examine demographic, financial, and household characteristics associated with HEAS uptake, and apply predictive models to identify high-propensity non-users. We then segment this group into subpopulations to explore likely behavioural, informational, or structural barriers. Based on these insights, we propose targeted policy strategies to support more informed and equitable access to home equity in retirement. The research contributes to international debates on decumulation by offering new insights into reverse mortgage behaviour and identifying practical levers to unlock housing wealth for financially constrained retirees.

Bio: Yunxiao (Chelle) Wang is a Lecturer in the School of Risk and Actuarial Studies at the UNSW Business School. Her research interests include retirement planning, superannuation, pensions, life-cycle models, stochastic control, and optimisation. She received her PhD in Actuarial Studies from Monash University, where she focused on economic forecasting and the optimisation of retirement decisions. Her work has been published in journals such as *Annals of Actuarial Science* and the *European Journal of Operational Research*.

RENTING IN RETIREMENT: WHY RENT ASSISTANCE NEEDS TO RISE

Joseph Moloney (Grattan Institute)

Abstract: Most Australians enjoy a comfortable retirement. Three in four own their homes, most feel financially secure, and few face hardship.

But retirees who rent are being left behind. Two in three renters live in poverty, including more than three in four single women. Half have less than \$25,000 in savings, and a growing number face homelessness.

The problem is worsening. Home ownership is falling fast among low-income Australians approaching retirement. Among the poorest 40 per cent of 45-54 year-olds, home ownership fell from 68 per cent in 1981 to 54 per cent in 2021. And social housing – which caps rents at 30 per cent of income – is increasingly out of reach.

Many older renters lack the savings to keep paying rent in retirement. The poorest 40 per cent of renting households aged 55-64 have less than \$40,000 in net financial wealth. Rent Assistance helps, but not enough. Even after recent increases, a single retiree relying on income support can afford to rent just 4 per cent of one-bedroom homes in Sydney, 13 per cent in Brisbane, and 14 per cent in Melbourne.

Rent Assistance should be increased by 50 per cent for singles and 40 per cent for couples. It should also be indexed to rents, not just inflation. Evidence shows most of the benefit would flow to renters, not landlords.

These increases would allow single retirees to spend \$350 a week on rent and couples \$390 – enough to afford the cheapest quarter of rentals in capital cities.

Given high rental stress among younger households, these changes should apply to all recipients. Boosting Rent Assistance would cost about \$2 billion a year, with a quarter going to retirees – and could be funded by reforming super tax breaks or housing tax concessions.

Bio: Joey Moloney is the Deputy Program Director of Grattan Institute's Housing and Economic Security program. He is an economist with experience in public policy research and implementation. He has worked at the Productivity Commission and the Commonwealth Treasury, with a focus on the superannuation system and retirement income policy. Joey holds a Bachelor of Arts with majors in Politics and Media from La Trobe University, and a Bachelor of Commerce with Honours in Economics from the University of Melbourne.

SESSION 3C

MORTALITY INEQUALITY

Chair: Francesco Ungolo (UNSW Sydney)

Venue: Colombo C

AGE-PERIOD MODELING OF MORTALITY GAPS: THE CASES OF CANCER AND CIRCULATORY DISEASES

Andrea Nigri (University of Foggia)

Abstract: Understanding and modeling mortality patterns, especially differences in mortality rates between populations, is vital for demographic analysis and public health planning. We compare three statistical models within the age-period framework to examine differences in death counts. The models are based on the double Poisson, bivariate Poisson, and Skellam distributions, each of which provides unique strengths in capturing underlying mortality trends. Focusing on mortality data from 1960 to 2015, we analyze the two leading causes of death in Italy, which exhibit significant temporal and age-related variations. Our results reveal that the Skellam distribution offers superior accuracy and simplicity in capturing mortality differentials. These findings highlight the potential of the Skellam distribution for analyzing mortality gaps effectively.

Bio: Andrea Nigri is a tenure-track Assistant Professor of Statistics at the University of Foggia. His work focuses on developing and enhancing statistical methodologies in the field of statistical demography. In particular, his research bridges longevity analysis with statistical and machine learning approaches. Andrea has undertaken research stays at the Max Planck Institute for Demographic Research, the Interdisciplinary Centre on Population Dynamics at the University of Southern Denmark, the Department of Clinical Epidemiology at Aarhus University, and the Department of Actuarial Studies and Business Analytics at Macquarie University. Andrea serves as Associate Editor for Population Health Metrics and the Journal of Population Research. His current research follows two parallel strands: (i) methodological development in longevity risk, and (ii) the analysis and monitoring of demographic phenomena.

FORECASTING MORTALITY: LEVERAGING CAUSE-OF-DEATH DATA THROUGH FULLY CONNECTED NEURAL NETWORK

Dion Krisnadi (University of Lausanne)

Abstract: Accurate mortality model is crucial for informed decision-making and effective risk management. The utilisation of richer data, including multi-country mortality data and socio-economic factors, has been explored to enrich mortality modelling, but cause-of-death data remains a valuable yet underexplored source of information. Poor data quality and complex inter-cause dependencies have posed significant challenges that hinders direct modeling. The widely used Lee-Carter (LC) model struggles to capture complex, non-linear relationships in mortality data, while its extensions often require extensive manual adjustments or restrictive assumptions. In contrast, neural networks offer a promising alternative by easily processing multiple covariates, while automatically uncovering intricate interactions and constructing new features optimized for forecasting. This study aims to leverage neural networks to enhance mortality forecasting using cause-of-death data.

We start by modeling the single-year-of-age U.S. cause-of-death data from 1959 to 2017 with a feed-forward fully-connected neural network (FFNN). This architecture has demonstrated superiority over classical stochastic approaches in multi-population all-cause mortality modeling. The cause-specific mortality data is first aggregated into six categories: circulatory, neoplasm, respiratory, digestive, external, and others. We also explore the idea of transfer learning using simulated datasets. The datasets are generated by perturbing the last mortality rate in the training data with a normal random variable with zero mean and a variance estimated from the observations. 5000 time-steps are then generated for each of the six causes and two genders.

Empirical analysis was performed across twelve cause-gender groups. The results demonstrate that the pretrained FFNN outperforms classical models, including LC, age-period-cohort (APC), and Renshaw-Haberman (RH), in eight of those groups. Moreover, it is shown that the network effectively captures the cause-age interaction, emphasizing its ability to capture complex mortality patterns. This highlights the potential of deep learning in cause-of-death mortality modeling and offers practical insights in managing risks associated with increasing longevity.

Bio: Dion Krisnadi is a PhD student at the Department of Actuarial Science at the University of Lausanne (HEC Lausanne). His current research focuses on leveraging neural networks for cause-of-death mortality data, while his research interests include machine learning in insurance and risk modeling. Prior to his PhD, He worked in academia as a lecturer at a private university in Indonesia, teaching and doing research in computer science and actuarial science. He is an associate of Society of Actuaries of Indonesia (Persatuan Aktuaris Indonesia).

CAUSE-SPECIFIC MORTALITY TRENDS AND INEQUALITIES: PRE- AND POST-COVID INSIGHTS

Ayse Arik (UNSW Sydney)

Abstract: We analyse trends in cause-specific excess mortality and mortality improvements in England, with a focus on socio-economic disparities and the impact of the COVID-19 pandemic. Drawing on death registration data from 2001–2022, stratified by single year of age, gender, cause of death, and Index of Multiple Deprivation (IMD) deciles, we establish baseline trends in all-cause and cause-specific mortality across population subgroups. Our approach combines decomposition techniques with flexible statistical models, including penalised B-splines and age-period-cohort frameworks, to deliver robust yet interpretable

results. We then consider how mortality dynamics have shifted since the pandemic and explore the integration of our framework with established projection tools such as the Continuous Mortality Improvement (CMI 2024) model.

Bio: Ayse Arik is a Senior Lecturer at the School of Risk and Actuarial Studies at the University of New South Wales, Sydney, Australia. Prior to this, she held research and postdoctoral positions at Heriot-Watt University, UK, and holds a Ph.D. from Hacettepe University, Türkiye. Her research focuses on stochastic modelling of morbidity and mortality, socio-economic inequalities in health outcomes, and applications at the intersection of life insurance and financial mathematics. She is a Fellow of the Actuaries Institute (Australia), the Institute and Faculty of Actuaries (UK), and the Actuarial Society of Türkiye. She is also an active member of the International Actuarial Association's Mortality Virtual Forum and a board member of ASTIN/ERM.

