

ANNUAL REPORT 2016



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ARC CENTRE OF
EXCELLENCE IN
**POPULATION
AGEING
RESEARCH**



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CEPAR would like to acknowledge the generous financial and/or in-kind support of the following organisations:



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INTRODUCING THE CENTRE

ABOUT CEPAR

THE ARC CENTRE OF EXCELLENCE IN POPULATION AGEING RESEARCH (CEPAR) IS A COLLABORATION BETWEEN ACADEMIA, GOVERNMENT AND INDUSTRY.

The Centre is based at the University of New South Wales (UNSW) with nodes at the Australian National University (ANU), the University of Sydney and the University of Melbourne. It aims to establish Australia as a world leader in the field of population ageing research through a unique combination of high level, cross-disciplinary expertise drawn from Economics, Psychology, Sociology, Epidemiology, Actuarial Science, and Demography.

CEPAR is actively engaged with a range of influential government and industry partners to cooperatively deliver outcomes to meet the challenges of population ageing. It is building a new generation of researchers to global standard with an appreciation of the multidisciplinary nature of population ageing.

VISION

Our vision is to be internationally recognised as a leading research authority on population ageing.

MISSION

CEPAR's mission is to produce research of the highest quality to transform thinking about population ageing, inform product and service development and provision and public policy, and improve people's wellbeing throughout their lives.

OBJECTIVES

THE OBJECTIVES OF THE CENTRE ARE TO:

- Produce original research, to be published in leading international academic journals, in each of the nominated fields, integrating them to advance knowledge globally
 - Establish outstanding research capability to generate the evidence base and policy analysis required to anticipate and respond constructively to the demographic transition
 - Undertake evidence-based research to allow development of products and markets relevant to an ageing population
 - Create new cohorts of researchers with an enriched appreciation of cross-disciplinary contributions by training PhD students and early career researchers (ECRs), thus building high quality research capacity for the generation for which population change is especially crucial
- Become a global intellectual hub for population ageing research, by combining in-house expertise with leading researchers globally in initiatives to target research issues and generate new outcome-oriented approaches to studying the population ageing process and its implications
 - Engage with external stakeholders as an integral part of the Centre's research activity, to develop research goals, to share in project execution, and to translate research output into forms accessible by the professional community, both national and global.

DIRECTOR'S REPORT & HIGHLIGHTS



PROFESSOR JOHN PIGGOTT

2016 has been a watershed year for CEPAR. We have consolidated our position as a globally leading centre in population ageing research.

As we approach the end of the Centre's initial funding term, our extraordinary contribution to research is becoming clear, both to ourselves and to our peers. Our reach in Australia and internationally, not just with research, but with mentoring, with engagement, with knowledge sharing, is growing ever stronger.

PERHAPS THE MOST IMPORTANT EVENT FOR CEPAR IN 2016 WAS THE ANNOUNCEMENT THAT WE WERE ONE OF NINE SUCCESSFUL APPLICANTS TO SECURE SEVEN YEARS OF FUNDING IN THE 2017 CENTRES OF EXCELLENCE (COE) FUNDING ROUND.

CEPAR was the only Social Sciences centre funded in this round, remains the only Centre outside STEM (Science, Technology, Engineering, Mathematics) to be awarded a second term, and the only COE based in a Business School. As well, we were awarded almost all the support we requested. There could be no clearer articulation of peer support for our achievements so far, along with the recognition that much remains to be done, and that our new research program is an innovative path forward.

This is an extraordinary achievement, the result of a major team effort. Centre funding is highly competitive, and the application process is long and arduous. Nine centres every three years is not very many. There were about 100 expressions of interest; then 20 short-listed applications, each many hundreds of pages; and finally, invitations for interview.

In preparing the application and interview for the new Centre, many people contributed. But I would especially like to record my thanks to Anne Gordon, the Centre's Director of Operations, and Marc de Cure, Advisory Board Chair,

for their huge contributions to this outcome. They have been involved in the CEPAR initiative for well over a decade, in Marc's case pretty much the whole of this century, and have been central in building to what we are today. Very few Social Sciences centres operate at the scale we do, anywhere in the world, and we've had to carve our own path to make it all happen.

Our new research program has not yet begun, of course, so it is premature to comment on its potential impact, other than to say our senior researchers, viewed as a team focused on population ageing research, are without peer globally.

But this is a report about our activities in 2016. A lot more happened in 2016 than the new award. And the first edition of CEPAR still has all of 2017 to run (the Centres are expected to run concurrently for a few months towards the end of next year) before we finalise the current research program.

ONE SATISFYING DEVELOPMENT IN 2016, EVIDENCE TO SUPPORT THE VIEW THAT CEPAR HAS COME OF AGE, IS THAT TWO HIGHLY RELEVANT AND TIMELY EDITED VOLUMES WERE PUBLISHED, BOTH EDITED BY CEPAR PERSONNEL.

They are quite different in style. The first focuses specifically on the Economics of Population Ageing. It is a Handbook, produced in the prestigious Elsevier series, and covers a diverse range of topics, drawn from many fields within the discipline. Political Economy, Finance, Labour, Risk and Uncertainty, Health, Inequality – all these topics and more are covered, with authoritative surveys written by global leaders in their fields. This project has taken several years to bring to fruition. Many contributors met one another for the first time at a Harvard Workshop in 2013 – this event gave the project collective impetus, and was critical in its development.

The second volume focuses on Australian issues. A couple of years ago, CEPAR joined forces with the Academy of Social Sciences in Australia (ASSA) to mount a Symposium on Population Ageing, the focus of the annual ASSA meetings that year in Canberra. This volume cuts across many disciplines, not just fields within a discipline. Many CEPAR affiliates participated, and it is co-edited by a sociologist, a demographer, and an economist. The book based on that Symposium has just been published by ANU Press.

We see these volumes as platforms upon which further research may be built. They are supported by and are reflected in the Centre's focus and multidisciplinary, which generates perspectives and research questions that might otherwise be neglected. And their implementation and execution allows for active collaborations with other centres and research groups, which has value in itself, creating connections and building networks.

A third such initiative, scheduled for publication in 2017, relates to a research focus on tax and pensions. This interaction has been ignored in the literature – public finance specialists think of pensions as a small part of what they do, while pension economists regard tax structures as only one small part of pension research. CEPAR joined forces with CESifo in Munich to run a two part conference (one in Sydney, the other in Munich) at which a series of papers was presented. These have since been revised, and the portfolio of topics extended. We are aiming for this to become a landmark volume in this neglected area, on which a new research program can be built.

A rather different research initiative was undertaken by Chief Investigator (CI) Peter McDonald and his team. They established RADAR, the Regional Australian Database for Ageing Research, which is accessible through the CEPAR website. This is available for public use, and almost 200 professional users have downloaded the data set since its release in July this year. It promises to improve both the quality and quantum of ageing social research in Australia.

IN ANOTHER EXAMPLE OF MAJOR INTERNATIONAL COLLABORATION, CEPAR JOINED FORCES WITH NETSPAR, BASED AT TILBURG UNIVERSITY IN THE NETHERLANDS, AND THE PENSION RESEARCH COUNCIL, AT THE WHARTON SCHOOL OF THE UNIVERSITY OF PENNSYLVANIA, TO ESTABLISH A GLOBAL NETWORK OF PENSION RESEARCHERS.

There is a definite need for such an organisation. Many researchers in developing countries in Asia and Africa, whose policymakers are in dire need of expert advice, and whose national experience can add to global knowledge about policy and business impact, have no effective connection with the global pension research network that researchers in developed countries enjoy. The International Network of Pension, Ageing and

Retirement Researchers (INPARR) has been fortunate to gain the support of the Organisation for Economic Cooperation and Development (OECD), which has agreed to host an annual conference and provide a secretariat. Critical to these arrangements is the participation of Willis Towers Watson, a partner organisation in the new Centre.

The first conference was held in June, with speakers and panellists drawn from each of the founding centres, as well as Japan, the UK, South Africa, and Europe. More than 140 participants from all over the world attended. Following the success of the first conference, a follow-up event is being organised for mid-2017.

The long term goal of this initiative is to develop a formal association, which would be self-funding.

In 2014, we were awarded strategic funding from UNSW to establish the Australia-China Population Ageing Research Hub. This initiative draws on the intellectual base that CEPAR embodies to better understand the causes and consequences of demographic change in

this very large and rapidly ageing nation. We appointed Partner Investigator (PI) Professor Hanming Fang (University of Pennsylvania) early in 2015 on a fractional appointment as Scientific Director of the Hub. Early this year Katja Hanewald joined the Hub as a Senior Research Fellow, giving it continuing operational presence, and then two senior research associates took up appointments in September. Along with Lu Bei, a CEPAR Research Fellow, who has been our Chinese link now for several years, this is a formidable team, and I'm looking forward to research outcomes over the next 12 months.

In both 2015 and 2016, the Centre has organised a workshop which brings together researchers specialising in China from around Australia to interact, and features one or two keynote speakers from China. The 2016 keynote was Professor Albert Park, from the Hong Kong University of Science and Technology.

A range of other engagement activities took place through the year. Highlights included:

- The Colloquium of Superannuation Researchers, which has

DIRECTOR'S REPORT & HIGHLIGHTS

now been running for 24 years. A theme at the colloquium was the industry response to behavioural issues around pensions and saving.

- **THE LONGITUDINAL DATA ROUNDTABLE FOCUSED ON DATA NEEDS FOR ANALYSIS ON AN AGEING DEMOGRAPHIC.**

Held at the ANU's Crawford School, it was attended by interested academics and government officials, with Professor Jim Smith, from RAND Corporation, giving a keynote talk. CEPAR is very keen for a nationally representative, multidisciplinary longitudinal survey to be established focused on people aged 50 and over, to complement the existing survey focused on young people and the working age population. The data gap is becoming more important as our population ages. Funding for such a survey has become urgent.

These activities give a sense not only of our ongoing research program, but also research engagement. As well, however, end users actively engaged with CEPAR throughout the year. Marc de Cure will elaborate on this activity in his Chair's report.

Mentoring is an important part of CEPAR's mission. While some activities are directed to CEPAR personnel, others reach beyond CEPAR affiliates to the nation as a whole. Following the success of our first Early Career Researcher Retreat in 2015, we followed this with a second, where engagement was emphasised. Marc de Cure led a group of speakers who focused on the importance of, and approaches to, engagement, and various research related activities were undertaken directed towards linking stakeholders with research initiatives. One outcome of the first ECR retreat in 2015, was a focus on mid-life as a topic for research. This led to the 2016 Mid-Life Employment Workshop, organised and run by Elena Capatina and Diane Hosking, two early career researchers from UNSW and ANU respectively.

The annual Emerging Researchers in Ageing (ERA) conference was held this year at ANU, organised by Kaarin Anstey. Vice Chancellor Professor Brian Schmidt opened the conference, a testament to the importance he places on early career mentoring, and students, from all over the country took part.

Finally, each year CEPAR supports a workshop on a topic that will appeal to young researchers. In December, Professor Hans Fehr, from the University of Wuerzburg, presented a 4 day workshop on computational economics. More than 30 people registered, including groups from the Reserve Bank, the Commonwealth Treasury, and the Department of the Prime Minister and Cabinet, as well as emerging researchers nationally.

AS USUAL, CEPAR RESEARCHERS ACCUMULATED THEIR SHARE OF AWARDS AND HONOURS.

Among the highlights:

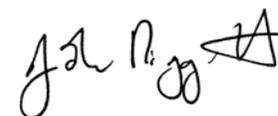
- CI Bob Cumming was named as a highly cited researcher. The list is based on citations over the 11 years from

2004-2014, and is updated annually. There were 115 Australian-based academics on this year's 2016 highly cited list, produced by Clarivate Analytics, formerly the IP & Science division of Thomson Reuters, and just over 3000 worldwide. Australia had the fifth highest number of researchers highly cited. Bob was one of six University of Sydney researchers identified in this year's 2016 list. It was a rare honour.

- CI Hal Kendig was made an Honorary Life Member of the Australian Association of Gerontology for 'Outstanding Contribution to the Australian Association of Gerontology'.
- CEPAR Associate Investigator (AI) Heather Booth was appointed an Associate Member of Nuffield College at the University of Oxford.
- Senior Research Fellow Katja Hanewald and CI Michael Sherris were awarded the Bob Alting von Geusau Prize for their paper 'Pricing and Solvency of Value-maximizing Life Annuity

Providers' along with their co-author Maathumai Nirmalendran.

- The *North American Actuarial Journal* awarded its 'best paper' prize to CEPAR researchers Michael Sherris, Al Adam Wenqiang Shao and AI Joelle Fong for their paper 'Multistate Actuarial Models of Functional Disability'.



John Piggott

HIGHLIGHTS

59 PROJECTS

138 JOURNAL PUBLICATIONS

\$27.25M IN ARC FUNDS AWARDED FOR A SECOND SEVEN YEAR TERM FOR CEPAR

INTERNATIONAL NETWORK FOR PENSIONS, AGING, AND RETIREMENT RESEARCH (INPARR) LAUNCHED AT INAUGURAL CONFERENCE HOSTED BY THE OECD IN PARIS

ROUNDTABLE ON LONGITUDINAL SURVEY FOR OLDER COHORTS HELD IN CANBERRA

24TH ANNUAL COLLOQUIUM OF SUPERANNUATION RESEARCHERS HOSTED BY CEPAR AND UNSW SCHOOL OF RISK AND ACTUARIAL STUDIES

THE REGIONAL AUSTRALIA DATABASE FOR AGEING RESEARCH (RADAR) LAUNCHED IN JULY 2016

SECOND CEPAR WORKSHOP ON THE CHINESE ECONOMY HELD IN SYDNEY

MID-LIFE EMPLOYMENT WORKSHOP HELD IN SYDNEY

15TH NATIONAL EMERGING RESEARCHERS IN AGEING CONFERENCE HELD IN CANBERRA

ADVANCED TRAINING WORKSHOP ON COMPUTATIONAL ECONOMICS HELD IN SYDNEY

CEPAR DISTINGUISHED VISITOR ELSA FORNERO DELIVERED A PUBLIC LECTURE ON FINANCIAL LITERACY

CHIEF INVESTIGATOR ROBERT CUMMING LISTED AS A HIGHLY CITED RESEARCHER IN THE 2016 CLARIVATE ANALYTICS REPORT

CHIEF INVESTIGATOR KAARIN ANSTEY AND TEAM LAUNCHED NHMRC CENTRE OF EXCELLENCE IN COGNITIVE HEALTH

CHIEF INVESTIGATOR HAL KENDIG AWARDED HONORARY LIFE MEMBERSHIP OF THE AUSTRALIAN ASSOCIATION OF GERONTOLOGY FOR OUTSTANDING CONTRIBUTION TO THE ASSOCIATION

CHIEF INVESTIGATOR MICHAEL SHERRIS ELECTED TO CHAIR THE AFIR/ERM SECTION OF THE INTERNATIONAL ACTUARIAL ASSOCIATION

CHAIRMAN'S MESSAGE



MARC DE CURE

2016 has been an extraordinary year for CEPAR. The most significant achievement was the award to CEPAR of a second round of seven year funding from the Australian Research Council (ARC). Implicit in this is recognition by the ARC of CEPAR's past success and the significant national and global need for further research into population ageing. This funding will enable CEPAR to broaden its research and bring in new expertise in areas not previously covered, such as workplace reform and opportunities for older Australians to work longer, and trade and economic implications of changing demand and supply of capital, labour, goods and services between countries as their populations age at different rates.

The key role of the Advisory Board is to provide a conduit for research to be informed by the ultimate users of the research, driven by their strategic and policy imperatives and critical knowledge gaps. The Advisory Board also plays a key role in directing the research outputs to those best able to use it to inform product and policy development, and/or influence social and community attitudes and awareness.

Advisory Board members and Partner Organisation representatives contributed enormously to the success of the bid for a second term of CEPAR funding. They provided critical input in shaping the research program, provided valuable advice on the further development of our engagement strategy and met with, and provided connection to, new partners and other key influencers.

They also played a crucial role in the development of engagement initiatives designed to promote knowledge exchange. In 2016, this included providing feedback on presentations of current CEPAR research in progress; providing input to the development of submissions and research briefs; and contributing to

the development of the concept of a CEPAR-hosted Commonwealth-State government roundtable on population ageing issues.

Board members performed key roles in engagement initiatives. For example, Serena Wilson, Jenny Wilkinson and Mark Cormack spoke on policy challenges and knowledge gaps at the CEPAR Roundtable on a Longitudinal Survey for Older Cohorts, and Serena Wilson served as a panel member at the public lecture on Reform, Information, Education: A New Paradigm for Pension Reform. In addition, Board members and Partner Organisation representatives participated in a range of CEPAR seminars, conferences and workshops. These included the joint CEPAR-Wharton-NetSPAR Conference on Research Challenges for Global Pensions hosted by the OECD in Paris; the annual Workshop on Population Ageing and the Chinese Economy held at UNSW; and the annual Colloquium of Superannuation Researchers convened at UNSW. Board members were also active in mentoring CEPAR Early Career Researchers, and supporting the Centre Director John Piggott and his management team.

On behalf of CEPAR, I would like to acknowledge and thank our partners and their Advisory Board representatives for their contributions in these and many other areas during 2016 which have been vital to CEPAR's engagement model success.

I would like to take this opportunity to thank Jonathan Deane from AMP who left the Board at the end of 2016. Jonathan has been an active and engaged member of the Board since its inception in 2010 and has been the main link to our partner and great supporter, AMP. In addition to their generous support of the CEPAR research program, AMP has also been a key partner in a Linkage Grant project focused on best policy and practice in relation to mandatory pre-funded retirement income schemes.

Looking forward, 2017 will be a year of considerable change for CEPAR as the original grant period comes to an end. It will also be a year in which some of the new research strands will commence, which will in turn drive a refocus of the Advisory Board and engagement activity. It will provide an opportunity to reflect on what we have achieved and position

ourselves for continued nationally and globally significant research. Several other changes aimed at enhancing the effectiveness of the Board are being considered.

An addition to the engagement model is planned for the new Centre to improve engagement at the individual research program level, to provide greater connectivity between researchers and Partner Organisations for specific research projects.

CEPAR's future looks bright with an established brand, proven research capability and engagement model, and a further eight years of funding. The Advisory Board will continue its focus on supporting and enabling the two-way engagement process between research activity and end users to ensure maximum impact is achieved from the investment and the dedication of our researchers.

Marc de Cure

ACTIVITY PLAN FOR 2017

In 2017, CEPAR will continue to harness the capabilities of its high quality and well-focused research team to further enhance its position as a leading authority in multidisciplinary population ageing research. We will focus on our priority areas of research; produce high quality research on issues that matter and disseminate output to those that can use it to drive impact; contribute to key agendas, policy initiatives, and product development; expand global collaborative networks; and build research capacity and capability to ensure CEPAR's sustainability.

ENGAGEMENT AND OUTREACH

A number of events are planned in 2017 to stimulate discussion on the issue; engage with industry, government and the global research community; and raise the profile of the Centre. These include:

- A Longevity Risk Workshop to be hosted by PwC in February;
- A Longevity Research Forum to be held at the UNSW node in February;
- A roundtable with state government department representatives in the first half of the year;
- A roundtable with key stakeholders in the first half of the year to discuss CEPAR's achievements and future directions;
- A workshop on Population Ageing and the Chinese Economy mid-year;
- Collaboration with the Australian Human Rights Commission on attitudes towards ageing and age discrimination;
- A workshop on Ageing Well and Productively in Australia with comparative case studies from China, India, and Southeast Asia countries in conjunction with the

International Association for Gerontology and Geriatrics Congress in July;

- The annual Colloquium of Superannuation Researchers in July;
- The second annual conference of the International Network for Pensions, Aging and Retirement Research to be co-organised by CEPAR in collaboration with the Wharton School at the University of Pennsylvania, NetSPAR and Willis Towers Watson and hosted by the OECD in Paris;
- A joint policy dialogue focused on post-retirement incomes hosted in conjunction with the Crawford School of Public Policy in the second half of the year;
- A roundtable for stakeholders on Health and Aged Care in September;
- The 'Cognitive Health: New Directions and Policy Impacts' symposium to be held at ANU;
- Sponsorship of and involvement in a Research Day titled 'Great Expectations Inspiring Hope through Research' with Alzheimer's Australia ACT.

- A one-day conference to celebrate the 150th anniversary of the publication of the first life table for Australia prepared by Morris Birkbeck Pell, to be organised in conjunction with other groups in the Melbourne School of Population and Global Health;
- A policy workshop on the needs of older people in rural Indonesia and possible policy directions, to be held at the Indonesian Government's National Planning Board in Jakarta in the latter half of 2017;
- The Summer Workshop on the Economics of Health and Ageing in November;
- CEPAR's fortnightly seminar series; and
- Public talks featuring CEPAR personnel and distinguished visitors.

CEPAR will also work closely with our stakeholders to identify particular areas of interest in 2017 and discuss suitable modes of engagement (e.g., roundtable discussion, boardroom briefing) as well as organise the participation of CEPAR personnel in these activities.

A three-part Research Brief on Retirement Incomes is planned for release early in 2017. The brief will integrate research findings from multiple disciplines to present a synthesis of evidence pertaining to this important topic. Later in the year a second brief will be produced which will focus on cognitive ageing.

In terms of publicly available resources, Peter McDonald's team will create the Australian National Transfer Accounts (ANTA) website which will be accessible through the CEPAR website. This resource which will extend back to the early 1980s will also include a new account for 2015. Following the release of the new account, an event will be held in Melbourne and potentially other cities to publicise the findings from ANTA and demonstrate its capabilities. In the latter part of 2017, after the 2016 Census results are published, the RADAR database will be extended to include both the 2011 and 2016 Censuses.

ACTIVITY PLAN FOR 2017

NATIONAL AND INTERNATIONAL NETWORKS

In the wake of the successful establishment of the Association of Pacific Rim Universities (APRU) Population Ageing Research Hub, CEPAR will continue to provide leadership in shaping and building this initiative and implementing the Hub's three year plan. This includes supporting the development of a collaborative research project on 'frailty' involving Hub members and the organisation of a joint workshop focused on this issue.

Work will continue on the development of linkages between the Australia-China Population Ageing Research Hub and key institutions in China as well as connecting with national researchers focused on this area of research. Key to the development of national linkages will be the 3rd annual workshop on Population Ageing and the Chinese Economy.

Distinguished visitors expected in 2017 include Professors Linda Clare, Robert Holzmann (Malaya), Carol Jagger (Newcastle-on-Tyne), Sau-Him Lau (Hong Kong), Olivia S. Mitchell (Wharton), James Nazroo

(Manchester), Professor Rong Peng (Guangdong), Merrill Silverstein (Syracuse), Ian Tonks (Bath) and Senior Research Fellow Erik Hernæs (Frisch Centre).

Visiting students who will work with Kaarin Anstey at the ANU node, include Endeavour Fellow Malinee Neelamegam, from the University of Southern Florida who will undertake research on medication use and cognitive health; and Divya Vanoh, a National University of Malaysia student, who will work on nutrition and cognitive ageing.

Fulbright Fellow Millicent Cripe will spend ten months at the University of Sydney under the supervision of Al Kate O'Loughlin.

MENTORING

The suite of mentoring programs developed by CEPAR to engage early career researchers (ECRs), Higher Degree Research and undergraduate students will continue to be offered in 2017. Two ECR workshops, one to be held at the ANU node on longitudinal methods, and the other at the UNSW node focused on Engagement and Impact, will be offered; a regular research seminar series targeted at ECRs and students will be convened; summer scholarships will be offered to undergraduate students; and CEPAR will again support the Emerging Researchers in Ageing national conference which will be hosted by Curtin University.

RESEARCH

Research in 2017 will be advanced on a number of topics consistent with the six key Areas of Research Focus identified in the CEPAR Strategic Plan. Specific activities include:

1 Causes and Consequences of Demographic Change

Extend to other countries (Netherlands, Norway) comparative research on links between retirement system rules, labour supply and saving

Estimate cohort based mortality models using multiple factor methods for financial and risk management applications

Implement multiple state health models with systematic longevity risk to generate future population health state and age distribution scenarios

Estimate the National Transfer Account for 2016-17 to add to the existing six NTA accounts. Calculate the associated wealth account for 2015-16

Extend and enhance the public-use database, RADAR

Further develop and implement alternative demographic models of the dynamics of population age structure changes for use in a dynamic economic model for simulating economic impacts

Further develop the research project on the interaction between taxation and pensions

Complete research on the implications of population ageing for educational choice, endogenous technical change and international trade

2 Cognition and Decision Making

Examine the gender, contextual and biological influences on cognitive decline in older adults

Continue to investigate how cognitive impairment impacts on volunteering, driving and social engagement

Continue to analyse the impact of dietary intake on the maintenance of cognitive health

Continue to examine the impact of sensory disability on everyday function in older adults including driving

Continue to investigate the impact of the tax system on household consumption and investment in owner-occupied and rental housing over the life-cycle

Investigate negative gearing in investment properties in Australia using a general equilibrium, overlapping generations model framework

Examine the effects of various potential changes in the design of the Australian social system on labour supply and consumption over the life-cycle, the timing of retirement, and bequests

3 Resources in Retirement

Assess pre-retirement investment strategies taking into account housing as an illiquid asset and its consumption benefits

Assess post-retirement investment strategies including housing, reverse mortgages and long-term care insurance in a life-cycle model that captures the unique characteristics of housing

Continue work on the construction of a life-cycle model of a family household, estimate its parameters using econometric methods on data drawn from the Household, Income and Labour Dynamics in Australia (HILDA) panel of households, and use it to analyse retirement decisions under alternative pension policies

Continue work on the estimation of a life-cycle model of individuals using maximum likelihood and Bayesian methods and use it to address labour supply and asset accumulation over the life-cycle

4 Ageing Well and Productively

Continue analysis for Attitudes to Ageing in Australia, including intergenerational relations and change over time (2010 to 2017)

Continue Australian and English comparative analyses, on the socioeconomic determinants of health and wellbeing across the life course

Investigate the implementation of new knowledge into aged care and public health practice and policies, including falls prevention and risk of falls in primary care

Examine age differences in the use of emotion regulation strategies, and the implications of this for stress exposure, reactivity and wellbeing in older adulthood

Analyse HILDA to examine healthy working-life expectancies and productive-life expectancies for older Australians, with a multi-dimensional model of health

Analyse data from HILDA on labour force participation and older people

5 Health and Aged Care

Analyse patterns of use of hospital and aged care services among older men

Identify sociodemographic factors associated with use of health and aged care services among older men

Continue to analyse longitudinal pathways on work and caregiving and the relationship with health, wealth and wellbeing

Collaborate in papers with survey and data linkage on health service trajectories

Continue to work on a life-cycle model with idiosyncratic health and earnings risk to study the effects of health on earning dynamics, labour supply and asset accumulation

Continue to work on models of how people make life-cycle decisions regarding investment in health and human capital including analyses of employer provided health insurance take up and health spending by socioeconomic status

Continue to analyse a calibrated life-cycle model to estimate the importance of family dynamics for savings and consumption decisions, and to quantify the impacts of long-term care policy reforms

Continue to investigate the association between having a college educated spouse and health, health behaviours, health transition, and mortality

6 Ageing in Asia and its impact on Australia

Analyse life expectancy in China, its evolution and determinants.

Document comparatively, long-term care policy and practice in Asia.

Conduct survey of health of older people in Mongolia.

Continue to conduct macro-level research on population ageing in Asian countries.

Conduct analysis of micro-level data collections in 10 Indonesian villages completed in 2015 and 2016.

Continue analyses of the CHARLS and SAGE survey data on health and productivity of ageing people in China

A close-up photograph of two hands shaking in a firm grip. The hands are positioned centrally, with the fingers interlaced. The skin is a natural tone, and the texture is visible. The hands are wearing dark grey or black suit sleeves with white cuffs. A large, white, stylized number '1' is superimposed over the right side of the handshake. The background is a dark, solid grey. At the bottom of the image, there is a horizontal red bar.

SECTION

GOVERNANCE
& STRUCTURE

GOVERNANCE

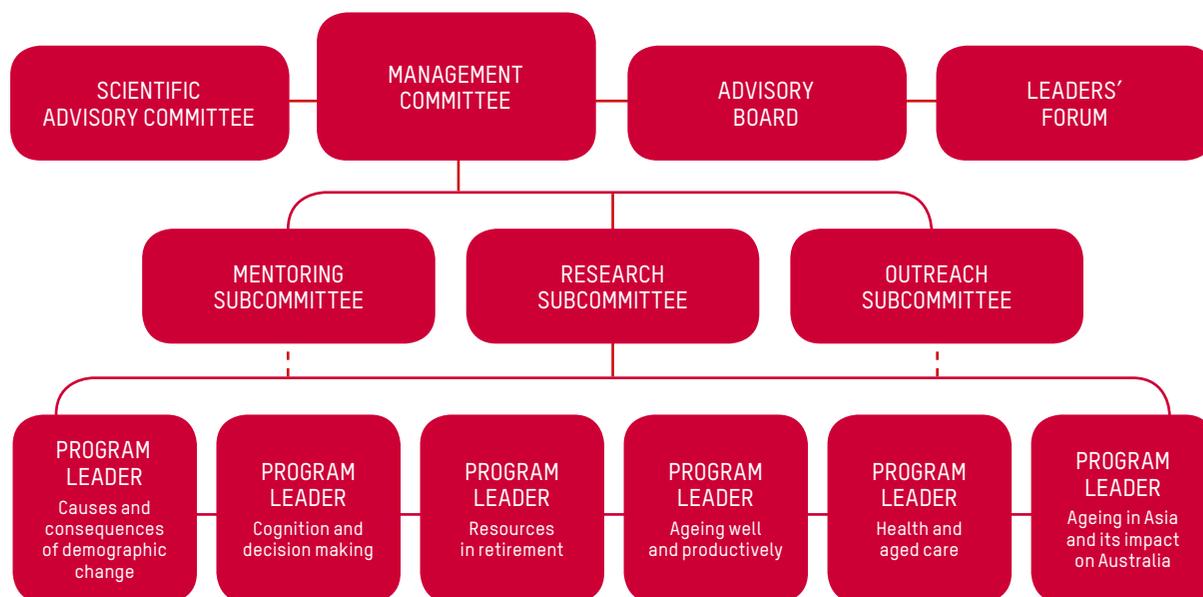
Central to CEPAR's governance are the Centre Director and the Management Committee who have overall responsibility for Centre performance and for ensuring that the Centre is conducted in accordance

with the Funding Agreement between the University of New South Wales and the Australian Research Council. Three subcommittees - focused on research management, mentoring, and outreach - support the Management Committee.

Three external committees support strategic development as well as engagement between researchers, industry and government. The Scientific Advisory Committee, Centre Advisory Board and the Leaders' Forum provide the

Management Committee with external perspectives on the formulation of research programs, their implementation, and the dissemination of research outcomes.

CEPAR ORGANISATIONAL CHART



SCIENTIFIC ADVISORY COMMITTEE

The Scientific Advisory Committee comprises a core group of international leaders in the area of population ageing, drawn from a range of fields reflecting the Centre's multidisciplinary nature. It

provides advice on the strategic direction of the Centre from a global perspective, with emphasis on research programs. Members of the Committee actively build the international profile of the Centre and identify potential international partners and linkage opportunities.

The Scientific Advisory Committee comprises:

Professor David E. Bloom,
Harvard School of Public Health

David E. Bloom is Clarence James Gamble Professor of Economics and Demography in the Department of Global Health and Population,

Harvard T.H. Chan School of Public Health and Director of Harvard's NIA-funded Program on the Global Demography of Aging. He is also a Faculty Research Associate at the National Bureau of Economic Research, Research Fellow at IZA in Bonn, elected Fellow of the American

Academy of Arts and Sciences, and a member of the Board of Directors of JSI. Dr Bloom is an economist and demographer whose work focuses on health, demography, education, and labour. In recent years, he has written extensively on the links among health status, population

dynamics, and economic growth and on the value of vaccines and pharmaceuticals. Dr Bloom has published over 400 articles, book chapters, and books.

Professor Gordon Clark, University of Oxford

Gordon L. Clark DSc FBA is Professor and Director of the Smith School of Enterprise and the Environment at the University of Oxford with cross-appointments in the Saïd Business School and the School of Geography and the Environment at Oxford. He holds a Professorial Fellowship at St Edmund Hall, is the Sir Louis Matheson Distinguished Visiting Professor at Monash University's Department of Banking and Finance, and is a Visiting Professor at Stanford University's Global Projects Center. Previous academic appointments have been at Harvard's Kennedy School of Government, the University of Chicago, Carnegie Mellon's Heinz School and Monash University. His current research, sponsored by Zurich Insurance, focuses upon financial decision making in the context of market volatility and long-term commitments. Related research concerns the design and management

of investment institutions including insourcing, out-sourcing, and off-shoring, and the pricing and utilisation of financial services relevant to pension funds, endowments, and sovereign wealth funds. His book *Institutional Investors in Global Markets* with Ashby Monk will be published by Oxford University Press in 2017.

Professor Yasuhiko Saito, Nihon University

Yasuhiko Saito is a Professor at the University Research Center at Nihon University, Tokyo, Japan. He has served as a council member of the International Union for the Scientific Study of Population (IUSSP) from 2005 to 2009 and has been serving as an executive committee member of the International Social Science Council (ISSC) representing IUSSP since 2010. His specialisations are in demography and gerontology, where his focus is on population ageing and health issues in both developed and developing countries.

Professor Merrill Silverstein, Syracuse University

Merrill Silverstein, Ph.D., is the inaugural holder of the Marjorie Cantor Chair in Aging Studies at Syracuse University in the Maxwell School, Department of Sociology and the Falk College, Department of Human Development and Family Science. He received his doctorate in sociology from Columbia University. Prior to his current appointment, he served as Professor of Gerontology and Sociology at the University of Southern California. In over 150 research publications, Dr. Silverstein has focused on the topic of ageing in the context of family life, with an emphasis on intergenerational relationships, social support, grandparenting, religiosity, and international-comparative perspectives. He has edited or co-edited the books *Intergenerational Relations across Time and Place*, *Handbook of Theories of Aging, Kin and Cohort in an Aging Society*, and *Later-Life Social Support and Service Provision in Diverse and Vulnerable Populations*. Dr. Silverstein currently serves as principal investigator of the Longitudinal Study

of Generations, a project that has tracked multigenerational families for more than four decades. He originated the Longitudinal Study of Older Adults in Anhui Province that for fifteen years has focused on the wellbeing and intergenerational exchanges of elders in rural China. He also has had collaborative projects in Sweden, the Netherlands, Israel, and Germany on related topics. Dr. Silverstein is a Fellow of the Gerontological Society of America, the Brookdale National Fellowship Program, and the Fulbright International Senior Scholars Program. He served as editor-in-chief of *Journal of Gerontology: Social Sciences* between 2010 and 2014.

ADVISORY BOARD

The chief role of the Advisory Board is to facilitate two-way engagement between stakeholders and researchers. Board members provide independent advice to the Management Committee with regard to strategy and external relations; facilitate the Centre's engagement with relevant stakeholders; identify new opportunities for engagement; and act as advocates and champions of CEPAR.

The Board comprises delegates of organisations providing financial support to CEPAR, along with a broader membership representing research, policy and community groups. Members are appointed by the Director in consultation with the Chair and Management Committee, for a term of three years.

Board members seek to both facilitate and enable the achievement of the Centre's mission and objectives by bringing their expertise and experience to bear. Members play an active role in strengthening links between academe, industry, government and the not-for-profit sector by participating in a range of activities which may include:

- Serving on a task force or working party to examine a specific issue
- Supporting executive development and corporate education programs
- Developing and hosting events such as symposia, fora, and conferences
- Participating in fundraising and sponsorship activities
- Mentoring staff and researchers
- Facilitating access to data, information, or people to facilitate research projects
- Facilitating the transfer of knowledge from research into practical application in business, government, or the not-for-profit sector.

In 2016, the Board met as a group on 14 April and 11 August to discuss CEPAR's research directions and opportunities for engagement. A key focus was the idea of a CEPAR Commonwealth-State Government roundtable on issues related to ageing. The Advisory Board also provided valuable guidance on approaches to building support for the introduction of a longitudinal survey of older people in Australia and the development of the forthcoming CEPAR research brief on retirement incomes.