SESSION 4A

DECUMULATION STRATEGIES

Chair: Hanlin Lou (UNSW Sydney)

Venue: Colombo A

SECURING AUSTRALIA'S RETIREMENT: IT'S TIME TO PROTECT RETIREES FROM DUD INVESTMENT OPTIONS

Roberta Chen (Super Consumers Australia)

Abstract: Superannuation plays a central role in supporting Australians financially through retirement. As the number of retirees with superannuation is set to more than double in the coming decade, ensuring the system delivers fair and effective outcomes in the retirement phase is increasingly vital. However, safeguards that protect consumers in the accumulation phase, such as the annual performance test, do not extend to retirement products.

To assess the performance of retirement products and their financial impact on retirees, we analysed data released by the Australian Prudential Regulation Authority (APRA) on retirement-phase superannuation investment options to assess their performance and financial impact on retirees. Using APRA's latest June 2025 Quarterly Superannuation Product Statistics, we examined non-platform multi-sector, multi-manager investment options open to new members, focusing on 10-year net investment returns across growth asset bands. Regression analyses were used to identify underperforming options relative to expected risk-adjusted returns, and to model the potential effect of underperformance on retirement outcomes. Results reveal wide variation in net investment returns even after accounting for risk profile. Retirees in the worst performing options could lose between \$57,000 and \$179,000 in investment returns across retirement. Several super funds - AMP, Russell Investments, Colonial First State, and REST - underperformed across all growth categories. These findings demonstrate the substantial financial harm caused by underperforming retirement options and the lack of accountability for trustees. In addition, 124 (89%) of the 140 accumulation investment options that failed the performance test since 2023 were also offered to retirees. However, under the current law the trustees are not required to notify retiree members that their investment option failed. Our insights reveal significant risks faced by retirees in the superannuation system and adequate protection can only be provided by extending the annual performance test and its mandatory consequences to account-based pension retirement phase products.

Bio: Roberta Chen is a researcher and data analyst at Super Consumers Australia, an advocacy organisation for superannuation consumers. In her role, she manages key research projects and analyses datasets to support the team's campaign strategies aimed at promoting a fairer superannuation system for everyone. She was recently awarded a

doctorate in social psychology from the University of Sydney, where her research focused on mass media strategies to reduce prejudice toward Asian and Chinese communities in Australia. Prior to joining Super Consumers, she was part of a research team investigating the educational and occupational pathways of Australian youth and young adults. Being part of Super Consumers has allowed Roberta to continue leveraging research to advocate for meaningful and positive systemic change in Australia.

THE FUTURE OF THE 60/40 ALLOCATION: MODELLING THE PERFORMANCE OF THE 60/40 PORTFOLIO IN RETIREMENT

Bei Cui (Monash University)

Abstract: The traditional 60/40 investment portfolio—allocating 60% to equities and 40% to fixed-income securities—has long been favored for its simplicity and balance between growth and capital preservation. While historically effective, its suitability as a retirement income strategy requires renewed scrutiny in light of increasing life expectancies, market volatility, and diverse retiree profiles.

This report evaluates the 60/40 portfolio's ability to sustain retirees over a 25-year period in both Australian and U.S. contexts. Using advanced Monte Carlo simulations, we assess portfolio longevity under various conditions, including lifestyle aspirations, initial account balances, gender-based differences, and market return patterns. Our findings highlight that the 60/40 strategy's effectiveness is highly contingent on individual circumstances. In particular, a higher initial balance substantially improves the likelihood of meeting retirement goals, whereas aspirations for a comfortable lifestyle often risk premature fund depletion without supplementary income or conservative withdrawal strategies.

The analysis also reveals significant gender disparities in retirement outcomes, emphasizing the need to address structural financial gaps in retirement planning. Moreover, the sequence-of-returns risk—where early negative market performance adversely impacts portfolio durability—emerges as a critical vulnerability.

In response, we advocate for a paradigm shift towards more flexible and personalized retirement planning. This includes dynamic withdrawal strategies, proactive risk management, and improved financial literacy to support informed decision-making. While the 60/40 portfolio remains a useful baseline, it must be complemented by adaptive strategies tailored to the evolving financial realities of retirement. Only then can it truly support retirees in maintaining financial security and quality of life throughout their postworking years.

Bio: Bei Cui is a Senior Research Fellow at the Monash Centre for Financial Studies, Monash Business School. She holds a PhD in Finance from the University of Hong Kong, as well as an MSc in Finance (with Distinction) from the University of Warwick. Her research focuses on sustainable finance, retirement systems, carbon markets, and investment strategy, with an emphasis on applied, data-driven approaches that support policy, investment, and regulatory decision-making. Dr. Cui's work spans both academic and industry settings, and she has published across peer-reviewed journals and practitioner-focused outlets. Dr. Cui has led interdisciplinary research projects that integrate empirical analysis, policy insights, and industry engagement. Her work has informed the development of widely referenced financial indices and is used by investors and researchers globally. Dr. Cui's research has gained recognition through multiple grants and awards for research impact and engagement. She actively contributes to the curriculum design and delivery of undergraduate and postgraduate teaching units and executive education programs, ensuring that academic insights are translated into practice and made accessible to a broader audience.

READY OR NOT? ASSESSING SYSTEM PREPAREDNESS FOR RETIREMENT PHASE DEFAULTS IN SUPERANNUATION

Aidan Nguyen (Actuaries Institute)

Abstract: Superannuation policy settings in the retirement phase remain an area of frequent debate in Australia. Despite the Retirement Income Covenant and system objective reforms, current policy settings mean many members remain in accumulation mode well into retirement, highlighting a potential and potent role for automatic transitions or "retirement defaults" that could shift members from accumulation to retirement phase products.

This paper examines Australia's readiness to implement such defaults by analysing precedents across other developed pension markets, identifying institutional, regulatory, and market conditions that enabled their implementation. Drawing on these international lessons, the analysis posits a framework of prerequisites for retirement defaults, including system maturity, product availability, regulatory capability, and data sufficiency. Applied to Australia's current superannuation system, this framework reveals data and regulatory gaps that, if left unaddressed, would hinder effective implementation. The analysis in this paper contributes to retirement policy by assessing Australia's readiness for this potentially transformative reform and offers observations on appropriate policy sequencing.

Bio: Aidan Nguyen is the Public Policy Lead for the Actuaries Institute. He helps actuaries use their voices as trusted advisers to get better public policy across Australia's superannuation, investment and life insurance systems. Aidan previously worked in superannuation and life insurance policy at a peak industry body and before that as a consulting actuary. A proud actuarial graduate from the University of New South Wales, Aidan has gone on to become a Fellow of the Institute of Actuaries of Australia and has also obtained a Masters of Business Law from the University of Sydney. This paper is written in Aidan's personal professional capacity. It is emphasised that all opinions expressed strictly remain those of the author and do not necessarily reflect the views of the Actuaries Institute or the actuarial profession at large.

SESSION 4B

INTERNATIONAL PENSION SYSTEMS

Chair: Trang Le (UNSW Sydney)

Venue: Colombo B

SUSTAINABLE AND EQUITABLE PENSION REFORM FOR EMERGING ECONOMIES: AN APPLICATION TO INDONESIA

John Piggott (UNSW Sydney)

Abstract: This study develops a general equilibrium overlapping generations model with heterogeneous households to examine pension reforms in an emerging economy with large informal employment, using Indonesia as our exemplar economy. We calibrate the model with detailed household-level data from the Indonesian Family Life Survey, along with macroeconomic and fiscal datasets, to capture the nation's labour market structure, characterised by high informality. The study assesses the impacts of three key reforms, namely, raising formal workers' pension access age, introducing a flat-rate social pension for informal labour and an overall reform combining the two. Although a social pension alone (set at 6.5% of per capita GDP) improves informal households' welfare, it imposes a fiscal burden that reduces formal sector welfare. However, extending formal workforce participation alleviates fiscal pressure. This combined pension reform improves welfare and equity across both worker groups while remaining fiscally feasible.

Bio: John Piggott AO FASSA is Director of the UNSW Centre for Population Ageing Research (CEPAR) within the UNSW Business School, where he is Scientia Professor of Economics. A former Australian Professorial Fellow, he has published widely on issues in retirement and pension economics and finance; and in public finance more generally; his research has appeared in the leading international economics and actuarial academic journals. John worked with the Japanese government for nearly a decade from 1999 on pension and population ageing issues. From 2008-2010 he was Visiting Scholar at the Wharton School of Business, and in 2018, was awarded a Rockefeller Residency to undertake research into ageing and inequality in Asia. In 2019, he was appointed co-chair of the Think20 (T20) Task Force on Aging Population during Japan's G20 Presidency. He was a Commissioner on the US National Academy of Medicine's International Commission on Creating a Global Roadmap for Healthy Longevity from 2019 to 2022. He jointly led the establishment of the International Pension Research Association (IPRA) which was launched at the OECD in Paris in 2019. At a national level, he was a member of both the Henry Tax Review (2008-9) and the Australian Ministerial Superannuation Advisory Committee for 5 years from 2007. He served on the Steering Committee of the annual Nikkei-Financial Times International Conference on Ageing and the Advisory Board of the Nikkei Asia Award from 2023-2024. John is a member of the Advisory Committees of the International Centre for Future Health Systems, the Global Policy Hub, and the Social Policy Research Centre, all based at UNSW Sydney. At UNSW Sydney, John served three terms as Head of School of Economics, was Associate Dean Research for the Business Faculty for 7 years, and was Interim Dean of the Faculty for more than 12 months in the lead-up to its integration with AGSM. He was elected to the University Council in 2012, and re-elected in 2014 and 2016. In 2020, he was the recipient of the UNSW Business School Staff Excellence Global Impact Award. In 2024, John received the UNSW Business School Staff Excellence Lifetime Achievement Award for Impact.

COUNTERACTING THE IMPACT OF SOCIETAL AGING ON INCOME INEQUALITY: A CASE STUDY OF MALAYSIA

Philip O'Keefe (UNSW Sydney)

Abstract: This paper analyzes the effect of societal aging on income inequality in Malaysia, to date and in coming decades. The study starts from the hypothesis that, all things equal, aging exerts upward pressure on inequality (Deaton and Paxson (1994, 1995)). Drawing on nationally representative household survey data over the past two decades we find evidence in support of this hypothesis in Malaysia. This picture becomes even sharper when we project inequality levels for the years when Malaysia is forecast to reach aged (2045) and super-aged (2056) status. We estimate that between 2022 and 2056, overall inequality of individual incomes could rise by as much as 13 percent due to aging. We then demonstrate that expansion of a social pension system would attenuate this projected rise in inequality. We undertake counterfactual exercises in which we simulate the expansion of an old age social pension with various design variants. The variants we consider would expand existing social transfers for older people and are broadly manageable from a fiscal perspective, given public spending patterns in Malaysia. Our analysis suggests that, relative to the observed situation in 2022, pensions could have resulted in lower inequality in household per capita income amongst older individuals (by 12 - 26 percent), thereby lowering overall inequality (by 4 - 9 percent). This inequality-reducing effect of pensions becomes even more marked when we project estimates of inequality for 2045 and 2056. We find, moreover, that expanded pensions would have resulted in a lower headcount poverty rate in 2022 by 1.3 – 4.2 percentage points among the 60+ population, and by 0.5 – 1.9 points among the overall population.

Bio: Philip (Pip) O'Keefe is Professor of Practice and Director of the Ageing Asia Research Hub at CEPAR. Prior to joining CEPAR, Philip worked from 1993-2021 at the World Bank,

based in Washington D.C., Beijing, New Delhi, Sydney and Budapest. He worked in East Asia and Pacific, South Asia, and Eastern Europe and Central Asia regions, most recently as Practice Manager for Social Protection and Jobs for EAP region. During his World Bank career, he was regional Lead Human Development Economist for EAP, Lead Economist in EAP and SAR, and a founding member of the Global Expert Team on Social Assistance. He was lead author and core team member on numerous flagship World Bank publications, including the EAP Regional Ageing report, China 2030 (co-authored with the Development Research Centre of the State Council of China), a forthcoming flagship on Social Protection in Asia Pacific, and Protecting All, a global strategy on the future of social protection systems in a changing world of work. He also led policy dialogue with governments and managed budget support and investment lending operations across Asia and ECA regions. Prior to joining the World Bank, he was Lecturer at the University of Warwick, UK, focusing on international economic law, and Researcher at the University of London.

THE DYNAMIC EVOLUTION OF CHINA'S PENSION SYSTEM AND FUTURE PROSPECTS AND POLICY ISSUES

Han Gao (UNSW Sydney)

Abstract: China's pension system plays a vital part in social and economic policy and has been fundamentally transformed in recent decades. It is an unusually complex system, given its parallel schemes for formal and informal sector workers, the interaction of pension policies and incentives with the hukou household registration system, and the extent of decentralized implementation. It also presents an interesting mix of harmonized national policies with considerable subnational variety in levels of pension generosity, financial balances, administrative capacity, and other factors. While significant progress has been made in expanding coverage, it remains a system where different types of workers (formal/informal, migrant/local, urban/rural, men/women) have significantly different levels of financial protection. And like other countries which are rapidly ageing, China's pension system is subject to growing fiscal pressures, with implications not only for the wellbeing of older people but overall fiscal balances. Finally, perhaps the most striking features of Chinese pension policy in recent decades have been the speed of the system's evolution and the pragmatic approach to policy development.

Bio: I am a Postdoc Fellow in economics at the University of New South Wales and an associate investigator at CEPAR. I received my PhD in economics from the University of Minnesota in 2021. My research fields include macroeconomics, labor economics, and monetary economics.

SESSION 4C

MORTALITY ANALYTICS

Chair: Andrés Villegas (UNSW Sydney)

Venue: Colombo C

TOWARDS FAIRER RETIREMENT OUTCOMES: SOCIO-ECONOMIC MORTALITY DIFFERENTIALS AND RETIREMENT PRODUCT IMPLICATIONS

Fei Huang (UNSW Sydney)

Abstract: Australia's superannuation system is tasked with delivering both sustainable and equitable retirement incomes. However, the limited uptake of longevity-protected products—such as annuities—has hindered its ability to pool longevity risk effectively. A major challenge lies in the lack of granular, population-wide evidence on mortality differentials across socio-economic groups, particularly in the post-retirement years.

This paper addresses that gap using individual-level data from the Australian Bureau of Statistics' Personal Level Integrated Data Asset (PLIDA), encompassing the full Australian population aged 60–100 during 2016–2017. We apply flexible Hermite-spline Poisson regression models to examine mortality variation by socio-economic indicators including area-level advantage and disadvantage, income, marital status, and home ownership.

Our findings reveal stark disparities in mortality and life expectancy across socio-economic strata—most notably, an 11.5-year gap in period life expectancy at age 60 between the most and least advantaged males, and a 9.1-year gap for females. These mortality gaps diminish at older ages but remain significant.

We further demonstrate how these longevity differentials affect annuity outcomes by presenting case studies across various retirement products, including immediate annuities, deferred annuities, and annuities with death benefits. The results underscore the critical importance of incorporating mortality heterogeneity into the design and pricing of retirement income products, and provide evidence to inform future policy and product innovation aimed at achieving fairer retirement outcomes

Bio: Fei Huang is an Associate Professor in the UNSW School of Risk and Actuarial Studies. Fei's research focuses on responsible AI and data-driven decision making. She has published in top-tier actuarial journals and received the Carol Dolan Actuarial Summit Prize and ASTIN Colloquium Best Paper Award for her research. She was a recipient of the Actuarial Institute's Volunteer of the Year Award and the UNSW Business School SDG Research Impact Award.