The August meeting was held in Canberra, to emphasise the importance of our links with government. This enabled representatives from the Commonwealth Departments of Health, the Prime Minister and Cabinet, Social Services and Treasury to participate in person.

In addition to the two formal meetings, the Director and Chair met bilaterally with individual members on a number of occasions to discuss particular issues.

LEADERS' FORUM

The Leaders' Forum provides engagement, leadership and support for CEPAR. It comprises the CEOs, Chairs, and Board members of some of Australia's largest corporations, professional and community organisations, and senior federal departmental secretaries.

The Forum is a conduit for industry and government to help shape the research agenda on demographic change. Established in 2004 to support the Australian Institute for Population Ageing Research at UNSW, the Forum is a fluid group which provides high level strategic insight and facilitates engagement with end users. In 2016, Leaders' Forum members played vital roles in securing partnerships for the new Centre.

The calibre and breadth of representation of this group is strong testimony to the significance of population ageing as an issue and to the group's recognition of the need for transformational research.

MARC DE CURE,
CHAIR OF THE LEADERS' FORUM

2016 ADVISORY BOARD MEMBERS

MARC DE CURE	Chair
HELEN BARTLETT	Pro Vice-Chancellor, Monash University Malaysia and Convenor, Emerging Researchers in Ageing Initiative
HAZEL BATEMAN	CEPAR Director of Research Engagement
MARK CORMACK	Deputy Secretary, Strategic Policy and Innovation Group, Department of Health
JONATHAN DEANE	Chief Innovation Officer, AMP
ANNE GORDON	CEPAR Director of Operations
DAVID GRUEN	Department of the Prime Minister and Cabinet
HAL KENDIG	CEPAR Director of Research Engagement
CATHERINE NANCE	Partner, PricewaterhouseCoopers
PIP O'KEEFE	Lead Economist, Human Development, Asia Pacific, The World Bank
JOHN PIGGOTT	CEPAR Director
JENNY WILKINSON	Head, Retirement Income Policy Division, Commonwealth Treasury
SERENA WILSON	Deputy Secretary, Department of Social Services
IAN YATES	Chief Executive, Council on the Ageing

2016 LEADERS' FORUM MEMBERS

MARC DE CURE	Chair
MARTIN BOWLES PSM	Secretary, Department of Health
CRAIG DUNN	Board Member, Westpac
JOHN FRASER	Secretary, Treasury
KEN HENRY AC	Chair, National Australia Bank and Executive Chair, ANU Institute of Public Policy
JOHN LAKER AO	formerly Australian Prudential Regulatory Authority
CRAIG MELLER	CEO, AMP
MICHAEL ORSZAG	Head, Global Research Services, Willis Towers Watson
JOHN PIGGOTT	Director, CEPAR
FINN PRATT AO PSM	Secretary, Department of Social Services
HEATHER RIDOUT AO	Chair, AustralianSuper
SUSAN RYAN AO	former Age and Disability Discrimination Commissioner, Australian Human Rights Commission
GEORGE SAVVIDES	former CEO, Medibank Private



MARC DE CURE
CHAIR, ADVISORY BOARD
AND LEADERS' FORUM

Marc de Cure has long recognised the social and economic significance of demographic change and the need to undertake and promulgate research to inform government policy, and social and commercial responses. He played a key role in the establishment of the Leaders'

Forum in 2004 and, as its Chair, was pivotal in securing industry and government support for the Centre of Excellence bids in 2010 and 2016.

Marc is a non-executive company Director and business advisor and previously held senior executive roles in leading financial and professional services groups across Australia and Asia.

He was AIA Group CFO and AMP Group CFO, Executive General Manager Strategy & Development and Executive Director of its main operating subsidiaries.

In professional services Marc was a senior Partner with PwC including Chairman of the Australian Financial Services practices, and more recently he was a Principal Advisor with Bain & Company.

In 2015 Marc served on the Business Advisory Council and the Executive Committee of the UNSW Business School and was appointed as an Adjunct Professor at the UNSW Business School. He holds a Bachelor of Commerce (Honours) from UNSW, a Master of Wine Quality from UWS and is a Fellow of the Institute of Chartered Accountants in Australia.

MANAGEMENT COMMITTEE

The role of the Management Committee is to oversee all operational matters, including budget management, approval of specific major programs, selection of postdoctoral fellows and postgraduate students, approval of visitors and organisation of workshops. In strategic planning, the Committee seeks high level advice from the Centre Advisory Board, Scientific Advisory Committee and Leaders' Forum.

In 2016, the Committee comprised:

JOHN PIGGOTT	Centre Director (Chair)
PETER MCDONALD	Deputy Director, Chief Investigator and University of Melbourne Node Leader
KAARIN ANSTEY	Chief Investigator and Australian National University Node Leader
ROBERT CUMMING	Chief Investigator and University of Sydney Node Leader
ALAN WOODLAND	Chief Investigator and University of New South Wales Node Leader
ANNE GORDON	Director of Operations

In 2016, the Committee met on 20 April, 6 October and 28 November. Consultation also took place via email and teleconferencing and a number of informal meetings were held to handle research management decision making tasks.

The Management Committee is supported by three subcommittees:

RESEARCH SUBCOMMITTEE

The research subcommittee is responsible for reviewing the progress of the research programs on a regular basis, identifying opportunities for cross-program collaboration, and recommending remedial action where required.

Chaired by the Centre Director, its membership comprises all the Chief Investigators and the Director of Operations.

In 2016, the subcommittee met on 25 May and 28 November.

MENTORING SUBCOMMITTEE

The Mentoring subcommittee oversees the Honours, Higher Degree Research and Early Career Researcher (ECR) programs and events, and provides advice on innovation in these arenas. It is focused on developing policies and programs to support students and ECRs affiliated with CEPAR as well as those around the country working on ageing issues.

The subcommittee is chaired by CEPAR Deputy Director, Peter McDonald, and in 2016 consisted of the Centre Director, the Director of Operations, plus Associate Investigator Kate O'Loughlin, ERA representative Matthew Carroll, Associate Investigator Loretti I. Dobrescu and PhD students Natasha Ginnivan and Shang Wu. The subcommittee met in person on 11 May and virtually on 22 November.

OUTREACH SUBCOMMITTEE

The Outreach subcommittee oversees events, the distinguished visitors program, and monitors the production of research briefs and other initiatives designed to communicate research findings to the wider community.

A meeting, chaired by Chief Investigator Michael Sherris, was held on 4 May. Membership comprised the Centre Director, the Director of Operations, the two Directors of Research Engagement, CEPAR's Communications and Marketing Manager, and Senior Research Fellow Rafal Chomik.

STRUCTURE

CEPAR is based at the University of New South Wales (UNSW) with nodes at the Australian National University (ANU), the University of Sydney, and the University of Melbourne. It is strongly supported by a number of key government, industry and international university partners.

NODES

The UNSW node, led by Scientia Professor Alan Woodland, is hosted by the UNSW Business School.

The ANU node consists of teams based in the Centre for Research on Ageing, Health and Wellbeing and up until July the Crawford School of Public Policy. Professor Kaarin Anstey currently serves as ANU Node Leader.

Professor Peter McDonald moved to The University of Melbourne in July as head of the new Demography Unit within The Centre for Health Policy and heads the Melbourne node.

The University of Sydney node consists of teams in the School of Public Health and the Ageing, Work and Health Research Unit. Professor Robert Cumming leads the University of Sydney node.

All eight Chief Investigators (CIs) and many of the Centre's Associate Investigators (AIs) are based at one of the four nodes. Within Australia, Associate Investigators are also based at the Australian Catholic University, Curtin University, Flinders University, Macquarie University, Monash University, the University of Newcastle and the University of Technology Sydney.

PROGRAMS

The research program is organised into six different, but intimately connected, areas of research focus:

Causes and Consequences of Demographic Change

Cognition and Decision Making

Resources in Retirement

Ageing Well and Productively

Health and Aged Care

Ageing in Asia and its Impact on Australia

INTERNATIONAL UNIVERSITY PARTNERS

Our partner investigators are drawn from five world-class research organisations:

The University of Manchester

The University of Newcastle, UK

The Institute for Fiscal Studies

The Wharton School

The University of Pennsylvania

Through our internationally based AIs and joint research initiatives we are connected to the following key research institutions:

CESifo

Chinese Academy of Social Sciences

Harvard University

Indian Statistical Institute

Indonesian National Population and Family Planning Board

Michigan Retirement Research Center

Nanyang Technological University

Network for Studies on Pensions, Aging and Retirement (NetSPAR)

The Organisation for Economic Co-operation and Development

Peking University

Pennsylvania State University

The Ragnar Frisch Centre for Economic Research, Oslo

Research Institute for Policies on Pension and Aging (RIPPA)

St Gallen University

Southwestern University of Finance and Economics

Statistics Indonesia

Tsinghua University

United Nations Population Fund

University of Kansas

University of Malaya

University of Naples Federico II

University of Oxford

University of Parma

University of South Florida

University of Trieste

University of Wuerzburg

Zhejiang University

INDUSTRY AND GOVERNMENT PARTNERS

CEPAR is actively engaged with a range of influential government and industry partners to cooperatively deliver outcomes to meet the challenges and opportunities of population ageing. These include:

The Treasury

Department of Health

Department of Social Services

NSW Department of Industry

AMP

Bain & Company

Medibank

NAB

PricewaterhouseCoopers

Stockland

Organisations joining CEPAR for the first time in 2017 as part of the new Centre include the Australian Human Rights Commission, the Department of Foreign Affairs and Trade, MLC, NSW Treasury, the Reserve Bank of Australia, Safe Work Australia, Willis Towers Watson and the World Bank.

CENTRE PERSONNEL

CHIEF INVESTIGATORS

Scientia Professor John Piggott (Centre Director)

School of Economics
UNSW SYDNEY

Professor Peter McDonald (Deputy Director)

Crawford School of Public Policy
AUSTRALIAN NATIONAL UNIVERSITY
(UNTIL 30 JUNE 2016) and
The Centre for Health Policy
THE UNIVERSITY OF MELBOURNE
(FROM 1 JULY 2016)

Professor Kaarin J. Anstey

Centre for Research on Ageing,
Health and Wellbeing
AUSTRALIAN NATIONAL UNIVERSITY

Professor Robert Cumming

School of Public Health and
Centre for Education and
Research on Ageing
UNIVERSITY OF SYDNEY

Professor Michael Keane

School of Economics
UNSW SYDNEY and
Nuffield College
UNIVERSITY OF OXFORD

Professor Hal Kendig

Centre for Research on Ageing,
Health and Wellbeing
AUSTRALIAN NATIONAL UNIVERSITY

Professor Michael Sherris

School of Risk and
Actuarial Studies
UNSW SYDNEY

Scientia Professor Alan Woodland

School of Economics
UNSW SYDNEY

PARTNER INVESTIGATORS

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INSTITUTE FOR FISCAL STUDIES

Professor Hanming Fang

Department of Economics
UNIVERSITY OF PENNSYLVANIA

Professor Carol Jagger

Institute of Health and Society
UNIVERSITY OF NEWCASTLE, UK

Professor Olivia S. Mitchell

Wharton School
UNIVERSITY OF PENNSYLVANIA

Professor James Nazroo

School of Social Sciences
UNIVERSITY OF MANCHESTER

HONORARY PROFESSOR

Professor Robert Holzmann

Social Security Research Center
UNIVERSITY OF MALAYA

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UNIVERSITY OF KENT

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Community Sciences,
School of Aging Studies
UNIVERSITY OF SOUTH FLORIDA

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School of Economics
UNIVERSITY OF SYDNEY

Professor Helen Bartlett

Emerging Researchers in Ageing
(ERA) Initiative
MONASH UNIVERSITY

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School of Risk and
Actuarial Studies
UNSW SYDNEY

Craig Blackburn

CHALLENGER

A/Professor Heather Booth

School of Demography
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Dr Richard Burns

Centre for Research on Ageing,
Health and Wellbeing
AUSTRALIAN NATIONAL UNIVERSITY

Professor Colette Browning

Royal District Nursing Service
Limited Research Institute and
School of Primary Health Care
MONASH UNIVERSITY

Professor Monika Bütler

Department of Economics
UNIVERSITY OF ST GALEN

Professor Peter Butterworth

Melbourne School of Population
and Global Health and the
Melbourne Institute of Applied
Economic and Social Research
THE UNIVERSITY OF MELBOURNE

Professor Julie Byles

Research Centre for Generational
Health and Ageing
UNIVERSITY OF NEWCASTLE

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Institute for Health and Ageing
AUSTRALIAN CATHOLIC UNIVERSITY
(MELBOURNE CAMPUS)

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Health and Wellbeing
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Centre for Studies in Economics
and Finance
UNIVERSITY OF NAPLES FEDERICO II

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Ageing, Work and Health Research
Unit, Faculty of Health Sciences
UNIVERSITY OF SYDNEY

A/Professor Loretta I. Dobrescu

School of Economics
UNSW SYDNEY

Professor Denzil Fiebig

School of Economics
UNSW SYDNEY

Dr Joelle HY Fong

Nanyang Business School
NANYANG TECHNOLOGICAL
UNIVERSITY

Professor Bob Gregory

College of Business
and Economics
AUSTRALIAN NATIONAL UNIVERSITY

Senior Research Fellow Erik Hernæs

The Ragnar Frisch Centre for
Economic Research
UNIVERSITY OF OSLO

Dr Vasant Hirani

School of Life and
Environmental Sciences
UNIVERSITY OF SYDNEY

A/Professor Rafat Hussain

School of Medicine and Centre for
Research on Ageing, Health and
Wellbeing
AUSTRALIAN NATIONAL UNIVERSITY

Dr Fedor Iskhakov

Research School of Economics
AUSTRALIAN NATIONAL UNIVERSITY
(FROM 1 JULY 2016)

Professor Tamara Jacka

College of Asia and the Pacific
AUSTRALIAN NATIONAL UNIVERSITY

Dr Kim Kiely

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Health and Wellbeing
AUSTRALIAN NATIONAL UNIVERSITY

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AUSTRALIAN NATIONAL UNIVERSITY

Dr Vanessa Loh

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SYDNEY

Dr Ramona Meyricke

SUNCORP

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Ageing, Work and Health Research
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A/Professor Rachel Ong

Bankwest Curtin
Economics Centre
CURTIN UNIVERSITY

¹ Not all Associate Investigators were actively involved in the research program in 2016.

Professor Ermanno Pitacco
Faculty of Economics
UNIVERSITY OF TRIESTE

Dr Renuka Sane
INDIAN STATISTICAL INSTITUTE

Dr Kerry Sargent-Cox
College of Medicine,
Biology and Environment
AUSTRALIAN NATIONAL UNIVERSITY

Professor Elizabeth Savage
Centre for the Study of Choice
UNIVERSITY OF TECHNOLOGY,
SYDNEY

Adam Wenqiang Shao
MINE WEALTH + WELLBEING
(FROM 27 FEBRUARY 2016)

Professor Martin Sliwinski
Center for Healthy Aging
PENNSYLVANIA STATE UNIVERSITY

Dr Olena Stavrunova
UNIVERSITY OF
TECHNOLOGY SYDNEY

Professor Noriyuki Takayama
Research Institute for Policies on
Pension and Ageing
HITOTSUBASHI UNIVERSITY

Dr Chung Tran
Research School of Economics
AUSTRALIAN NATIONAL UNIVERSITY

Dr Iwu Utomo
School of Demography
AUSTRALIAN NATIONAL UNIVERSITY

Professor Peter Whiteford
Crawford School of Public Policy
AUSTRALIAN NATIONAL UNIVERSITY

Mr Edward Whitehouse
PENSION ECONOMIST

Dr Tim Windsor
School of Psychology
FLINDERS UNIVERSITY

Professor Zhongwei Zhao
School of Demography
AUSTRALIAN NATIONAL UNIVERSITY

Dr Rong Zhu
National Institute of
Labour Studies
FLINDERS UNIVERSITY

Dr Jonathan Ziveyi
School of Risk and
Actuarial Studies
UNSW SYDNEY

ASSOCIATE PROFESSOR OF ECONOMIC DEMOGRAPHY

A/Professor Jeromey Temple
THE UNIVERSITY OF MELBOURNE
(FROM 1 JULY 2016)

SENIOR RESEARCH FELLOWS

Rafal Chomik
UNSW SYDNEY

Dr Katja Hanewald
UNSW SYDNEY

Dr Fedor Iskhakov
UNSW SYDNEY
(UNTIL 30 JUNE 2016)

Dr Ralph Stevens
UNSW SYDNEY
(UNTIL 16 DECEMBER 2016)

SENIOR RESEARCH ASSOCIATES

Dr Jennifer Alonso García
UNSW SYDNEY

Dr Héloïse Labit Hardy
UNSW SYDNEY
(FROM 19 SEPTEMBER 2016)

Dr Han Li
UNSW SYDNEY
(FROM 1 SEPTEMBER 2016)

Dr Andrés Villegas
UNSW SYDNEY

Dr Shang Wu
UNSW SYDNEY
(FROM 10 OCTOBER 2016)

RESEARCH FELLOWS

Mr Shea Andrews
AUSTRALIAN NATIONAL UNIVERSITY
(FROM 26 AUGUST 2016)

Dr Elena Capatina
UNSW SYDNEY

Dr Xu Xiao Chun
UNSW SYDNEY

Dr Xiaodong Fan
UNSW SYDNEY

Dr Cathy Gong
AUSTRALIAN NATIONAL UNIVERSITY

Dr Vasant Hirani
UNIVERSITY OF SYDNEY
(UNTIL 5 FEBRUARY 2016)

Dr Diane Hosking
AUSTRALIAN NATIONAL UNIVERSITY

Dr Meimanat Hosseini Chavoshi
AUSTRALIAN NATIONAL UNIVERSITY
(UNTIL 30 JUNE 2016) AND
THE UNIVERSITY OF MELBOURNE
(FROM 1 JULY 2016)

Dr Ben Hsu
THE UNIVERSITY OF SYDNEY
(FROM 1 FEBRUARY 2016)

Dr George Kudrna
UNSW SYDNEY

Dr Xiangling Liu
UNSW SYDNEY

Dr Bei Lu
UNSW SYDNEY

Dr Timothy Neal
UNSW SYDNEY

Dr Adam Wenqiang Shao
UNSW SYDNEY
(UNTIL 20 FEBRUARY 2016)

Dr Gaoyun (Sophie) Yan
UNSW SYDNEY
(FROM 1 AUGUST 2016)

**Dr Vasoontara
Yiengprugsawan**
AUSTRALIAN NATIONAL UNIVERSITY



CEPAR PERSONNEL AT THE 2016 ECR RETREAT

RESEARCH ASSISTANTS

Johan Bonekamp
NetSPAR

Lisa Cannon
AUSTRALIAN NATIONAL UNIVERSITY

Nicole Ee
AUSTRALIAN NATIONAL UNIVERSITY
(FROM 13 MAY 2016)

Natasha Ginnivan
UNSW SYDNEY

Pat Moran
OXFORD UNIVERSITY

Andrew Kingston
UNIVERSITY OF NEWCASTLE, UK

James Ma
UNSW SYDNEY
(FROM 1 MARCH 2016)

Erika Martino
DEAKIN UNIVERSITY

Dr Gaoyun (Sophie) Yan
UNSW SYDNEY
(FROM 1 MARCH UNTIL 31 JULY 2016)

ADMINISTRATIVE STAFF

Anne Gordon
Director of Operations
UNSW SYDNEY NODE

Belinda Batkin
Administrative Support Officer
AUSTRALIAN NATIONAL
UNIVERSITY NODE

Amy Brushwood
Administrative Officer
UNSW SYDNEY NODE

Dee Bryant
Stakeholder Relationships
Manager
UNSW SYDNEY NODE
(UNTIL 29 MARCH 2016)

Marion Eluga
Executive Assistant to
Professor Kaarin J. Anstey
AUSTRALIAN NATIONAL
UNIVERSITY NODE

Colleen Faes-Scott
Management Accountant
UNSW SYDNEY NODE
(FROM 17 NOVEMBER 2016)

Annabella McHugh
Administrative Assistant
UNSW SYDNEY NODE

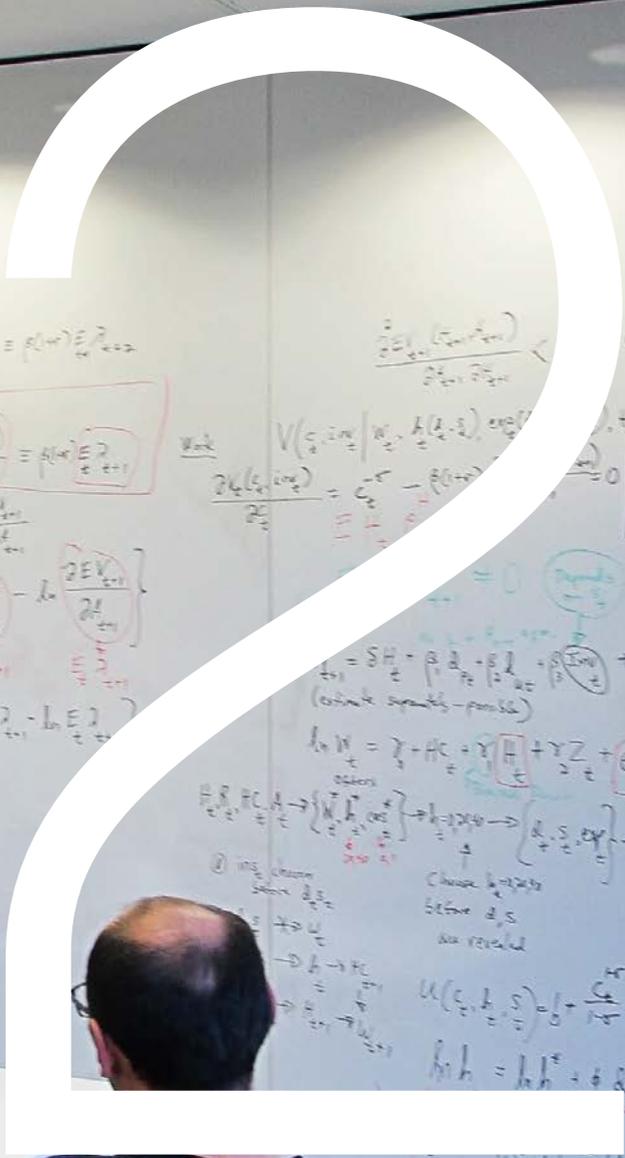
Grainne Murphy
Communications and
Marketing Manager
UNSW SYDNEY NODE
(UNTIL 20 APRIL 2016)

Pamela Simpkins
Senior Finance Officer
AUSTRALIAN NATIONAL
UNIVERSITY NODE

Somphone Siviengphanom
Research Group Administrator
UNIVERSITY OF SYDNEY NODE
(UNTIL NOVEMBER 2016)

Martina Stierner
Finance Officer
UNSW SYDNEY NODE
(UNTIL 19 JULY 2016)

SECTION



RESEARCH &
RESEARCH TRAINING

CHIEF INVESTIGATOR MICHAEL KEANE WITH RESEARCH FELLOWS
ELENA CAPATINA AND FEDOR ISKHAKOV

AREA OF RESEARCH FOCUS

1

CAUSES AND CONSEQUENCES OF DEMOGRAPHIC CHANGE

Population ageing has national, regional and global economic, social and policy implications. Understanding the causes of fertility behaviour and longevity change, and improving the accuracy and texture of our projections and forecasts, is therefore critical for long-term planning and innovation by both government and business. Demographic change impacts families and individuals through changes in the economic and social environment within which they work.

These adjustments are mediated through markets, impacting wage rates, resource allocation, productivity and growth; through international and regional migration; through innovation and regulatory change in financial product markets; and through changing patterns of demand for social services and aged care, and social interactions. Government is impacted through increased expenditures required for age pensions, public health provision and the development of economic and social policy settings.

TO VIEW PUBLICATIONS
AND WORKING PAPERS RELATING
TO THIS RESEARCH VISIT CEPAR.EDU.AU

RESEARCH PROJECTS

HANDBOOK OF THE ECONOMICS OF POPULATION AGING	22
AGEING IN AUSTRALIA: CHALLENGES AND OPPORTUNITIES	24
POPULATION AGEING AND AUSTRALIA'S FUTURE	25
ANALYSING THE EFFECTS OF POPULATION AGEING IN A DEMOGRAPHIC OVERLAPPING GENERATIONS MODEL	26
POPULATION AGEING, INNOVATION AND GROWTH	28
ESTIMATION OF LIFE-CYCLE MODELS OF AUSTRALIAN HOUSEHOLDS WITH RETIREMENT POLICY	29
NATIONAL TRANSFER ACCOUNTS	30

This area of research focus (ARF) encompasses both demographic and macro type economic analysis of population change. As well, in 2016, it delivered two landmark edited research volumes. These are important because in different ways, they provide a foundation for future research in their respective areas. The Elsevier *Handbook of the Economics of Population Aging* is an important step in defining a new sub-field in Economics; the ASSA volume on *Population Ageing and Australia's Future*, by contrast, is a genuinely inter-disciplinary volume focused on Australia's changing demographic and the challenges it generates. As well, a further edited volume summarises the Australian experience of ageing, and associated policy. Final write-ups of these projects appear in research reports in this section. Other highlights in the ARF for 2016 include:

- **NATIONAL TRANSFER ACCOUNTS**
The development of a set of National Transfer Accounts (NTA) for Australia has had a long gestation. It is part of an international effort to generate these accounts for some 60 countries around the world. Their essential purpose is to show how various resources, both time and money, flow between age cohorts, and thus get some sense of intergenerational fairness for policy. The NTA measures age-specific labour income, asset income, consumption, transfers and saving, accounting for flows within households, between households, through the public sector and with the rest of the world. This broad initiative has unquestionably lifted the quality of analysis around intergenerational

issues, both in Australia and around the world. This ongoing work, led by CI Peter McDonald, has now established NTA accounts for a range of years starting in 1980, and international comparison work is underway. It provides a powerful tool for policy analysis in areas where intergenerational transfers are important.

- **ECONOMIC MODELLING FOR AUSTRALIA**
Most of the CEPAR macro-modelling work focused on Australia is led by CI Alan Woodland. Through 2016, advances in a range of modelling projects have been achieved. These include the application and extension of the Overlapping Generations Model for Australia developed with George Kudrna and Chung Tran. This model is ideally suited to analysing the budgetary implications of policy change in the context of demographic transition, and several papers have been written and published focusing on this topic. In addition ongoing and path-breaking work on endogenous growth and population change – a project aimed at capturing the interdependencies between technical change and population

change – has advanced. Other modelling exercises include life-cycle estimation with retirement policy, and housing – two separate projects have been initiated to focus on this very important lifetime resource.

RESEARCHERS

JOHN PIGGOTT
ALAN WOODLAND

Over the last several years, a handbook of the economics of population ageing has been under preparation, edited by Cls John Piggott and Alan Woodland, to be published by Elsevier. The Elsevier Handbook series is the most prestigious in the Economics discipline: in the past these handbooks have helped define new fields of research, with contributions from major figures in Economics. This Handbook is no exception.

The plan was to execute the volume over the life of CEPAR. Authors were carefully chosen in 2011 and 2012. In 2013, the project received real impetus, and

benefited immensely, from a workshop held in the Department of Global Health and Population, Harvard University, in October. David Bloom hosted the workshop and the Harvard University Australian Studies Committee provided financial support. Chapters were prepared, externally reviewed, and revised, over the next three years. It was published in December 2016.

The Handbook, in two volumes, aims to contribute to the accumulating knowledge base around population ageing by bringing together some of the world's leading economists to provide perspectives from their field to understand the issue. CEPAR scholars were prominent among the contributors.

Each of the editors authored or co-authored a chapter. In addition, Cl Michael Keane, Pls Hanming Fang and Olivia S. Mitchell, and Al Loretto I. Dobrescu authored or co-authored chapters. All up, the Handbook comprises 17 chapters, with more than 1000 published pages over the two volumes.

The Handbook objective is to gather into one place as much accumulated knowledge and insight as possible on the economic causes and consequences of demographic change, along with analyses of the policy responses that have emerged. The hope is that this will provide a base to inform and inspire future research in the field.

It can be read either as a whole, or as a source of expert knowledge on a specific topic. Volume 1A begins by documenting and explaining theories about demographic change, and then highlights macroeconomic and market adjustments. The underlying motivation here is to provide up-to-date syntheses of current economic thinking on the broad causes and consequences of population ageing. Volume 1B drills down to analyse household behaviour and policy response. Intergenerational transfers, of time, money, and other resources, are primarily transacted through family and government, so it is natural that these institutions receive emphasis. A concluding chapter describes the data infrastructure which has

been built around older cohorts over the last quarter century, which will provide an important basis for future empirical research in the field.

Volume 1A opens with an account of the current state of empirical knowledge and theoretical structures to explain the phenomenon of population ageing (Part I). This thorough overview provides the backdrop for much of the analysis to follow. It was important to begin the volume with what is known and what we understand about the demography of population ageing.

**DR GAOYUN (SOPHIE) YAN**

BS (Econ) Shanghai University
of Finance and Economics,
PhD UNSW

RESEARCH FELLOW

Sophie Yan is a CEPAR Research Fellow at the UNSW Business School. She started in 2016 after graduating with a PhD in Economics from the University of New South Wales.

Sophie's research interests include labour economics, health economics, pension and retirement saving, with a particular focus on policy evaluation. Her current work studies the pension system and retirement saving in Australia, as well as suicidal behaviour among the elderly in rural China.

In 2016 Sophie was involved in the development of Chapter 14 in the *Handbook of the Economics of Population Aging*, 'Workplace-linked pensions for an aging demographic', and the forthcoming CEPAR Research Brief on Retirement Incomes.

Part II examines both macroeconomic and specific market analyses to explore what we know about the overall economic impacts of population ageing.

It includes chapters devoted to macroeconomic and global analysis. They deal both with adjustments within a country, and with the interactions between regions with different demographic dynamics. Separate chapters are devoted to the links between migration and ageing; the functioning of the insurance market in the face of an ageing demographic; intergenerational risk-sharing; and the political economy of ageing.

Volume 1B begins with a group of chapters (Part III) designed to show how population ageing impacts household decisions and behaviour. These impacts can be direct, for example through the influence of smaller families and longer lifespans, and indirect, through fiscal adjustments that change the nature of household decision making. Chapters cover labour market interaction and the retirement decision, financial choices, and issues within the family, and pay particular attention to the challenges households confront in making complex and unfamiliar choices, especially in the context of cognitive ageing.

Part IV brings a policy perspective to demographic change. Chapters in this Part cover the major areas of policy that are impacted by an ageing demographic – taxation, health and long-term care, retirement incomes, and inequality. The taxation chapter analyses the fiscal implications of demographic change, and discusses design issues, such as age-dependent taxation and the role of capital income taxation in an ageing economy. Other chapters deal with retirement incomes. These are followed by a chapter focused on ageing and poverty. Part IV concludes with a chapter on health and long-term care, which

emphasises this latter topic, now at the frontier of policy towards an ageing demographic in many countries. Finally, a concluding chapter (Part V) reviews an important social science research infrastructure development – the establishment of multidisciplinary and nationally representative surveys of older cohorts, now covering about two thirds of the world's population. These surveys, which are to a considerable extent harmonised between countries, generate an enormous potential for future research.

The Handbook objective is to gather into one place as much accumulated knowledge and insight as possible on the economic causes and consequences of demographic change, along with analyses of the policy responses that have emerged. The hope is that this will provide a base to inform and inspire future research in the field.



SCIENTIA PROFESSOR JOHN PIGGOTT
BA Syd., MSc PhD Lond., FASSA
CENTRE DIRECTOR

John Piggott is Scientia Professor of Economics in the UNSW Business School.

He has a long standing interest in retirement and pension economics and finance, and in public finance. His publications include more than 100 journal articles and chapters in books, which have

appeared in the leading international academic journals as well as in highly cited conference volumes. In addition, he has co-authored two books, both published by Cambridge University Press.

His national policy experience includes membership of both the Henry Tax Review Panel (2008-2009) and the Australian Ministerial Superannuation Advisory Committee (2007-2011), among other appointments.

Internationally, he worked with the Japanese government for nearly a decade from 1999 on pension and population ageing issues. In 2004, he was tasked with evaluating World Bank assistance on pension reform in the Asian region for the Bank's Operations Evaluation Department. In 2007 he was appointed Visiting Professor at Zhejiang University in China, an on-going appointment, and from 2008-2010 was Visiting

Scholar with the Department of Insurance and Risk Management, Wharton School of Business, University of Pennsylvania.

John serves as book review editor of the *Journal of Pension Economics and Finance* and is an Associate Editor of the new Elsevier journal, *The Journal of the Economics of Ageing*.

RESEARCHERS

KATE O'LOUGHLIN
COLETTE BROWNING
HAL KENDIG

This edited book published by Springer International for release in January 2017 provides a multidisciplinary overview of the social and individual dimensions of ageing in Australia. The textbook-style publication provides a strong evidence base for practitioners, policymakers, graduate students, and international readers on ageing and older people in community settings and health and aged care services.

The book has a foreword by the Honourable Mark Butler MP. CEPAR-affiliated researchers have written nine of the chapters:

Introduction: Challenges and Opportunities

O'Loughlin, Kendig and Browning provide an overview of the book's constructive approach to ageing and the opportunities and challenges ahead for individuals and Australia.

Australian Developments in Ageing: Issues and History

Kendig creates a 'big picture' of Australian developments in ageing over the post-WWII era including life span development, social change and historical legacies.

Attitudes to Ageing

O'Loughlin and Kendig examine age-based attitudes and stereotypes, and available evidence on how these are manifested in the workplace, public institutions, health care and policy discourses and strategies.

Population Ageing A Demographic Perspective

McDonald considers population ageing in the context of national and global trends with a particular focus on spatial patterns and geographic diversity.

Health and Ageing

Byles provides a health profile of older Australians including epidemiological evidence on changing patterns of health-related capacities and vulnerabilities.

Retirement Income

Bateman, Chomik and Piggott review Australia's retirement income system (pensions, superannuation, and taxation) and its capacity to provide equitable and sustainable standards of living for older people.

Primary Healthcare and Older People

Browning and colleagues provide an overview of health services in community settings, focusing on initiatives in terms of access, affordability and efficacy.

Care and Support for Older People

Jeon and Kendig consider what we mean by aged care (self-help, family, accommodation) and review policy from 'industry' and consumer perspectives and recent policy reforms including implementation and practice issues.

Direction and Choices for the Future

Kendig reviews issues of intergenerational equity, fiscal sustainability and national productivity, as well as self-determination and wellbeing of older people, including promising directions for Australians.

This edited book provides a multidisciplinary overview of the social and individual dimensions of ageing in Australia.



ASSOCIATE PROFESSOR
KATE O'LOUGHLIN

BA (Hons) Macq., PhD Syd.
ASSOCIATE INVESTIGATOR

Kate O'Loughlin is an Associate Professor in Health Sociology, and a member of the Ageing, Work and Health Research Unit in the Faculty of Health Sciences at the University of Sydney.

Her research interests and expertise are in population ageing with a particular focus on the baby boom cohort and workforce participation, and social policy relating to ageing in Australia and globally. Her current research projects investigate the interplay between paid work and unpaid caregiving and its relationships with health and wellbeing; behaviours and

exposures across the life course and their effect on health outcomes in later life; and individual and community attitudes to ageing, with a specific focus on age discrimination in the workplace. She leads the CEPAR project on Work and Caregiving, an international collaboration with scholars from universities in Canada (Alberta), the UK (Sheffield),

New Zealand (Auckland) and China (Zhejiang).

She has published widely in the gerontology/ageing and sociology literature and has a record of successful supervision and mentoring of higher degree students; she is primary supervisor of two CEPAR-affiliated students from the Faculty of Health Sciences.

RESEARCHERS

HAL KENDIG
PETER MCDONALD
JOHN PIGGOTT

The book *Population Ageing and Australia's Future* was based on the Academy of Social Sciences in Australia (ASSA) 2014 Annual Symposium, on population ageing, which was sponsored by CEPAR. The event and the subsequent publication, provided an opportunity for CEPAR to lead national thinking on the long-term challenges and opportunities of an ageing Australia. The book was a joint effort by ASSA and CEPAR, with publication by ANU Press. It was launched by the Hon Kay Patterson AO, Age Discrimination Commissioner, on 8 November at the ASSA National Symposium in Canberra.

The editors, Hal Kendig, Peter McDonald and John Piggott, are all CEPAR Chief Investigators, and all Fellows of ASSA. In addition to the editors, who each have separate contributions in the volume, the authors are all leaders in their fields with a number of CIs, AIs and Research Fellows contributing. CEPAR contributors include Kaarin Anstey, Tim Windsor, Richard Burns, Colette Browning, Hazel Bateman, Rachel Ong, Lisa Cannon, Cathy Gong and Rachel Curtis. Naohiro Ogawa, Professor of Population Economics at Nihon University, Japan, also contributed, offering a global overview of demographic change.

Following the Editors' Introduction, the volume comprises four substantive sections: Perspectives on the future; Population ageing: global, regional and Australian perspectives; Improving health and wellbeing; and Responses by government and families/individuals. The book's multidisciplinary approach - economists, demographers, sociologists, gerontologists and psychologists have all contributed - reflects the CEPAR paradigm, and brings together various research on population ageing in Australia, and contrasts them with global experiences.

The book brings new perspectives to bear on the traditional issues of health, wellbeing and social inclusion; the retirement decision; pensions and superannuation; and housing; expounded by some of Australia's most prominent experts on the topics. The book is a testament to the range of research currently being conducted on population ageing, and calls for new research, policy, and public affairs initiatives. It makes an important contribution to the field with the potential of being frequently cited, as the issue continues to grow in importance.

The book (provides)... an opportunity for CEPAR to lead national thinking on the long-term challenges and opportunities of an ageing Australia.

ANALYSING THE EFFECTS OF POPULATION AGEING IN A DEMOGRAPHIC OVERLAPPING GENERATIONS MODEL

RESEARCHERS

GEORGE KUDRNA
CHUNG TRAN
ALAN WOODLAND

Australia, like most other developed countries, has an ageing population, attributed to falling mortality and fertility in the past. Projected mortality improvements in the next several decades will lead to further ageing of Australia's population, which is also expected to increase significantly in size due largely to immigration. Such fundamental demographic changes will have vast implications for the Australian economy and, in particular, for the fiscal policies of the government, since it is likely to experience budgetary stress as a consequence of having

public expenditures that depend heavily on age related public programs. Foremost amongst these are pension, aged care and health programs, each of which induce greater expenditures with an ageing population. Fiscal reform will inevitably form part of the overall policy response to demographic change, but formulating such policy response requires a solid understanding of the evolution of demographic structure and its interaction with economic activities.

This project develops a framework to study the economy-wide effects of the dynamic evolution of the age structure and the size of Australia's population and of fiscal policy responses to such demographic changes. More specifically, our model

consists of a demographic model with population projections and an economic general equilibrium model. The demographic model is used to project future changes in the age structure and size of the population, based on assumptions regarding future movements in the age profiles for fertility, longevity and immigration. The economic model is a small open-economy model with overlapping generations that embodies a rich fiscal structure with public expenditures on health care, aged care and means-tested pension as well as on education and family benefits. The benchmark economy is calibrated to match key Australian macroeconomic and fiscal aggregates and to approximate the life-cycle

behaviour of Australian households, including labour supply, labour earnings and pension payments observed from the household survey data.

The first paper 'The Dynamic Fiscal Effects of Demographic Shift: The Case of Australia', which resulted from this project, quantifies the economic and fiscal effects of projected demographic shift and examines the sensitivity of these effects with respect to alternative assumptions for fertility, mortality and net immigration rates. The paper was presented at several international conferences and seminars, and published in *Economic Modelling* in 2015.

The follow-up paper 'Facing Demographic Challenges: Pension Cuts or Tax Hikes?'

investigates the two policy options to mitigate fiscal pressure arising from population ageing in Australia. Using an extended version of our economic model that accounts for technical progress and disaggregates households not only by age but also by income type, the paper quantifies the macroeconomic and distributional welfare effects of (i) cuts to government spending by reducing pension benefits and (ii) increases in tax revenues through adjusting consumption or income taxes. The results highlight the inter- and intra-generational conflicts of interest and political constraints when designing a more sustainable tax-transfer system.



DR CHUNG TRAN

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ASSOCIATE INVESTIGATOR

Chung Tran is a Senior Lecturer in the Research School of Economics at the Australian National University. Prior to his appointment at ANU, he worked at the University of New South Wales and Indiana University.

Chung's primary research interests lie in the areas of macroeconomics and public finance. Much of his current work explores the role of social insurance systems and macroeconomic aspects of fiscal policy. Specific research topics include: evaluating trade-offs in designing social security and health insurance systems; analysing the dynamic effects of fiscal

policy; and understanding the consequences of debt financing and fiscal austerity measures. His work appears in leading academic journals including the *European Economic Review*, the *Journal of Development Economics* and the *Journal of Economic Dynamics and Control*.

This second paper was presented at several international venues, and accepted for publication in *Macroeconomic Dynamics* in September 2016.

In 2016, we started working on the third paper titled 'Ageing and Sustainable Pensions with Means Testing' that is part of this research project. The objective of this paper is to examine how and to what extent the automatic stabilising device built in a means-tested pension system can absorb the fiscal cost caused by demographic shift. Specifically, we characterise combinations of the maximum pension benefit and taper rate that maintain long-run fiscal sustainability. We also analyse macroeconomic and welfare outcomes of such a sustainable means-tested

pension system. The results will be written up as a CEPAR working paper and submitted for publication in a high-quality peer reviewed journal in economics in the second half of 2017.

The three aforementioned papers make use of deterministic population projections. The alternative approach to forecast demographic outcomes is to apply stochastic population models that also use historical data, but in which future fertility, mortality and net immigration rates are considered as random variables. In 2016, we used the program for error propagation (PEP) developed by Alho *et al.* (2005) to generate stochastic population forecasts with a probability distribution of Australia's population over the period of 2013-2100.

We will incorporate these stochastic population forecasts into our overlapping generations model to investigate the effects of uncertain demographic transitions on the government's budgetary situation, including the implications for age-related expenditures and tax revenues. It is anticipated that this research will be completed by the end of 2017.

Project outputs include:

- 1 Kudrna, G., Tran, C. and Woodland, A. (2016). Facing Demographic Challenges: Pension Cuts or Tax Hikes?. *Macroeconomic Dynamics* (forthcoming).

- 1 Kudrna, G., Tran, C. and Woodland, A. (2015), The Dynamic Fiscal Effects of Demographic Shift: The Case of Australia. *Economic Modelling*, 50, 105-122.

Fiscal reform will inevitably form part of the overall policy response to demographic change, but formulating such policy response requires a solid understanding of the evolution of demographic structure and its interaction with economic activities.



SCIENTIA PROFESSOR
ALAN WOODLAND
BA PhD UNE, FASSA, FES
CHIEF INVESTIGATOR
AND UNSW NODE LEADER

Alan Woodland is Scientia Professor of Economics in the School of Economics within the UNSW Business School.

Woodland's primary research interests and publications are in the areas of international trade theory, applied econometrics and population ageing. He has published in leading journals including *Econometrica*, *Review of Economic Studies*, *Journal of Econometrics* and *Journal of International Economics*.

He is the recipient of the Distinguished Economist Award of the Economics Society of Australia. He is an Associate Editor of the *Review of International Economics*, a past editor of the *Economic Record*, and is currently on the editorial boards of *Empirical Economics*, the *International Journal of Economic Theory* and the *Economic Record*.

Woodland has been a Reserve Bank of Australia Fellow in Economic Policy and a Senior Fulbright Fellow. He is also on the scientific boards of the European Trade Study Group (ETSG), Asia Pacific Trade Seminars (APTS), Australasian Trade Workshop (ATW) and the Dynamics, Economic Growth, and International Trade (DEGIT) Research Centre.

RESEARCHER

ALAN WOODLAND

External Collaborator

XIAO CHEN
(UNSW)

This research project is primarily concerned with the potential roles of individual ageing and population ageing in determining rates of innovation and technological progress. Since economic growth depends largely on innovation, this project will investigate various aspects of whether and how economic growth is affected by individual ageing or population ageing.

The main theme of the project is to undertake a theoretical analysis of the effect of ageing, including both individual ageing and population ageing, upon endogenous economic growth. The primary tasks are to construct and analyse theoretical models of the impacts of ageing upon technological progress, including whether technological progress has certain bias in different research sectors, and how population ageing could affect the skill premium, in an international trade model.

During 2015, following the completion and formal approval of Xiao Chen's PhD thesis on this topic, several research papers were drafted. The first models individual ageing in accordance with the psychology literature and analyses its impact on technological progress, in an international context with both technology innovation and adoption. The second paper amends the classical overlapping-generation model with survival uncertainty and human capital investment via costly education and analyses how population ageing affects educational effort and macroeconomic performance. The third paper studies the impacts of population ageing educational efforts, technological progress and especially skill premium in an international trade model.

During 2015, research effort was mainly devoted to further research on the third paper. It was anticipated that further work required to bring the paper to the stage of journal submission would have been done during 2016. However, progress was limited due to other commitments. Nevertheless, some numerical experiments designed to provide numerical illustrations of the model's features and results were programmed and undertaken and these were promising. The extension of these experiments and the re-writing required to bring this paper to fruition will now be done in late 2017.

Overall, the project aims to contribute to knowledge about how population ageing affects technological innovation and, hence, how it impacts on productivity, the rate of growth and economic welfare.

The main theme of the project is to undertake a theoretical analysis of the effect of ageing, including both individual ageing and population ageing, upon endogenous economic growth.

ESTIMATION OF LIFE-CYCLE MODELS OF AUSTRALIAN HOUSEHOLDS WITH RETIREMENT POLICY

RESEARCHER

ALAN WOODLAND

External Collaborator

CHRIS STRICKLAND
(BANK OF QUEENSLAND)

One of the important aspects of the study of population ageing concerns the behaviour of individuals and households over their life-cycle (life course) and how this behaviour is affected by market forces and by retirement and tax policy settings of governments. This project aims at using panel data on Australian individuals and households drawn from the Household, Income, Labour Dynamics in Australia (HILDA) Survey to estimate structural models of life cycle behaviour and to use the estimates to simulate the impacts of policy upon life-cycle behaviour. The expected outcome from the project is a better understanding of how individuals behave and how changes in policy arising from population ageing affect the household sector.

This project is based upon the premise that it is important to understand how taxation and retirement policy, including Age Pension and superannuation rules, affects household behaviour concerning decisions to save, work and retire using available household data. This research project does this by constructing a structural model of household behaviour over the life-cycle that is firmly based upon economic theory and is estimated using econometric techniques applied to panel data drawn from the HILDA Survey.

During 2015, work continued but at a reduced level due to the departure of one of the researchers (Strickland) from CEPAR early in the year. Nevertheless, by maintaining a consultative role, work has continued on the writing of software programs to estimate the

model via both maximum likelihood and Bayesian estimation methods. Access to the Katana multiple CPU computing facility was developed to facilitate the computational demanding estimation methods. During 2016, we had hoped to reach the stage of detailed estimation of the economic model and analysis of results using the HILDA data but other commitments prevented this outcome. Nevertheless, work continued and the major development was the theoretical construction of a new algorithm for solving the life-cycle problem. This promising method remains to be programmed and tested numerically.

This task will continue into 2017. Once tested positively, it will be applied to the estimation and analysis task at hand.

Overall, the project aims to contribute to the structural modelling of life-cycle behaviour, to knowledge about the life-cycle decisions of Australian households and to the evaluation of retirement and tax policy impacts arising from population ageing.

It is important to understand how taxation and retirement policy, including Age Pension and superannuation rules, affects household behaviour concerning decisions to save, work and retire using available household data.

RESEARCHERS

PETER McDONALD
JEROMEY TEMPLE

External Collaborator

JAMES RICE
(ANU)

The Australian National Transfer Account project (ANTA) is part of the international NTA Programme now underway in more than 60 countries. With increasing interest in the heterogeneity in age-based consumption and production, in 2014 this team constructed the first full NTAs for Australia using the internationally consistent NTAs methodology for two years: 2003-04 and 2009-10.

The formal definition of the NTA is 'a system of macroeconomic accounts that measures current economic flows by age in a manner consistent with the United Nations System of National Accounts. NTA measures age-specific labour income, asset income, consumption, transfers and saving, accounting for flows within households, between households, through the public sector and with the rest of the world'².

With multiple cross-sections, the NTA offers the ability to study the evolution of intergenerational transfer systems and the consequences of alternative approaches to age reallocations embodied in public policy with respect to

pensions, health care, education and social institutions. In recognition of this important contribution to knowledge, the team were contracted by the Department of Social Services to construct NTAs for previous years. The result is that NTAs are now available for Australia for the following years: 1981, 1988-89, 1993-94, 1998-99, 2003-04 and 2009-10. A comprehensive report on the results was provided to the Department of Social Services in 2016 and this report is now ready for publication in the near future. The report provides estimates of economic flows in a wide range of forms across age groups that arise from differential consumption and production

profiles, and how these flows have changed across time. The new report also includes account estimates for assets and liabilities, the first time that these estimates have been included in the NTA for any country.

During 2016, work was undertaken on three papers using NTA results:

(1) how the Australian NTA compares with the NTAs for other OECD countries, (2) changes over time (1984 to 2010) in the components of the Australian NTA, and (3) application of NTA wealth data to estimate the asset types and values of persons who die in a given year.

... the NTA offers the ability to study the evolution of intergenerational transfer systems and the consequences of alternative approaches to age reallocations embodied in public policy with respect to pensions, health care, education and social institutions.

² United Nations. (2013). *National Transfer Accounts Manual: Measuring and Analysing the Generational Economy*. United Nations, New York.



ASSOCIATE PROFESSOR JEROMEY TEMPLE

BA Population Studies (Hons)
BCom PhD (Demography) ANU

ASSOCIATE PROFESSOR OF
ECONOMIC DEMOGRAPHY

Jeromey Temple is Associate Professor of Economic Demography at CEPAR, located in the Melbourne School of Population and Global Health at the University of Melbourne.

Temple is one of Australia's few economic demographers and leads the Australian National Transfer Accounts (NTA) project. The NTA seeks to improve our understanding of the generational economy through documenting the economic life-cycle in a manner consistent with the system of National Accounts. The Australian NTA forms part of a large international effort with research teams on the

NTA covering over 80 countries in the Asia-Pacific, Americas, Europe and Africa with a total population in excess of 6 billion people. Jeromey also works on a range of other research projects, mainly at the intersection of demography, economics and public policy, and their relationship to ageing at both the individual and population level. Jeromey is currently supervising a number of

PhD students on topics including population ageing and equity market performance, microsimulation models of aged care and the economic contribution of migrants to the Australian economy. Over the past decade, he has completed over forty research projects for Australian Federal and State governments as well as private sector clients.

AREA OF RESEARCH FOCUS

2

COGNITION AND DECISION MAKING

Individual ageing involves changes in competency that may affect relationships, communication and decision making, including the ability to drive, determine the best retirement plan or sensibly choose a health insurance policy. Population ageing has brought with it government policies designed to reduce public exposure to support for older cohorts, or the risks they face.

This inevitably means that ageing cohorts now and in the future will confront decisions that are important, and in which they or their families have little experience. Increasingly these choices will have to be made at advanced ages, when cognitive decline may impact decision making and choice. Our research combines the expertise of economists, actuaries and psychologists to investigate these issues.

TO VIEW PUBLICATIONS
AND WORKING PAPERS RELATING
TO THIS RESEARCH VISIT CEPAR.EDU.AU

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Most of the research undertaken under this area of research focus can be grouped into three categories: Cognitive ageing; issues in choice and decision-making; and extensions to the life-cycle paradigm. These are of course connected. Studies around cognitive ageing reveal the vital psychological and physiological causes behind the process of cognitive decline, and how it might be slowed. Life-cycle models provide a frame within which errors in choice might be identified and their severity assessed. And choice studies provide new knowledge about how choices are actually made.

Among this year's highlights are:

- **COGNITIVE AGEING**
A fascinating project being led by CI Kaarin Anstey is investigating the complex range of factors that influence individual trajectories of cognitive development and cognitive decline in ageing. The 2016 focus was on gender, partly motivated by a search for an explanation for why Alzheimer's disease in late life is more prevalent among women. Extensive analysis of 12 year follow-up data from the PATH Through Life cohorts has shown that there are large differences in the prevalence of risk and protective factors between men and women. Men tend to have more cardiovascular risk factors (hypertension, diabetes, smoking) and women have higher rates of depression. Examination of gender differences in cognitive abilities found that there are differences in this dimension too, and that these are consistent across age groups and over time.
- **LIFE-CYCLE MODELS**
Life-cycle models are complex to build and estimate. Once constructed and estimated, they provide the basis for explaining individual choices, and evaluating how consumers can get complex choices wrong. The complexity of construction means that these estimated models often omit important dimensions of choice context. CEPAR research led by CI Michael Keane aims to progressively generalise estimated models of the life-cycle to address these shortcomings. One particular project reported here examines how people take account of their own life expectancy and productivity in making investments in health care. An important aim is to better understand the causal pathways that lead to the well documented association between higher socioeconomic status and better health. This will add to the evidence base required for more effective health policy decisions.
- **CHOICE STUDIES**
The global shrinkage of government insurance programs around retirement and health means that households are now required to make unfamiliar and complex decisions about their financial and health futures, sometimes at advanced ages. Complex financial decisions are specifically addressed in a major study led by AI Hazel Bateman. This research is informing decisions by superannuation funds, in assessing the efficacy of on-line financial advice, and in providing new insights into annuity demand, a long standing puzzle in financial and insurance economics.

RESEARCHERS

KIM KIELY
KAARIN J. ANSTEY

This program of research investigates the social and health implications of age-related sensory impairment. Vision and hearing loss can have debilitating impacts on an individual's professional and personal life, especially for those who have enjoyed good sensory functioning earlier in life. Despite high prevalence of hearing loss and vision loss, decline in sensory acuity is poorly recognised and 'invisible', exerting subtle effects that accumulate over time if not detected and treated early. For example, communication and mobility difficulties arising from sensory loss can give rise to loss of independence, social

withdrawal, poorer mental health, and reduced quality of life. Importantly, as both hearing and vision loss predict cognitive decline and dementia incidence, their comorbidity may not simply be a coincidental result of general ageing processes but could reflect a causal connection via an underlying biological aetiology or social pathway.

In 2016, our research on the intersection between cognitive ageing, sensory decline, and non-cognitive aspects of dementia has been presented at the Australian Association of Gerontology (AAG) annual conference and the Alzheimer's Association International Conference (AAIC), and at public talks for the Flinders Centre for Ageing Studies, and Alzheimer's Australia Brain

Awareness Week Forum. An invited submission to a special issue in *International Psychogeriatrics* is currently being prepared on sensory impairment as a dementia prodrome.

Research highlights include showing how neuropsychiatric symptoms are associated with single sensory loss among adults living with dementia and with dual sensory loss among adults living with mild cognitive impairment. However, there are no links between sensory impairment and neuropsychiatric symptoms among cognitively healthy adults.

These findings show that cognitive resources are important for managing daily life with sensory loss (manuscript currently under review). Current work is focusing on elucidating causal pathways between sensory loss and cognitive decline.

These findings show that cognitive resources are important for managing daily life with sensory loss.



DR KIM KIELY
BLib (Hons) Syd. PhD ANU
ASSOCIATE INVESTIGATOR

Kim Kiely is a Postdoctoral Research Fellow within the Centre for Research on Ageing, Health and Wellbeing (CRAHW) at the Australian National University. He currently holds an NHMRC Early Career Fellowship entitled 'Estimating and Alleviating the Impacts of Age-Related

Sensory Decline' and in 2015 was awarded the RM Gibson Award from the Australian Association of Gerontology.

Kim has a background in psychology and epidemiology, and his research is orientated by a contextualised perspective to human development across the life course. His core research interests encompass aspects of healthy and productive ageing, focusing on the

social, functional and cognitive impacts of sensory loss in late life.

Current work includes the estimation of sensory impairment and cognitive impairment free life expectancies, analyses of the determinants and outcomes of successful sensory aid use, and identifying mechanisms underlying sensory-related cognitive decline. Kim also maintains a strong interest in

psychiatric epidemiology through his involvement in a research program investigating the mental health of welfare recipients. This stream of research examines mental health inequalities among Age Pension recipients and considers the implications of reforms to the pension system.

RESEARCHERS

KARRIN J. ANSTEY
KIM KIELY
DIANE HOSKING

External Collaborator

RANMALEE ERAMUDUGOLLA
(ANU)

This program of research aims to describe and characterise driving in older adults, develop methods and instruments to evaluating risk and psychological readiness to cease driving, and interventions to improve safety. This research program is multi-pronged – with outputs aimed at clinicians, individual drivers and policymakers.

Specific advances in 2016 include the collation of data on our Readiness to Ease Driving Inventory (REDI) for which we have collected data on over 450 drivers aged 65 and older. Analysis of the scale shows it has five factors: Intention, Expectation, Regulation, Control and Willingness.

The subscales demonstrated good internal reliability and content validity against a range of self-reported measures of driving habits and behaviours in two samples. Comparison with prospective data on actual driving cessation revealed that the REDI full-scale and categories showed good predictive validity, sensitivity and specificity for identifying adults who go on to cease driving.

In other work submitted for publication we have characterised older drivers in our PATH Through Life cohort and shown that only one per cent of adults in their 70s cease driving per annum. Older Australian drivers in their 70s expected to drive for another 12.6 years and the majority drove six or more days per week. Participant expectations of giving up driving were associated with poorer self-rated health, mastery, difficulties reading maps, self-rated visual function, years of driving experience, and fewer kilometres driven per week.

Finally, one of our intervention projects has evaluated a laboratory based cognitive training package to improve older driver skill. This pilot study demonstrated improvement on a commonly used driver screening test after the training but future research is needed to establish whether the benefits will transfer to actual on-road driving.

Participant expectations of giving up driving were associated with poorer self-rated health, mastery, difficulties reading maps, self-rated visual function, years of driving experience, and fewer kilometres driven per week.

RESEARCHER

KARRIN J. ANSTEY

External Collaborator

RANMALEE ERAMUDUGOLLA
(ANU)

Findings from a study of cognitive interventions to improve older adults' driving skills demonstrate that computerised training of information processing speed leads to significant improvement in the speed at which older adults detect information in their visual periphery, and their speed of foot and hand responses to visual information, when compared with older adults who did not receive any training. No effect of training was found on a number of other tasks related to driving safety, including tasks

measuring sensitivity to visual motion, cognitive flexibility, and knowledge of road law – demonstrating the specificity of the effects. Importantly, however, training was also associated with significantly slower detection of traffic hazards on naturalistic video footage of a driving environment. The results suggest that although the effects of this cognitive training program can translate to similar processes relevant to driving behaviour, it may lead to changes in strategy on more goal-directed cognitive

tasks, which may not be beneficial to safe driving. The findings are in preparation for publication. Further work is required to determine factors that influence how cognitive training effects are translated to complex driving behaviours, and the ultimate effects of such training on on-road driving skill in older adults.

...computerised training of information processing speed leads to significant improvement in the speed at which older adults detect information in their visual periphery, and their speed of foot and hand responses to visual information.



PROFESSOR KAARIN J. ANSTEY
BA (Hons) Syd., PhD Qld., FASSA
CHIEF INVESTIGATOR AND
ANU NODE LEADER

Kaarin Anstey is a Professor of Psychology and Population Health at the Australian National University (ANU) and Director of the ANU Centre for Research on Ageing, Health and Wellbeing.

Kaarin's substantive research interests lie in the causes of cognitive decline, the social impact of cognitive impairment, and interventions to improve cognitive function and prevent cognitive decline. Kaarin has worked extensively with longitudinal studies and leads the PATH Through Life Project. Kaarin has also developed a model of driving safety and conducts research

to improve older driver safety. Kaarin is a member of the Expert Advisory Panel of the NHMRC National Institute for Dementia Research, and a member of the Governance Committee of the Global Council on Brain Health, an initiative supported by the American Association of Retired Persons and Age UK.

THE IMPACT OF DIETARY INTAKE ON MAINTENANCE OF COGNITIVE HEALTH

RESEARCHERS

KAARIN J. ANSTEY
KIMBERLY ASHBY-MITCHELL
DIANE HOSKING
ROSS ANDEL

One of the pathways by which diet impacts on cognitive health is via causal association with chronic diseases such as cardiovascular disease and diabetes that are also risk factors for cognitive decline and dementia. During 2016 we continued our investigation into the impact of dietary stability and change on the development of diabetes and the cluster of symptoms that constitute the metabolic syndrome. The Australian Diabetes and Obesity Study has measured multiple health and lifestyle variables, including dietary intake in a large nationally representative sample of

adults aged 25-95. We included all those who were 50-years and over at baseline assessed in 1999-2000. Initial analyses aimed to characterise the different types of food combinations (dietary patterns) consumed by this cohort across the 12 year assessment period. Individuals' scores for each of the different dietary patterns were calculated. Cluster analyses grouped people according to these scores, but results indicated that individuals clustered across multiple dissimilar eating patterns. These findings precluded further investigation of within person transitions from one main dietary pattern to another over time. We have now shifted the focus of our enquiry to examining how longitudinal consumption of a dietary pattern defined by

discretionary foods impacts on our outcome measures.

There have been recent promising findings from the United States regarding the potential for diet to modify dementia risk and support cognitive health during ageing. The MIND diet (Mediterranean-DASH Intervention for Neurodegenerative Delay) is a hybrid diet derived from the Mediterranean and DASH diets. It emphasises plant based foods, limits consumption of animal products and saturated fat, does not specify high fruit consumption, and limits fish to one serving a week. The associations between dietary intake and cognitive outcomes found in one cohort may not generalise to another. Populations from different regions differ in multiple ways that impact

upon the potential influence of diet on cognitive health. We are currently investigating the protective effect of the MIND diet in an Australian sample by reproducing as closely as possible the analyses undertaken in the United States. In the 60s cohort of the PATH study we calculated individuals' MIND diet scores from their baseline responses on the CSIRO food frequency questionnaire. Preliminary correlational analyses show that the MIND diet is significantly related to female sex, more years of education, better general health, greater physical activity, less depression, and lower energy intake. Associations will be tested between MIND diet scores in the PATH cohort at baseline and 12-year incidence of probable dementia and

cognitive change across four measurement occasions controlling for a comprehensive range of covariates.

The associations between dietary intake and cognitive outcomes found in one cohort may not generalise to another.



DR DIANE HOSKING
BA ANU, BHthSc (Hons) PhD Adel.
RESEARCH FELLOW

Diane Hosking is an Early Career Research Fellow at the Centre for Research on Ageing Health and Wellbeing at the ANU.

Diane joined CEPAR in 2014 and has a research background in psychology and nutrition, specifically the role of dietary factors in protecting against age-related cognitive decline. Currently, her work falls within the Cognition and Decision making stream where she is involved in projects examining the impact of cognitive ageing at both the individual and societal level.

She is also continuing her work investigating the relevance of diet and other lifestyle factors to cognitive health and cognitive decline.

GENDER, CONTEXTUAL AND BIOLOGICAL INFLUENCES ON COGNITIVE DECLINE IN OLDER ADULTS

RESEARCHERS

KAARIN J. ANSTEY
SHEA ANDREWS
KERRY SARGENT-COX

External Collaborator

AMBER WATTS
(UNIVERSITY OF KANSAS)

This program of research focuses on understanding the complex range of factors that influence individual trajectories of cognitive development and cognitive decline in ageing. In 2016 we have focussed on measuring gender differences in cognitive abilities across the adult life span and gender differences in rates of cognitive change in ageing. This was partly motivated by a search for an explanation for why Alzheimer's disease in late life is more prevalent among women. Extensive analysis of 12 year follow-up data from the PATH Through

Life cohorts has shown that there are large differences in the prevalence of risk and protective factors between men and women. Men tend to have more cardiovascular risk factors (hypertension, diabetes and smoking) with women having higher rates of depression. Examination of gender differences in cognitive abilities found that there are differences and these are consistent across age groups and over time. In other research we found that among the older adults in the study, a cancer diagnosis prior to entry into our study was associated with a decline in processing speed but that a diagnosis of cancer during our study had a protective effect against cognitive decline. These add to the intriguing findings in other literature showing that survival of a

cancer diagnosis is associated with reduced risk of Alzheimer's disease. Further putative risk factors examined in our cohort include medications for diabetes and high cholesterol, neither of which impacted on cognitive decline. Increasingly we are also examining how lifestyle and health factors interact with genetic factors to either increase or decrease the risk of cognitive decline in ageing.

Alzheimer's risk genes in normal cognitive ageing

With advancing age individuals experience a deterioration in cognitive abilities that is characterised by substantial inter-individual variation in the observed trajectories of cognitive decline. Late onset Alzheimer's disease (LOAD) susceptibility genes are good candidates for examining the association of genes with cognitive decline, as the pathological features of LOAD progress to varying degrees in individuals without dementia or cognitive impairment and are associated with nonclinical cognitive decline. The role of 25 LOAD risk loci in non-linear cognitive change was examined, both individually and collectively as a genetic risk score (GRS). Data

collected from the 60+ cohort of the Personality and Total Health (PATH) Through Life project was used, in which 2,551 participants were assessed at four-year intervals for a total of 12 years on a comprehensive battery of cognitive tests.

Twelve LOAD risk loci were associated with baseline cognitive performance (ABCA7, MS4A4E, SORL1), linear rate of change (APOE, ABCA7, INPP5D, ZCWPW1, CELF1) or quadratic rate of change (APOE, CLU, EPHA1, HLA-DRB5, INPP5D, FERMT2). In addition, a weighted GRS was associated with linear rate of change in episodic memory and information processing speed.



SHEA ANDREWS
BA BSc (Hons) Qld.
RESEARCH FELLOW

Shea Andrews is a Postdoctoral Research Fellow in the ANU Centre for Research on Ageing, Health and Wellbeing and CEPAR. He joined CEPAR in August 2016 after submitting a thesis in Medical Science (Genetics) at the ANU John Curtin School of Medical Research.

His primary research aims include examining the association of Alzheimer's disease genetic risk loci with normal cognitive ageing and how environmental and lifestyle risk factors interact with these genetic variants. Thus far he has published his research findings in the *Journal of Alzheimer's Disease*, *Neurobiology of Aging* and *Genes, Brain and Behaviour*.

Further research goals include the development of multi-domain risk models for cognitive impairment and dementia that account for genetic, environmental and lifestyle risk factors and their interactions.

These results suggest that a subset of LOAD related Single Nucleotide Polymorphisms (SNPs) may be associated with cognitive decline. However, the effect size of each locus is small and when demographic and lifestyle factors are taken into account, neither individual SNPs nor genetic risk scores explain a significant proportion of the variance in cognitive decline in our sample. Further research is required to verify these results and to examine the effect of preclinical LOAD in genetic association studies of cognitive decline. The identification of LOAD risk loci associated with cognitive performance may help in screening for individuals at greater risk of cognitive decline.

Preprints of publications reporting are available at www.biorxiv.org/content/early/2016/08/04/067694

Physical activities and cognitive ageing

In a review of literature, our previous CEPAR work suggests that physical activity may be the single most effective intervention to promote healthy cognitive ageing, although effects have been shown to vary by age, sex, and genetic factors. One particular genotype, the MET polymorphism of the Brain Derived Neurotrophic Factor (BDNF) gene is associated with altered physiological response to exercise and may contribute to individual differences in the cognitive benefits of physical activity. Using PATH Through Life data we have found that across 12 years, the cognitive benefits of physical activity were dependent on sex and BDNF genotype. While physical activity benefited cognition for females regardless of genotype, among males, physical activity only benefitted those who did not carry the MET allele for the BDNF genotype.

Possible explanations for these sex differences include different levels of physical activity between older males and females, use of estrogen therapies among older females, and sex differences in lean and fat body mass. A manuscript describing these results was recently submitted to a peer-reviewed journal for publication.

Late onset Alzheimer's disease (LOAD) susceptibility genes are good candidates for examining the association of genes with cognitive decline.

RESEARCHERS

KAARIN J. ANSTEY
DIANE HOSKING
LILY O'DONOUGHUE JENKINS

Cognitive ageing occurs on a continuum. The majority of older adults experience some age-related cognitive loss, and for those who develop dementia, its onset is preceded by many years of gradual decline prior to diagnosis. The aim of this project is to broaden the current focus of research and policy regarding the personal and societal impact of dementia to include the spectrum of age-related cognitive decline that will affect an increasing proportion of the population. In 2016 two ongoing studies were completed as part of this project.

Longitudinal data across eight years from the older cohort of PATH Through Life study were used to compare general practitioner (GP) service between those with a mild cognitive disorder (MCD) and those without. Those with MCD have clinically relevant cognitive decline and memory impairment but do not meet dementia criteria. MCD is associated with comorbid

medical conditions and currently there is limited knowledge of the impact of cognitive impairment on GP service use. Participants were aged 60-64 at baseline and 68-72 at follow-up. Findings indicated that those categorised with MCD used significantly more GP services and that this association remained significant after adjusting for sociodemographic and health variables, arthritis and depression. The study findings provide novel evidence that MCD, even in the 'young-old' potentially contributes to burden in the healthcare system³.

There is evidence that decline in cognitive resources is associated with reduced motivation for activity engagement. We used data from waves 3 and 4 of the PATH study to investigate the relationship between decline in everyday cognitive capacity as perceived by close informants of participants (IQCODE score) and four-year

change in participants' engagement in mental, physical, and social activities. Only those who were cognitively healthy were included. Previously, we reported preliminary findings that cognitive decline was associated with activity disengagement. During 2016 we undertook further analyses and included objective measures of cognitive change in the models. Differential associations were found between psychometrically defined cognitive decline and activity engagement, compared to IQCODE and activity engagement. Interestingly, both psychometric decline and IQCODE were associated with change in mental activity, but only IQCODE was related to change in physical and social engagement.

Findings suggest that changes in everyday cognitive ability observed by significant others may be more relevant to physical and social domains than psychometric cognitive tests. We also examined the role of informant relationship in determining outcomes. Partners, family members or friends did not differ in the level of decline they ascribed to participants, but associations between reported decline and activity engagement were stronger when a partner or spouse was the informant. The manuscript reporting the study is undergoing revision.

There is evidence that decline in cognitive resources is associated with reduced motivation for activity engagement.

³ O'Donoghue Jenkins, L., Butterworth, P. and Anstey, K.J. (2016). A Longitudinal Analysis of General Practitioner Service Use by Patients with Mild Cognitive Disorders in Australia. *Dementia and Geriatric Cognitive Disorders*, 41(5-6), 324-333.

JOINT LABOUR SUPPLY AND RETIREMENT OF AUSTRALIAN COUPLES

RESEARCHERS

XIAODONG FAN
ALAN WOODLAND

This project was originally titled 'A Lifetime Model of Labour Supply and Asset Allocation of Australians: Estimation and Policy Implications'. As a research strategy, it was deemed appropriate and practical to divide the original project into several different sub-projects, each of which has a more specific and dedicated focus. One of these is the current project, which focuses on joint labour supply and retirement in Australia.

As the population ages across the world, many countries, Australia included, are undertaking policy reforms to increase

the labour force participation of elderly individuals and to ease the financial pressures from publically provided age pensions. In Australia, over three quarters of age-eligible retirees receive the Age Pension, which is means tested via the assets and income tests. Understanding the interaction between the labour supply and retirement decisions of individuals and government policies, especially Age Pension policies, is crucial in assessing the effectiveness of these reforms.

In this project, we study the joint labour supply and retirement decisions among Australian couples. This is important for two reasons. First, the decisions by members of a household are inter-dependent. Second,

the Australian Age Pension payment and the means test depend upon marital status. To analyse these inter-dependencies, we propose a parsimonious dynamic model in which each couple decide collectively their hours worked in the labour market, while facing uncertainty in individual survival and health condition. We then propose to econometrically estimate the model using data drawn from an Australian panel data set. We carefully model relevant policies in Australia, including the income tax codes, the tax offsets (the SAPTO - Senior Australian and Pensioner Tax Offset, and the LITO - Low Income Tax Offset), and most importantly, the Age Pension and Pension Supplement.