A UNIVERSE OF INDIVIDUAL-LEVEL MORTALITY MODELS

Xiaochuan Lu (UNSW Sydney)

Abstract: Individual-level mortality modelling is becoming increasingly important for insurers and longevity researchers. This paper proposes a novel framework, the Universe of Individual-Level Mortality Models (the "Universe"), that simultaneously accounts for the effects of age and covariates on mortality rates. This framework decomposes individual-level mortality models into an age component, a covariate component, and a link between the two. The Universe facilitates the classification, decomposition, analysis, and development of mortality models. The framework encompasses traditional individual-level mortality models, such as the Cox proportional hazards and survival tree models. We use the Universe to introduce new parametric machine learning models, namely survival tree partitioning and mob tree partitioning, which integrate a parametric age component with a tree-based covariate component. These models extend age-only parametric models by incorporating covariate information and interactions between the covariates. We illustrate the Universe using data from the Chinese Longitudinal Healthy Longevity Survey (CLHLS), a dataset with eight survey waves and 59,078 observations, by fitting both novel and traditional models. The results demonstrate the Universe's potential to structure existing mortality models and generating novel modelling approaches.

Bio: Xiaochuan Lu is a PhD candidate at the School of Risk and Actuarial Studies at UNSW Sydney. His current research focuses on survival analysis and individual-level mortality modelling.

IMPACT OF COVID-19 ON COHORT LIFE EXPECTANCY: A COUNTERFACTUAL PROJECTION BASED ON THE PENALIZED COMPOSITE LINK MODEL

Francesco Ungolo (UNSW Sydney)

Abstract: This study quantifies the long-term impact of the COVID-19 pandemic on cohort life expectancy, an issue of critical relevance for public policy, life insurance, and superannuation systems. While period life expectancy sharply declined from 2019 to 2020 across most Western countries, this metric captures only the immediate, cross-sectional mortality burden of the pandemic. In contrast, the long-term effects on cohort mortality—reflecting the lifetime experience of specific birth cohorts—remain largely unexplored.

We address this gap by developing a counterfactual projection framework to estimate the pandemic's impact on cohort mortality and life expectancy. The analysis is based on high-quality all-cause mortality data from developed countries available in the Human Mortality Database. Mortality trajectories for incomplete cohorts are reconstructed using the Penalized Composite Link Model (PCLM), a flexible data-driven method that ungroups coarsely grouped death counts and smooths mortality schedules by age. The approach treats the number of survivors at a given truncation age as partially observed cohort deaths, which can be forecast to complete the mortality experience.

Counterfactual cohort projections—representing the mortality patterns that would have been observed in the absence of the pandemic—are derived from pre-2020 data. Comparison between the observed and counterfactual trajectories provides an estimate of the pandemic-induced deviation in cohort life expectancy within a potential outcomes framework.

The results shed light on how temporary shocks in period mortality can propagate into long-term cohort outcomes, providing new quantitative evidence on the enduring demographic and actuarial implications of the COVID-19 pandemic.

Bio: Francesco Ungolo is a Senior Lecturer in the School of Risk and Actuarial Studies at UNSW Sydney. He earned his PhD in Actuarial Mathematics from Heriot-Watt University, under the supervision of Prof. Torsten Kleinow and Prof. Angus S. Macdonald. His research lies in the field of actuarial statistics, with interests including the analysis of actuarial datasets with missing data, the development of stochastic mortality models, and the insurability of health risks for individuals living with chronic diseases. At UNSW, he teaches courses in life insurance mathematics and statistics for actuarial students.

SESSION 5: PANEL

RETIREMENT CHOICE ARCHITECTURE

Chair: Hazel Bateman (UNSW Sydney)

PANEL SESSION

- Nathan Bonarius (Actuaries Institute)
- Katrina Ellis (Super Consumers)
- Joey Moloney (Grattan Institute)
- Geoff Warren (The Conexus Institute)

Hazel Bateman is Faculty Academic Chair, and a Professor in the School of Risk & Actuarial Studies, UNSW Business School. She has expertise in pension economics, behavioural retirement insurance and lifecycle finance. Her current research investigates the role of choice and information architecture, financial advice and financial literacy on lifecycle

financial decisions including superannuation and housing. She also works on design of and demand for retirement products including annuities, aged care insurance and reverse mortgages. Hazel works closely with the financial services industry, superannuation and pension funds and policy makers in Australia and internationally and has consulted to international organisations including the World Bank and the OECD. She is Chair of the Netspar Scientific Council, President of the International Pension Research Association (IPRA) and serves on the Advisory Boards of the Mercer CFA Institute Global Pension index and the Conexus Institute. In 2024 she was appointed to the board of UniSuper.

Nathan Bonarius is a Partner at PwC Australia and a qualified actuary (FIAA, CERA) with an MBA from Macquarie Graduate School of Management, known for his expertise in superannuation, group insurance, retirement modelling, data analytics, and public policy. He advises Boards, CEOs, and management teams on strategic matters including mergers, insurance reviews, member outcomes, and actuarial valuations, and has contributed to government policy through major industry reviews and consultations. Nathan plays an active role in shaping public policy via the Actuaries Institute Public Policy Council Committee and previously through ASFA's Industry Efficiency Policy Council.

Joey Moloney is the Deputy Program Director of Grattan Institute's Housing and Economic Security program. He is an economist with experience in public policy research and implementation. He has worked at the Productivity Commission and the Commonwealth Treasury, with a focus on the superannuation system and retirement income policy. Joey holds a Bachelor of Arts with majors in Politics and Media from La Trobe University, and a Bachelor of Commerce with Honours in Economics from the University of Melbourne.

Katrina Ellis has over 20 years experience in the financial sector. As the Deputy CEO of Super Consumers Australia she is passionate about ensuring that the super system works for everyone. Prior to joining Super Consumers, Katrina had a long career at the Australian Prudential Regulation Authority in a range of leadership roles. In particular, she led teams who implemented many of the key regulatory changes in the superannuation industry over the last decade. She was an academic in Australia and the US and has a PhD in finance from Cornell University.

Geoff Warren is Research Fellow at the Conexus Institute and Honorary Associate Professor with the Australian National University. He is a member of various advisory boards including the ASIC Consultative Panel and Public and Private and Advisory Group, Atlas Infrastructure Investment Governance and Macro Advisory Boards, ANU Student Managed Fund Investment Advisory Committee, Brandes Center Asia-Pacific Advisory Board, Conexus Institute Advisory Board, Salvation Army Investment Advisory Group and Super Consumers Australia Research Committee. Geoff's research has an applied and policy emphasis with particular focus on superannuation, retirement and fund management. Previous positions held include Director of Capital Markets Research at Russell Investments; analyst, Chief Strategist and Head of Research with investment bank Ord Minnett / JP Morgan Australia; and equity portfolio manager at AMP Capital. Geoff has a PhD from the AGSM, and a BComm (Hons) with the University Medal from UNSW.

SESSION 6A

INNOVATIVE RETIREMENT INCOME STREAMS

Chair: Andrés Villegas (UNSW Sydney)

Venue: Colombo A

MINIMIZING PAYOUT VOLATILITY IN LONGEVITY RISK-SHARING POOLS: AN ASSET-“LIABILITY” APPROACH

Manuel Garcia-Huitron (Nuova Longevità Research)

Abstract: The use of longevity risk-sharing pools in defined contribution plans to provide assured lifetime income in retirement is growing. Unlike insured annuities, risk-sharing pools are not backed by a guarantor and do not subject the sponsor to liabilities or risk reserves. As a result, they offer higher payout rates than annuities. A drawback, however, is that their payouts vary over time in response to the pool’s mortality and investment return experience. Many retirees are reliant on their personal savings as a source of income to fund their living expenses. For them, income stability is important and so there is a need to develop methods for minimizing the volatility of their payouts. Furthermore, policymakers in many countries place a high value on post-retirement income stability, and in some places, they even require it. The characteristics of a risk-sharing pool’s payouts – the level, growth rate, and volatility – are primarily a function of the investment strategy and the discount rate used to value future payouts. We illustrate how simple asset and liability matching strategies combined with dynamic discount rates can minimize payout volatility while optimizing expected returns.

Bio: Manuel García-Huitrón is an economist with degrees from ITAM, Yale, and Tilburg University. He is co-founder of Nuovalto Ltd. and a member of the Academic Council of the Mercer-CFA Global Pension Index. From 2017 to 2020, Manuel was advisor to the Latin American and Caribbean Pension Network, comprising pension regulators across Latin America. He worked at Inter-American Development Bank, World Bank, and APG and has counseled pension reform in several countries.

DESIGNING PAYOUT RULES UNDER SOCIODEMOGRAPHIC INEQUALITY IN LONGEVITY AND WEALTH

Gayani Thalagoda (UNSW Sydney)

Abstract: Longevity pooling products for mutual risk sharing provide an attractive alternative to lifetime annuities and income drawdown structures in providing retirement income for life. Designing such arrangements requires careful consideration of both the stability and equitability of payouts. While increasing the pool size improves payout stability via the law of large numbers, neglecting heterogeneity in longevity and initial wealth can lead to inequitable cross subsidies that benefit some retiree groups at the expense of others. We propose a theoretical framework which utilizes multi-objective optimization to design payout rules balancing stability and equitability. Applying the optimization to Australian socio-economic mortality data, we characterize the Pareto frontier between the two objectives. Our results show that payouts based on pessimistic mortality assumptions can improve stability but exacerbate inequity, and that achieving balance requires front-loading benefit payouts. In situations where the optimal payout rule cannot be implemented, managing retiree groups separately can improve equitability; however, the effectiveness of this approach depends on pool size and composition. These findings are particularly relevant in regulatory settings mandating uniform pricing. We make two contributions to the literature. First, we propose a theoretical framework for pooling longevity risk across individuals who differ in both initial wealth and mortality risk, allowing age-specific payout rules under uniform pricing. Second, as a practical contribution, our work informs the design of longevity pooling

products that are more attractive to retiree groups. Especially those who feel excluded from current non-guaranteed solutions, and to regulators focused on fairness. Our approach helps reduce adverse selection and improves product viability in voluntary retirement income markets.

Bio: Gayani Thalagoda is a PhD candidate at the University of New South Wales (UNSW) and a research student at the ARC Centre of Excellence in Population Ageing Research (CEPAR). Her research interests fall within the interdisciplinary areas of actuarial science and data science. Research interests include, valuation of guarantees embedded in variable annuities and longevity risk management.

RISK-SHARING RULES FOR MORTALITY POOLING PRODUCTS WITH STOCHASTIC AND CORRELATED MORTALITY RATES

Yuxin Zhou (UNSW Sydney)

Abstract: Risk-sharing rules have been applied to mortality pooling products to ensure these products are actuarially fair and self-sustaining. However, most of the existing studies on the risk-sharing rules of mortality pooling products assume deterministic mortality rates, whereas the literature on mortality models provides empirical evidence suggesting that mortality rates are stochastic and correlated between cohorts. In this paper, we extend existing risk-sharing rules and introduce a new risk-sharing rule, named the joint expectation rule, to ensure the actuarial fairness of mortality pooling products while accounting for stochastic and correlated mortality rates. Moreover, we perform a systematic study of how the choice of risk-sharing rule, the volatility and correlation of mortality rates, pool size, account balance, and age affect the distribution of mortality credits. Then, we explore a dynamic pool that accommodates heterogeneous members and allows new entrants, and we track the income payments for different members over time. Furthermore, we compare different risk-sharing rules under the scenario of a systematic shock in mortality rates. We find that the account balance affects the distribution of mortality credits for the regression rule, while it has no effect under the proportional, joint expectation, and alive-only rules. We also find that a larger pool size increases the sensitivity to the deviation in total mortality credits for cohorts with mortality rates that are volatile and highly correlated with those of other cohorts, under the stochastic regression rule. Finally, we find that risk-sharing rules significantly influence the effect of longevity shocks on fund balances since, under different risk-sharing rules, fund balances have different sensitivities to deviations in mortality credits

Bio: Yuxin Zhou is an Associate Lecturer at the School of Risk and Actuarial Studies, UNSW Sydney. He obtained his PhD in Actuarial Studies from UNSW Sydney. His current research interests include longevity risk management, long-term care (LTC) risk management, retirement products, risk sharing, mortality modelling, and multi-state health modelling. Yuxin has published in top actuarial journals, such as the Scandinavian Actuarial Journal, North American Actuarial Journal, and Annals of Actuarial Science. Prior to the commencement of his PhD, he obtained his Bachelor of Actuarial Studies (Honours Class 1) from UNSW Sydney.

SOLVING FOR FEAR, NOT JUST LONGEVITY: DEMYSTIFYING THE TRUE VALUE OF INNOVATIVE RETIREMENT INCOME STREAMS

Estelle Liu (AMP)

Abstract: While longevity risk is a central concern for superannuation policy and product design, individual members rarely perceive it as a risk that applies to them. Many Australians underestimate how long retirement may last, often referencing the lifespans of previous generations and planning for only 15 years—when a retirement of 30 years or more is

increasingly likely. Despite this underestimation, most retirees continue to underspend their superannuation, with 60% drawing down only at the statutory minimum. Why does this disconnect exist?

Data and insights from AMP's MyNorth Lifetime income stream product suggest the main driver is not explicit concern about outliving savings, but rather a pervasive fear of running out of money—an ambiguity aversion around future spending needs. This behaviour persists even among advised members who, in theory, should be better prepared. Since launching MyNorth Lifetime, we have seen a material shift: the proportion of advised members who invested in MyNorth Lifetime drawing down at the minimum has fallen from 50% to 25%. Yet, allocations between account-based pensions and lifetime income streams remain highly individual and unpredictable by factors including balance, with emotional factors and risk preferences playing a decisive role.

These findings challenge the assumption that lower-balance members do not need lifetime income products due to the safety net of the Age Pension. Instead, we find the true value of innovative retirement income streams lies in providing members with certainty and security, empowering them to spend more confidently in retirement. The impact is universal—solutions that address the fear of running out should be accessible to all, not just to specific cohorts.

We call on the industry—including super funds, insurers, advisers, regulators, and policymakers—to move beyond viewing these solutions simply as “longevity products.” Instead, we should recognise and communicate their broader role in addressing behavioural barriers and improving confidence and the quality of retirement for all Australians.

Bio: Estelle Liu joined AMP in July 2024 as the Head of Retirement Solutions, before this she was with Aware Super (formally First State Super) as the Actuarial Practice Lead. Previous experience includes consulting with Rice Warner, focusing on retirement solutions. Estelle has been the chair of the Actuaries Institute's Superannuation Projection and Disclosure Sub-committee since 2019, a member of the Superannuation Practice Committee. Estelle is also on the Alumni Advisory Board for UNSW.

SESSION 6B

RETIREMENT OUTCOMES

Chair: Francesco Ungolo (UNSW Sydney)

Venue: Colombo B

RETIREMENT INCOME STRATEGY SURVEY FINDINGS

Yolanda Li (EY)

Abstract: In July 2024, APRA released an update to Prudential Standard SPS 515 on Strategic Planning and Member Outcomes. The revised SPS 515 includes APRA's expectations to support the Retirement Income Covenant (RIC). This includes a requirement for RSE licensees to ensure their Retirement Income Strategy (RIS) is subject to review.

On 21 May 2025, APRA and ASIC issued a joint letter to all RSE Licensees on upcoming regulatory initiatives relating to the retirement phase of superannuation. APRA and ASIC have emphasised that implementation of the RIC remains a priority.

EY has conducted a retirement income strategy survey during March to April 2025, collecting responses from industry, retail and public sector funds, across the full range of fund sizes in our market. The presentation looks to summarise the results of the EY RIS industry survey and provides insights into the approach taken by superannuation fund trustees to:

- Implement, review and refine their RIS
- Identify and engage with members in relation to their retirement needs

Bio: Yolanda Li is a Senior Manager in EY's Actuarial Services practice in Sydney. She has over 10 years of experience across Superannuation and Life Insurance in both consulting and corporate roles, and is a Fellow of the Institute of Actuaries of Australia. Yolanda brings deep expertise in life insurance financial and management reporting, as well as in the retirement income space— helping clients navigate complexity with insights that support strategic decision-making and deliver long-term value.

MEASURING MEMBER OUTCOMES FOR SUPERANNUATION FUNDS: RETIREMENT ADEQUACY AND INCOME STREAM EFFICIENCY (RAISE)

Shang Wu (Aware Super)

Abstract: Measuring outcomes for participants of defined contribution retirement plans is a challenging but meaningful task, with significant implications to industry practioners, policy makers and regulators. We developed a framework to measure member outcomes for superannuation funds in Australia.

Our framework not only enables superannuation funds to measure member outcomes as a retrospective measure of success, but also as a forward-looking tool to embed it into the business planning process to drive internal allocation of resources and prioritisation. This allows the success measure to have a real impact beyond just reporting, which is consistent with the merits of the uplifted regulation on member outcomes.