We estimate the model using data drawn from the first 13 waves of the Household, Income and Labour Dynamics in Australia (HILDA) survey data, which is a national representative sample of Australian households. During 2016 we completed the initial formulation and estimation of the model. We initially estimated the model using the Maximum Likelihood Estimation method but decided to also estimate it using the method of generalised simulated moments. Some initial estimates have been obtained and are currently being evaluated. This whole process took longer than expected since several model structures were developed, requiring amended computer programs to be written.

Once the initial estimation results are evaluated positively, it is proposed to conduct various experiments to investigate the effects on Australian household behaviour concerning labour supply and retirement of a range of policy experiments. These policy experiments include further increasing the Age Pension eligibility age and changing the Age Pension benefit level, as well as varying the income and assets test policy settings. We expect to complete the project at the end of 2017 and write up the results for submission to peer-reviewed journals.



DR XIAODONG FAN

BE ME Tsinghua, MS UTexas Austin,
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RESEARCH FELLOW

Xiaodong Fan is a CEPAR Research Fellow located in the UNSW Business School. He joined the Centre in September 2012 after graduating with a PhD in Economics from the University of Wisconsin-Madison.

His research interests include Labour Economics, Applied Microeconomics, and Computational Economics. His current research studies the determinants of labour supply and retirement in the life-cycle context, as well as policy evaluations.

'Working at CEPAR provides me with a great opportunity to focus on my research, as well as opening up windows to ageing related policy analysis.'

RESEARCHERS

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In 2016 CEPAR researchers, in conjunction with their external collaborators, continued to investigate aspects of retirement saving choices and decisions in research funded primarily

by an ARC Discovery Grant 'The paradox of choice: unravelling complex superannuation decisions', an ARC Linkage Grant with partner UniSuper 'Improving flexibility, trust and communication' and a grant from Financial Literacy Australia. Our work focused on how to help people with retirement decisions through financial advice, financial literacy and information disclosure.

The ARC Discovery Grant team (Bateman, Eckert, Iskhakov, Louviere and Thorp) continued to analyse data from two incentivised discrete choice experiments (DCEs) of choice of financial adviser. Research using the first financial advice DCE, which explored how individuals assess the quality of financial advice they receive and how they

form judgments about advisers, was accepted for publication in *Management Science* (Agnew et al, 2016). The key finding was that first impressions clearly matter in a client-adviser relationship and that once a first impression has been made, confirmation bias may influence the clients' subsequent evaluation of the adviser. The second DCE elicited the subjects' 'willingness to pay' for financial advice. A working paper investigating why clients' perceptions of their financial adviser deviate so much from the actual quality of these advisers and estimating the monetary impact of these deviations will be completed in 2017.

Financial literacy is also important for retirement decision making. Despite a growing body of literature

focusing on ways to measure financial literacy using survey questions, there is little agreement on which questions to ask to measure financial capability, or on how to combine the answers to the questions into an overall index of financial capability. In 2016, a subset of the researchers completed a project funded by Financial Literacy Australia (Bateman et al 2016a) which developed a method to reliably and accurately measure individuals' financial capabilities. Using two surveys of financial literacy experts we identified sets of discriminating questions considered by experts to be highly informative and developed a scoring model to rate individuals' financial capability using their (correct and incorrect)

answers to the discriminating questions.

The ARC Discovery Grant has also supported research on financial decisions in retirement, specifically through an investigation of the market for long-term care insurance (LTCI) in the form of an annuity product which provides higher income when the individual is in bad health (Wu, Bateman, Stevens, Thorp). In 2016 we focused on the analysis of data from an experimental survey of retirement benefit decisions from a menu comprising an LTCI income product, a life annuity and a liquid investment account. We found that the LTCI income product complements, rather than substitutes, high-level informal care and that access to the product could release precautionary



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Hazel Bateman is Head of the School of Risk and Actuarial Studies in the UNSW Business School.

She is one of Australia's leading experts in superannuation and pensions and is widely published in the area of the economics and finance of retirement incomes.

The overall themes of her research are the adequacy and security of retirement saving and retirement benefits and issues associated with the increasing risk and responsibility faced by retirement savers under defined contributions arrangements. Her work on administrative costs and charges of superannuation funds has informed global pension policy developments, including the financial product

disclosure legislation in Australia. Over the past ten years, Hazel Bateman has jointly held six ARC Discovery Grants and four ARC Linkage Grants, including an ARC Discovery Grant of \$960,000 over 2010-2014 to undertake research to better understand complex retirement and superannuation decision making.

Hazel has been a consultant on retirement income issues to a range of

Australian and international organisations including the OECD, the World Bank, the Social Insurance Administration (China) and the Korean Institute of Health and Social Affairs. She has served on the Australian Government's Superannuation Roundtable and is currently a member of the editorial board of the *Journal of Pension Economics and Finance*.

savings for the purchase of additional longevity insurance. A working paper will be finalised in 2017.

In related work the UniSuper Linkage Grant team (Bateman, Dobrescu, Newell, Ortmann and Thorp) designed and implemented a series of incentivised DCEs to investigate use of the so-called MySuper product dashboard – a prescribed disclosure format for information on returns, risk and fees designed to assist retirement savers with superannuation product and investment option decisions. Regulators hope that such simplified disclosures will make comparisons between alternative financial products easier and will improve choices. We found that super fund members switch quickly when an alternative plan starts

charging lower fees but are reluctant to switch when an alternative plan starts earning higher returns. However, hypothetical simplifications of the disclosure format for returns make comparisons easier and lead to significantly higher account balances. In 2016 we presented this study at conferences in Australia and overseas and submitted our working paper to a peer reviewed journal (see Bateman et al 2016b).

Project outputs:

- Agnew, J.R., Bateman, H., Eckert, C., Iskhakov, F., Louviere, J., Satchell, S. and Thorp, S. (2016). First Impressions Matter: An Experimental Investigation of Online Financial Advice. *Management Science*. In press (available online December 2016).

- Louviere, J., Bateman, H., Thorp, S. and Eckert, C. (2016a). Developing New Financial Literacy Measures to better Link Financial Capability to Outcomes. Report for Financial Literacy Australia.
- Bateman, H., Dobrescu, L.I., Newell, B.R., Ortmann, A. and Thorp, S. (2016b). Flicking the Switch: How Fee and Return Disclosures Drive Retirement Plan Choice. CEPAR Working Paper Series 2016/15.

We found that super fund members switch quickly when an alternative plan starts charging lower fees but are reluctant to switch when an alternative plan starts earning higher returns.



ASSOCIATE PROFESSOR
LORETTI I. DOBRESCU

BA (Hons) Nottingham Trent University; MSc West University of Timisoara; PhD University of Padua
ASSOCIATE INVESTIGATOR

Loretti I. Dobrescu is an Associate Professor in the School of Economics, UNSW Sydney. She is also an Associate Investigator in CEPAR.

Loretti is an established researcher with expertise in developing structural models and using panel data and bounds methods to study various issues related to savings and cognition in older age. She has published significantly in top international journals of economics and mathematical modelling and is generally active in the field of

microeconometrics, with particular emphasis on the Economics of Ageing and Health Economics. Loretti was also part of the backbone team that developed the first comprehensive dataset of ageing in Europe – the Survey of Health, Ageing and Retirement in Europe.

EFFECTS OF TAXES AND SAFETY NET PENSIONS ON LIFE-CYCLE LABOUR SUPPLY, SAVINGS AND HUMAN CAPITAL: THE CASE OF AUSTRALIA

RESEARCHERS

MICHAEL KEANE
FEDOR ISKHAKOV

In this project we develop and estimate a structural dynamic model of labour supply, consumption and savings, and human capital accumulation of Australian male workers. Our analysis is based on a life-cycle labour supply model that incorporates several key features: asset accumulation, liquidity constraints, human capital accumulation via learning by doing, and a discrete choice of hours involving several possible levels. The model replicates the superannuation and Age Pension rules, and allows for individual retirement decisions.

Considering several decisions simultaneously allows us to draw conclusions about how different choices interconnect, in particular how investments in human capital throughout the life-cycle are affected by various aspects of the pension system and tax rules. Including both labour supply during working ages and the retirement decision (intensive and extensive margins) into the model with human capital leads to new insights in the variability of labour supply elasticity in the population and over the life-cycle, and contributes to the understanding of the discrepancy between labour supply elasticities in micro and macro literature.

In this project we examine the long-term effects of the changes in the social security system and tax rules on the labour supply over the life-cycle and the time of retirement. We quantify the differences between the effects of anticipated and unanticipated policy changes, and study how the effects of the latter vary with the age of the agent when the new policy is put in effect.

This project is in its final stage of completion. By 2016 the main structure of the model was built and an innovative solution method was implemented to cope with the high computational complexity of the model. The empirical analysis of the HILDA panel data, our primary source of data, was

completed, and the draft of the research paper was prepared. In 2017 the estimation process that ensures a good match between the simulated data produced by the theoretical model and the observed data, will be completed. Already preliminary estimation results show a remarkable fit to the observed data in both labour supply dynamics, retirement choice, hours of work, wages and wealth accumulation and decumulation dynamics.

In 2016 preliminary results from the project have been presented at a number of international conferences. The final version of the paper will be submitted to an international academic journal.

Considering several decisions simultaneously allows us to draw conclusions about how different choices interconnect.



DR FEDOR ISKHAKOV
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ASSOCIATE INVESTIGATOR

Fedor Iskhakov is a senior lecturer at the Research School of Economics, Australian National University and an Associate Investigator at CEPAR.

Previously he held positions at CEPAR, the Centre for the Study of Choice, University of Technology Sydney and the Graduate School of Management at St Petersburg University. He has also been a Visiting Research Scholar at Universities. Between 2002 and 2011 he was affiliated with the Frisch Centre for Economic Research at the University of Oslo where he has held the positions of

research fellow and postdoctoral research fellow. His doctoral thesis, 'A dynamic structural analysis of health and retirement,' was awarded His Majesty the King of Norway's gold medal, for the best research in social sciences among young researchers in Norway in 2008. His research interests lie in the area of applied econometrics, microeconomics and

computational methods; more specifically in structural estimation of dynamic models of individual and strategic choice, as well as market equilibrium models, with applications to labour economics, household finance and applied industrial organisation.

HOUSING IN AN AGEING SOCIETY: A SIMULATION STUDY

RESEARCHER

GEORGE KUDRNA

External Collaborator

HANS FEHR
(UNIVERSITY OF WUERZBURG)

Home ownership and housing assets have important economic and social implications. Over the life cycle, the proportion of home owners typically increases and housing assets become a particularly important wealth component in retirement. In addition, the consumption stream from housing assets provides an (implicit) insurance cover in retirement against both long-term care and longevity risks. Therefore, especially ageing societies should benefit from efficient housing markets and high rates of home ownership. Quite surprisingly, despite huge tax incentives in most industrialised countries, home ownership rates differ quite substantially, ranging from 44% in Germany to 70% in Australia. To what extent can these differences be explained by differences in the population structure and dynamics? How important are institutional features such as retirement income policy, tax incentives or the market for mortgage loans? How will population

ageing affect the housing market in both countries in the future? What are the distributional equity and efficiency consequences of various tax and pension reforms in both countries?

In order to answer these questions, this research project will construct a computable general equilibrium life-cycle (CGE) model with uninsurable labour income to account for differences in wealth accumulation and home ownership between Germany and Australia. Both models will be programmed in Fortran and will apply the same preferences and technologies. However, they will differ in their population dynamics, their fiscal systems and their housing markets.

Compared to similar previous quantitative studies on asset allocation, housing demand and home ownership, our approach offers three major innovations. First, we will not only consider the long run steady state equilibrium effects of policy changes (as per existing literature) but will also simulate the whole transition path in order to analyse intergenerational welfare changes. Second, our approach will incorporate

detailed demographic projections in both countries to study their impact on the housing market (compared to existing studies that use a stationary demographic structure). Third, we plan to quantify the aggregate efficiency effects of policy reforms by means of lump-sum compensation payments (compared to existing studies that deal only with distributional welfare consequences).

Although Australia has very high home ownership rates, Australian households have lower financial assets and retirement incomes in comparison with German households. This research project will provide explanations for these observed differences in asset allocation and home ownership between the two countries, with a view to informing policy innovation in each country.

The two countries also differ substantially in their tax and pension policy settings and we hope that our study sheds some light on the advantages and disadvantages of both systems. In addition, our comprehensive simulation model developed as part of this project can be used as the basis for future research into pension and other

housing-related issues (e.g., the impact of the highly debated policy reform related to exemptions of owner-occupied housing from the means test applied to the Australian Age Pension).

In the second half of 2016, Hans Fehr visited CEPAR for three months to work intensively on the project. Significant progress was made in relation to the development of the model structure and its computation and calibration to both the Australian and German economies. The project is expected to produce several publications in leading peer-reviewed international journals.

Home ownership and housing assets have important economic and social implications. Over the life-cycle, the proportion of home owners typically increases and housing assets become a particularly important wealth component in retirement.

RESEARCHERS

XU XIAO CHUN
MICHAEL KEANE

For most Australians, housing assets make up the major component of wealth. Housing impacts on many dimensions of household welfare, including financial security and adequacy, consumption smoothing, and portfolio allocation. In addition, on aggregate, housing purchases have significant macroeconomic effects, including on capital formation and housing prices.

The project will analyse Australian housing policies such as negative gearing and housing supply. Such issues require a life-cycle modelling approach to capture the intergenerational implications as well as the effects over time. The project's model features heterogeneous agents to create both renters and home owners, and thus the distributional effects of housing policies can be analysed as well.

The existing literature mostly models housing as a consumption good only and ignores its investment role. This project's model will feature endogenous, stochastic housing prices and will be able to explore

the dual purpose of housing as both a consumption and investment vehicle. This project will also consider the transition effects of any policy change that affects housing supply and prices, in contrast to the existing literature which focuses on the steady state results.

This project investigates how housing policies in Australia can influence tenure decisions of households and their implications for portfolio allocation and wealth accumulation. The analysis will be based on a macroeconomic general equilibrium overlapping generations model, which

takes into consideration a wide range of factors such as demand and supply of housing and investment risk. The model will be calibrated using Australian data and will be used to analyse Australian housing policies such as negative gearing and housing supply.

This project is still at an early stage, however it is anticipated that a preliminary model and working paper will be completed by the end of 2017.

This project investigates how housing policies in Australia can influence tenure decisions of households and their implications for portfolio allocation and wealth accumulation.



DR XU XIAO CHUN
BA Econ PhD Econ UNSW
RESEARCH FELLOW

Xu Xiao Chun is a Research Fellow based at the CEPAR UNSW Node.

Prior to his current role, he worked as a policy analyst for the Australian Treasury, providing advice on a wide range of issues including: fiscal and monetary policy, macroeconomics, banking, and financial markets.

Dr Xu's research interests include applied macroeconomics and econometrics.

His recent work involves life-cycle modelling of housing tenure and investment decisions as well as the effects of superannuation on the economy.

OPTIMAL CONSUMPTION AND HOUSING EQUITY OVER A LIFE-CYCLE

RESEARCHERS

MICHAEL KEANE
XIANGLING LIU

The tax system is a crucial determinant of the net incentives of households' investment in owner-occupied and rental housing. It would be of much interest to understand how different taxation rules impact investor behaviour. In Australia, the family home attracts no tax subsidies. By contrast, in the U.S., owner-occupied housing is treated favourably. The income tax subsidies for the family home in the U.S. enable deductions from mortgage interest and from all the other costs of the family home. But rental housing debt interest cannot be deducted from wage income, as it can in Australia.

This project studies the impact of housing-related tax provisions on household choices in terms of consumption and investment in owner-occupied housing and rental housing over different periods of life. The organising concept is the life-cycle, and the aim is to build and estimate a dynamic discrete choice life-cycle model. Agents are finitely-lived households heterogeneous from the perspective of labour income. Households choose consumption of housing and the numeraire good (other consumption), and an investment portfolio in housing assets and risk-free bonds. The HILDA data for the Australian study and the Panel Study of Income Dynamics (PSID) data for the U.S. study are used.

In 2016, the sample selection for the collected data was completed and the data imputation for variables for which direct data were unattainable was completed. The dataset includes information on demographics, housing tenure status, expenditure on non-durable goods, expenditure on housing services, labour earnings, net wealth, liquid assets, home value, home size, and the value of the investment property. For the U.S., the data is for years 1984, 1989, 1994, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013. For Australia, the data is for years 2006, 2010 and 2014. Both are unbalanced panel datasets for around 7000 households. In addition, improved parameterisation

has been undertaken for exogenous house price dynamics. Elementary simulations of household choices over different periods of life have been performed and elementary structural estimates have been obtained, which provide some evidence on the significance of the impacts of the taxation subsidies to investor behaviour.

This project studies the impact of housing-related tax provisions on household choices in terms of consumption and investment in owner-occupied housing and rental housing over different periods of life.



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She joined the Centre in October 2015 after graduating with a PhD in Economics from the University of New South Wales.

Her research interests include real estate economics and finance, applied econometrics, and household debt and finance.

'Working at CEPAR is a great opportunity for me to focus on my research of interest, which shall also provide me with the best opportunity for developing my academic career.'

RESEARCHERS

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SHIKO MARUYAMA
ELENA CAPATINA

Given the rising health care costs and ageing populations in most countries, it is becoming increasingly important to develop the tools needed for the design of effective policy aimed at improving health outcomes. This project aims to shed light on the causal pathways that lead to the well-documented association between higher socio-economic status (SES) and better health. At present, little is understood regarding these pathways, mainly because it is difficult to empirically identify the effect of SES on health, the effect of health on SES and the effect of common factors

systematically correlated with both SES and health.

Modelling and estimating these pathways require that we advance the existing literature in several areas. First, we develop a novel and comprehensive model of health over the life-cycle, recognising that health is a complex multi-dimensional concept. Unlike existing literature where health is single dimensional (good or bad), we distinguish between different aspects of health with different causes and effects. For example, some health shocks affect productivity while others do not, some are predicted by existing health risks while others are random, and some are temporary while others are long lasting. This rich health process is crucial in enabling us to accurately capture

individuals' incentives to invest in health.

Second, while previous literature has established that poor health lowers wages and labour supply, little is understood about the nature of health risk and its effects on earnings dynamics. Our rich health process allows us to model and estimate how different dimensions of health affect labour market outcomes: wages, sick days (earnings), and human capital (experience) accumulation. Thus, we estimate the importance of various pathways through which health affects the ability to earn income. We use this framework to determine the importance of health as a source of individual risk and cross-sectional heterogeneity.

Third, we investigate the level of equity in the U.S. health care system, studying SES differences in medical spending conditional on insurance type, demographics, and specific medical conditions at the ICD-9 level. Previous research documents inequities in specific settings, whereas we study equity at the national level. Thus, we contribute to the literature studying SES discrimination in health care systems.

We build and estimate a structural model of health formation over the life-cycle in the spirit of Grossman (1972), emphasising the role of decisions regarding investment in health by different SES groups⁴. We use a standard life-cycle model with idiosyncratic earnings and health risk,

endogenous labour supply and consumption/savings decisions, adding endogenous health investment. Individuals accumulate human capital (experience) while working, and can invest in health capital through effort such as seeing a doctor regularly and exercise. The incentives to invest in health and human capital are analysed in relation to one another. A key feature of the paper is to model a realistic health process over the life-cycle using data from the Medical Expenditure Panel Survey. In particular, we use data on respondents' detailed medical conditions to distinguish between different types of health shocks with different causes and effects: shocks that affect the ability to work and those that do not,



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His research interests include empirical applied microeconomics and a wide range of health economics topics, such as health insurance, informal care, elderly care, long-term BMI trends, and the effect of birth outcomes.

Previously he has held Visiting Scholar positions at the Department of Economics at Queen's University, the

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shocks that affect future health and those that are transitory, and shocks that are predictable in the sense that they are correlated with previous health and health behaviour and those that are unpredictable. In addition, this paper is the first to study the medical expenditure shocks associated with detailed medical conditions. This modelling and estimation are important since they enable us to accurately capture how people form expectations regarding the evolution of health and the degree of health risk they face throughout their lives in order to estimate how health impacts individuals' economic decisions such as the allocation of resources between consumption,

leisure, work and health investment. We also emphasise that health impacts human capital accumulation over the life-cycle through its effect on labour supply decisions.

We currently have three working papers that are part of this project. The first focuses on modelling and studying individuals' decisions to invest in health, the second focuses on the effects of health on earnings dynamics, and the third studies SES inequities in medical expenditures in the U.S. health care system. All papers will be finalised in 2017. They will be submitted to peer-reviewed top-rated journals in Economics or Medicine by the end of the year.

Given the rising health care costs and ageing populations in most countries, it is becoming increasingly important to develop the tools needed for the design of effective policy aimed at improving health outcomes.

⁴ Grossman, M. (1972). On the Concept of Health Capital and the Demand for Health. *Journal of Political Economy*, 80 (2): 223–255.



PROFESSOR MICHAEL KEANE

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Michael Keane is an Australian Laureate Fellow and Professor of Economics in the UNSW Business School. He is also a Professor of Economics at the University of Oxford.

Several independent sources have placed Michael Keane among the top 50 economists internationally in terms of citations and the impact of his work. Recently he was ranked as top economist in the 1990 PhD cohort by Research Papers in Economics (RePEc). He is considered to be a world leader in choice modelling and his expertise is sought both nationally and internationally.

He has had a long association with two agencies of the US Department of Health and Human Services as a member of the Peer Review Panel of the National Institutes of Health (NIH) in 1995-6, 1999 and 2001-5. In November 2009 he prepared a report on tax transfers and labour supply for the Australian Treasury's Commission on Australia's Future Tax System. He has been a visiting scholar at the

International Monetary Fund at various times throughout his career.

He was elected to the Council of the Econometric Society in 2009 and is also a member of the American Economic Association and the American Statistical Association. He is an Associate Editor of the *Journal of Econometrics* and *Quantitative Marketing and Economics*.

EVALUATING CONSUMERS' CHOICES OF MEDICARE PART D PLANS

RESEARCHERS

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TIMOTHY NEAL

External Collaborators

JONATHAN KETCHAM
NICOLAI KUMINOFF
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This project is investigating the degree of rationality in the decision making of elderly individuals living in the United States who choose prescription drug plans (PDPs) under the Medicare Part D program. Abaluck and Gruber (2011), using individual choice data from 2006 (the first year of the program), found widespread irrationality in PDP choice and overspending for drugs. For instance, they found the elderly place significantly more weight on plan premiums relative to

out-of-pocket costs, while also placing almost no value on reducing the variance of out-of-pocket costs (or risk aversion). Ketcham et. al. (2016), which uses administrative data from 2006 to 2010 and more robust estimates of expected out-of-pocket costs under alternative plans, find important evidence against widespread irrationality in decision making albeit with significant heterogeneity in behaviour between individuals.

Understanding the prevalence and causes of overspending, whether it be sheer confusion or valuing aspects of PDPs that are hard to measure, is critical for assessing the cost and benefits of various policy reforms that have been proposed to simplify the Part

D program. Indeed, investigating these issues will also provide insight into larger questions of whether decision making ability is affected when individuals age, develop medical conditions that affect cognition, choose from larger choice sets, or gain experience in repeated choices. We will contribute to these issues using two complementary empirical methodologies that rely on the rich administrative dataset developed in Ketcham et. al. (2016). It constitutes a random 20% sample of the Medicare beneficiaries from 2006-2010, including their drug purchases, health conditions, PDP choices, and their expected out-of-pocket costs under each PDP plan in their choice set.

The first approach will expand on the nonparametric revealed preference (RP) tests in Ketcham et. al. (2016), and will provide a first attempt at ascertaining the proportion of consumers who are making suboptimal decisions, and whether this is correlated with an individual's age, experience in the program, and other characteristics. The second approach will move beyond discrete choice models that assume homogeneity in preferences by utilising the Mixed-Mixed Multinomial Logit ('MM-MNL') model framework. By placing restrictions on the preference parameters of one latent class to act as rational consumers per the theory, it is possible for the model to provide an estimate for the proportion of

individuals in the data who behave rationally as well as provide a posterior class probability to individuals for belonging to this rational latent class.

Furthermore, the class probabilities can be a function of the characteristics of an individual, such as the presence of medical conditions that affect cognition or the size of an individual's choice set. Expanding MM-MNL in this way will allow the model to estimate whether certain personal characteristics increase or decrease the likelihood that an individual will be in the rational latent class (inferring its effect on decision making ability more generally). We can also link a subset of these individuals to the Medicare Current Beneficiary Survey (MCBS)



DR TIMOTHY NEAL

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RESEARCH FELLOW

Timothy Neal is a Postdoctoral Research Fellow in the UNSW Business School and CEPAR. He joined CEPAR in July 2016 after completing a PhD in Economics at the UNSW Business School.

His primary research interests include choice modelling, panel data econometrics, and the distribution of income. Thus far he has published in *The Economic Record* and *The Stata Journal* in these areas, and has been ranked within the top 50 economists to first publish in the last five years by Research Papers in Economics (RePEc).

Alongside academic research, Tim has worked as an economic consultant at Ernst & Young where he supported the development of economic reports and business cases commissioned by government for a variety of transport infrastructure projects. Notable projects included the business case for the North West Rail Link and a study into Sydney's future aviation capacity.

'I am excited to be working at CEPAR and participating in research that is related to major policy issues that will significantly affect the future of Australia.'

that measures enrollees' knowledge of how Part D works along with their wealth, education, and other demographics that will further expand our understanding of choice behaviour across socioeconomic status. It will be the first time the two datasets have been used together for academic research in this way.

The model will also recognise the longitudinal nature of the data (the sample contains the choice behaviour of individuals over multiple years) by explicitly modelling inertia. Not only will this improve the accuracy of the results, it will allow us to investigate the circumstances that lead to plan changes over time and whether there is evidence of learning over the five-year period. Given the estimates of the distribution of taste parameters as well as the posterior class probabilities, it is possible to assess the welfare consequences of several items including the observed departures from rational choice behaviour, restrictions on the choice sets and other interventions in the market, and lastly predicting the demand for introducing new products.

It is our intent to not only provide a range of policy implications for the future of the Medicare Part D program as well as other insurance markets (such as the health insurance exchanges created under the Affordable Care Act, which share many parallels with the Part D markets), but also provide insight into a range of active research questions in the areas of discrete choice modelling and the nature of human decision making.

Understanding the prevalence and causes of overspending... is critical for assessing the cost and benefits of various policy reforms that have been proposed to simplify the Part D program.

AREA OF RESEARCH FOCUS

3

RESOURCES IN RETIREMENT

Governments around the world have been reforming policies (and often breaking public pension promises) to find ways to reduce the fiscal impact of the ageing baby boomer cohorts. Australia is unusual in having promised relatively little in public pensions, buttressing retirement incomes through mandated superannuation.

This policy regime provides a valuable test-bed for research into non-government approaches to retirement provision. Research in this area of focus takes private provision as a point of departure, and examines risk pooling, spreading and sharing mechanisms, public-private coordination, and the impacts of incentives, defaults, and compulsion on behaviour with respect to retirement choices. The analysis is designed to discover what innovations, by government and business, might improve outcomes.

TO VIEW PUBLICATIONS
AND WORKING PAPERS RELATING
TO THIS RESEARCH VISIT CEPAR.EDU.AU

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This area of research focus (ARF) covers policy and practice in delivering resources in retirement. It also involves estimates of longevity, especially with an eye to informing the pricing of longevity insurance products, such as annuities. Both public policy and private products are directed not only to the value of resources in retirement, but also the management of retirement-related risk. Broad topics emphasised in the 2016 program included the interconnection between taxation and pensions, improvements in pension policy design, and new methodologies to improve estimates of life expectancy.

Highlights for this ARF include:

- TAX AND PENSIONS**
While there is now a substantial literature relating to pension analysis, the taxation of pensions has been little studied. For several years now CEPAR, in association with CESifo in Munich, has been driving a research initiative aimed at filling this research gap. Conferences in 2014 and 2015 have generated a significant and coordinated group of papers which are now being assembled with the aim of publishing an edited volume that will be a foundation for future research. Several CEPAR affiliates are involved, as well as academics from Europe and the U.S., and international policy officials from organisations such as the IMF. The volume will include an extended introduction by the editors, CEPAR Honorary Professor Robert Holzmann and John Piggott.
- IMPROVEMENTS IN PENSION POLICY DESIGN**
Over the last decade, several countries have introduced what have become known as ‘notional defined contribution’, or NDC, public pension designs. These share characteristics of both pay-as-you-go type plans and standard pre-funded DC plans. On the one hand, the pension promise is contingent on the value of an accumulation account; on the other, the accumulation is not real; resources aren’t actually saved for retirement; the accumulation is a book entry only. But the classical requirements for a well-run pension fund – liquidity and solvency – must still be met. A major project led by research fellow Jennifer Alonso García addresses this issue by developing automatic balancing mechanisms to ensure that both contribution rates and payouts are calibrated to deliver solvency and liquidity.
- MORTALITY AND SOCIOECONOMIC CIRCUMSTANCES**
Over the past 30 years, life expectancy in high income countries has increased dramatically, but these gains have not been shared equally across all groups in society. The better educated and those on high incomes live significantly longer, and this gap is widening. Health inequalities are ubiquitous and persistent. This project develops a model that allows identification of specific causes of life expectancy difference, specifically related to socioeconomic covariates, and can then identify strategies that efficiently reduce these mortality differences. It will provide input to the prioritisation of health policy initiatives aimed at reducing the prevalence of different types of disease.

MODELS FOR DEPENDENCE IN MORTALITY WITH FINANCIAL APPLICATIONS

RESEARCHERS

DANIEL H. ALAI
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External Collaborator

ZINOVII LANDSMAN
(UNIVERSITY OF HAIFA)

This project explores approaches to modelling dependence with a range of survival distributions. This has a particular focus on estimating these distributions when used to model survival of human populations. Research issues include the censoring and truncation of survival data. In insurance and pension funds the full life time of the individuals in the pool have usually not been observed. The modelling is founded on the observation that mortality improvement has meant that pools of lives have common factors that impact the survival

probabilities, resulting in dependence in survival distributions.

Public and private institutions providing life-benefit products, such as pensions, are exposed to systematic longevity risk, which is typically analysed from the perspective of mortality rates. A mortality rate approach has its strengths and weaknesses; a pronounced weakness is the uncertainty surrounding mortality rates in the post-retirement age-bracket. Furthermore, this uncertainty is compounded when the input parameters of the probabilistic model are themselves uncertain. We avoid this issue by studying lifetimes directly, rather than the underlying mortality rates that drive them.

We investigate a family of distributions that includes a well-known multivariate Pareto distribution. This family has the ability to capture a range of dependency structures as well as both light-tailed and heavy-tailed phenomena. Given the anticipated continued increase of supercentenarians, the ability to model extreme values is critical. In past work, it has been shown that even a little dependence between lives can lead to much higher uncertainty.

Some challenging aspects are introduced when these distributions are used to model the survival of human populations. These include the censoring and truncation of survival data. In insurance and pension funds, the full lifetimes of the individuals in the pool

are usually not observed. It is also important to recognise that mortality improvement has meant that pools of lives have common factors that impact joint survival probabilities.

Pools can be interpreted in different ways, from nation-wide cohorts to employer-based pension annuity portfolios. In practice, data will come from a range of sources and allowing for different pools in the estimation is important. This project considers the modelling of survival (lifetime) distributions and has incorporated dependence in a pool of lives, either parametrically or via a common stochastic component. The ability to assess and incorporate the appropriate dependence structure, whilst allowing for

extreme observations, significantly improves the pricing and risk management of life-benefit products.

Research outputs from the project include:

- Alai, D.H. and Landsman, Z. (2016). Truncated Multivariate Distributions Generated by Multiply Monotone Functions. Working paper.
- Alai, D.H., Landsman, Z. and Sherris, M. (2016). Modelling Lifetime Dependence for Older Ages using a Multivariate Pareto Distribution. *Insurance: Mathematics and Economics*, 70, 272-285.



PROFESSOR MICHAEL SHERRIS
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Michael Sherris is Professor of Actuarial Studies in the UNSW Business School. His research sits at the intersection of actuarial science and financial economics, and has attracted a number of international and Australian awards. He has

published in leading international risk and actuarial studies journals, including *Journal of Risk and Insurance*, *Insurance: Mathematics and Economics*, *Journal of Economic Dynamics and Control* and *Geneva Papers on Risk and Insurance*. He is on the editorial board of the *Annals of Actuarial Science* and served on the editorial board of the *North American Actuarial Journal*.

Prior to becoming an academic he worked in the banking and finance industry for a number of major banks and a life insurance company. He has been an active member of the Australian actuarial profession having served on the Council of the Institute of Actuaries of Australia. He was President (2008-2009) of the Asia Pacific Risk and Insurance Association and a Board and Executive Member

of the Enterprise Risk Management Institute International. He was named Australian Actuary of the Year 2007 in recognition of his contributions to actuarial research and education both internationally and within Australia

ESTIMATION AND APPLICATION OF AFFINE CONTINUOUS TIME MULTI-COHORT MORTALITY MODELS

RESEARCHERS

MICHAEL SHERRIS
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JONATHAN ZIVEYI

This project has been developing and calibrating continuous time mortality multi-cohort models in an affine framework with applications to assessing the price of longevity risk and to developing value-based longevity indices. Previous models have either been single cohort models or have implied very high correlations across cohorts. Estimation of these models is also a challenge and ensuring consistent models with stability in estimation is as important. In our approach, the mortality intensity is modelled with age-period common factors that affect

all the cohorts as well as cohort specific factors that only affect specific cohorts, so that the correlations among cohorts are not perfect. The multi-cohort model is estimated using Danish male mortality data since there is a long history of mortality data for many cohorts. The model assumes two common factors for the age-period mortality which are fitted using a Kalman Filter algorithm. The cohort specific factors are estimated by minimising the residual calibration error.

In 2016 the project has used the model to calibrate a price of longevity risk using the BlackRock CoRI Retirement Indexes, which provide a daily level of estimated cost of lifetime retirement income for 20 cohorts in the U.S.

For these 20 cohorts, risk premiums of the common factors are assumed to be the same across cohorts, but risk premiums of the factor for a specific cohort is allowed to take different values for different cohorts. The prices of longevity risk are then calibrated by matching the risk-neutral model prices with the index values. Simple closed-form expressions for European options on zero-coupon longevity bonds are derived using the calibrated prices of longevity risk, and implications for hedging longevity risk with bond options considered.

The project has also applied the model to developing value-based longevity indices for multiple cohorts in two different countries.

A value-based longevity index is an effective instrument for hedging as it addresses major sources of risks associated with pension funds and life insurers. In constructing the index, we use a joint affine term structure model for mortality developments and an arbitrage-free Nelson-Siegel model for the dynamics of interest rates. In spite of the greater liquidity potential and the lower costs, an index-based longevity hedge brings in the problem of basis risk. To further develop an understanding of basis risk, we adopt a graphical risk metric which provides visual interpretations on the interplay between the portfolio to be hedged

and the hedge instruments. Assuming Australia and U.K. as the domestic and foreign countries respectively, practical examples are presented to illustrate the value-based indices and the graphical basis risk metric.

The project will produce three working papers in 2017 as it is drawn to completion.

A value-based longevity index is an effective instrument for hedging as it addresses major sources of risks associated with pension funds and life insurers.



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of Risk and Actuarial Studies. He received his PhD in Quantitative Finance from the University of Technology Sydney where his thesis was on the evaluation of early exercise exotic options. His current research interests include longevity risk management, valuation of guarantees embedded in variable annuities and option pricing under stochastic

volatility. His research output has been published in esteemed quantitative finance and actuarial journals such as *Insurance: Mathematics and Economics* and *Quantitative Finance*, among others, and has been presented at various international conferences.

PRE- AND POST- RETIREMENT INVESTMENT STRATEGIES - TARGET ANNUITISATION FUNDS

RESEARCHERS

MICHAEL SHERRIS
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This project is examining pre- and post- retirement investment strategies with an emphasis on the role of housing in funding retirement income and post retirement needs for long-term care. The initial research has focused on target annuitisation funds and assessed different portfolio insurance strategies taking into account superannuation contributions. Results using simulations show that while on average, the portfolio weights in bonds decrease over time, they have a high degree of variability. Since the aim is to meet a minimum level of retirement income in

the strategies, they lead to an increased exposure on average to equities as the fund accumulates a cushion over and above the minimum. The comparison between the two portfolio insurance strategies shows that constant proportion portfolio insurance (CPPI) strategies generally perform better than option based portfolio insurance (OBPI) strategies for higher equity market outcomes. In higher volatility equity markets, however, CPPI has a higher chance of not meeting the minimum target level of annuitisation. This is being written up and will be finalised as a working paper in early 2017.

In order to incorporate housing into the strategies, the project uses simulations

to assess the role of housing in financing retirement needs by considering the optimal time to buy a residential house. The family home is typically the single most important asset in household portfolios, and it plays an important role in retirement planning. A natural question that arises is when to become a home owner. We examine this question by looking at how purchasing a home at different ages affects an individual's pre-retirement consumption, retirement savings, and ultimately the lifetime utility level. We use a vector autoregressive process to model the dynamics of asset returns and labour income growth, and perform Monte Carlo simulations to analyse the impact. Purchasing a

property earlier in the working life leads to a higher level of wealth at retirement due to higher home equity and more liquid assets, but it comes at a higher cost of utility loss caused by several years of reduced consumption following the property purchase. Renting throughout the working life, however, significantly constrains the spending on non-housing consumption, which results in a low utility level. If an individual cares only about expected future wealth and savings for retirement then purchasing the property early in life is preferred. We also show that taking risk and preferences for consumption into account means that deferring residential property purchase to later ages results in increased

lifetime utility. This project is being finalised and is expected to produce a working paper in early 2017.

The final part of this project is to consider housing and health status in an optimal post retirement financing strategy taking into account a model of functional disability, the pattern of increasing health costs and the variability in housing value in financing future health needs.

Results using simulations show that while on average, the portfolio weights in bonds decrease over time, they have a high degree of variability.



DR ADAM WENQIANG SHAO
BEC BISU, MEd CUFE,
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ASSOCIATE INVESTIGATOR

Adam is an Associate Investigator at CEPAR and is a Senior Quantitative Analyst (Retirement Outcomes) at Mine Wealth + Wellbeing Super.

He became an Associate of the Society of Actuaries in December 2015. He was formerly a CEPAR Research Fellow.

His research expertise includes life-cycle models, pricing and risk analysis of retirement products (e.g., annuity, reverse mortgage, and long-term care insurance), solvency capital

requirements, longevity risk, and multiple state health transitions modelling.

MANAGING RETIREMENT RISKS WITH REVERSE MORTGAGE LOANS AND LONG-TERM CARE INSURANCE

RESEARCHERS

MICHAEL SHERRIS
ADAM WENQIANG SHAO

External Collaborator

HUA CHEN
(TEMPLE UNIVERSITY)

Increasing emphasis has been placed on understanding the role of housing in financing long-term care (LTC) needs in Australia and other countries. LTC insurance is also a product that is available in some countries such as France and the United States but not in Australia. Since there is a high proportion of home ownership in Australia and a house can be seen as a form of self-insurance against LTC costs, the question arises as to what the demand would be for products that can

potentially cover LTC costs such as LTC insurance and reverse mortgages (RMs) on a retiree's house.

To address this question, this project considers a retiree's optimal portfolio choice with respect to consumption, reverse mortgage loans, and private LTC insurance. We use a discrete time life-cycle model that takes into account mortality risk, health shocks and house price risk. The aim is to consider how individuals can use reverse mortgage loans and private LTC insurance to better manage retirement risks. In particular, we aim to quantify the extent to which the demand for private LTC insurance is reduced by home equity, which provides a form of self-insurance.

The main results are that borrowing against home equity dominates LTC insurance because it produces higher earlier consumption in the life-cycle model, and also provides some longevity insurance. LTC insurance with a lump sum premium transfers wealth from good health states to bad health states but reduces earlier consumption. Home equity complements LTC insurance in funding LTC costs and can 'crowd out' LTC insurance. The highest welfare benefits come from a combination of both RMs and LTC insurance, so this highlights the potential for new products that combine longevity and LTC insurance (health care annuities). The life-cycle framework does not reflect actual individual behaviour, where there is limited

reverse mortgage usage and limited purchase of LTC insurance, highlighting the potential for extension to more complex preferences and inclusion of market loadings in the research.

During 2016 the project has been developed into a working paper that has been presented at a number of conferences. The working paper, titled 'To Borrow or Insure? Long Term Care Costs and the Impact of Housing', will be finalised for publication in 2017.

Conference presentations included:

- Sherris, M. (January 2016). Managing Retirement Risks with Reverse Mortgage Loans and Long Term Care Insurance. Western Risk and Insurance Association Annual Meeting. Wailea, USA.
- Sherris, M., Shao, A.W. and Chen, H. (2016). To Borrow or Insure? Long Term Care Costs and the Impact of Housing. 7th China International Conference on Insurance and Risk Management, July, Xi'an, China and Second International Congress on Actuarial Science and Quantitative Finance, June, Cartagena, Colombia.



DR H ELO ISE LABIT HARDY

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H elo ise Labit Hardy commenced work as a Senior Research Associate in the ARC Centre of Excellence in Population Ageing Research at the UNSW Business School in

September 2016. She completed her PhD at the University of Lausanne at the department of Actuarial Science. She graduated from the French actuarial school *Institut de Science Financiere et d'Assurances*.

She works with CI Michael Sherris on mortality modelling, more specifically on longevity risk management and cause-of-death mortality

modelling. H elo ise was a member of the French-Swiss 'Germaine de Sta el' project Modelling population dynamics with causes-of-death mortality (Gds 2014-14).

'I am interested in fields relative to longevity risk. It is a great opportunity for me to join a multi-disciplinary research team committed to transforming thinking about population ageing.'

POST-RETIREMENT INCOME: FINANCIAL AND ACTUARIAL ISSUES

RESEARCHERS

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MICHAEL SHERRIS

This project is developing the contents of a book focusing on financial and actuarial issues in post-retirement incomes including modelling longevity and health, demand and supply issues including drawdown strategies and products such as annuities, long-term care annuities and variable annuities. Topics are expected to include longevity and disability trends, basic models of mortality and heterogeneity, post-retirement income institutions, markets, and products, and a framework for individual financing decisions. The book will reflect existing institutional

and regulatory structures and requirements and incorporates current research perspectives.

Although research based, the aim for the book is to also be a graduate teaching resource and assumes knowledge of undergraduate financial and actuarial mathematics, probability theory, and economics. The project has been scoped and developed over a number of years. A number of draft chapters were prepared by Ermanno Pitacco during 2015 and 2016. This project was largely deferred in 2016 but will receive additional focus in 2017. Challenges have included identifying authors for the chapters and finalising the structure and coverage of the chapters.

This project is developing the contents of a book focusing on financial and actuarial issues in post-retirement incomes.



PROFESSOR ANNAMARIA OLIVIERI

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ASSOCIATE INVESTIGATOR

Annamaria Olivieri is Professor of Mathematical Methods for Economics, Actuarial Science and Finance in the Department of Economics at the University of Parma.

Her areas of research include life and health insurance modelling and risk management. She is an actuary and full member of the *Istituto Italiano degli Attuari* (Italy) and Associate Editor of the *European Actuarial Journal*. In 2011 she was awarded the Bob Alting von Geusau Memorial Prize, together with Ermanno Pitacco, for the best paper published in the *ASTIN Bulletin*

on an AFIR related topic. She has presented in continuous professional development courses and masters programmes (in Italy and abroad) for both actuaries and non-actuaries, in the field of actuarial mathematics and risk management techniques. She is an author and co-author of many research articles and the recent textbooks, *Introduction to Insurance Mathematics:*

Technical and Financial Features of Risk Transfers, 2nd edition (2015) with Ermanno Pitacco, and *Modelling Longevity Dynamics for Pensions and Annuity Business* (2009) with Pitacco, Denuit and Haberman.

MORTALITY IMPROVEMENT RATES: MODELLING AND PARAMETER UNCERTAINTY

RESEARCHER

ANDRÉS VILLEGAS

External Collaborator

ANDREW HUNT
(PACIFIC LIFE RE, LONDON, UK)

One important strand in meeting the challenges of an ageing population has been the development of a wide range of models in order to forecast the future evolution of mortality rates, based on a combination of statistical extrapolation of historic data and expert judgement. However, one of the subtle differences between academic models for forecasting mortality and those used by actuaries in the life insurance industry is over what variable to model. Academic mortality models usually focus on modelling mortality rates with most of the recent advances building on the

well-known Lee-Carter model. In contrast, practitioners are often interested primarily in the modelling of mortality improvement rates. This is because it is the changes in mortality rates that are of interest when assessing longevity risk for an insurer or pension scheme. Furthermore, the discussion of mortality improvement rates also allows practitioners to compare the evolution of mortality in populations with very different levels of mortality, for instance, men and women or in different countries.

In recent years, a number of academic studies have started looking at modelling and forecasting improvement rates. However, the modelling of improvement rates is more

challenging than the modelling of mortality rates themselves: since they are effectively the first derivatives of the mortality rates, any uncertainty in the measurement of mortality rates is magnified significantly in the measurement of improvement rates. The academic studies of improvement rates to date, whilst trailblazing in their approach to the topic, have been forced to make ad hoc modelling assumptions in order to deal with the challenges associated with the direct modelling of mortality improvement rates. In contrast, there exists a well-developed theoretical framework for age-period-cohort models of mortality rates.

This project aims to apply some of the structure developed for the study of mortality rates to the modelling of mortality improvements, allowing a more rigorous examination of mortality improvement rates. This means that we can draw on the large amounts of work done to model mortality rates to obtain robust and stable estimates of improvement rates without requiring the ad hoc modelling frameworks that have been a feature of previous studies. Furthermore, we investigate the parameter estimates obtained under previous studies and find that, not only are they subject to considerable parameter uncertainty, but they also give significantly different best-estimate forecasts of future mortality

rates, which may be biased and less robust in comparison with our approach and with models of mortality rates.

Results from this project have been written up in the working paper, Hunt, A. and Villegas, A.M. (2016) Mortality Improvement Rates: Modelling and Parameter Uncertainty, and have been presented at the Second International Congress on Actuarial Science and Quantitative Finance, Cartagena, Colombia, 2016; the International Insurance: Mathematics and Economics Conference in Atlanta, USA, 2016; and the Society of Actuaries' 2017 Living to 100 Symposium in Orlando, USA.



DR ANDRÉS VILLEGAS

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SENIOR RESEARCH ASSOCIATE

In 2016 Andrés was a Senior Research Associate at the UNSW CEPAR node. In January 2017 he took up the position of lecturer at the UNSW School of Risk and Actuarial Studies.

He completed his doctoral studies at Cass Business School in London focusing on the modelling and projection of mortality. Before his doctoral studies he obtained an MSc degree in Industrial Engineering from *Universidad de Los Andes* (Colombia) and worked as a risk analyst at one of the biggest Colombian life insurance companies. Andrés's research interests include mortality modelling

and longevity risk management. His recent research has focused on assessing the trends and financial implications of socio-economic differences in mortality.

'I am very fortunate to have the opportunity to develop and enrich my population ageing research within CEPAR's multidisciplinary environment.'

MIND THE GAP: A STUDY OF CAUSAL MORTALITY BY SOCIOECONOMIC CIRCUMSTANCES

RESEARCHERS

ANDRÉS VILLEGAS
DANIEL H. ALAI

External Collaborators

SÉVERINE ARNOLD (-GAILLE)
(UNIVERSITY OF LAUSANNE)
MADHAVI BAJEKAL
(UNIVERSITY COLLEGE
LONDON)

Over the past 30 years, life expectancy in high income countries has increased dramatically, averaging a gain of about two years per decade. However, these gains have not been shared equally across all groups in society. For instance, in England, people living in the poorest residential areas can, on average, expect to die eight years earlier than people living in the most affluent. Recent evidence indicates that inequalities in life expectancy in England have not only widened but

are forecasted to widen even further. This situation is not unique to England; elsewhere in the developed world, notwithstanding differences in the size and trend of the absolute gap in mortality rates between the most and least advantaged social groups across countries, the underlying message is the same: health inequalities are ubiquitous and have persisted over time.

This project provides the basis to assist government bodies in implementing well-informed strategies aimed at reducing social inequalities in health. This is especially relevant today around the world, where addressing such inequalities has become a key focus of public policy. The proposed approach uses cause-specific mortality data in

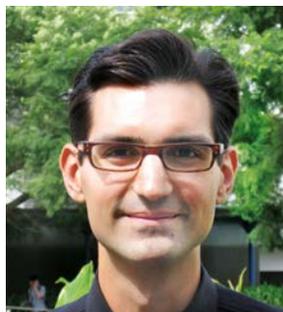
order to gain insight into differences in life expectancies by deprivation categories. We investigate the relationship between socioeconomic circumstances and causal mortality on a unique dataset obtained from the UK Office for National Statistics and apply a model that has the ability to incorporate any combination of cause-specific mortality shocks. This investigation is performed in two steps. First, the multinomial logistic model developed in a previous CEPAR project (Alai, D. H., Arnold (-Gaille), S., and Sherris, M. (2015). Modelling cause-of-death mortality and the impact of cause-elimination. *Annals of Actuarial Science*, 9(1), 167-186.) is extended to allow for socio-economic covariates. Second, an optimisation procedure is

developed that identifies the cause-specific reduction scenario that simultaneously maximises the overall gain in life expectancy whilst minimising social inequalities.

The results found in this project may have important consequence in forming public policy. For example, while it is well-known that the decline in heart disease mortality was a major contributor to increases in life expectancy over the past 25 years across all socioeconomic groups in England, the elimination, or reduction, of such causes-of-death contributes, according to our results, to an increase in inequalities by socioeconomic circumstances. Public policy exclusively targeting cardiovascular diseases

may, therefore, be contradictory to the aim of reducing the social gradient in life expectancy.

Results from this project have been written up in the working paper, Alai, D.H., Arnold (-Gaille), S., Bajekal, M., and Villegas, A.M. (2016) Causal mortality by socioeconomic circumstances: A model to assess the impact of policy options on inequalities in life expectancy and have been presented at the Society of Actuaries' 2017 Living to 100 Symposium in Orlando, USA.



DR DANIEL H. ALAI

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Daniel Alai is a Lecturer in the Centre for Actuarial Science, Risk and Investment at the University of Kent.

Prior to his appointment at Kent in early 2014, Daniel was a Senior Research Associate in the Australian Institute for

Population Ageing Research at the UNSW Business School.

Daniel joined UNSW in June 2010 following his graduation from the Department of Mathematics at ETH Zurich. He has also worked for insurance companies such as Sun Life (Waterloo) and Manulife (Waterloo), as well as for consulting companies KPMG (Toronto) and Tillinghast-Towers Perrin (New York City).

He has expertise in actuarial risk management and loss modelling, development and assessment of models for longevity risk and application to product developments, risk management and regulatory requirements.

AUTOMATIC BALANCING MECHANISMS IN PAY-AS-YOU-GO PENSION SYSTEMS WITH CONSIDERATIONS OF ADEQUACY AND FAIRNESS

RESEARCHER

JENNIFER ALONSO GARCÍA

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There are three main challenges facing public pension systems. First, pension systems need to provide an adequate income for pensioners in the retirement phase. Second, participants wish a fair level of benefits in relation to the contributions paid. Last but not least, the pension system needs to be financially sustainable in the long run. These projects aim to devise risk-sharing mechanisms that affect key parameters of the pension system in order to ensure its

sustainability, while looking at the actuarial fairness and adequacy.

The first project looks into the liquidity and solvency of a defined contribution pension scheme, commonly known as a 'notional defined contribution' pension scheme. The liquidity, a cross-sectional equilibrium, implies that all that is received is paid. On the other hand, solvency corresponds to analysing whether the liabilities towards all participants are backed by sufficient assets, which in a pay-as-you-go environment corresponds to an estimation of the 'pay-as-you-go asset'. Given that classical parameterisation doesn't ensure either liquidity or solvency in a dynamic setting, in this project we derive an indexation rate paid to

pensions and a notional rate paid to contributions which provides liquidity and solvency in the short and long run.

In the second project we look to the sustainability of defined benefit and defined contribution jointly and devise risk-sharing mechanisms that involve changes in the key variables of the system such as the contribution rate and indexation rate. Here we obtain a flexible risk-sharing mechanism which shares the burden in a transparent way between the contributors and pensioners. Both projects show that such mechanisms are necessary given the current population and socioeconomic structure.

Furthermore, these mechanisms increase substantially the actuarial fairness of the various pension schemes considered at the expense of pension adequacy.

The first project is about to be finalised and the results written up for submission to a leading international pension finance journal. The results of the second project have been reported in the CEPAR Working Paper 2016/22: Alonso-García, J., Boado-Penas, M.d.C., and Devolder, P., Adequacy, Fairness and Sustainability of Pay-as-You-Go-Pension-Systems: Defined Benefit Versus Defined Contribution. The output of this project has been presented at various national and international conferences and seminars including the

Mathematical and Statistical Methods for Actuarial Sciences and Finance in Paris, France, the European Actuarial Journal Conference in Lyon, France and at the Pierre and Marie Curie University in Paris, France.

These projects aim to devise risk-sharing mechanisms that affect key parameters of the pension system in order to ensure its sustainability, while looking at the actuarial fairness and adequacy.



DR JENNIFER ALONSO GARCÍA

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Jennifer Alonso García joined the UNSW Business School node of CEPAR as a Senior Research Associate in July 2015. She completed her undergraduate studies in mathematics in Spain and Germany, and received a PhD

in Actuarial Sciences from the *Université Catholique de Louvain* in Belgium in 2015. She is also a fully qualified member of the Belgian Institute of Actuaries.

Her research combines the areas of pension economics, quantitative finance and actuarial science to study population ageing. Her research program centres around the following overarching question: 'How can we develop sound

retirement income schemes that are fiscally sustainable and attractive for participants in an ageing environment?' During her PhD she studied both the fiscal sustainability and adequacy of pay-as-you-go financed defined contribution public pension schemes. Her research has been published in leading international actuarial science journals, including *Insurance: Mathematics and Economics* and the *ASTIN*

Bulletin. Jennifer is currently involved in research projects on the influence of institutional settings and cultural aspects in the choice of retirement income products, welfare analysis of drawdown structures in Australia and the Netherlands as well as pricing and hedging guarantees embedded in variable annuities. She is also the Research Strand Coordinator for the Resources in Retirement strand.

THE EFFECT OF LABOUR TRANSITIONS IN PUBLIC PENSION FINANCING: A CASE STUDY FOR SPAIN

RESEARCHER

JENNIFER ALONSO GARCÍA

External Collaborator

BEATRIZ ROSADO-CEBRIÁN
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The recent financial crisis has intensified the public debate on the sustainability of both pay-as-you-go and funded public pension schemes because the economic risk is expanding the effects of the already present demographic risk. Spain has experienced a dramatic decrease of births per woman since 1960 attaining a record low of 1.23 births per woman in 2000 and is among the European countries with the highest life expectancy.

This leads to a decreasing ratio of employed to retirees as less individuals enter the system and they do it at later ages. In particular, the combination of ageing and decrease in economic growth with an increase in unemployment, public debt and market volatility is challenging the payment of pension entitlements in Spain as well as other European countries.

The objective of this project is to analyse the effect of the levels of unemployment and inactivity after the global financial crisis in Spain on the income from contributions and pension expenditures as a percentage of the GDP by using the Aggregate Accounting framework. The framework studied considers the latest pension reforms that have been put in place in Spain in 2011 and 2013. The analysis is performed by considering the transition probabilities between two contributory states (employment and unemployment) and one non-contributory state (inactivity), as calibrated from the cross-sectional data stemming from the Labour Force Survey for the post-crisis period 2008 to 2016. By taking these transitions into account in our endogenous model, the cash flows related to the income and expenditures will become more realistic, producing more insightful estimates of the future pension expenditures burden. This innovative approach is a novelty in pension economics to the best of the authors' knowledge.

We analyse the pension expenditures for the current pattern as well as for full employment and conclude that while the economic risk outweighs the demographic risk until 2040, the main driver of expenditures lies in the ratio of pensioners to working age population in the long run. Our results raise the need to tackle the current labour market situation and confirm that the most recent reforms made in Spain don't suffice to attain sustainability in the long run.

The results of the second project have been reported in CEPAR Working Paper 2016/21: The Effect of Labour Transitions on Public Pension Financing: A Case Study for Spain.

Our results raise the need to tackle the current labour market situation and confirm that the most recent reforms made in Spain don't suffice to attain sustainability in the long run.

MANDATORY PRE-FUNDED RETIREMENT INCOME SCHEMES: BEST POLICY AND PRACTICE

RESEARCHERS

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In 2016 CEPAR and the Network for Studies on Pensions, Aging and Retirement (NetSPAR) continued their collaboration on a large-scale research program focused on mandatory pre-funded retirement income systems. Funded by the ARC, in collaboration with partners APG in the Netherlands and AMP and PwC in Australia, the project investigates the critical elements of retirement income product design in two countries with established and high quality mandatory pre-funded systems: Australia and the Netherlands.

The project has two distinct parts. First, the team led by

CEPAR CI Michael Sherris considers supply-side issues with the key aim of designing retirement income products which could enhance welfare. One study focuses on developing a product which matches the optimal consumption for retired individuals while accounting for housing wealth and health-state transitions. However, this ideal product may not be welfare enhancing for all income levels. In this context, a second study considers the impact of various popular product choices in both the Netherlands and in Australia for differing income levels and where market returns and mortality are stochastic.

The second part of the project led by CEPAR AI Hazel Bateman considers demand-side issues, with an emphasis on the behavioural aspects of retirement benefit decisions. One study uses an experimental survey to investigate the impact of framing (consumption versus investment and gain versus loss) and institutional framework on choice of retirement benefit from a menu comprising a lifetime

annuity and a liquid investment product. The experimental survey was designed in 2016 and will be fielded in both Australia and the Netherlands using commercial panels in February 2017. A second study is motivated by widespread international evidence that, contrary to theory, retirees are holding onto their retirement savings well into retirement. In 2016 an experimental survey was designed with the aim of identifying why the elderly are not drawing down as expected. The survey was fielded in the Netherlands in December 2016 using the Longitudinal Internet Studies for the Social Sciences (LISS) and the CentER panels and will be fielded in Australia through a commercial web panel in February 2017. Findings from both studies will be written up as working papers in 2017.

A key output in 2016 was a working paper comparing the retirement income arrangements in Australia, the Netherlands and the United Kingdom (Stevens 2016). This provided a detailed institutional foundation for framing the specific research questions for the project.

The progress made on the sub projects has been facilitated through regular research visits by members of the research teams. In 2016 CEPAR Research Fellow Jennifer Alonso García and AI Hazel Bateman visited NetSPAR and NetSPAR Researcher Johan Bonekamp visited CEPAR. Further visits have been arranged in 2017 to ensure the successful completion of the projects.

...the project investigates the critical elements of retirement income product design in two countries with established and high quality mandatory pre-funded systems: Australia and the Netherlands.

MARKOV REGIME SWITCHING AND THE LEE-CARTER MODEL

RESEARCHER

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This project aims to investigate how to use and improve the application of Markov regime switching in modelling the changes in mortality probabilities over time in the context of structures such as the Lee-Carter model. Applying a Markov regime switching model to mortality data allows for periods (regimes) where the changes in mortality are different. There is evidence that past mortality changes have been different over time. Incorporating the possibility that the dynamics of mortality changes might vary over time is important

for stochastic forecasts as the spread of possible future mortality probabilities would otherwise be underestimated.

This project comprises two parts. In the first part of the project we use Monte Carlo simulations to analyse various methods to improve the estimation for the Markov regime switching models. Here we focus on Markov regime switching models where the intensity to switch between regimes is small. In this case, Monte Carlo simulations show that the estimated parameters in the Markov regime switching model are biased. For example, the estimated intensity to change regimes can be twice as large as the real intensity. This is due to a sequence of observations which are incorrectly

modelled as regime change but are just random derivations.

In the second part of the project, we use three different Markov regime switching models for Monte Carlo simulations. We use Markov regime switching models in trend; in volatility; and in trend and volatility. We improve the standard Markov regime switching models by incorporating a minimum number of periods this process is required to remain in a regime before it can switch. Our analysis shows that this can enhance the estimation. We find that for Markov regime switching models in trend when the volatility is large that the minimum period should be large. For Markov regime switching models in trend and volatility when the

volatility is large and the transition intensity is low, the minimum period should be large. And for Markov regime switching models in volatility when the volatility is large and the transition intensity is not too low, the minimum period should be large. Future work in this project includes the application of the models to mortality data and investigating the extent of the difference in estimation from alternative estimation techniques.

Incorporating the possibility that the dynamics of mortality changes might vary over time is important for stochastic forecasts as the spread of possible future mortality probabilities would otherwise be underestimated.



DR RALPH STEVENS

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SENIOR RESEARCH FELLOW

Ralph Stevens joined the UNSW CEPAR node in July 2012 as a Senior Research Fellow. Previously he held the position of Lecturer in the School of Risk and Actuarial Studies at

the University of New South Wales. He holds a PhD degree from CentER, Tilburg University, where his research was focused on the Network for Studies on Pensions, Aging and Retirement (NetSPAR) theme: Living Longer in Good Health. He is also a NetSPAR Fellow.

His current research focuses on the effects of systematic longevity risk on annuities. This includes managing and measuring systematic longevity risk in a portfolio of life insurance and pension products and calculating the capital reserves for systematic longevity risk.

He is also interested in retirement choices. This incorporates optimal decision making in life-cycle models as well as describing, understanding and improving choices related to the individual retirement decision.

RESEARCHERS

JOHN PIGGOTT
ROBERT HOLZMANN
HAZEL BATEMAN
RAFAL CHOMIK
GEORGE KUDRNA
ALAN WOODLAND

Demographic transition naturally generates a policy appetite for pension reforms. While there is now a substantial analytical and policy literature on pension policy, the taxation of pensions has received relatively little attention. Increasingly, however, pension taxation is coming under the spotlight, either directly, as tax preferences for pension saving and pension pay-outs are weakened, or indirectly, through reducing pensions by means tests or cuts to pension entitlements.

One reason why the interaction between pensions and taxation has been ignored in the literature is that public finance specialists think of pensions as a small part of what they do, while pension economists regard tax structures as only one small part of pension research. Pension taxation must be seen in the context of broader taxation structures. Too often pension taxes have been analysed in isolation from the other tax and transfer instruments prevailing in an economy.

A more comprehensive approach brings into play the rationale for alternative policy designs, and their economic impacts. In turn, these broad structures have differential effects, depending on the inter-

jurisdictional mobility of capital and labour. At the same time, new ideas are emerging in the literature about capital income taxation, and the idea of age-based taxes, once an intellectual curiosity, is now gaining policy traction.

This project has explored these issues, and their inter-relationship, through two conferences, held in late 2014 (at CEPAR UNSW) and 2015 (at CESifo Munich). (One of the spin-offs of the project was to establish a collaboration between CEPAR and CESifo.)

Through 2016, papers were revised, and are now being assembled into a conference volume to be considered for publication by MIT Press. The idea is to provide a comprehensive and systematic treatment of

this neglected topic that will provide a benchmark for future research.

In combination, the research addresses three crucial concerns:

- How can the accumulation of actual and notional individual pension wealth and the pay-out of pensions be integrated most effectively with prevailing tax regimes to deliver the most efficient and equitable outcomes?
- How can pension taxation help address the challenges of old-age poverty, longevity and intergenerational equity within retirement income policies?
- What are the taxation principles that allow marrying full portability of acquired pension

rights and benefits of international mobile workers with national objectives of efficiency, sustainability and equity?

In addition, specific regional problems have been addressed:

- The debate about means testing in the U.S.
- The European integration agenda which guarantees full mobility of workers and pensioners
- The Australian tax system, requiring reform of its complex arrangements

The proposed volume comprises 16 chapters. The book begins with papers providing an overall treatment of both theoretical and policy issues regarding pension taxation,



DR GEORGE KUDRNA

MA Econ TUL Czech Republic,
PhD Econ Syd.

RESEARCH FELLOW

George Kudrna is a CEPAR Research Fellow, located in the UNSW Business School. He joined the Centre in July 2011 after working for two years as a Postdoctoral Fellow for the UNSW School of Economics. He completed his undergraduate studies in

economics and insurance management in the Czech Republic, and received a PhD in Economics from the University of Sydney in 2009.

His research encompasses the areas of public economics, macroeconomics and population ageing. He develops and applies rigorous macroeconomic models to investigate the economic impacts of demographic change and retirement income

policy reforms in Australia – with the ultimate aim of informing and influencing major policy decisions in this area. His research on pension and ageing related topics has been published in both national and international economics journals, including the *Economic Record*, the *Journal of Macroeconomics*, *Macroeconomic Dynamics* and *Economic Modelling*. He has also co-authored several

government reports on pension and tax related issues, including commissioned reports for the Australian Treasury, for the U.S. Social Security Administration and for the NSW Treasury. He serves as Research Strand Coordinator for Causes and Consequences of Demographic Change – one of the key Areas of Research Focus of CEPAR.

with both academics and policy officials contributing. There follow chapters analysing specific country issues – countries/regions covered include the U.K. and U.S., Scandinavia, Australia, Germany, Switzerland and Portugal. Next comes a section on overlapping generations models, in the tradition of Peter Diamond: these models comprise perhaps the most sophisticated empirical analysis of pension policy; and cross border arrangements. In addition, the volume features an extended introduction by Holzmann and Piggott, which aims to relate contemporary theory to policy and practice.

Six CEPAR-affiliated personnel were involved in this project: Robert Holzmann and John Piggott are volume editors, as well as authors; Hazel Bateman, Rafal Chomik, George Kudrna, and Alan Woodland are also authors of papers included in the volume.

The chapter by Kudrna and Woodland gives a flavour of the contributions. It provides a quantitative analysis of hypothetical replacements of the current taxation treatment applied to Australia's superannuation with the traditional exempt-exempt-tax (EET) and TEE tax regimes. Under both reforms, the existing flat tax rates on contributions and fund investment earnings that are currently paid by superannuation funds are abolished and either the benefits or the contributions are treated as ordinary income and taxed progressively at marginal income rates. The project also examines the effects of the TEE variant recommended by the Henry Tax Review, which includes a flat-rate tax offset so that most taxpayers pay 15 percent tax on their contributions. A computable overlapping-generations model is used to examine the economic implications of the

superannuation taxation reforms. In 2015 and 2016, the modelling was further extended to allow more precise results concerning progressive taxation to be generated. The model-based simulation results indicate that, irrespective of the superannuation payout type and the budget-balancing tax instrument, all three examined reforms to superannuation taxation improve the vertical equity, as shown by larger relative gains in welfare and net incomes experienced by lower income households. The reforms are found to increase aggregate total assets and reduce public pension expenditures in the long run.

Pension taxation must be seen in the context of broader taxation structures. Too often pension taxes have been analysed in isolation from the other tax and transfer instruments prevailing in an economy.

ASSESSING PENSION TAX REGIMES: AN AUSTRALIAN PERSPECTIVE

RESEARCHERS

GEORGE KUDRNA
HAZEL BATEMAN

Retirement savings (or private pensions) can be taxed at one or more of three points – contributions (T), fund earnings (T) and/or benefits (T). Most countries currently tax private pensions under an expenditure tax – EET – regime where contributions to and earnings of the pension fund are exempt from any taxation, but benefits are treated as ordinary income and taxed progressively. Fewer countries tax pensions under a comprehensive income tax – TTE – regime, which sees contributions to the pension fund and fund earnings taxed but then no further taxes apply or the hybrid approach – TTT – where pensions are taxed at all three points. However, due to fiscal pressures associated with ageing populations, and increasing labour and retiree migration, many EET countries are considering a shift towards TEE or TTE to bring forward pension tax revenue.

Over the past 30 years, superannuation (Australia's term for private pensions) has been taxed under all three regimes – starting with

EET until 1988, then TTT between 1988 and 2007 and TTE since 2007. The current taxation of superannuation in Australia features a flat rate of tax on contributions and fund earnings (including capital gains), while retirement benefits are generally tax free. The Australian experience therefore provides lessons for jurisdictions contemplating a similar move. In particular, Australia's current approach to pension taxation has been widely criticised because of vertical equity concerns (due to the flat rate taxes on contributions and fund earnings), with superannuation tax concessions providing a larger tax break to high income earners. This has resulted in frequent tinkering by successive governments in attempts to imitate progressive taxation, and the consequent disengagement of super fund members due to perceptions of constant change and politicisation.

The purpose of this project is twofold. Firstly, we trace the evolution of the taxation of superannuation over the past three to four decades and compare the Australian approach with international experience. In doing so, we

highlight key deficiencies with the current superannuation tax approach and lessons for pension tax reform internationally. Secondly, we undertake a quantitative analysis of a reform that replaces a comprehensive income tax (TTE) regime applied in Australia or an expenditure tax (EET) regime commonly applied in other countries with a pre-paid expenditure tax (TEE) approach. Our methodology builds on general equilibrium life-cycle models. Specifically, we develop two benchmark models – a model for Australia with the existing concessional TTE tax treatment of superannuation and a more general model with private pensions taxed under the EET approach – to numerically evaluate the impacts of the shift to TEE on equity and aggregate efficiency.

In 2016, we completed the numerical analysis of a switch from the existing comprehensive income taxation (TTE) of superannuation to a pre-paid expenditure tax (TEE) regime, using a model stylised to the Australian economy. Our model-based simulation results indicate that such reform to

superannuation taxation (with contributions progressively taxed) would improve vertical equity and reduce income inequality upon impact, as well as in the long term, as shown by larger welfare gains and income improvements experienced by lower income households and a reduced Gini coefficient. We also find positive effects on total assets and reduced government expenditures on the means tested Age Pension. However, the reform yields a small aggregate efficiency loss.

This research was presented at the CEPAR-CESifo Workshop on 'Taxation of Pensions' held in Munich in September 2015. Outputs in progress include two chapters in the conference volume expected to be published by MIT Press, as well as a working paper to be submitted for publication in an international economics journal by mid-2017.

The current taxation of superannuation in Australia features a flat rate of tax on contributions and fund earnings (including capital gains), while retirement benefits are generally tax free.

AREA OF RESEARCH FOCUS

4

AGEING WELL AND PRODUCTIVELY

A whole of life approach to ageing naturally suggests that healthier lifestyles will lead to more productive ageing, whether in the formal labour market or in the family context. The core research question here is how social structures and policy initiatives can encourage individual and social actions that support ageing well and productively.

Research examines ways in which health and psycho-social factors influence productive contributions as well as independence, wellbeing, and use of health and community services. It focuses especially on those aspects of decision making and life choices that are important for a longer and more productive life, an important issue in the context of demographic change because as baby boomers age, the potential productivity of this cohort will depend on how well they age.

TO VIEW PUBLICATIONS
AND WORKING PAPERS RELATING
TO THIS RESEARCH VISIT CEPAR.EDU.AU

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Population ageing inevitably means that older cohorts are going to become more important, numerically and in terms of overall social impact, as the demographic transition evolves. This area of research focus (ARF) focuses on two important aspects of this evolution. First, it will be critical that older cohorts remain productive for longer. Encouraging older workers to stay in, or re-join, the workforce requires greater understanding of the forces - both demand and supply driven - that lead so many to leave at relatively young ages. In 2050, mature age workers in Australia will increase to 5.6 million people from today's 3.1 million, an increasingly important economic resource. And there is evidence to suggest that maintaining workforce attachment can contribute positively to individual wellbeing. As well, of course, productive ageing encompasses unpaid work: caring, and volunteering especially.

Second, health costs are rising - public health costs alone are projected to rise from 7% of GDP today to 12% by 2050. Private health costs account for a further 5% today - who knows what that will be in another generation? Research undertaken here shows how older people can maintain good health for longer.

In both these areas, social attitudes are critical - in the workplace, in the community generally and between generations.

2016 highlights for this ARF include:

- **PRODUCTIVE AGEING AND ATTITUDINAL INFLUENCES**
Three projects led by Cl Hal Kendig and Al Julie Byles focus on this aspect of the ARF. A paper led by Tazeen Majeed that explored workplace participation patterns across the lifecourse for men and women born 1946-51, was published in 2016. The study showed clear gender differences in work patterns, with men being more likely to remain in full-time work, compared to women; and with women being likely to move into part-time work at older ages. However, 24% of men had little paid work after age 55, and a further 11% had little or only part-time work after this age. Related work will investigate the extent of engagement in productive activities, and the determinants and consequences of engagement in productive activities for more recent cohorts of ageing individuals in Australia.