In contrast, the typical approaches used by the industry today stay at headline reporting and suffer from identification issues to attribute the impact on member outcomes to activities of the superannuation funds, seperately from the impact of external environment (financial markets, macroeconomic environment, and policy and regulation changes) that can be dominating.

The framework is quantitative based and measures the Retirement Adequacy for accumulation members and Income Stream Efficiency for members in retirement – hence RAISE. This presentation will introcue RAISE and illustrate how it can be operated on annual basis in practice. We also highlight the key characteristics required for a member outcomes measure to be embedded in business planning.

Bio: Shang Wu is the Portfolio Manager, Retirement Strategy in the Investments team at Aware Super. Shang's role focuses on the investment and retirement strategy for members including retirement solution and asset allocation. He is also responsible for the research collaboration between the fund and academia in these fields. Shang obtained his PhD in Actuarial Studies at UNSW Australia. His academic research focuses on financial decision making in retirement. He has published several papers in leading international economic journals. Shang is a qualified actuary, the Convenor of the Actuaries Institute's Retirement Income Work Group and a member of the Superannuation and Investments Practice Committee.

BEST POSSIBLE RETIREMENT 2025

Alana Devitt and Harry Inwood (Core Data)

Abstract: This study examines the evolving landscape of retirement preparedness among Australian preretirees and retirees, revealing persistent challenges in financial literacy,

planning adequacy, and institutional support mechanisms. Contemporary retirement transitions are characterized by heightened uncertainty, with pre-retirees demonstrating substantially elevated financial anxiety compared to their retired counterparts. The investigation reveals that cost-of-living pressures have significantly altered retirement financial expectations, necessitating substantial asset accumulation that exceeds historical benchmarks. Many retirees find themselves engaging in post-retirement employment to address unforeseen financial shortfalls, indicating systematic underestimation of retirement expenses during the planning phase. These findings suggest that traditional retirement models may be inadequately aligned with contemporary longevity patterns and economic realities. Despite widespread demand for professional guidance, substantial portions of the retirement population remain unaware of available support resources, indicating systemic communication failures within the retirement ecosystem. The research underscores the necessity for transformative approaches to retirement planning that encompass flexible transition models, comprehensive educational initiatives, and personalized guidance frameworks. These findings advocate for policy and industry responses that address the complex interplay between demographic transitions, economic volatility, and evolving retirement expectations in the Australian context.

Bios: Alana Devitt is a Research Consultant at CoreData. Her responsibilities include research design and implementation, data analysis, and research report writing for both syndicated and bespoke research in the superannuation and other financial sectors. She holds a Bachelor of Business Administration (Marketing) from the Maynooth University, Ireland, along with a diploma in Digital Business. Before working at CoreData, Alana previously worked for market research agency Core Research in Ireland where she worked across numerous sectors including the finance sector, she also worked for Accenture helping clients build their digital marketing strategies from the ground up. This allowed her to gain a passion for finding the story behind the data to create actionable change for clients.

Harry Inwood is a researcher at CoreData, where he focuses on economic modelling and data analysis. At CoreData, he has applied econometric tools to uncover narratives from large datasets, developed models to forecast demographic trends, and synthesised both public and academic research to inform the firm's broader analytical work. Harry holds a Bachelor of Commerce from the University of Melbourne, and a Bachelor of Economics (Honours – First Class) from Monash University, awarded under the Sir John Monash Scholarship for Excellence. Before joining CoreData, he interned at Cordis Asset Management, where he supported analysts in stock valuation and constructed basic models to assess the impact of emerging demographic and medical trends.

RETIREMENT AFFORDABILITY: MYTHS, MATHS AND THE MESSY MIDDLE

Kaye Fallick (Staying Connected)

Abstract: There are many competing targets for what is needed to fund an affordable retirement. For many years the target of \$1 million was promoted – and this false goal has possibly led to many ordinary Australians abandoning the idea of enjoying a comfortable retirement. In recent times a little more realism has crept into the discourse, with suggested superannuation savings targets lowered to around \$690,000 for couples and \$595,000 for singles. There has only belatedly been recognition of those who rent. But few in industry have challenged these long-held but discouraging targets. Until they are refuted, most retirees will continue to believe a comfortable retirement is a dream beyond their grasp and to undervalue the benefits of financial planning for their retirement life course.

Thus we need to better recognise and communicate with the 'messy middle'. Who is this? Retirement funding can be understood across three different groups:

- The 20% so-called ‘high net worth individuals’, a cohort largely funded by private savings, assets and superannuation income, albeit inflated by tax concessions,
- The 20% or so who rent or are hosted by family, living on a full Age Pension, and
- The 60% in the middle – those who are living on a full or part-Age Pension which is topped up by savings and super.

The median super savings (ATO 2022-23) are \$217,954 for males, \$199,006 for females (assume \$416,690 for couples) aged 65-69, i.e. those on the cusp of retirement. Perhaps one-third or more are now carrying mortgage on a family home, so there is a wide gap between most peoples’ reality and the above-mentioned targets.

This presentation will share new retirement affordability targets for six different retirement ‘tribes’ and demonstrate the likely income sources and longevity of funding for those in the middle 60 per cent of retirees.

Bio: With 25+ years’ experience publishing for baby boomers, Kaye Fallick is the founder of STAYINGconnected website and publisher, SuperConnected ageing demographics enewsletter. She is also a freelance writer on topics relevant to lifestage changes including planning retirement, downsizing/rightsizing, aged care, government policy, superannuation and Age Pension entitlement. Kaye is also owner and content director for digital retirement income tools, PensionChecker and RetirePlanner.

SESSION 6C

ANNUITIES

Chair: Yang Shen (UNSW Sydney)

Venue: Colombo C

GUARANTEED INCOME OR INVESTMENT-LINKED INCOME: A FRAMEWORK TO CHOOSE THE RIGHT RETIREMENT INCOME PRODUCT

Philip Clark (Azuria Partners)

Abstract: The Australian retirement market features a diverse range of products that can be difficult to compare, even when offered by the same provider. For the typical retiree or even a well-informed retirement adviser, decisions between guaranteed lifetime income and investment-linked income can be complex and confusing. This paper introduces a framework to support better retirement income decisions by evaluating products through the lens of individual risk tolerance. Rather than relying on headline rates or modelled projections alone, the framework focuses on how much income a retiree can expect within their personal comfort with risk, both in terms of asset risk and longevity risk. Using this method, the paper compares the outcomes of two lifetime income options from the same provider—one with a guaranteed income stream, the other with investment-linked payments, considering both asset risk and individual longevity risk. By reframing the question from “which product pays more income?” to “which product pays more income for the same individual risk tolerance?”, this approach offers a clearer way to assess value. The goal is to support retirees and their advisers in making informed, confident decisions that align with long-term financial wellbeing.

Bio: Philip Clark is a qualified actuary specialising in retirement and longevity and has authored several papers that have contributed to understanding longevity issues, including 2024 Melville Prize award-winning paper on Australian mortality trend. Philip is an active member of the Retirement Income Working Group of the Actuaries Institute, and a Senior Consultant with Azuria Partners. Philip supports clients navigating the complexities of longevity risk management and longevity assumptions.

CAN IMPROVING LONGEVITY LITERACY MOTIVATE INTEREST IN LIFE ANNUITIES?

Hanlin Lou (UNSW Sydney)

Abstract: Longevity literacy is crucial for retirement planning, as individuals need to understand their life expectancy and longevity risk to make optimal financial decisions. In an online experiment with Australians near retirement, we test several longevity literacy interventions and find that providing average or personalized life expectancy information increases interest in lifetime annuities, but only among those who revise their expectations upward after receiving the information. Simply eliciting longevity beliefs or providing information on survival probabilities or financial risks does not influence annuity interest. Interest is also strongly associated with perceptions of annuities' risk management features and concerns about later-life income

Bio: Hanlin Lou is a Research Fellow at CEPAR, UNSW Sydney. His research focuses on behavioural economics, behavioural finance, and applied econometrics. He designs and conducts field, laboratory, and online experiments to address real-world problems.