- **SUPPORT IN MAINTAINING HEALTH**
Research led by Al Lindy Clemson, part of a major international collaboration, relates to falls prevention. Among older people, falls can potentially have a massive impact on health, wellbeing, and productivity.

The LiFE program is a non-traditional approach to exercise, embedding balance and strength training into daily life activity, which has transformed thinking about exercise worldwide. The program was developed and proven in a randomised trial in 2013 led by Clemson. This project is adapting the LiFE program to an aLiFE version for young old

(60-70 years) recent retirees, using ICT-based phenotyping of individual risks to personalise the intervention and refinements to the program. The objective is to enable self-assessment and self-management delivery of exercise with the aim of moving risk detection earlier and prevention by self-administered support.

RESEARCHERS

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SHANE THOMAS
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This project is based primarily on the Melbourne Longitudinal Studies on Healthy Ageing program (MELSHA), led by Al Browning and Cl Kendig, with CEPAR support for analyses this year. MELSHA is a 16 year population-based longitudinal cohort study

which has contributed to healthy ageing policy in Australia and to the importance of including older people in health promotion programs.

In 2016, Browning and colleagues (including Thomas and Kendig), published two chapters in the *Encyclopaedia of Geropsychology*, based on MELSHA and Healthy Ageing. The ASSA/CEPAR book, *Population Ageing and Australia's Future*, (edited by Kendig, Piggott and McDonald and detailed on page 25) published in 2016; includes a chapter on wellbeing and its improvement as a national goal (Burns and Browning); and another chapter examining social influences

on ageing well and strategies to achieve it in health and care policies (Kendig and Browning).

Wister and colleagues (including Kendig and Loh), published a comparison paper in the *BMC Geriatrics*, on multimorbidity, health and ageing in Canada and Australia. They concluded that the associations between multimorbidity and health are similar between the two countries, and suggest that findings from either country could have application to the other in regards to epidemiological and health services research and health promotion.

A paper by Burns, Browning and Kendig, focusing on living well with chronic disease, has been accepted by *International Psychogeriatrics*. They found that as people reach advanced later life they are more likely to not be 'living well' – that is, independently with good self-rated health and quality of life – and that this ageing well measure was more powerful than chronic disease in predicting mortality. Another paper by Burns and colleagues is under review, addressing the functional capacity to estimate mortality-risk in late-life (with Kendig and Anstey).

A paper led by Enticott with Browning, Kendig, and Thomas titled 'Trajectories of Ageing Well among Older Australians: A 16-year Longitudinal Study' is in press (*Ageing and Society*).

Browning and Kendig have commenced analyses of the oral health data from MELSHA led by Associate Professor Rodrigo Marino and a group of honours students. The aim of the analyses is to examine changes in oral health over time and its relationship to general health and wellbeing.



DR RICHARD BURNS
BMus ANU, BA CSU, PGDE UC,
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ASSOCIATE INVESTIGATOR

Richard Burns is a Research Fellow at the Centre for Research on Ageing, Health and Wellbeing (CRAHW). Previously, Richard was a Research Fellow on a Capacity Building Grant and a joint

NHMRC/ARC funded project, the DYNOPTA project, which were based at CRAHW.

Richard's research focuses on wellbeing and mental health and has encompassed varied contexts including educational, organisational and epidemiological. More recently, Richard has been examining longitudinal changes in dimensions of

wellbeing and mental health across adulthood and more specifically in the years leading to death.

Current work is focusing on describing 1) changes in wellbeing and cognitive function in late life, 2) the psycho-socio-demographic factors that drive flourishing and positive mental health across the lifespan, and 3) the

impact of job strain and workplace climate on employee health and wellbeing, and as barriers to workforce participation in later life.

In 2017, based on our systematic review of exercise interventions for falls in people with diabetes we will examine physical activity, falls, foot health and diabetes across time to determine causal relationships. Dual sensory loss will also be a focus for 2017. We will examine changes in sensory loss over time and associated impacts on health and wellbeing.

... as people reach advanced later life they are more likely to not be 'living well' – that is, independently with good self-rated health and quality of life – and that this ageing well measure [is] more powerful than chronic disease in predicting mortality.



PROFESSOR COLETTE BROWNING

BSc (Hons) MSc Monash,
PhD La Trobe

ASSOCIATE INVESTIGATOR

Colette Browning is Director of the RDNS Research Institute, Honorary Professor at Peking University and Adjunct Professor at Monash University.

She is recognised as a national and international leader in psychology and health. Professor Browning is a Fellow of the Australian Psychological Society. Together with Hal Kendig, she co-directs the Melbourne Longitudinal Studies on Healthy Ageing program. Previously she convened the Healthy Ageing theme of the

ARC/NHMRC Research Network in Ageing Well.

Her research focuses on healthy ageing and improving quality of life for older people, chronic disease self-management and consumer involvement in health care decision making. She leads a large program of research in China on chronic illness management supported by

the China Ministry of Health. She is the Director of Research at the Shenzhen International Institute for Primary Care Research and a member of the China Family Panel Study Advisory Committee.

SOCIOECONOMIC DETERMINANTS OF HEALTH AND WELLBEING ACROSS THE LIFE COURSE

RESEARCHERS

HAL KENDIG
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KATE O'LOUGHLIN
JAMES NAZROO
VANESSA LOH
CATHY GONG
RICHARD BURNS
TAZEEN MAJEED

External Collaborators

BRAM VANHOUTTE
CHRIS PHILLIPSON
(BOTH MANCHESTER)

This project examines how the life experiences of the baby boom cohort (born 1946-1950) influence their health, productivity, wellbeing, pension and service use at ages 60 to 64 years. In 2016, a special issue on 'Social Inequalities over the Life Course: Comparative Perspectives' (edited by Kendig and Nazroo), was published in the *Journal of Population*

Ageing, and included seven articles including co-authorship with Byles, O'Loughlin, and Loh that examine the influence of different societal and policy developments over the post war period.

Chris Phillipson and Tine Buffel from the University of Manchester visited the Australian National University in July, sponsored by CEPAR, leading further work on age friendly cities. A chapter was completed in an international book on age-friendly communities as well as a public seminar on age-friendly issues in Canberra. Professor Kendig gave an invited presentation at the International Federation on Ageing in Brisbane; and Phillipson and Buffel led a symposium on the international evidence on age-friendly cities. A

paper by Kendig, Gong, Cannon and Browning (accepted for publication), utilised the Melbourne Longitudinal Studies on Healthy Ageing program (MELSHA) data to examine preferences and predictors of ageing in place.

The ASSA/CEPAR book, *Population Ageing and Australia's Future*, (edited by Kendig, Piggott and McDonald and detailed on page 25) included chapters addressing socioeconomic determinants include 'Ageing and Social Change' by Gong and Kendig. Socioeconomic dimensions of ageing are also examined by a number of CEPAR collaborators in the book, *Ageing in Australia: Challenges and Opportunities*, edited by O'Loughlin, Browning, and Kendig and detailed on page 24.

Majeed and others (including Kendig and Byles) published papers exploring workplace participation patterns across the lifecourse for men and women born 1946-51. These people are the leading edge of the baby boomer cohort, with many having reached the usual age of retirement. The study showed clear gender differences in work patterns, with men being more likely to remain in full-time work, compared to women; and with women being likely to move into part-time work at older ages. However, 24 percent of men had little paid work after age 55, and a further 11 percent had little or only part-time work after this age. A cross cohort comparison of women in the Australian Longitudinal Study on Women's Health showed a

change in workforce participation during the first half of working life, but only for women who had no children.

A paper led by Vanhoutte investigating the influence of migration from England to Australia on health and wellbeing in later life is under review.

Plans for 2017 include completion of articles in progress and continuing Australia and English comparative analyses across the life span.



PROFESSOR JAMES NAZROO
BSc MB BS Lond., PhD UC Lond.
PARTNER INVESTIGATOR

James Nazroo is Professor of Sociology at the University of Manchester, UK. He also serves as co-Director of the Manchester Institute for Collaborative Research on Ageing and Director of the Centre on Dynamics of Ethnicity.

His research focuses on issues of inequality, social justice and underlying processes of stratification, particularly in relation to ageing and ethnicity. He works on the social determinants of health and wellbeing in later life, social inequalities over the life course, and longitudinal surveys of health and retirement.

He is the lead investigator for the six year interdisciplinary research programme 'Frailty, Resilience and Inequalities in Later Life (fRailL)' (2011-2017); a Chief Investigator on the ongoing 'English Longitudinal Study of Ageing (ELSA)'; and a Partner Investigator on the ARC Discovery grant

'Socioeconomic determinants and health inequalities over the life course' being conducted in collaboration with CEPAR Investigators Kendig, Loh, Byles and O'Loughlin.

RESEARCHERS

HAL KENDIG
 CATHY GONG
 KATE O'LOUGHLIN
 VASOONTARA
 YIENGPRUGSAWAN
 KIM KIELY
 VANESSA LOH

In Australia, there has been increasing policy attention on maintaining productivity by enabling and supporting Australians to continue participation in productive activities as they age. Productive activities may be paid or unpaid, and include volunteering, caregiving, and other informal help to others such as childcare and housework. This project draws primarily from the Australian Longitudinal Household, Income and Labour

Dynamics in Australia (HILDA) Survey from 2001 to 2012. The aim of this research is to investigate the extent of engagement in productive activities, and the determinants and consequences of engagement in productive activities for more recent cohorts of ageing individuals in Australia.

Presentations drawing from the HILDA Survey were presented at the National Longitudinal Data Conference and the Australian Association of Gerontology 49th National Conference, in Canberra. Gong and Kendig examined the impact of voluntary and involuntary job exits on individual wellbeing and the impact of health on ageing workers; while Kiely presented on healthy working life expectancies in Australia.

Papers focusing on caregiving and employment have also been published in 2016, including in the Special Issue 'Older Workers and Caregiving in a Global Context', in the *Journal of Cross-cultural Gerontology* (in press) by O'Loughlan and Phillips (Swansea University, U.K.) and a paper by O'Loughlin, Loh and Kendig on the carer characteristics and health, wellbeing and employment outcomes of older Australian baby boomers. Yiengprugsawan, with Kendig and colleagues published 'Caregiving and mental health among workers: Longitudinal evidence from a large cohort of adults in Thailand' published in *Social Science and Medicine - Population Health*. O'Loughlin and colleagues have a published paper and book chapter

(in press) on retirement and productive activities in retirement associated with ageing for people with mild/moderate intellectual disabilities in open employment.

In 2017, Gong and Kendig will further develop and publish their previous conference papers including 'Changes in healthy life expectancies among older Australians 2006 to 2011: Using different health measures from HILDA' and 'The factors predicting voluntary and involuntary unemployment at mature age'. Their paper on the impact of voluntary and involuntary job exits on individual wellbeing is also in progress. Kiely will utilise the HILDA Survey to examine healthy working life expectancies and productive life expectancies

for older Australians. Differentials in healthy working life expectancies will be examined in relation to gender, education, and other markers of socioeconomic position. A multi-dimensional model of health will be used, and analysis will focus on participation in the paid workforce, as well as other productive activities during retirement. Preliminary findings show that education is an important moderator of difference in healthy working life expectancies between men and women.



PROFESSOR HAL KENDIG

AB UC Davis, MPI PhD USC, FASSA
 CHIEF INVESTIGATOR

Professor Kendig is a sociologist and gerontologist. He is Professor of Ageing and Public Policy at the Australian National University in the Centre for Research on Ageing, Health, and Wellbeing in the Research School of Population Health. He

previously served at the University of Sydney as Head of the Ageing, Health and Work Research Unit and as National Convenor of the ARC/NHMRC Research Network in Ageing Well.

He leads the CEPAR Ageing Well, Ageing Productively Area of Research Focus, including collaborative projects on social inequalities over the life course, Australian Attitudes to Ageing, and other

research on aged care and men's health. From 2016 to 2018 he will lead a collaborative ARC Discovery grant on ageing well in China. He is active in a number of policy advisory responsibilities.

Professor Kendig is a Fellow of the Academy of Social Sciences in Australia (ASSA) serving on the Policy and Advocacy Committee, a Fellow of the Gerontological Society

of America, Distinguished Fellow of the Australian Association of Gerontology, and a founding Board member of the Global Social Initiative on Ageing. He serves on the editorial boards of *Ageing and Society*, the *Australasian Journal on Ageing*, the *Journal of Population Ageing* and the *Journal of Gerontology: Social Sciences*.

ACTIVITY SPACES AND ENGAGEMENT IN PHYSICAL ACTIVITY IN MID-AGED AND OLDER AUSTRALIAN ADULTS

RESEARCHERS

ESTER CERIN
ERIKA MARTINO

Urban environment characteristics can impact on successful and productive ageing by facilitating or hindering an active lifestyle across mid-to-late adulthood. Global Positioning System (GPS) data (providing information on indoor/outdoor locations participants visited over seven days and travel routes and modes) were collected in 2011/2012 from 238 randomly selected mid-aged and older adults residing in New South Wales, Queensland and South Australia and participating in the AusDiab3 study. Participants also wore monitors capturing their physical activity and

sedentary behaviours. This study aims to examine associations of characteristics of the neighbourhood environment and areas surrounding other frequently visited destinations (e.g., workplace) with physical activity and sedentary time. This information can be used to identify optimal mixes of destinations and environmental attributes that are associated with an active lifestyle within an Australian urban context.

GPS monitors can provide objective data on locations where physical activity and sedentary behaviours occur. However, GPS data processing is time-consuming and technically challenging. In 2015, this project focused on solving GPS data processing problems and transforming

GPS data into information that can be used for the determination of environment-activity associations. Our efforts resulted in the development of a procedure for the conversion of raw GPS data (collected using different GPS models) into files that can be imported into the Personal Activity Location Measurement System (PALMS), an encrypted web application that simultaneously processes, cleans and filters time-stamped physical activity monitor and GPS data and detects visited locations and trips.

In 2016, we created maps of locations and trips to/from locations visited during each day of a seven-day monitoring period for each of the 238 participants. We also created appropriate layers of

Geographic Information Systems (GIS) data that can be used to characterise attributes of the residential neighbourhood, workplace 'neighbourhoods' and trip corridors to which participants were exposed during the study. A portion of the locations visited by the 238 participants across the seven-day period of monitoring has been categorised into location types (e.g., parks; commercial locations; residential buildings). We expect data collation and processing to be completed in 2017. We will then examine participants' activity levels and sedentary behaviours across different contexts, times of the day and days of the week. We will also establish the extent to which the environmental characteristics of one's

residential and workplace 'neighbourhoods' are associated with visitation and time spent in active recreational locations, time spent outdoors, and with the likelihood of using active versus motorised travel.

This information can be used to identify optimal mixes of destinations and environmental attributes that are associated with an active lifestyle within an Australian urban context.



PROFESSOR ESTER CERIN
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PhD NYU (UK)
ASSOCIATE INVESTIGATOR

Ester Cerin is Professor of Physical Activity and Health in the Institute for Health and Ageing at the Australian Catholic University and currently holds an Australian Research Council Future

Fellowship in Urban Design and Active Ageing. Her research interests focus on environmental and psychosocial determinants of lifestyle behaviours (physical activity and diet) and health across the lifespan. She is a member of the Executive Committees, the chief analyst and one of the main investigators of two

multi-country studies on environmental correlates of physical activity and obesity in adults and adolescents (IPEN Adult and Adolescent studies) funded by the National Institutes of Health (USA). She is a Chief Investigator on an NHMRC Centre of Research Excellence in Cognitive Health.

She leads the Institute's research program on the neighbourhood built environment, physical activity and cognitive health. She is a Deputy Editor-in-Chief of the *International Journal of Behavioral Nutrition and Physical Activity*.

RESEARCHERS

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KERRY SARGENT-COX
LISA CANNON

This project aims to determine changing societal attitudes towards older workers, recent retirees, and those in advanced old age concerning intergenerational justice and related social issues and policies. The rights and self-respect of older people depend largely on their 'social treatment' in everyday life, but there is growing evidence that they face negative attitudes and discrimination that limit their contributions and wellbeing.

In 2016, preparation of publications continued including a chapter on 'Attitudes to Ageing' (O'Loughlin and Kendig) for the book *Ageing in Australia: Challenges and Opportunities* and a paper by Sargent-Cox, 'Ageism: We are our own worst enemy', published in *International Psychogeriatrics*. Further analyses on the 2009-2010 Attitudes to Ageing in Australia (AAA) survey were conducted with CEPAR support, as a component of the national Australian Survey of Social Attitudes (AuSSA). The research team also designed a second round of the AAA survey that was conducted in 2015-16, with the final data collection being available by mid-2017. The focus for the survey continues to be on the

attitudes of different age and socioeconomic groups, possible social and economic influences on them, and how they relate to political and social views relevant to older people. The 2015-16 AAA survey also inquires in greater depth into ageing people's experiences and perceptions of ageist treatment, and younger people's experiences and perceptions that may give rise to them.

Kendig, O'Loughlin and Sargent-Cox presented invited keynotes as part of the President's Plenary Symposium 'Attitudes to Ageing' at the Australian Association of Gerontology (AAG) Conference in Canberra. Kendig examined data from both AAA waves to address Attitudes to Intergenerational Equity,

while O'Loughlin's report on Discrimination in the workplace included the (preliminary) results from the 2015-16 AAA study. The Sargent-Cox keynote utilised data from ACTWell and the National Survey on Brain Health and Cognition (partially funded by CEPAR) to address 'the burden of age'. Hussain also presented a paper examining both waves of the AAA survey at the AAG conference, to highlight the perceptions of ageing by older people and health professionals (co-authors: Kendig, O'Loughlin and Cannon).

Further investigations are underway comparing how attitudes to ageing may have changed between the two waves of the AAA survey, along with the

socioeconomic and political change including developments between the 2010 and 2015 Intergenerational Reports. In 2017, Kendig, O'Loughlin and Hussain will publish their papers as an invited collection in the *Australasian Journal on Ageing*.

This project aims to determine changing societal attitudes towards older workers, recent retirees, and those in advanced old age concerning intergenerational justice and related social issues and policies.



ASSOCIATE PROFESSOR
RAFAT HUSSAIN

MBBS Karachi, MPH North Carolina, PhD ANU

ASSOCIATE INVESTIGATOR

Dr Rafat Hussain is a public health physician with qualifications in medicine, public health and epidemiology. Currently Dr Hussain is working as an Associate Professor in Population Health at the

Australian National University (ANU), with joint affiliation across the ANU Medical School and Research School of Population Health (Centre for Research in Ageing, Health, and Wellbeing). A/Prof Hussain has received several major nationally-competitive research grants including a current four-year grant on Disabilities and Ageing funded by the Australian Research Council. She also has an

ongoing long-term collaboration on several projects on disabilities and ageing with her colleagues at various academic institutions in Western Australia. This has led to several research grants and highly cited publications.

A/Prof Hussain has published extensively in high quality international journals with over 90 refereed journal papers and presentations at over 75 research conferences

and symposia. Many of her research publications are widely cited with 3,500 citations of her published scholarly work. She has been on the scientific committee for several national and international conferences and symposia and is a reviewer for a number of international journals on health and ageing.

RESEARCHERS

TIM WINDSOR
VICTORIA ALLEN

This project examines how daily activities, resources (e.g., cognitive health and physical functioning), and exposures to positive and negative events relate to wellbeing in a sample of older adults, and a comparison group of younger adults. A key aim is to identify important markers of resilience by studying stress reactivity. To do this, we assess (i) whether or not participants experienced a stressful event on a given day, and (ii) their corresponding levels of emotional wellbeing on that day. Typically we expect a rise in negative emotions, and a drop in positive

emotions on ‘stress days’ relative to ‘non-stress days’. However the extent to which individuals are reactive to stress varies from person-to-person. Resilient individuals might be expected to maintain relatively stable profiles of (good) emotional functioning irrespective of daily stress exposures. Using this data we will examine the extent to which theoretically relevant factors (e.g., use of different emotion regulation strategies, social support, personality, and functional health) increase, or decrease vulnerability to stress, and whether the significance of these different factors for resilience changes with ageing.

To achieve these ends, a micro-longitudinal design has been employed in which 38 younger (aged 17-25) and 44 older (aged 65 and over) adults have completed a baseline assessment including measures of cognition, personality, positive and negative social exchanges, and emotion regulation strategy use. Subsequently, participants completed daily measures including stress exposure and affect (to name a few) over 20 consecutive days. Three follow-up assessments concerned with life events, physical health, mental health, and psychological wellbeing are implemented as part of the study design, with follow-up assessments occurring immediately after

completion of daily measures, six months after completion of daily measures, and twelve months following completion of daily measures. Data for the two initial follow-up assessments has been collected and collection of 12-month follow-up data is ongoing. Preliminary data analysis is underway, with PhD candidate Victoria Allen initially examining links between stress exposure and negative emotion, considering the role of personality factors in moderating this relationship.

This project will form the basis of Victoria’s thesis, and we plan to present the initial findings at the International Association of Gerontology and Geriatrics World Congress in San Francisco in 2017.

Resilient individuals might be expected to maintain relatively stable profiles of (good) emotional functioning irrespective of daily stress exposures.



DR TIM WINDSOR
BA PhD UNE
ASSOCIATE INVESTIGATOR

Tim Windsor is an Associate Investigator with CEPAR and Director of the Flinders Centre for Ageing Studies, located within the School of Psychology at Flinders University.

Tim’s research interests are focused on psychosocial aspects of adult development and ageing, including developmental differences in emotional health and self-regulation. Recent projects undertaken while an Australian Research Council Future Fellow have been concerned with changes that take place in social networks

and social behaviour in later life, and how these changes relate to emotions, mental health, and cognition. Tim is involved in a number of collaborative studies of ageing in Australia including the Australian Longitudinal Study of Ageing (ALSA), PATH Through Life, DYNOPTA, and the Transitions in Later Life Study (TRAILLS).

THE LIFE PROJECT - LIFESTYLE FUNCTIONAL EXERCISE PROGRAM TO REDUCE FALLS IN OLDER PEOPLE

RESEARCHER

LINDY CLEMSON

The LiFE program is a non-traditional approach to exercise, embedding balance and strength training into daily life activity, which has transformed thinking about exercise worldwide.

The program was developed and proven in a randomised trial in 2013 led by Professor Lindy Clemson. It also draws on a behaviour change model based on belief of benefit, skill development and habit theory which frames the importance of intent, planning and situational and environmental cues in prompting action and follow through.

The program is now part of several translational and implementation projects. For example Lindy is advisor and co-investigator in a European commission funded Horizon 2020 project PreventIT, a consortium of nine universities led by Professor Jorunn Helbostad at the Norwegian University of Science and Technology.

Given the initial functional outcomes in the original study, the outcomes of interest are to improve function as well as falls prevention. This project is adapting the LiFE program to an aLiFE version for young old (60-70 years) recent retirees, using ICT-based phenotyping of individual risks to personalise the intervention and refinements to the program to optimise the challenge level.

In the eLiFE version the behaviour change components based on habit reframing theory are being strengthened by using ICT (smartphone/smartwatch) based individualised motivational messages, reminders and feedback. The objective is to enable self-assessment and self-management delivery of exercise with the aim of moving risk detection earlier and prevention by self-administered support.

The LiFE program is a non-traditional approach to exercise, embedding balance and strength training into daily life activity, which has transformed thinking about exercise worldwide.



PROFESSOR LINDY CLEMSON

Dip (OT) NSW College of Occupational Therapy, B App Sc (OT) WAIT, MAppSc (OT) PhD Syd.

ASSOCIATE INVESTIGATOR

Lindy Clemson is a Professor in Ageing and Occupational Therapy. She is the convenor of the Ageing, Work & Health Research Group at the University of Sydney and an Honorary Professor at Nottingham University, U.K.

Lindy has more than 150 peer-reviewed publications, with over half on falls prevention, and has produced several practical manuals providing frameworks for practice. She developed the first assessment procedure for identifying fall hazards in the home. This Westmead Home Safety assessment, currently considered a gold standard, is used by numerous universities and clinical settings nationally and internationally. Her three

effective fall prevention programs are now all recognised in U.S., U.K. and Australian Guidelines and the U.S. Centre for Disease Control (CDC) *Compendium of Effective fall interventions: What works for community-dwelling older adults*.

Lindy served on the Board of Directors of the Independent Living Centre for ten years up to 2008, has served on the NSW Policy Development Working Party (Falls) and has regularly

served on NHMRC Grant Review Panels. She currently serves on the executive of the Australian and New Zealand Falls Prevention Society and as an invited member of the World Federation of Occupational Therapists International Advisory Group on Accessibility and Participation. She is on the editorial board of the *Journal of Aging and Health* and the *Australian Occupational Therapy Journal*.

AREA OF RESEARCH FOCUS

5

HEALTH AND AGED CARE

An ageing demographic will have dramatic implications for health and aged care budgets, and new strategies for delivering service while containing cost are urgently needed. Among older cohorts, health and aged care fit together. When prolonged hospitalisation is required (the most expensive type of health care delivery), this often leads to long-term residential care.

In many countries aged care is largely publicly funded or subsidised. While in Australia the cost is not currently large, it is projected to increase rapidly as baby boomers age. Patterns of use, changes in health status, new financing mechanisms, and delivery innovations, all fall within this Area of Research Focus.

TO VIEW PUBLICATIONS
AND WORKING PAPERS RELATING
TO THIS RESEARCH VISIT CEPAR.EDU.AU

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In adjusting to an older demographic profile, societies can benefit greatly from supporting the individual ageing process so that older cohorts are able to enjoy greater wellbeing, and to contribute productively to their communities, either through paid work, or through taking on caring and volunteering roles. CEPAR research through 2016 focused on three important topics in this area of research focus (ARF): Work and care; the analysis of men's health as they age; and long-term care insurance. (Long-term care insurance is also treated in other ARFs; for example, long-term care insurance policy in China is reported in ARF 6.) These three complementary topics all add to our grasp of how society might better promote healthy and productive ageing. Highlights include:

- WORK AND CARE**
Led by AI Kate O'Loughlin, this project examines the connections between paid work and caregiving within the context of population ageing and its impact on individuals, families and the broader economy. The specific aims are to determine how individual circumstances and social and economic policy impact on productivity (labour force participation, caregiving activities), and health and wellbeing. The project is strongly associated with the International Association of Gerontology and Geriatrics, and international linkages have flowed from the project which suggests a strong future research program.
- THE CONCORD HEALTH AND AGEING IN MEN PROJECT (CHAMP)**
CHAMP is a major research initiative, one of the few detailed longitudinal studies of older men which focus on detailed health trajectories. In 2016, oral health received special attention. Edentulism used to be a standard condition for old men; now, most have teeth, implying a need for greater resources devoted to oral care. As well, linkages have been established with administrative datasets, allowing analysis of the relation between health behaviours, chronic conditions, and socioeconomic factors. For example, research through 2016, led by CEPAR's Vasant Hirani, has established that sarcopenia (loss of muscle mass) is a major risk factor for poor health outcomes in older men, more important than obesity. Obvious health care implications follow.
- LONG-TERM CARE INSURANCE**
Long-term care (LTC) insurance is becoming increasingly important for both policy and practice. Projects focused on LTC appear not only in this ARF, but also under ARF 3 (Resources in retirement) and ARF 6 (Ageing in Asia). In the projects reported here, two different approaches are taken to enrich our understanding of how LTC contracts might be written and marketed. In the first, Ermanno Pitacco begins with the observation that accurate pricing of LTC insurance contracts is difficult because so little biometric data is available. The consequence is that insurance companies undertake substantial reserving, elevating prices. He then tests a number of possible LTC insurance designs with respect to how sensitive they are to changes in biometric data. He finds the least exposed are

those products which combine LTC coverage with other types of (hedging) benefits, such as longevity insurance.

A second approach is embodied in a major project led by Research Fellow Elena Capatina. She and her collaborators build a choice model to determine how changes in family circumstances, and differences in peoples' concern with expenditure on LTC impact LTC insurance demand.

RESEARCHERS

KATE O'LOUGHLIN
VANESSA LOH
HAL KENDIG

The Older Workers and Caregiving Project, an initiative of the IAGG's Global Social Initiative on Ageing, has two key objectives: 1) build international comparative knowledge on older workers and caregiving to inform initiatives in socioeconomic policies; and 2) establish an international collaborative network to work towards sustainability in policy-relevant research on carers and caregiving. The project examines the nexus between paid work and caregiving within the context of population ageing and its impact on individuals, families and

the broader economy. The specific aims are to determine how individual circumstances and social and economic policy impact on productivity (labour force participation, caregiving activities), health and wellbeing, and to consider how and why governments may need to look at new ways of organising and sustaining care work (paid and unpaid). Funding to support the collaboration (2012-2017) has come from CEPAR, the Worldwide Universities Network (WUN) Research Development Fund and other WUN members (Alberta (Janet Fast), Sheffield (Sue Yeandle), Auckland (Matthew Parsons), Zhejiang (Lin Kal)).

A number of outcomes were associated with the WUN Research Development

Fund Project (2016-2017): *Sustainable Care: Connecting People and Systems* in 2016. These include:

- Webinars (February, March): involved WUN collaborators, early career researchers and postgraduate students from each of the member universities.
- International workshops: Zhejiang, April; Sheffield, July; CEPAR-Sydney, November.
- UK Economic and Social Research Council Large Grant application submitted October 2016 (lead Yeandle Sheffield); planning meetings held in Zhejiang and Sheffield. CEPAR is an international academic partner on the application.

- Four co-authored comparative papers in peer-reviewed academic journals (to be submitted by March 2017); draft papers presented and workshopped at Sydney meeting.
- *International Journal of Care & Caring* (Policy Press); first issue due March 2017; established the Australasia IJCC Regional Editorial Group at Sydney meeting.

A special issue of the *Journal of Cross-Cultural Gerontology* on 'Older Workers and Caregiving in a Global Context' (to be published in February 2017 and edited by O'Loughlin & Phillips) comprises papers on older working carers from researchers in Australia, U.K., N.Z., China, Singapore, and Sub-Saharan Africa.

It also includes a paper by O'Loughlin, Loh, and Kendig titled, 'Carer characteristics and health, wellbeing and employment outcomes of older Australian baby boomers'.

It is expected that a number of papers based on the research results will be presented at the 7th International Carers Conference, Adelaide, 4-6 October 2017 and a symposium abstract has been accepted for 'Connecting people and systems: Challenges in developing sustainable care' at the 7th International Community, Work and Family Conference, Milan, 25-27 May 2017. A number of papers based on the WUN Research Development Fund Project and 2016 conference presentations are also expected to be published.



DR VANESSA LOH
BLibStudies (Int) (Hons), PhD Syd.
ASSOCIATE INVESTIGATOR

Vanessa Loh was a CEPAR Research Fellow in the Ageing, Work and Health Research Unit, Faculty of Health Sciences at the University of Sydney until July 2014, before accepting a position as a Postdoctoral Research Fellow in the School of Psychology at the University of Sydney.

Her research interests include the psychosocial, individual and environmental predictors and determinants of healthy and productive ageing, work and retirement, and older adults' continuing contributions via paid work and other productive activities.

'My work as a CEPAR Research Fellow between 2012 and 2014 enabled me to broaden and extend my

research interests from individual and organisational factors in work and retirement to broader issues in population ageing research and healthy and productive ageing. Working with CEPAR has provided me with unique opportunities to meet and collaborate with both CEPAR-affiliated and other researchers from a range of disciplines with similar research interests. For

example, my six-week study visit to work with Partner Investigator Professor James Nazroo and his colleagues at the University of Manchester, provided me with a fantastic opportunity to establish lasting collaborative ties, and to develop my research and knowledge of quantitative methods used in sociological research by consulting directly with leading international experts in the field.'

RESEARCHERS

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(ALL UNIVERSITY OF SYDNEY)

The Concord Health and Ageing in Men Project (CHAMP) was designed to fill the gap in knowledge about the health of older men. Between 2005 and 2007, men aged 70 years and over living in the community around Concord Hospital in Sydney were invited to participate in

CHAMP. A total of 1705 men were recruited. Two-, five- and eight-year follow-up assessments have been completed and 71 papers based on CHAMP data have been published (or are in press) in peer-reviewed academic journals.

The eight-year follow-up was completed in June 2016, with 735 men participating. This follow-up has a focus on oral health. The mouths of older Australians now are very different to those of previous generations. In the past, older people tended to be edentulous (complete tooth loss). The prevalence of edentulism in Australia among men aged 65 years and over fell from 60 percent in 1979 to 17 percent in 2010. Papers using CHAMP data are currently being prepared on

the prevalence of functional tooth units, caries and gum disease. CEPAR PhD student Kate Milledge is now analysing data on the relationship between nutrition and oral health. Further work will address use of oral health services according to age, country of birth, living arrangements, private health insurance and economic status.

The year 2016 also saw the start of data linkage between CHAMP and the NSW Admitted Patient Data Collection, using the Centre for Health Record Linkage (CHReL). This will enable the study of health trajectories of older men, including the interplay between health behaviours, chronic health conditions, sociodemographic variables and hospitalisation. Initial

analysis by CEPAR postdoctoral fellow Ben Hsu is looking at how dementia and frailty influence the frequency of admission to hospital and length of stay in hospital. During 2017 data linkage will be extended to use of aged care services, available through the Australian Institute of Health and Welfare.

Sarcopenia, the loss of muscle mass with age, is attracting increasing interest internationally and CHAMP is at the forefront of this work. During 2016, Vasant Hirani led three CHAMP papers on sarcopenia. The first paper examined the relationships between anaemia and sarcopenia and found that anaemia was associated with increased

risk over time of sarcopenia, slow walking speed and weak grip strength. The second paper examined sarcopenic obesity, the combination of low muscle mass and obesity, and found that it was associated with increased risk of falls and fractures. The third paper extended this work and explored longitudinal associations between body composition and frailty, disability, institutionalisation and mortality. Men with sarcopenia alone were at increased risk of frailty; men with sarcopenic obesity had an increased risk of frailty and disability; but those with obesity alone were at lower risk of being admitted to an aged care institution. These findings suggest that sarcopenia, not obesity,



DR BENJUMIN HSU
BSc UNSW, PhD Syd
RESEARCH FELLOW

Benjamin Hsu recently joined CEPAR as a Research Fellow at the University of Sydney. He is currently working with Chief Investigator Robert Cumming on the Concord Health and Ageing in Men Project (CHAMP).

He is very familiar with the CHAMP study having used data from the project as the basis for his PhD. He completed his PhD in Epidemiology at University of Sydney in 2016.

As a CEPAR research fellow, he works on establishing data linkages between data from CHAMP men and external routinely-collected data sources related to the health and aged care systems, including the NSW hospital

admission database. He uses the linked data to describe trajectories of CHAMP men through the health and aged care system and investigate the relationships between sociodemographic characteristics of CHAMP men (including income, education and ethnic background) and their use of the health and aged care systems.

is a risk factor for poor health outcomes in older men.

It is known that people with dementia are at increased risk of falls and fractures. CHAMP has the data to investigate these relationships in detail and data analyses revealed that men with dementia were at high risk for falls and hip fracture, but not other types of fracture. This is an intriguing finding that suggests that men with dementia are prone to falling on their sides, on the area of their hip. This supports an important role among people with dementia for interventions, such as external hip protectors, that reduce the force applied to the hip in a fall.

Physical activity is essential for good health but there has been limited research among very old people. Analyses of CHAMP data showed that older men who engaged in strenuous exercise and those who increased their walking speed had lower risk of all-cause and cardiovascular mortality over seven years of follow-up. These findings were apparent in men under age 80 years and in men aged 80 years and over. The implication is that, even in very old age, it is important to undertake exercise at a reasonably high intensity.

Another strand of CHAMP research in 2016 investigated sexual function among older men. Fifty six percent of CHAMP men at baseline reported being sexually active at least once in the previous month. After adjusting for age, men who were sexually active were about 33 percent less likely to die during seven years of follow-up than men who were not sexually active.

CHAMP has been supported over the years by the NHMRC, CEPAR, the Sydney Medical School Foundation and the Ageing and Alzheimer's Institute.