ADDRESSING LOW ANNUITY DEMAND WITH CAPITAL TAXES

Khademul I. Chowdhury (ANU)

Abstract: This paper investigates the interaction between capital taxes and annuity demand, both analytically and quantitatively, using a life-cycle model that incorporates entrepreneurial activity and bequests. The analytical model reveals that the direction of the impact of capital taxes on annuity demand is theoretically ambiguous. The quantitative model successfully captures key features of the economy, including business investment, entrepreneurial heterogeneity, intergenerational wealth transmission, and wealth and income inequality. The findings indicate that annuity demand is responsive to changes in capital taxation, even under varying demographic conditions. Specifically, low annuity ownership can increase from around 5% in the real economy to more than 10% with reasonable capital tax rates. However, when the population continues to age, the government has to impose higher capital taxation to address the low demand for annuities.

Bio: Khademul Chowdhury is a researcher with a strong focus on macroeconomic modelling, revenue forecasting, and tax policy formulation. His primary area of research involves life-cycle and overlapping generation models, with a particular emphasis on computational approaches to fiscal policy analysis. As a PhD candidate in Economics at the Research School of Economics, The Australian National University, He explores computational macroeconomics and tax policy using advanced tools using MATLAB, Python, and FORTRAN, along with statistical analysis in STATA and R. His academic work bridges theoretical frameworks and practical applications, addressing key issues in taxation and revenue systems. Complementing his research, Khademul has extensive tutoring experience, sharing expertise in economics, modeling, and policy analysis with students and peers. His academic pursuits are enriched by his professional background, including significant roles in the Ministry of Finance of the Government of Bangladesh and the National Board of Revenue (NBR), where he contributed to macroeconomic forecasting, fiscal policy development, and pioneering reforms in tax administration. He is a student affiliate of CEPAR since 2022.

FINANCIAL ADVISOR VIEWS ON LIFETIME ANNUITIES

Anthony Asher (UNSW Sydney)

Abstract: Financial advisors seldom sell lifetime annuities in Australia although three companies are actively promoting them. A sample of financial advisors has been interviewed to investigate their views of the benefits and drawbacks of the products available.

As expected, the majority of their clients are sufficiently wealthy and do not need longevity insurance. Most of those interviewed, however, had clients with full or part Age Pensions, who would seem to be in the annuity target market. Knowledge of the products ranged from a vague awareness to detailed understanding that naturally correlated with actual recommendations to purchase. Some of the respondents did not appear to have grasped the benefits of the new investment linked products.

All the well-known objections to annuitisation were raised at some point. These include the lack of: liquidity, bequests, trust in providers and value for money. More than one respondent defined their role as ensuring that investment returns were sufficient to last well into the clients' nineties. Not all were aware of research that framing the annuity as an investment discouraged their purchase.

Most interviewees did not believe that their own income would significantly reduce if they recommended lifetime annuities. Some respondents noted that regulatory complexity left time to only explain essentials to clients, and not novel developments.

Companies offering the products are reliant on business development managers (BDMs) to explain the benefits of the new products. One interviewee said that they thought advisors were reluctant to "waste" time with BDMs—with one explaining that their team resented being "sold" a new idea.

There would appear to be scope to encourage advisors to offer lifetime annuities to less wealthy clients both as a professional responsibility, and to focus their efforts on clients more likely to benefit from their services.

Bio: Anthony Asher is an actuary and part-time Associate Professor at the UNSW Business School. His working life has been divided between university teaching and a variety of professional roles including Chief Actuary of a life insurer, consultant actuary, and with APRA. Within the Actuaries Institute he is currently a member Risk and Audit Committee. He is well known in the profession for his interest in ethics in professional life, particularly the social impact of actuarial work. He is also on the board of Fresh Hope Communities, which operates aged care facilities and retirement villages in NSW, and of PPS Mutual, which administers and distributes life and disability insurance designed for graduate professionals. The design of post-retirement products and advice is the focus of his current research, which extends his publications in the fields of regulation, investments and insurance.

SESSION 7A

AGED CARE AND FAIRNESS

Chair: Yuxin Zhou (UNSW Sydney)

Venue: Colombo A

DISTRIBUTIONAL IMPACT OF MEANS-TEST REFORM IN RESIDENTIAL AGED CARE

Hengzhe Zhao (Macquarie University)

Abstract: The distributinoal impact of the means test in Australian residential aged care remain unclear, particularly during periods of major policy reform. This has led to suboptimal policy design and residents financial planning. To address this issue, we design cross-sectional and longitudinal analyses to examine the financial implications under two policy settings. We use simulation studies of residents with representative financial profiles to numerically illustrate the distributional impacts of the reform and develop a simulation tool to support future policy development. We conclude with policy insights by identifying advantaged and disadvantaged cohorts based on means profiles from the perspective of the means test. Our findings suggest that the reform could affect saving and spending behavior differently across households with varying levels of means and portfolio structures, as well as incentivize asset annuitization.

Bio: Hengzhe Zhao is a Ph.D candidate in Actuarial Studies and Business Analytics at Macquarie University and a research assistant at the Macquarie University Centre for the Health Economy (MUCHE). His research focuses on aged care financing, policy evaluation, and Statistical learning. His current work examines the distributional impact and behavioral implications of Australia's residential aged care means test reform.

LEARNING FAIR DECISIONS WITH FACTOR MODELS: APPLICATIONS TO ANNUITY PRICING

Ran Zhao (ANU)

Abstract: Fairness-aware statistical learning is essential for mitigating discrimination against protected attributes such as gender, race, and ethnicity in data-driven decision-making. This is particularly critical in high-stakes applications like insurance underwriting and annuity pricing, where biased business decisions can have significant financial and social consequences. Factor models are commonly used in these domains for risk assessment and pricing; however, their predictive outputs may inadvertently introduce or amplify bias. To address this, we propose a Fair Decision Model that incorporates fairness regularization to mitigate outcome disparities. Specifically, the model is designed to ensure that expected decision errors are balanced across demographic groups—a criterion we refer to as Decision Error Parity. We apply this framework to annuity pricing based on mortality modeling. An empirical analysis using Australian mortality data demonstrates that the Fair Decision Model can significantly reduce decision error disparity while also improving predictive accuracy compared to benchmark models, including both traditional and fair factor models.

Bio: Ran Zhao is a PhD candidate in Statistics at The Australian National University. Her research interests include factor models, high-dimensional statistical inference, tensor methods, robust analysis, insurance pricing, and mortality forecasting.

SESSION 7B

RETIREMENT AND HEALTH

Chair: Trang Le (UNSW Sydney)

Venue: Colombo B

EXAMINING DIFFERENCES IN BUNCHING AT STATUTORY RETIREMENT AGES IN AUSTRALIA AND THE NETHERLANDS: EXPLORING THE ROLE OF FIRMS AND EXECUTIVE

Jan Kabatek (University of Melbourne)

Abstract: In a cross-country analysis, we document stark differences in the retirement hazard at the Statutory Retirement Age (SRA) for Dutch workers (65%) and Australian workers (5%). To understand the role of firms and executives in explaining this disparity, we use comprehensive administrative data for both countries to construct monthly worker-firm-executive datasets and examine job separation rates at the SRA. Focusing on firms/executives employing multiple older workers, we perform a variance decomposition and estimate a series of regressions to quantify firm and executive effects. Consistently, the results show that firms and executives matter in both countries, though to a much greater extent in the Netherlands. Our estimates imply that moving a worker from a bottom quartile firm to a top quartile firm, in terms of SRA separation propensities, would raise the worker's separation probability at the SRA by 28 percentage points in the Netherlands, while the comparative figure in Australia is just 5 percentage points. We discuss possible institutional reasons for the differences across countries, including the system of automatic job termination at the SRA in the Netherlands and the more targeted public pension in Australia.

Bio: Jan Kabatek is a Senior Research Fellow and the leader of the Artificial Intelligence Group at the Melbourne Institute. In his research, Jan leverages large administrative registers to generate data-driven insights into various domains of public policy, including ageing, employment, family, gender, and education. He is passionate about improving research infrastructures and empowering researchers who work with—or aspire to work with—administrative data

COHORT TRENDS IN INTRINSIC CAPACITY IN EUROPE

Meimei Chen (Macquarie University)

Abstract: This paper examines cohort trends in intrinsic capacity (IC), a composite measure of physical and mental capacities central to the World Health Organization's approach to healthy ageing. Using harmonised longitudinal data from ten European countries that participated in all regular waves of the Survey of Health, Ageing and Retirement in Europe (SHARE) between 2004 and 2022, we construct IC and five subdomain scores (cognitive, psychological, sensory, locomotor, and vitality) using bifactor and correlated confirmatory factor analysis. Longitudinal measurement invariance is tested to ensure comparability of scores across time. Multilevel growth curve models are applied to estimate cohort differences in both IC level at age 50 and subsequent trajectories. We find that more recent birth cohorts enter older age with higher levels of IC and experience slightly slower rates of decline, particularly in cognitive and locomotor domains. We also explored country variations to assess whether cohort trends are consistent across different policy, economic, and health system contexts. While improvements in IC were observed in most countries, the magnitude of cohort gains and domain-specific patterns varied, reflecting heterogeneous exposures and policy environments. These findings extend previous work in England and China and suggest that generational improvements in functioning are occurring across diverse European settings. The results have implications for the modelling of longevity risk

and healthy life expectancy, and for the design of retirement and long-term care systems that reflect changing functional capacity in later life.

Bio: Meimei Chen is a PhD student at the Macquarie University Centre for the Health Economy, specialising in causal inference, machine learning, and econometrics. Her research focuses on leveraging machine learning techniques to enhance causal inference and explore preference heterogeneity.

SESSION 7C

BEHAVIOUR AND DECISIONS

Chair: Hanlin Lou (UNSW Sydney)

Venue: Colombo C

ELICITING RISK PREFERENCES FOR IMPACTFUL DECISIONS IN THE PENSION DOMAIN

Jorg Goossens (Radboud University)

Abstract: The pension investor's asset allocation ideally reflects her risk attitude. However, it remains rather unknown how individuals prefer to take risks in the pension domain. We quantitatively measure risk preferences in the pension domain for about 1600 pension fund participants using multiple elicitation methods from experimental economics. Our results confirm the risk elicitation puzzle: pension risk preferences vary substantially across elicitation methods with median estimates for the coefficient of relative risk aversion ranging from about 3 to about 7. 66% of the participants have consistent risk preferences, while 84% of the students have consistent risk preferences. The risk elicitation puzzle is age dependent and more pronounced for the elderly. Using simulation exercises, we find that the observed consistency of risk preferences is best explained by stochastic preferences with at most 10% of the pension plan members making random risk preference choices. Stated cognitive certainty is strongly related to revealed consistency measures.

Bio: I am Jorgo Goossens, Assistant Professor of Finance (Tenured) at Radboud University Nijmegen, Assistant Professor (Visiting) at Tilburg University, academic advisor at APG Asset Management, and research fellow at Netspar. I hold academic degrees in econometrics, (teaching) mathematics, and finance. My research areas cover behavioral and experimental finance, gathered towards asset pricing, household finance, pensions and preferences.

INCOME RISK, SELF-CONTROL, AND VALENCE-DEPENDENT UPDATING: A NON-BAYESIAN MODEL OF PRECAUTIONARY SAVING BEHAVIOR

Jialing Lin (LMU Munich)

Abstract: Economic theory predicts that income risk induces precautionary saving under the prudence assumption. In practice, empirical literature remains inconclusive on its strength. This paper extends the standard precautionary saving model in three aspects. First, the model considers anticipatory utility in addition to the standard consumption utility. Second, the model studies the precautionary saving problem in a three-period setting with a time-separable, additive utility function to formalize the belief formation process regarding income risk and saving decisions over time. Specifically, I formally demonstrate how a valence-dependent updating rule results in biased beliefs in response to negative income risk information, leading to undersaving. Third, the model allows for self-control, assuming the agent is aware of her biased updating process. The formal analysis shows that full self-control is not always optimal. Specifically, partial self-control yields higher total utility for an agent who is pessimistic about her income risk, less wealthy, has more conservative (high-

order) risk preferences, and expects relatively accurate information. The conditions are then illustrated numerically with a log-utility function. Our findings help explain the empirical puzzle regarding insufficient precautionary savings, particularly among the poor. Additionally, the preference for partial self-control when information is too accurate or priors are pessimistic provides insights into the ongoing discussion on information avoidance in behavioral economics.

Bio: Jialing Lin is a fourth-year PhD candidate and teaching & research associate at the Munich Risk and Insurance Center at the LMU Munich School of Management. Her research combines microeconomic modeling and empirical analysis to study how behavioral factors influence decision-making under risk and uncertainty. Her current projects examine the role of psychological and neurological factors in household decision-making, including how worry and belief formation influence saving behavior, as well as the broader role of mental health in household risk management in financial and health domains.

SESSION 8: PLENARY

INNOVATIVE RETIREMENT INCOME STREAMS

Chair: Katja Hanewald (UNSW Sydney)

Venue: Colombo A

INNOVATIVE RETIREMENT INCOME STREAMS – TO INSURE OR NOT TO INSURE?

Kathryn Spragg (Australian Retirement Trust)

Abstract: The Australian Retirement Trust (ART) Lifetime Pension is an innovative retirement income stream product launched in 2021 which was designed to provide members with income for life, higher drawdown rates, money-back protection feature and optional spouse protection. Since its launch, the product has seen continued uptake and now operates at a scale sufficient to support its money-back protection feature internally.

From 1 July 2025, ART removed the insurance-based funding mechanism for the money-back protection feature, previously provided by ART Life Insurance Limited. This change marks a significant milestone in the product's evolution, reflecting its maturity and financial resilience. The money-back protection will continue to be offered on the same terms, but now funded directly from the Lifetime Pension pool—eliminating insurance costs and reducing external dependencies without introducing additional volatility or risk to pensioners.

This presentation explores the research-based rationale behind the change, including cost efficiencies, risk management considerations, product pricing, expected change in pool performance going forward from redefining mortality credits, long-term member outcomes, the transition of existing members and implications for long-term sustainability. The session aims to contribute to broader discussions around the design of lifetime income products in Australia's evolving retirement landscape.

Bio: Kathryn Spragg is a Fellow of the Institute of Actuaries of Australia and a Chartered Enterprise Risk Actuary, specialising in global retirement income systems. She has been with Australian Retirement Trust for over a decade, where she leads the design, development, and continuous improvement of retirement and longevity products. This includes the ongoing monitoring and solvency management of the ART's Innovative Retirement Income Stream product, Lifetime Pension.

OPTIMAL HURDLE RATE AND INVESTMENT POLICY IN LIFETIME PENSION POOLS

Jean-François Bégin (Simon Fraser University)

Abstract: Lifetime pension pools—also known as group self-annuitization plans, pooled annuity funds, and retirement tontines in the literature—offer retirees lifelong income by collectively managing mortality risk and adjusting benefits based on the investment performance and the mortality experience within the pool. The benefit structure hinges on two key design parameters: the investment policy and the hurdle rate. However, past research offers limited guidance on optimal asset allocation in such settings, often relying on overly simplistic strategies. Furthermore, the choice of hurdle rate has received virtually no attention in the literature. This study addresses this gap by jointly analyzing optimal hurdle rates and investment strategies using a dynamic programming approach that allows for varying degrees of risk aversion via a hyperbolic absolute risk aversion utility function. Our findings reveal that, as risk aversion increases, the model favours more conservative portfolios and lower hurdle rates; conversely, lower risk aversion supports riskier allocations and higher hurdle rates. The threshold parameter—which reflects the minimum acceptable level of consumption—plays a critical role in shaping the hurdle rate behaviour.

Bio: Dr. Jean-François Bégin is an Associate Professor in the Department of Statistics and Actuarial Science at Simon Fraser University in British Columbia, Canada. He is a specialist in financial modelling as well as statistical and mathematical applications to finance and insurance. Before joining Simon Fraser University, he received his PhD in Financial Engineering from HEC Montréal. He is also a Fellow of both the Society of Actuaries and the Canadian Institute of Actuaries. Over the past few years, his research program has focused on the construction of complex models for long-term economic predictions, the understanding and management of credit risk, the modelling of option prices, and the development of sustainable retirement solutions and designs. He was the recipient of the first Young Researcher Award of the Canadian Institute of Actuaries in 2017. He also won the 2019 Bob Alting von Geusau Prize of the AFIR-ERM section of the International Actuarial Association and the Early Career Faculty Research Award of Simon Fraser University's Faculty of Science.