It is known that people with dementia are at increased risk of falls and fractures. CHAMP has the data to investigate these relationships in detail and data analyses revealed that men with dementia were at high risk for falls and hip fracture, but not other types of fracture.



DR VASANT HIRANI

BSc Leeds, MSc London School of Hygiene and Tropical Medicine, Diploma in Dietetics London Metropolitan University, PhD University College London

ASSOCIATE INVESTIGATOR

Vasant Hirani is a CEPAR Associate Investigator, currently working at the Charles Perkins Centre, University of Sydney as Senior Lecturer in Nutrition and Dietetics. Vasant is a lead

author for papers published in a range of international peer-reviewed journals. Her research programme started with investigating the impact of vitamin D status on ageing of older men participating in CHAMP. Vasant has conducted longitudinal research to investigate health and longevity, examining a range of socio demographic, economic and lifestyle factors and subjective and objective measures of health as

predictors of mortality in older community dwelling men in Australia. She has also investigated the impact of anaemia on frailty, and looked at associations between anaemia and vitamin D status and anaemia and associations with physical function.

Vasant initiated and now leads research on sarcopenia and sarcopenic obesity and associations with a number of health outcomes on the CHAMP.

Vasant's research plan for the future is focused on investigating the relationships between nutrition and health outcomes. She is supervising a PhD student who is looking at nutrition and oral health including edentulism, periodontitis and will also collaborate on, and supervise other nutrition-related projects.

RESEARCHERS

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This project assesses patterns of health care use by men and women aged 75 years and over. The project uses survey information from the Australian Longitudinal Study on Women's Health (ALSWH) and the 45 and Up Study linked to the NSW Admitted Patient Data Collection (APDC). The project produced three publications in 2016:

- 1 Harris, M., Dolja-Gore, X., Kendig, H. and Byles, J.E. (2016). First Incident Hospitalisation for

Australian Women Aged 70 and Beyond: A 10 Year Examination using Competing Risks. *Archives of Gerontology and Geriatrics*, 64, 29-37.

In ALSWH, 80 percent of women born 1921-26 had at least one hospital admission between July 2000 and December 2010. Over 50 percent of first admissions were related to cardiovascular disease, with atrial fibrillation most common. Admissions were also driven by medications and by private health insurance. Women living in inner regional areas had a higher rate of hospitalisation. Many first admissions may have been avoidable through better chronic disease management.

- 2 Dolja-Gore, X., Harris, M., Kendig, H. and Byles, J. (2016). Patterns of Hospitalization Risk for Women Surviving into Very Old Age: Findings from the Australian Longitudinal Study on Women's Health. *Medical Care*. In press (available online August 2016).

Four main patterns of hospital use by women were identified: low (25 percent with less than 5 percent chance in any year); increasing (21 percent); moderate (38 percent with about 20 percent chance per year); and high (17 percent with 40-50 percent chance per year). Drivers of high rate of admission were cardiovascular disease, stroke, arthritis and rehabilitative care, with falls being most prevalent in the group with increasing

hospital use. Those in the high hospital use group were also more likely to die in the next two years.

- 3 Harris, M., Dolja-Gore, X., Kendig, H. and Byles, J.E. (2016). End of Life Hospitalizations Differ for Older Australian Women According to Death Trajectory: A Longitudinal Data Linkage Study. *BMC Health Services Research*, 16(484).

85 percent of women had at least one admission in the last year of life; and 8% had their first observed admission during this time. Around 30 percent of deaths were attributed to cancer, 13 percent to organ failure, 13 percent to dementia/Alzheimer's disease, 7 percent to diabetes, and 4 percent to influenza/pneumonia. The remaining

24 percent were attributed to other causes such as acute myocardial infarction, stroke, other chronic heart and cerebrovascular disease, and intra-cerebral hemorrhage. Women who died of cancer, diabetes and 'other' causes were admitted earlier in their last year than women who died of organ failure, dementia and influenza. Women who died of organ failure had the highest maximum number of hospital days, but women with cancer had the highest median length of stay. Long length of stay was driven by comorbidity, particularly hypertension, and mode of separation.



PROFESSOR JULIE BYLES
B Med PhD Newcastle
ASSOCIATE INVESTIGATOR

Professor Julie Byles is Director of the Research Centre for Generational Health and Ageing – a Priority Research Centre at the University of Newcastle.

She is also Head of the International Longevity Centre – Australia, and a director of the Australian Longitudinal Study on Women's Health.

As a clinical epidemiologist, Professor Byles' interests are in risk determination, health assessment, other health care evaluation, and measurement of health outcomes.

As a Gerontologist and Fellow of the Australian Association of Gerontology, Professor Byles' research interests in ageing include the role of health services, preventive activities, and treatments in maintaining quality of life for older people, and in determining physical, psychological and social

factors associated with optimal physical and mental health of men and women as they age.

LONG-TERM CARE INSURANCE: A SENSITIVITY ANALYSIS

RESEARCHER

ERMANNO PITACCO

Long-term care insurance (LTCI) covers are rather recent products, in the framework of health insurance. It follows that specific biometric data are scant; pricing and reserving problems then arise because of difficulties in the choice of appropriate technical bases. Different benefit structures imply different sensitivity degrees with respect to changes in biometric assumptions. Hence, an accurate sensitivity analysis can help in designing LTCI products and, in particular, in comparing stand-alone products to combined products, i.e., packages including LTCI benefits and other lifetime-related benefits.

The following LTCI products have been considered:

- 1 Stand-alone LTCI cover;
- 2 LTCI as an acceleration benefit in a whole-life assurance;
- 3 LTC insurance package, including a deferred life annuity and a death benefit;
- 4 Enhanced pension, that is an immediate life annuity with uplift in case of an LTC claim.

Single premiums have been calculated for all the above products. Then, a sensitivity analysis has been performed, with respect to the disablement assumption (that is, the probability of entering the LTC state) and the mortality assumption (viz the extra-mortality assumed for people in the LTC state).

Numerical results show, in particular, that the LTCI stand-alone cover is much riskier than all of the LTCI combined products that we have considered. As a consequence, the LTCI stand-alone cover is a highly 'absorbing' product as regards capital requirements for solvency purposes. Combined LTCI products mainly aim at reducing the relative weight of the 'risk' component by introducing a 'saving' component into the product, or by adding LTC benefits to an insurance product with an important saving component; the reduction of the risk component then implies a lower sensitivity to the biometric assumptions.

The following paper has been published:

Pitacco, E. (2016). Premiums for Long-term Care Insurance Packages: Sensitivity with Respect to Biometric Assumptions, *Risks*, 4(1), 3.

The research has also been presented as an invited lecture at the 2nd European Congress of Actuaries, Brussels, April 2016.

Numerical results show, in particular, that the LTC stand-alone cover is much riskier than all the LTCI combined products that were considered.



PROFESSOR ERMANNO PITACCO
ASSOCIATE INVESTIGATOR

Ermanno Pitacco is Professor of Actuarial Mathematics and Life Insurance Technique at the University of Trieste, and Academic Director of the Master in Insurance and Risk Management at the MIB School of Trieste.

His current research interests lie in the area of life and health insurance mathematics and techniques, focusing in particular on longevity risk, life annuity and life insurance portfolio valuations and solvency assessment. He is an author and co-author of textbooks and papers in the actuarial field. He has published in leading international risk and actuarial studies journals,

including *Insurance: Mathematics and Economics*, *Risks*, *ASTA Advances in Statistical Analysis*, the *ASTIN Bulletin*, the *Journal of Pension Economics and Finance*, and *The Geneva Papers on Risk and Insurance*. He was awarded the 1996 INA Prize for Actuarial Mathematics, from the *Accademia Nazionale dei Lincei*, and the 2011 Bob Altling von Geusau Memorial Prize,

together with Annamaria Olivieri. In December 2016 he was appointed vice co-chairman of the Mortality Working Group of the International Actuarial Association.

Ermanno is editor of the *European Actuarial Academy* series (Springer), co-editor of the *European Actuarial Journal* and Associate Editor of a number of international journals.

RESEARCHER

ELENA CAPATINA

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MINCHUNG HSU
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STUDIES)

Rapid population ageing poses significant challenges in terms of long-term care (LTC) provision and financing. In countries that lack a universal public LTC insurance system, out-of-pocket LTC costs are high and persistent, and represent a large source of individual financial risk. Social insurance systems face rising challenges to cope with the increasing number of individuals who cannot afford to pay for their LTC needs in old age, mainly due

to the shifting demographics. Therefore, a major endeavour in the current LTC literature is to better understand individuals' saving decisions in relation to LTC needs, and determine how these decisions are affected by the insurance environment.

This project will advance the current literature by focusing on two important but relatively understudied aspects: family dynamics and how individuals value LTC consumption when LTC needs arise. First, the absence/presence of a spouse matters greatly for saving behaviour for several reasons: healthy spouses can provide care at home when LTC needs arise lowering the cost of care; unhealthy spouses with LTC needs could deplete joint assets leaving the other spouse financially

unprepared for his/her future needs; and the death of a spouse can be a major shock to financial planning.

Second, Ameriks et al. (2015) show that savings behaviour is strongly influenced by people's preferences over LTC expenditures and that there is a high marginal utility from expenditures in the LTC state.⁵ We recognise that there is a wide range of quality types of LTC and that the presence of a healthy spouse may also affect the quality of LTC received.

Therefore, we model an LTC-state, family-type dependent utility function and allow for endogenous LTC expenditures. By incorporating these important features, our project will deliver an improved framework in which policy reform can be analysed.

We build a rich general equilibrium framework that accounts for the features listed above and for population ageing. The model is calibrated to the United States using data from the Health and Retirement Study. We use the calibrated model to quantify the impacts of LTC policy reforms such as the expansion of the Medicaid LTC insurance program and the provision of a universal public system that pays for a minimum level of LTC costs.

We have a preliminary calibrated model and working paper, and we anticipate completing the project and submitting the paper to a first tier peer-reviewed Economics journal in mid-2017. The paper will be presented at several international workshops and conferences in 2017.

A major endeavour in the current LTC literature is to better understand individuals' saving decisions in relation to LTC needs, and determine how these decisions are affected by the insurance environment.

⁵ Ameriks, J., Briggs, J.S., Caplin, A., Shapiro, M.D., and Tonetti, C. (2015). Long-Term Care Utility and Late in Life Saving. Working Paper 20973. National Bureau of Economic Research.



DR ELENA CAPATINA

BA Econ. UBC, MA PhD Toronto
RESEARCH FELLOW

Elena Capatina is a CEPAR Research Fellow located in the UNSW Business School. She joined the Centre in July 2011 after graduating with a PhD from the University of Toronto. Her research interests include

Macroeconomics, Health and Labour Economics. Her articles have been published in the *Journal of Monetary Economics and Labour Economics*.

'Since my arrival at CEPAR, I have been continuing my research on health risk in the context of life-cycle models of labour supply and saving. CEPAR has been an ideal environment to conduct

research in this area. As an Early Career Researcher, I have greatly benefitted from the support and mentorship of senior leaders at CEPAR, especially Michael Keane. CEPAR has also provided great support for building my research networks through organised workshops and conferences and its visitors program. One of the great benefits of working here is

making my research known and developing more collaborations with others in my field. In addition, the multidisciplinary aspect of CEPAR has enriched my experience as I have gained an understanding of the importance of my research in a larger scheme.'

AREA OF RESEARCH FOCUS

6

AGEING IN ASIA AND ITS IMPACT ON AUSTRALIA

Asia is the world's most rapidly ageing region, with a range of demographic stages represented. The Asian region is also home to more than 40% of the world's population, living in countries with dramatically different per capita incomes and rates of economic growth. Research focuses on these population dynamics and their interactions, including the determination of evolving demographics in some of the region's largest countries.

It examines differences between and within national populations, their health status, and their life expectancy, and studies policy reform and its implications both for the countries involved and for Australia.

TO VIEW PUBLICATIONS
AND WORKING PAPERS RELATING
TO THIS RESEARCH VISIT CEPAR.EDU.AU

RESEARCH PROJECTS

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More than half of the world's population lives in Asia, and in many Asian countries the population is ageing fast, spurred on by dramatic falls in fertility and increases in longevity. Many countries in the region have deficient social and policy infrastructure to meet this challenge. It is therefore important that CEPAR focuses some of its research expertise on Asia. This area of research focus gathers some of these research initiatives.

Projects cover a range of country-specific studies: Indonesia, China, Vietnam, and Iran. The Australia-China Population Ageing Research Hub, established with UNSW strategic funding, is pursuing several research projects and developing a substantial research output portfolio. As well, some studies take a pan-Asian perspective, comparing a group of countries within Asia with respect to some specific question.

Highlights for 2016 include:

- MEETING THE NEEDS OF OLDER PERSONS IN RURAL INDONESIA**
The project examines the needs of older people in rural Indonesia for income, housing, health care, assistance with daily tasks and social interaction, especially in locations where the out-migration of young people is high. It measures their needs, the extent to which their needs are met and how the needs are met. It also considers the efficacy of existing policy programs and how policy might be improved. The initial study of three villages in three provinces (DIY Yogyakarta, Central Java and West Sumatra) was funded by a CEPAR grant. Further funding allowed the pilot to be expanded to ten villages.

Around 3,000 older people were interviewed in total. Information was also collected from the head of the household in which the older person lived on the economic situation of the household and upon the residents of the household. The focus was on building an evidence base for policy support before elder need in rural settings becomes critical.

- INEQUALITIES IN HEALTHY LIFE EXPECTANCY ACROSS CHINESE PROVINCES**
Health inequality can be more important than income inequality, especially in old age. This has received evidential attention only recently, even in developed countries. The present project, led by Senior Research Fellow Katja Hanewald, aims to document health inequalities by province in China, specifically by estimating differences in healthy life expectancy by province. This is done not only through self-assessment of health status, but also by examining the impact of different environmental factors prominent in different provinces. The results will provide a new evidence base for policymakers and financial services providers in China.

- LONG-TERM CARE IN CHINA**
This project is based on detailed use and health data for a pilot program for long-term care (LTC) in Qingdao, the capital of Shandong Province. The pilot is one of several being used by authorities to assess future LTC policy options in China. We are currently working on patterns of exit probabilities from the LTC system. In almost all cases, this is precipitated by death. Estimates can be made for populations with different characteristics (age, gender, disability status etc.) of what the expected tenure in LTC might be. In 2017, this information will be combined with other data to permit estimation of use by age, condition, and background, and the cost covering premium that would be required to ensure program sustainability.

CHANGES IN AGE PATTERNS OF MORTALITY BY MAJOR CAUSES OF DEATH IN RECENT EPIDEMIOLOGIC TRANSITION AND POPULATION AGEING IN TAIWAN AND HONG KONG

RESEARCHER

ZHONGWEI ZHAO

External Collaborator

YAN YU
(UNIVERSITY OF CANBERRA)

This research project began in July 2015 and was partly supported by CEPAR under the Associate Investigator funding scheme.

As a part of a large study, this project intends to examine changes in age patterns of mortality in the process of epidemiological transition in order to provide further insights about mortality decline, especially its decline at old ages. The original aim of this research project was to analyse data collected from Hong Kong and Taiwan and to examine long-term mortality decline and changes in major causes of death with a view to improving our knowledge about the late stage of epidemiologic transition and shed light on changes in healthy life expectancy in the process of population ageing.

Dr Yan Yu joined the research team in late 2015. Over the last year, we have conducted a literature review, further collected required data, conducted preliminary data analysis, and tested some theoretical hypotheses. We have already had some interesting results and research findings.

The project has produced a paper, *'Age patterns and sex differentials in mortality'* which has been accepted for publication by the *Handbook of Asian Demography* in 2017.

We have extended our early study to include some developed countries in the world where high quality mortality data, covering a longer period, and with detailed information on causes of death are available.

We have analysed mortality data collected from Hong Kong and Taiwan and compared them with those in Australia, England, Wales, France, Italy, Japan, Sweden and the United States. The project is now largely completed and a paper reporting the findings, is being prepared for journal submission.

... this project intends to examine changes in age patterns of mortality in the process of epidemiological transition in order to provide further insights about mortality decline, especially its decline at old ages.

ENVIRONMENTAL IMPACT ON OLD AGE MORTALITY IN EAST ASIA SINCE THE 1970S

RESEARCHER

ZHONGWEI ZHAO

The research project began in late 2015 with the partial support of CEPAR.

As part of a larger study, this project examines the temperature-mortality relationship in East Asia, especially its impact on the older population. It has been found that levels of daily mortality are closely related to changes in daily temperature. However, the relationship has not been constant and has changed considerably over time.

The study will help to improve our knowledge about the impact of climate change, populations vulnerable to such changes, and social and health policies that may contribute to further improvement of healthy life expectancy.

Most of the data analysis has been conducted and the preliminary findings communicated via a conference presentation and a public lecture. Additional data analysis will be undertaken in the first half of 2017 which is expected to produce a research paper for submission to a peer-reviewed journal. The project is expected to be complete by the middle of 2017.

... this project intends to examine the temperature-mortality relationship in East Asia, especially its impact on the older population.



PROFESSOR ZHONGWEI ZHAO
BA PKU, MA Exeter, PhD Camb.
ASSOCIATE INVESTIGATOR

Zhongwei Zhao is a Professor in the School of Demography at the Australian National University.

Prior to taking up his present appointment, he was a senior fellow at the Demography Program in the Research School of Social Sciences at the Australian National University; a senior research associate at the Cambridge Group for the History of Population and Social Structure; and a Bye Fellow at Pembroke College, University of Cambridge.

Zhongwei has published many papers in world leading demographic journals. Research interests include: environmental impacts on population health and mortality; mortality and fertility transition in Asia, especially East Asia; computer microsimulation in demographic research; historical demography; changes in families,

households and kinship networks; demographic estimation and mortality models; and demographic impacts of famines.

RESEARCHERS

JOHN PIGGOTT
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PETER McDONALD

This project investigates the impact of demographic change on labour markets and economic growth in Asia-Pacific Economic Cooperation (APEC) countries. At the heart of our approach is the identity which links GDP change to changes in population, participation and productivity.

The APEC encompasses a range of countries which are very heterogeneous in almost all dimensions. Demography is no exception. APEC nations exhibit the full range of demographic age, and also rate of demographic change. This means that generalisations are hard to

come by (other than that all APEC countries are ageing). But exactly these differences may create new opportunities for cooperation that, with appropriate policy planning and developments, have the potential to improve wellbeing across member nations.

A simple model has been developed, and calibrated using data from the ILO, IMF, UN, and other sources. This is supplemented by international migration data, both from within APEC and beyond, since migration policies potentially constitute one of the major channels of welfare and efficiency gain across countries with very different demographic profiles. Results so far suggest that, looking forward to 2050, all developed and most

emerging economies within APEC will rely primarily on productivity growth to deliver GDP growth, and to offset population ageing and in some cases population declines.

But some emerging economies, such as the Philippines and Indonesia, will have the prime age population that will contribute to larger labour forces and economic growth over this period. Two important sources of labour and growth are the development of more extensive formal markets, and education, which both increase the productivity of workers; and, especially, increases the formal labour force participation of females, who are often recorded as having very low participation rates in these economies.

The project, which was commissioned by the Australian Department of Employment, was written up in a paper and presented to the Workshop on the Development of an APEC Labour Mobility Framework, in Nha Trang, Vietnam, in February 2017.

As part of the project, Rafal Chomik produced a working paper on 'Sustainable Development Goals, Population Ageing, and Social Security in Asia', which was commissioned by the United Nations Population Division. It was presented at the UN in New York, in October 2016. The paper reviewed how development goals relate to the needs of older people in retirement. It showed how each need – such as retirement income, care,

and health – is addressed to a greater or lesser degree by government, community, family and the individuals themselves in Asia.

Results so far suggest that, looking forward to 2050, all developed and most emerging economies within APEC will rely primarily on productivity growth to deliver GDP growth, and to offset population ageing and in some cases population declines.



RAFAL CHOMIK
BEcFin UWA, MEd
London Metropolitan
SENIOR RESEARCH FELLOW

Rafal Chomik is a Senior Research Fellow at CEPAR, located in the UNSW Business School. He joined CEPAR in April 2012.

Rafal has worked in public administration and policy analysis for over a decade, initially as a project manager in economic regeneration and subsequently as an economist focusing on social policy.

He has experience in economic and business consulting in the private sector, working as an economic advisor for the

British Government and as a pensions economist at the Organisation for Economic Cooperation and Development in Paris. He specialises in social policy design, public and private pension analysis, static microsimulation modelling of the tax-benefit system, and poverty and income measurement.

His current work at CEPAR is centred on producing policy related briefing papers, summarising existing CEPAR and external research and assisting the secretariat in producing technical content for conferences and the media.

RESEARCHERS

CATHY GONG
COLETTE BROWNING
HAL KENDIG
VASOONTARA
YIENGPRUGSAWAN
JAMES NAZROO
JULIE BYLES
MERRIL SILVERSTEIN

External Collaborators

SHANE THOMAS
CATE D'ESTE
(BOTH ANU)
ANNA CHAPMAN
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X HE
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With the world's largest population in Asia, regional comparisons on drivers and consequences of rapid population ageing will provide opportunities to gain insight into the responses in countries at different levels of development and socio-cultural background.

A three-year ARC Discovery project 'Ageing in China and Australia: Promoting health, productivity and wellbeing', led by CIs (Kendig, D'Este, and Thomas) and CEPAR affiliates (Bytes, Browning, Nazroo, Yiengprugsawan, Gong) is currently underway. Preliminary findings were presented at two significant conferences in 2016 as symposia supported by CEPAR and chaired by Al Byles: 'Understanding the implications of ageing in China: A view from down under' at the Australian Association of Gerontology 49th Annual Conference in Canberra and 'Ageing in China: Challenges for the future' at the Gerontological Society of America Annual Scientific Meeting in New Orleans. A Symposium on 'Ageing China and Australia: Economic, social, and health implications' was accepted

for the 2017 IAGG World Congress of Gerontology and Geriatrics which will be held in San Francisco.

In 2016, Gong, Kendig and He (Hunan University) published a paper on the 'Factors predicting health services use among older people in China' in *BMC Health Services Research*. Byles also contributed to two papers focusing on successful ageing among older people in China published in *Geriatrics and Gerontology International*, and *Sleep Medicine*. In 2017, Gong will continue her comparative research in China. These include three papers with Kendig and Silverstein, and two Australia-China comparative articles with Kendig.

Browning, Thomas and Chapman published in *BMJ Open* the outcomes of a

diabetes self-management trial for older people conducted in Beijing, China. They also published a paper in *BMC Health Services Research* on psychological care in people with diabetes in China. Browning and Thomas continue their work on primary health care in China and will commence in 2017 a trial on chronic illness management in primary care settings in Shenzhen, China. Thomas is investigating financing primary health care in the context of population ageing in China.

Yiengprugsawan led a comparative study on health system responses to population ageing and non-communicable diseases in Asia, in collaboration with Kendig and Byles.

The monograph was published in 2016 by the World Health Organization on behalf of the Asia Pacific Observatory on Health Systems and Policies.

With the world's largest population in Asia, regional comparisons on drivers and consequences of rapid population ageing will provide opportunities to gain insight into the responses in countries at different levels of development and socio-cultural background.



DR CATHY GONG
PhD Econ ANU
RESEARCH FELLOW

In 2016 Cathy Gong was a Research Fellow at CEPAR and the Centre for Research on Ageing, Health and Wellbeing (CRAHW) at the Australian National University. Prior to joining CEPAR in 2013 she worked as a Research Fellow with the National Centre for

Social and Economic Modelling as an Assistant Director with the Child Care Data and Modelling Team at the Department of Education; and Senior Statistician with the Urban Household Survey Division of the National Bureau of Statistics of China.

Her research interests include life course impacts on late life health and wellbeing, social determinants of healthy and productive ageing,

intergenerational support relationships, health services use, international comparison of ageing in Asia, age friendly communities, inequality and mobility in health, employment and economic wellbeing, as well as labour market and retirement choices in late life. She has published in three books and in the *Journal of Housing for the Elderly*, *BMC Health Services Research*, *Journal of*

Ageing and Health, *Population, Space and Place*, *Review of Income and Wealth*, *Child Indicators Research*; *Economic Papers*; and *Australasian Journal of Regional Studies*.

RESEARCHERS

PETER MCDONALD
IWU UTOMO

External Collaborators

TERENCE HULL
HASNANI RANKUTI
ARIANE UTOMO
(ALL ANU)

This study of the changing demography of Indonesia was conducted through a three-year Linkage Project based within CEPAR at the Australian National University. The project was completed in June 2016. The project was conducted in cooperation with the Department of Foreign Affairs and Trade (originally with support from AusAID), Statistics Indonesia, UNFPA Indonesia and the Indonesian National Population and Family Planning Board. The project

emerged because social and economic planning in Indonesia, particularly planning for the future ageing population, had been somewhat constrained by uncertainty about current and future demographic trends. The aims of the project were to make use of existing Indonesian demographic data, particularly analysis of the 2010 Population Census, to gain greater clarity about the accuracy of age and sex data from the census and the levels of fertility and mortality in Indonesia and its provinces and to conduct research on important issues such as migration and family using data from the census.

A central issue investigated by the project was the trend in fertility in Indonesia.

Comparison of fertility estimates based on the 2000 Census and the 2010 Census had given rise to the viewpoint that fertility in Indonesia had risen during the decade between these censuses. The project concluded that this viewpoint was incorrect and had arisen because of underestimation of fertility levels based on the results of the 2000 Census. The 2000 Census had been marked by enumeration difficulties and this had had an impact on the estimates of fertility. Our conclusion has since been confirmed by estimates of fertility based on the 2015 Intercensal Survey of Indonesia. In relation to mortality trends in Indonesia, the project concluded that the estimates that had been

made by Statistics Indonesia were as reliable as could be assessed given the absence of death registration data. This conclusion was based upon a comparison of age and sex specific intercensal survival ratios from the 2000 and 2010 Census with the equivalent survival ratios in the model life tables used to estimate Indonesian mortality.

In relation to age statement, the project showed that the tendency to round ages to the nearest age ending in zero or five had decreased substantially across time in Indonesia and, though still evident, was quite muted at the 2010 Census. An examination of age-specific sex ratios showed also that the quality of data has improved considerably across time. Previous

censuses had indicated large undercounts of men in the young adult ages (ages 15-35) and overstatement of age for men aged 70 and over. Both of these sources of inaccuracy were much less evident in the 2010 Census.

The project included an intensive analysis of interprovincial migration in Indonesia from 1971 to 2010. This was undertaken as part of Hasnani Rangkuti's successful ANU PhD thesis in demography. Intensive analysis of interethnic marriage in Indonesia was conducted by Ariane Utomo. This work included an analysis of the classification of ethnicity in Indonesia for research purposes. Finally, the study developed a new system of household classification for Indonesia.



PROFESSOR PETER MCDONALD
BCom UNSW, PhD ANU, FASSA, AM
DEPUTY DIRECTOR
AND UNIVERSITY OF MELBOURNE
NODE LEADER

Peter McDonald is Professor of Demography and head of the Demography Unit within the Centre for Health Policy at The University of Melbourne. He was President of the

International Union for the Scientific Study of Population for the years, 2010-2013. In 2015, he received the Irene B. Taueber Award from the Population Association of America which recognises unusually original or important contribution to the scientific study of population. He is frequently consulted on the issue of population futures

(causes, consequences and policies) by governments around the world, especially in Australia, Europe and East Asia. In 2008, he was appointed as a Member of the Order of Australia. He is an inaugural ANU Public Policy Fellow and in 2014 was a member of the Independent Review into Integrity in the Subclass 457 Programme.

He has worked previously at the Australian National University, the Australian Institute of Family Studies, the World Fertility Survey and the University of Indonesia.

MEETING THE NEEDS OF OLDER PERSONS IN RURAL INDONESIA

RESEARCHERS

PETER McDONALD
IWU UTOMO

External Collaborators

ARIANE UTOMO
(ANU)

ROBERT SPARROW
(WAGENINGEN UNIVERSITY)

The project examines the needs of older people in rural Indonesia for income, housing, health care, assistance with daily tasks and social interaction. It measures their needs, the extent to which their needs are met and how the needs are met. It also considers the efficacy of existing policy programs and how policy might be improved. The initial study of three villages in three provinces (DIY Yogyakarta, Central Java and West Sumatra) was funded by CEPAR and by Andalas

University in West Sumatra. This work was conducted in October 2015. Subsequently, the study was funded by an ARC Discovery grant awarded to McDonald, Utomo and Sparrow. This has enabled the collection of data in a further seven locations in six other provinces of Indonesia [North Sumatra, Banten, West Java, East Java (two villages), Bali and East Nusatenggara] in September 2016. Data from the ten villages are now processed and available for analysis. Some preliminary results on health status and on family exchanges will be presented in a workshop in the Indonesian National Planning Board in early February 2017.

The villages were selected on the basis that they were all villages where the out-migration rate for the children of older people has

been high. In Indonesian tradition, the needs of older people are met first and foremost by their adult children but this system is brought under pressure when there is a high level of out-migration among the children of the older people. This will be increasingly the situation in Indonesia due to the dual processes of population ageing and urban development. The project, therefore aims to examine the policy situation in advance of major expansion of the issue under study. In the selected villages, all persons aged 60 and over are interviewed as well as their spouses where the spouse was aged 50-59 years. Thus, information is available for both husband and wife in cases where the older person is married. Also, where older persons

were not able to be interviewed because of illness or severe dependency, a proxy interview was conducted with the main carer. Around 3,000 older people were interviewed in total. Information was also collected from the head of the household in which the older person lived on the economic situation of the household and upon the residents of the household. Finally, questionnaires related to the relationship between parents and their children were used in interviews of children who lived in the same household as the older person and, by telephone, with children who lived in distant cities or towns.

In Indonesian tradition, the needs of older people are met first and foremost by their adult children but this system is brought under pressure when there is a high level of out-migration among the children of the older people.



DR IWU DWISETYANI UTOMO

BA Psych University of Indonesia,
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ASSOCIATE INVESTIGATOR

Iwu Utomo is a fellow at the School of Demography at the Australian National University (ANU). She joined CEPAR in September 2014.

She graduated from the ANU School of Demography in 1998

and returned to the School as a Postdoctoral Fellow in 2000 under a Merdeka Fellowship Award from the Australian Government. Her first appointment at ANU was with the National Centre for Epidemiology and Population Health (2002-2008) where she worked on issues relating to Gender, Sexuality and Health in Indonesia, Thailand, Mozambique and South Africa.

Iwu has been successful in gaining ARC funding for Harmful Sexual Practices in Southeast Asia (2005-2008); Indonesian Young Adults Transition into Adulthood (2008-2015); and Meeting the Needs of Older People in Indonesian Villages (with Peter McDonald and Robert Sparrow, 2016-2019). She is also involved in The Transition to Adulthood Longitudinal Survey which has received

funding from WHO (2008-2011); the Ford Foundation (2008-2020); and the National University of Singapore (2010). In 2008, Iwu received an AusAID Australian Development Research Award for a project on Integrating Gender and Reproductive Health Issues in the Indonesian National Curriculum. This study also received additional funding from the Ford Foundation.

RESEARCHERS

MEIMANAT HOSSEINI-CHAVOSHI
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External Collaborators

MOHAMMAD JALAL
ABBASI SHAVAZI
(BOTH TEHRAN UNIVERSITY)

Two new projects focused on ageing in Iran commenced in 2016.

Meeting the needs of older persons in out-migrant rural areas of Iran

This is a new research project started in 2016 as a modified replication of the same study conducted in Indonesia by Peter McDonald and Iwu Utomo. The project aims to explore the needs of older people living in rural areas of Iran including their needs for assistance with core activities as well as their financial, housing, health care and social

participation needs. It investigates the extent to which their needs are met and how the needs are met.

While around seven percent of the population in Iran are aged 65 years or older, there are some villages in Yazd, Markazi, Tehran and Isfahan provinces with proportions of older people ranging between 25 and 45 percent. After modification of the Indonesian questionnaires for usage in Iran, a pilot study was conducted in several villages in Yazd province in 2016. The pilot study enabled further modification of the questionnaire and our qualitative interviews with health service providers in rural areas. A Linkage proposal for the project is being prepared with the potential collaboration of the WDA Forum in St. Gallen

University and the Iran National Institute of Population Studies. A paper related to the project titled 'Ageing and Challenges for the Health System in Iran' was presented at the Health Systems for Ageing Societies in Asia Workshop and has been accepted for publication in a special issue of a journal.

Fertility decline and policy responses to future ageing in Iran

This is a new research project suggested in 2015 following an invitation to the research team to collaborate with the Iran Ministry of Health in the analysis of the 2015 Iran Demographic and Health Survey. The UNFPA representative supported the project and the research team published a policy

paper on fertility and discussed current and future perspectives of fertility in Iran and its policy implications. In addition, a chapter on 'Fertility Transition and Reproductive Health in Iran' was submitted for publication in the book, *Situation Analysis of Iran's Population*. Another output of the project in 2016 is a paper titled 'Fertility, Marriage, and Family Planning in Iran: Implications for Future Policy' (edit-proof stage) that will be published soon in *Population Horizon*. Also, a joint paper by the research team was presented at the 2016 European Population Conference and also at the conference of the Human Fertility Database in Berlin.

The paper was well regarded and has resulted in a visiting fellowship for Hosseini-Chavoshi to collaborate with the Human Fertility Database team in Vienna during 2017.

The project aims to explore the needs of older people living in rural areas of Iran including their needs for assistance with core activities as well as their financial, housing, health care and social participation needs.

**DR MEIMANAT HOSSEINI-CHAVOSHI**

BS (Public Health) Isfahan
University of Medical Sciences, MA
(Population Studies) PhD
(Demography) ANU

RESEARCH FELLOW

Meimanat Hosseini-Chavoshi is a CEPAR Research Fellow in the School of Population and Global Health at the University of Melbourne mentored by Professor Peter McDonald. Prior to this, she

worked at the ANU's Crawford School of Public Policy and School of Demography (formerly the Australian Demographic and Social Research Institute) where she carried out her postdoctoral research on fertility regulation and abortion in Iran.

Before moving to Australia, she had a longstanding career with the Iran Ministry of Health and Medical Education as Head of the Population and

Health Data Unit responsible for design, implementation and data analysis of several national surveys in the areas of reproductive health, fertility, adolescence and ageing. Over the last 10 years, she has collaborated in different research projects funded by such agencies as the Wellcome Trust, WHO, UNFPA, GDN and GERPA and the Australian Research Council.

Meimanat is currently

working on demographic perspectives of ageing in Australia exploring spatial patterns of older Australians, and factors associated with their living arrangements and health conditions. Meanwhile she continues her initial research interest in fertility dynamics and population policies in Iran, and is collaborating with the Iran 2015 Demographic and Health Survey (DHS) research team.

AGEING AND WELLBEING IN VIETNAM: AN IN-DEPTH STUDY OF CHANGING INTERGENERATIONAL SUPPORT STRATEGIES

RESEARCHERS

HEATHER BOOTH
CUC HOANG

Two of the main challenges in achieving wellbeing in old age are financial security and the provision of personal care. In Vietnam, the wellbeing of the older generation is both traditionally and legally the responsibility of the family. Research in this area has tended to focus on the elderly in rural communities that have experienced high levels of out-migration as a result of socioeconomic development. Other scenarios have received far less attention.

This project examines the wellbeing of Vietnamese elderly in relation to family support strategies. Detailed quantitative and qualitative fieldwork was undertaken in early 2016 in a village in North Vietnam that is not significantly affected by out-migration. Rather, the village enjoys the benefits of socioeconomic development through the nearby location of new factories and the associated infrastructure including housing for migrant workers and road networks, principally to Hanoi. These benefits include employment at the factories; new local markets for the rent of accommodation and the sale of food and handicrafts to migrant workers and their families; and greatly improved access to Hanoi. Older people take part in this evolving economy.

For some households, the development of the factories and infrastructure involved the compulsory sale of all or part of their agricultural land. The sale of productive land also occurs voluntarily as cash crop farming expands. Money from the sale of land may be used to support the higher education or job placement of children. Significant associations are found between land ownership, living arrangements, and elder wellbeing. Elders who sold land are least likely to live with an adult child, while elders who gave all their land to their children are significantly more likely to do so. Giving all land to children is positively associated with receiving financial support from children, whether the elder lives in the same household as an adult child or not.

The study demonstrates that productive land is fundamental to maintaining traditional intergenerational relations, and sheds new light on the role of agricultural land ownership in determining living arrangements and the wellbeing of the elderly in Vietnam.

Giving all land to children is positively associated with receiving financial support from children, whether the elder lives in the same household as an adult child or not.



ASSOCIATE PROFESSOR
HEATHER BOOTH

BSc Econ (Hons) London,
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ASSOCIATE INVESTIGATOR

Heather Booth is Associate Professor of Demography in the School of Demography at the Australian National University. She leads the Research Group on Longevity, Ageing and Mortality.

Her research in demographic modelling and forecasting focuses on methods for mortality forecasting with applications in population futures and population ageing. In addition, her current research focuses on international patterns in the achievement of best practice mortality.

Heather also leads a project on intergenerational support in Vietnam, and continues her research on the relationship between family-based social support through social networks and the wellbeing of older Australians, and on microsimulation modelling of the disability status of the older Australian population.

Three of Heather's doctoral students were awarded their degrees in 2016, and she currently supervises three students undertaking doctoral research on ageing and theoretical demography.

INEQUALITIES IN HEALTHY LIFE EXPECTANCY ACROSS CHINESE PROVINCES

RESEARCHERS

KATJA HANEWALD
HAN LI
SHANG WU

Researchers at CEPAR's Australia-China Population Ageing Research Hub are investigating province-level health inequalities in China. China has seen rapid economic development and improvement in population health over the past decades, but large differences continue to exist between provinces. Our project focuses on healthy life expectancy as a measure of population health and will provide new evidence on the development of regional health inequalities in China.

A major challenge for research in this area is the lack of age-specific mortality and morbidity data for Chinese provinces at different points in time. We use two strategies to overcome this problem. In the first part of the project, we use self-reported health data collected for several provinces in different household surveys to calculate prevalence rates of ill health. We combine these rates with census mortality data to calculate measures of healthy life expectancy using the well-known Sullivan method. This phase of the project will produce new empirical results on province-level trends in healthy life expectancies in China.

In the second part of the project, we develop a new statistical model to predict healthy life expectancy for Chinese provinces based on observable factors. The model is motivated by the observation that Chinese provinces differ so widely in their economic and social development that they could be considered as different countries. We therefore develop a model that combines international country-level data and province-level data for China to estimate the relationship between observable economic and demographic factors and healthy life expectancy. We test the model's validity based on results from the first part of the project.

The results will provide a new evidence base for policymakers and financial services providers in China. This project will be completed in 2017 and is expected to produce one or two papers to be submitted to leading international journals. The project provided a research training opportunity for an undergraduate student during the 2016/17 summer break. The student, Kevin Krahe, is funded by the UNSW Business School Summer Research Scholarship Program.

Our project focuses on healthy life expectancy as a measure of population health and will provide new evidence on the development of regional health inequalities in China.



DR SHANG WU

BBus (Hons) UTS, MAcc Syd.,
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PhD UNSW

SENIOR RESEARCH ASSOCIATE

Shang is a Senior Research Associate at the Australia-China Population Ageing Research Hub CEPAR.

He has a PhD in Actuarial Studies from the University of New South Wales. His PhD thesis studies the demand for long-term care and longevity insurance. Before starting his PhD he obtained a Bachelor of Business (Honours) degree in Finance from the University of Technology Sydney and a Master degree in Accounting.

Shang's main research interests are retirement income, retirement finance products and portfolio optimisation. He also has expertise in life-cycle modelling and survey design. His current research focuses on retirement finance decisions of older households and pension reforms in China.

MODELLING MULTI-STATE HEALTH TRANSITIONS IN CHINA: A GENERALISED LINEAR MODEL WITH TIME TRENDS

RESEARCHERS

KATJA HANEWALD
HAN LI
SHANG WU

Population ageing has reached a new dimension in China. China is the most populous country in the world and is very rapidly ageing due to improvements in life expectancy and low fertility rates in past decades. In 2010, one in ten older persons (aged 65+) globally lived in China, while in 2040 it is expected that one in four elderly – over 340 million people – will be Chinese. China's old age dependency ratio was 15% in 2015, but is expected to be close to 50% by mid-century.

The need for health care, aged care and financial services for the elderly in China is already large and

will grow in the future. Traditionally, older Chinese were cared for by family members, but the availability of family caregivers is declining due to demographic changes, the weakening of traditional values, greater geographic mobility, and improved gender equality. Formal aged care services such as institutionalised care, paid home care, and community-based care services are still very limited in China despite recent government policy initiatives. The resulting unmet aged care needs have a measurable impact on the mortality risk of older Chinese.

The development of formal aged care services in China will also require new funding mechanisms. Current social security programs for older people provide basic medical

insurance and a low age pension income. They do not cover the full cost of residential aged care facilities and are not accredited to fund community-based services. There is a need for social security programs specialising in the provision of aged care or the development of private market solutions such as long-term care insurance or specialised home equity release products.

We develop a new multi-state model for modelling the health transitions of older Chinese. The model describes transitions between three health states (healthy, functionally disabled and dead) and allows for recovery from the disabled state. The transition intensities are modelled in the generalised

linear models (GLM) framework, with age and time as covariates in the linear predictor. Our model can be used to predict the demand for aged care services and for the development of social security programs or insurance solutions aimed at funding aged care.

This project builds on successful previous research conducted in CEPAR by CI Michael Sherris, AI Joelle Fong and AI Adam Shao. The project will be completed in early 2017 and we plan to present the research results at major international conferences in Asia and Europe.

There is a need for social security programs specialising in the provision of aged care or the development of private market solutions such as long-term care insurance or specialised home equity release products.



DR HAN LI

BCom (Hons) in Actuarial Studies
Melb., PhD Monash
SENIOR RESEARCH ASSOCIATE

Han Li is a Senior Research Associate at the Australia-China Population Ageing Research Hub in CEPAR. She received a Bachelor of Commerce (Honours) degree in

Actuarial Studies at the University of Melbourne and completed her PhD degree at Monash University.

Her research expertise is in the field of mortality modelling and forecasting using advanced econometric and statistical techniques. She is currently working on projects involving multi-state

health transition models and long-term care insurance in China. Han's research has been published in top tier journals including *Insurance: Mathematics and Economics* and the *Journal of Forecasting*.

'Over the last few decades, the speed of population ageing in China has been phenomenal. I've always been

fascinated with population ageing study in China and appreciate the complexity and unique features of the research. I hope my research will make a real difference and contribute to the policymaking process to help China better prepare for population ageing.'

LONG-TERM CARE IN CHINA: ESTIMATING MULTI-STATE LIFE TABLES AND COSTS FROM A PILOT PROVISION PROGRAM

RESEARCHERS

BEI LU
JOHN PIGGOTT
MICHAEL SHERRIS

External Collaborators

HONG MI
YANAN ZHU
(BOTH ZHEJIANG UNIVERSITY)

Long-term care is the new policy frontier in population ageing, and nowhere is this more true than in China. The Chinese authorities have responded to this by establishing a range of pilot programs to test the efficacy of alternative approaches to delivering long-term care. One of the first of these is located in Qingdao.

Working with our collaborator, the Institute for Population and Development Studies at Zhejiang University,

we have embarked on a detailed analysis of pilot data. A preliminary step has been the documentation of what the pilot actually entails, and this has been completed. Essentially, the pilot is designed to move medical services out of a hospital setting into either home or institutional settings. In the home, a separate program, administered by the Ministry for Civil Affairs, provides nursing care (bathing, meals etc), on a means tested basis. This reduces pressure on the hospital system, and allows more people to spend more time in their homes, rather than in institutional settings.

We are currently working on patterns of exit probabilities from the long-term care system. In almost all cases,

this is precipitated by death. Estimates can be made for populations with different characteristics (age, gender, disability status etc.) of what the expected tenure in long-term care might be. The Cox Proportional Hazards model is being employed to give effect to this. It is designed to give new insight into the implications of the Pilot, its cost per client, and the determinants of cost differentials of clients presenting with different patterns of disability, using information on Activities of Daily Living (ADL) status and the mortality pattern in different care locations.

Preliminary findings indicate that over a 15 month period, the probability of exit from the program is 40 percent for institutional recipients and about 30 percent for home

recipients. But the difference between home and institutional care probabilities disappears after 12 months.

Preliminary estimates of multistate probabilities for mortality rates in the Qingdao long-term care system have also been obtained. We then use current service pricing rates to estimate the individual cost based on each age cohort. Once refined, these will allow us to present the pattern of home-to-institution and institution-to-home transfers; mortality differentials and expected tenure with age; and the cost-covering premium that would be required to provide sustainable coverage.

We are currently working on patterns of exit probabilities from the long-term care system.



DR BEI LU

BA Tsinghua, MBA S. Aust.,
PhD UNSW

RESEARCH FELLOW

Bei Lu is a CEPAR Research Fellow located at the UNSW Business School and a Research Fellow with Tsinghua University and Zhejiang University, China.

Bei returned to academia in 2002 to undertake a PhD in Economics at UNSW after

working as an international trader for 12 years. Her thesis and subsequent research focuses on pensions and population ageing related social welfare and economic issues.

Bei has been very successful in developing international linkages over the past ten years with organisations such as the provincial government of Zhejiang province, China,

the World Bank's Operations Evaluation Department and Zhejiang University. She is currently participating in a Chinese Key National Science Project, as well as a project focused on China's Second Pillar Pension Reform organised by the Chinese Academy of Social Sciences and major insurance companies in China.

She has presented her research at a number of

international conferences including the Stanford-Harvard Population Ageing Conference and the London School of Economics Long-Term Care Conference. Her research has appeared in the *International Social Security Review*, the *Journal of the Economics of Aging*, *Population Review*, *CESifo Economic Studies* and the *Journal of Aging and Social Policy*.

A DYNAMIC ANALYSIS OF CHINESE ELDERS' HEALTH FROM 2000-2010

RESEARCHERS

BEI LU
JOHN PIGGOTT

External Collaborators

XIAOTING LIU
MINGXU YANG
(BOTH ZHEJIANG UNIVERSITY)

Dramatic demographic, social and economic changes have taken place in the last few decades in China and they have huge impacts on population health. We aim to identify trends in health status, healthy life expectancy, and total life expectancy through the first part of this century. These are important to policymakers grappling with planning for future health and long-term care expenditures.

We use the Aged Population in Urban/Rural China (SSAPUR) data, and explore the dynamic changes of elders' health and disability prevalence from 2000-2010. Models are used to predict the impact factors of disability of elders; these are integrated with adjusted population mortality tables and projections using Sullivan's method. Disability Life Expectancy (DLE) and Life Expectancy (LE) at old ages are calculated and estimated.

Sullivan's method allows the calculation of the number of remaining years, at a particular age, that an individual can expect to live in a healthy state. It is computed by subtracting the probable duration of bed disability and inability to perform major activities from overall life expectancy.

The first part of this study focuses on the disabled status using Activities of Daily Living criteria (ADLs). We define elders with at least one of the six ADLs impairments as 'Disabled'. The results show that nationally, DLE has been compressing from 2000-2010. Improvement in disability prevalence is mainly attributed to urbanisation, better health among the younger old (60-80), higher income and better education. But morbidity expansion is observed in the 80+ age group. The research indicates increasing inequality in health status between rural and urban residents.

In 2017 we will turn attention to Instrumental Activities of Daily Living (IADLs) and chronic disease prevalence. Elders having at least one IADL have decreased from 39% in 2000 to 34% in 2010; elders having at least one chronic disease have increased from 69% in 2000 to 82% in 2010 in urban China, and from 52% to 72% in rural jurisdictions. A statistical model will be developed to identify the major predictors for changes in these trends.

The project is expected to produce two to three papers to leading health and demographic journals.

Dramatic demographic, social and economic changes have taken place in the last few decades in China and they have huge impacts on population health.

RESEARCHERS

VASOONTARA
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CATHERINE D'ESTE
(ANU)
NIRMALA NAIDOO
(WHO GENEVA)

This study provides comparative insights into the ways in which social and economic factors in China and India have influenced health and wellbeing among older adults. In particular, this study will investigate associations between social capital and quality of life in two of the world's most populated countries, China and India.

The study used data from the World Health Organization Study on global AGEing and adult health (WHO-SAGE, Wave 1 2007-2010) with nationally representative samples aged 50+ years in low and middle income countries worldwide. China and India are the main study sites in Asia. Health and wellbeing measures in this study were based on a standard WHO Quality of Life measure (WHOQoL scale 0-100) covering a range of subjective assessments such as financial resources, relationships, psychological wellbeing, and physical health. Social capital variables cover generalised social trust and social network composite measures which include marital status, religious activity, society

membership, and closeness to friends and relatives. Multivariable linear regressions were conducted separately for each country, and analyses take into account age, sex, rural-urban residence, permanent income quintiles, and potential health risks and other covariates such as smoking, alcohol consumption, and a number of chronic conditions.

Overall mean WHOQoL scores were 56.6 [SD 13.2] for China and 60.8 [SD 15.1] for India. Using multivariable linear regression, poor social networks were strongly and significantly linked with lower quality of life scores in China and India.

After taking into account the potential covariates, associations between lack of generalised trust and adverse quality of life were particularly strong in urban areas in both countries. Having higher income was protective of quality of life and having chronic conditions resulted in adverse quality of life scores in both countries. With the rapid increase in ageing in both societies, promoting social networking and neighbourhood safety could be beneficial to improving quality of life and wellbeing in China and India.

Preliminary findings were presented at the 2016 China Road International Conference, 13-15 August 2016 in Newcastle, Australia. In 2016 Vasoontara visited WHO Geneva to set up SAGE data and the WHO Regional Office in Delhi to discuss findings. In consultation with CEPAR CI Professor Hal Kendig, the project team is currently finalising a draft manuscript.

...this study will investigate associations between social capital and quality of life in two of the world's most populated countries, China and India.



DR VASOONTARA YIENGPRUGSAWAN
BA Econ Thammasat, MA IR
Syracuse, PhD Epidemiology ANU
RESEARCH FELLOW

Vasoontara Yiengprugsawan is a Fellow based at the Centre for Research on Ageing, Health and Wellbeing at the Australian National University. Vasoontara was awarded a 2016 Australian Endeavour

Research Fellowship, has led a comparative study on health system response to population ageing and non-communicable diseases appointed to the World Health Organization Asia-Pacific Observatory on Health Systems and Policies (2014-2016), and was a principal analyst for the Thai Cohort Study funded by the Australian National Health and

Medical Research Council and the Wellcome Trust UK (2008-2014).

Dr Yiengprugsawan's research interests cover life course determinants of health and wellbeing in mid to later life, risk factors and prevention of chronic diseases, and universal healthcare in Asia.

Her recent work includes social capital and health dynamics among older Australians, regional variations in health outcomes and health service use in China, and epidemiological and health-risk transitions in Thailand.

RESEARCH TRAINING & MENTORING

RESEARCH IMPACT AND ENGAGEMENT WAS THE THEME OF THIS YEAR'S EARLY CAREER RESEARCHER (ECR) RETREAT. THE 2016 TRAINING AND MENTORING PROGRAM ALSO FEATURED A WORKSHOP ON COMPUTATIONAL ECONOMICS, A NATIONAL CONFERENCE FOR PHD STUDENTS FOCUSED ON AGEING RESEARCH, AND A SUMMER SCHOLARSHIP PROGRAM FOR ASPIRING RESEARCHERS.

Led by John Piggott, Associate Investigator Hazel Bateman and the Chair of CEPAR's Advisory Board, Marc de Cure, this year's ECR retreat held in August provided valuable insights into building a research program designed to maximise impact.

The two day retreat included extended sessions where ECRs were tasked with developing multidisciplinary projects with the potential to achieve major impact. Similar sessions at last year's retreat led to several ECRs organising a 2016 CEPAR workshop titled, 'Mid-life Employment: Determinants, Consequences, and Policy', demonstrating the value of providing opportunities for our ECRs to brainstorm multidisciplinary initiatives.

In December, Visiting Professor Hans Fehr from Wuerzburg University convened a four day workshop to provide participants with state of the art techniques for quantitative macroeconomic research. Attracting young scholars from around the nation, as well as economists from government departments keen to enhance their skills, the workshop is one example of CEPAR's national leadership in research training for young researchers focused on population ageing.

Another way in which we build national research capacity in this vital field of research is through our sponsorship of the Emerging Researchers in Ageing (ERA) initiative. Hosted by ANU's Centre for Research on

Ageing, Health & Wellbeing (CRAHW) and organised by CEPAR Chief Investigator Kaarin Anstey, the theme of this year's ERA Conference was 'Pathways to Ageing Well'. The conference was opened by the ANU Vice Chancellor, Professor Brian Schmidt.

In the 2015/2016 summer we offered potential honours students a taste of research through the inaugural CEPAR Summer Scholarship program, an initiative designed to encourage second and third year undergraduates to consider a research career by offering them an opportunity to work on short-term projects at CEPAR. The program was a great success and another group of scholars joined CEPAR for the 2016/17 summer.

In 2017, we look forward to continuing to support initiatives which develop young researchers' skills and networks and, in so doing, increase the profile of CEPAR as a destination of choice for emerging researchers.

Peter McDonald
Deputy Director

CEPAR RESEARCHERS
WORKING TOGETHER AT
CEPAR'S SECOND ECR RETREAT

EARLY CAREER RESEARCHER MENTORING AND TRAINING

ECRs are mentored by CEPAR senior researchers and have opportunities to interact with experts within the four collaborating universities, as well as international leaders in the field who visit the Centre during the year. A range of events held throughout 2016 also provided frequent occasions to engage with our industry and government partners. Our ECRs participate in Centre activities such as workshops and seminars, contribute to the Centre's working paper series and have opportunities to develop a range of skills.

In 2016, 25 research fellows were funded directly by Centre grants and, additionally, 6 of our CEPAR Associate Investigators (AIs) were ECRs.

EARLY CAREER RESEARCHER RETREAT

Given the positive feedback and success of the first Early Career Researcher Retreat in 2015 it was decided that in 2016 we would again hold a retreat to bring together researchers from all of the nodes. An organising committee consisting of four CEPAR research fellows volunteered to put together a program suited to the needs of those attending.

The first day included a session on data as well as an opportunity to network. After lunch Marc de Cure, Chair of CEPAR's Advisory Board, presented to the group on Research Impact and Engagement which provided the background for the first interdisciplinary research project breakout session. In this session multidisciplinary teams were given time to work on a joint project of their choice.



RESEARCH TRAINING & MENTORING

Chief and senior Associate Investigators were on hand to provide encouragement and guidance. On the second day there was time to finesse the project ideas before presenting them to the whole group for feedback.

After lunch the group attended another session on Research Impact and Engagement with presentations by Marc de Cure and CEPAR AI Hazel Bateman. Most agreed this was the highlight of the two day program. Participants were also pleased with the opportunity to present their research to their peers across the nodes and to network in an informal setting.

EARLY CAREER RESEARCHER WORKSHOP

An advanced training workshop on Computational Economics was hosted by the CEPAR UNSW node in December 2016. Convened by CEPAR visitor Professor Hans Fehr and CEPAR Research Fellow George Kudrna, the workshop attracted ECRs and PhD students as well as industry and government employees from around the nation. The workshop was offered free of charge to both CEPAR and non-CEPAR affiliates



ECR WORKSHOP PARTICIPANTS

and CEPAR travel bursaries were available to assist with costs incurred by interstate participants. As well as providing an opportunity for participants to advance their skills, it also offered a forum to network with other emerging researchers working in the field.

The interactive four day workshop was designed to improve the ability of participants to conduct analysis of data, specifically using Fortran. The hands-on

workshop allowed participants to develop expertise in numerical solution methods and dynamic programming. The workshop also covered a number of models including the Ramsey Growth, Stochastic Growth, Life-cycle and Stochastic OLG Models.

In a follow-up survey of participants, many praised the practical nature of the workshop.

NATIONAL AND INTERNATIONAL NETWORKING OPPORTUNITIES

Creating opportunities for young researchers to develop their international networks and communicate the results of their research to international peers continued to be an area the Centre invested significant resources.

In 2016 the CEPAR ECR Travel Grant Scheme provided the opportunity for international collaboration and connection for CEPAR ECR Dr Jennifer Alonso García. She used the funds to make two four week trips, one to the University of Liverpool and the other to the *Universite Catholique de Louvain*. The periods spent at these international institutions provided Jennifer with the time to collaborate, explore and develop research projects on pension finance.



DR JENNIFER ALONSO GARCÍA

Research Fellow
UNSW Sydney node
ECR TRAVEL GRANT RECIPIENT

'In 2016 I had the opportunity to do a research visit to the Institute for Financial and Actuarial Mathematics (IFAM) at the University of Liverpool (UK) and one to the Institute of Statistics, Biostatistics and Actuarial Sciences (ISBA) at the *Universite Catholique de Louvain* (Belgium). These visits were possible thanks to the funding received from the ECR Travel Scheme. The aim was to develop a project together with Dr Carmen Boado-Penas and Professor Pierre Devolder on pension finance. The research on pension finance is vitally important for all countries as populations age. Many countries are still looking for solutions and even those which have found solutions are coping with another round of problems brought about by further change in the socioeconomic

environment. The funding received facilitated the interaction between me and my co-authors and allowed us to present our research at international conferences, raising awareness of our solutions to the dynamic aspects of pension financing. The research is reported in CEPAR Working Paper 2016/22.'

Our visitors program also provided our students and ECRs with opportunities to expand their international networks. This included international experts who were distinguished speakers at 2016 CEPAR or CEPAR-sponsored events such as the 24th Colloquium of Superannuation Researchers and the Mid-life Employment Workshop. Many of our visitors spent extended periods of time at the Centre meeting with CEPAR personnel to discuss CEPAR research and the development of joint projects. For our junior researchers, this provided an excellent opportunity to exchange ideas and perspectives with a range of multidisciplinary experts in an informal setting.

Hosting visiting ECRs and PhD students from institutions with which we are building a collaborative

research program, also expanded the networks of our young researchers and fostered the development of collaborative research relationships.

CEPAR students were also encouraged to present their research at international conferences. To enable this, CEPAR provided funding to seven PhD students in 2016 to assist with travel expenses.



XIAOYUN ZHANG

PhD student
UNSW Sydney node

**HDR STUDENT CONFERENCE
TRAVEL RECIPIENT**

'Thanks to the CEPAR HDR Student Conference Travel Scheme, I have presented the first chapter of my PhD thesis at the 7th APRU Research Symposium on Ageing in the Asia-Pacific on 6-8 November 2016 at Peking University in Beijing and at the 16th China

Economics Annual Conference on 3-4 December 2016 at Huazhong Science and Technology University in Wuhan. Many useful comments were received from the experts who participated in the two conferences. Also, I made progress on the second chapter of my thesis, 'Rural-urban migration and the health of elderly parents in China', as a result of a visit to the CHARLS data team at Peking University. I have established many new contacts and explored potential job opportunities during the visit. Overall, the visit considerably benefited my career development and helped me to find an academic position in China after completion of my PhD.'



JOHAN BONEKAMP

Researcher
Network for Studies on Pensions,
Aging and Retirement (NetSPAR)
ECR VISITOR

As part of a collaborative project with NetSPAR, CEPAR hosted a visit from Johan Bonekamp from 19 June – 15 July 2016 to advance the joint project.

'During my research visit, I was able to accomplish a lot thanks to CEPAR's support. I could closely collaborate with Jennifer Alonso Garcia, Ralph Stevens, and Hazel Bateman on designing an experiment for a research paper on the within subject (alternate) ranking of saving motives in a (stylised) Dutch and Australian pension system design; exchange knowledge with CEPAR researchers, and learn about current issues in the Australian pension system by attending the Colloquium of Superannuation Researchers. I am very grateful for this opportunity.'

HIGHER DEGREE RESEARCH TRAINING

42 HDR students are currently enrolled under the supervision of CEPAR Investigators and working on topics aligned with the Centre's research agenda. Details of their research theses are provided on pages 99-109. These students have the opportunity to participate in a range of Centre activities, including conferences and workshops and meetings with international visitors.

We contribute to the development of national research capacity more generally through our support for Emerging Researchers in Ageing (ERA), an initiative which aims to bring together students interested in ageing research and provide them with opportunities to form networks and undertake collaborative endeavours. In 2016 ERA membership continued to grow, with over 750 registered members, primarily doctoral students drawn from a wide range of disciplines but also key professionals, industry stakeholders and representatives from peak bodies in the field keen to play a role in supporting early career researchers.

RESEARCH TRAINING & MENTORING

ERA members have the opportunity to participate in the annual conference and virtual seminar series as well as take advantage of other opportunities, for example, the ERA travel exchange scheme.

CEPAR'S funding support allows the ERA administrative team to coordinate educational and mentoring activities for research students in the ageing field. The key annual ERA activity is the ERA National Conference. The theme of the 15th National ERA conference was *Pathways to Ageing Well*, hosted by the Centre for Research in Ageing, Health and Wellbeing at The Australian National University. The attendees reported a high degree of satisfaction with the conference, especially with the quality of the content. The conference entailed 47 oral presentations, 11 posters, five rapid fire oral presentations from poster presenters and seven full papers and covered a wide range of issues from a number of disciplinary perspectives including: neurological and biological pathways, physical functioning, health promotion and physical activity, nutrition and diet,

psychosocial dimensions, social relationships and participation, service use and planning, practitioner perspectives, and pathways through dementia. ERA provided 22 bursaries to student presenters to support their attendance at the conference.

ERA ran a joint workshop with the Australian Association of Gerontology (AAG) in addition to the conference. Associate Professor Inger Mewburn from The Australian National University (also known as the Thesis Whisperer) presented to 30 participants on the Critical Success Factors for an Academic Career which received very positive feedback.

Three post-conference workshops were well attended by ERA participants:

- Building research capacity (presented by Professor Elizabeth Beattie from Queensland University of Technology);
- Longitudinal research methods (presented by CEPAR AI Dr Kim Kiely from The Australian National University); and

- Using Research to Inform Health Promotion (presented by CEPAR CI Professor Kaarin Anstey from The Australian National University for the NHMRC Centre for Excellence in Cognitive Health).

Cassie Curryer, a PhD student at the University of Newcastle, was one of six CEPAR researchers to present. She was awarded a 2016 ERA Travel Bursary

to attend the conference and present her paper *'Remember, I live with my mother': The housing circumstances of women baby boomers in Australia*.

'The 2016 ERA conference in Canberra was a wonderful opportunity for higher degree research students and early career researchers to come together in a very welcoming, supportive and stimulating conference environment. I haven't

presented at many conferences, so thought I would be very nervous giving my presentation, but the audience was very supportive and the whole experience very positive and affirming. I received some excellent feedback on my research and presentation skills. The conference itself was very well organised, with good opportunities for networking, and the quality and range of topics presented was excellent. The post-conference workshops provided some very useful and practical advice regarding professional development and for improving success within highly competitive research and academic environments. I look forward to attending next year's conference in Perth'.



CASSIE CURRYER AT THE 15TH NATIONAL ERA CONFERENCE

EMERGING RESEARCHERS IN AGEING VIRTUAL SEMINAR SERIES

The ERA Virtual Seminar series continues to provide a regular opportunity for ERA members from across Australia and internationally to come together virtually to hear from leading researchers and stakeholders in the field of ageing and engage in extended discussion. Participation in the series included young researchers based in Australian metropolitan and regional areas as well as internationally. Two virtual seminars took place in 2016: one focused on conducting research on indigenous ageing in April, and the other provided advice on the preparation of fellowship and grant applications in September. In addition, ERA collaborated with the AAG to run a joint webinar on social media use in research in August which attracted 40 participants.

UNDERGRADUATE STUDENT ENGAGEMENT

SUMMER SCHOLARSHIP PROGRAM

In late 2016 CEPAR offered a Summer Scholarship Program at the UNSW node for the second time. Successful applicants were given the opportunity to work under the supervision of CEPAR Research Fellows for an eight week period over the summer break. The program generated a great deal of interest from undergraduate students in Economics and Actuarial Studies who competed for three awards. The successful students and their research projects were:

Robert Tiong

The Role of Cognition and Family Support on the Private Health Insurance Decisions of Older Australians

Ke (Kevin) Shen

Measuring Population Ageing and Ageing-Readiness of Chinese Provinces

Kevin Krahe

Inequalities in Healthy Life Expectancy across Chinese Provinces

The program is designed to provide students with a taste of working in a research centre and to inspire them to pursue research studies.



KEVIN KRAHE

Bachelor of Actuarial Studies/
Bachelor of Economics Student
SUMMER SCHOLARSHIP RECIPIENT

‘As an undergraduate student, the opportunity to work alongside experienced researchers with CEPAR over the summer period has been an invaluable learning and development exercise. The skills, knowledge and experience that I’ve acquired will equip me well for future roles, either in academic research or in industry.’

STUDENT THESES

CEPAR affiliated students work under the supervision of CEPAR Investigators on topics aligned with the Centre’s research agenda.

In 2016 a total of 42 HDR students and 2 honours students were affiliated with the Centre. This year 11 HDR CEPAR affiliates submitted their theses for examination and/or graduated:

- Kimberly Ashby-Mitchell (PhD awarded)
- Yodi Christiani (PhD awarded)
- Alice Falkiner (PhD submitted)
- Natasha Ginnivan (PhD submitted)
- Nerida Hunter (PhD submitted)
- Matthew Kidman (PhD submitted)
- Mahin Raissi (PhD submitted)
- Rosilene Waern (PhD awarded)
- Kylie Wales (PhD submitted)
- Shang Wu (PhD submitted)
- Xiaoyue (Luna) Xu (PhD awarded)

PHD STUDENTS AT THE UNSW BUSINESS SCHOOL

NATALIA ARANCO

MEc Universidad de Montevideo

SUPERVISORS:

Professor John Piggott
and Dr Shiko Maruyama

Assessing the impact of fertility differentials in the accumulation of human capital

The aim of this thesis is to provide new evidence on how the relationship between fertility and intergenerational accumulation of human capital, which we call fertility-education differentials (FD), varies across countries and over time. We propose a novel measure of FD, which is based on the realisation that if low educated women have more children than their higher educated counterparts then on average, given a certain cohort of babies, the education level of their mothers is expected to be lower than the education level of all women (of reproductive age) in the country. Data are drawn from the Demographic and Health Surveys, and comprise 236 surveys from 78 countries across 32 years.

RESEARCH TRAINING & MENTORING

BIANCA BONOLLO

*BSc Econ University of Padua,
MSc Econ Ca' Foscari University
of Venice*

SUPERVISOR:

A/Professor Loretta I. Dobrescu

CO-SUPERVISOR:

Professor John Piggott

Social networks and formal care usage

Older adults are a particularly sensitive category in terms of health care coverage due to deteriorating health, decreasing mobility and cognition, and the risk of social isolation. This research provides a deeper understanding of the role of social ties in determining the amount of formal care demanded by the elderly. Using European data, the project finds that social network members not only provide informal care as a substitute to formal care, but also shape the use of formal care through other channels. Social network members might in fact provide information about services, facilitate access, provide emotional support, etc. This work was presented at the 2016 CEPAR Summer Workshop in the Economics of Health and Ageing. The second chapter of the thesis will focus on another aspect of health-related choices: the diet of older urban Europeans.

YULONG LI

*BSc Appl Math RUC China, MEcon
ActStud CUFU China*

SUPERVISOR:

Professor Michael Sherris

CO-SUPERVISOR:

Dr Jonathan Ziveyi and
Dr Andrés Villegas

Retirement income product development – new methodologies and innovative solutions

This project aims to develop a new methodology and contribute new insights into the innovative design of a comprehensive retirement product which can help to solve the current issue of financing retirement risks. Earlier studies in this area are mainly focused on specific types of retirement income products or the shortcomings of current retirement systems. As noted in the Financial System Inquiry (2014), to face the current situation of longevity risk and inefficiencies of the superannuation system, innovation is needed for current retirement products.

In this project, the main goal is to design a personalised default comprehensive retirement income product to convert superannuation savings into sustainable income streams with some flexible features based on individuals' characteristics.

After the product design, we plan to analyse the impact of our product on the current market from both a government's and a product provider's perspective. Future research will involve the development of a robust framework for the effective modelling of both financial risk and mortality risk with the view of designing a default product; analysis of how these products interact with the Age Pension and aged care financing and then assessing the actuarial fairness of the whole retirement system; and the development of an innovative value-based longevity index which better reflects the interaction of longevity risk with financial risk to help find an optimal risk management strategy for product providers.

SHANG WU

*B Bus (Hons) UTS, MAcc Syd.,
BAppFin/BActStud Macq.*

SUPERVISORS:

Professor Hazel Bateman
and Dr Ralph Stevens

CO-SUPERVISOR:

Professor Susan Thorp

Demand for long-term care and longevity insurance

The thesis studies the demand for long-term care and longevity insurance from both theoretical and empirical perspectives. The

thesis first develops a life-cycle model of the retirement phase to analyse the demand for long-term care and longevity insurance. The thesis then conducts and analyses a large experimental survey to study the empirical demand for long-term care and longevity insurance using stated preference data. Finally, the thesis reconciles the theoretical and the empirical by calibrating individual utility parameters. This thesis was submitted on 31 August.

MENGYI XU

BCom (Hons), UNSW

SUPERVISOR:

Professor Michael Sherris

CO-SUPERVISORS:

Dr Adam Wenqiang Shao and
Dr Jennifer Alonso García

Housing and retirement savings

The research consists of three projects that aim to integrate pre-retirement investment strategies and post-retirement income solutions in the presence of housing. The first project looks at how to achieve a target income stream for retirement from a pension fund manager's perspective. Portfolio insurance strategies are used to achieve the target annuitisation level for fund members. The second

project, motivated by the significance of housing assets in household portfolios and its importance in retirement financing, looks at the optimal time to buy a residential house during the working life for a typical Australian. We perform numerical simulations to assess the impact of purchasing a home at different ages on pre-retirement consumption, retirement savings, and ultimately the life utility level. The third project looks at optimal consumption and portfolio choice in the post-retirement stage. We use a life-cycle model in the recursive utility framework to find a combination of products that can finance the optimal consumption path for a typical retiree.

XIAO XU

*BActSc, BFin BMath University of
Wisconsin-Madison, MSFE, Johns
Hopkins University*

SUPERVISOR:

Professor Michael Sherris

CO-SUPERVISORS:

Dr Jennifer Alonso García and
Dr Jonathan Ziveyi

Variable annuity guarantee benefits – An integrated study of financial and actuarial valuations

This study aims to develop a VA+GMBs valuation framework that will not

only fulfill the actuarial pricing needs, but will also be compatible for reserving and hedging purposes by solving the three puzzles: market consistent asset return models with efficient numerical methods, optimal hedging strategies with capital considerations, and mortality modelling with longevity risk analysis.

YAJING XU

BActSc MActSc Central University of Finance and Economics, China

SUPERVISORS:

Professor Michael Sherris and Dr Jonathan Ziveyi

CO-SUPERVISOR:

Professor John Piggott

Cohort models of mortality and development of a tradable longevity market

Longevity-linked securities have received significant attention due to increasing demand for additional capacity and regulatory requirements. However, compared to the potential longevity risk exposure, the size of the present market remains small. In promoting the development of a liquid market for trading longevity risk, the primary focus of this thesis is to develop required methodologies and benchmarks for such a market. This thesis consists of three parts. The first part proposes and calibrates a multi-cohort mortality model

with a focus on financial applications. The proposed mortality model employs modelling techniques from interest rate theory, and can assist with the valuation of longevity-linked products. The second part develops value-based longevity indexes for multiple countries and assesses the basis risk of index-based longevity hedging implementation. Finally, with the mortality model proposed in the first part, the third part investigates how to calibrate the market price of longevity risk and its application to longevity bond option pricing.

XIAOYUN ZHANG

BMgt Zhejiang University, China

SUPERVISORS:

Professor John Piggott, Dr Katja Hanewald and Dr Tess Stafford

Rural-urban migration and the health of elderly parents in China

Increasing rural-urban labour migration and population ageing are two important demographic developments in China. As a result of the unprecedented rural-urban migration, a considerably amount of rural elderly are left behind. The paper investigates the effects of the adult children's rural-urban migration on the health

of the elderly parents in China, using a panel dataset from the China Health and Retirement Longitudinal Study (CHARLS). We account for the endogeneity of children's migration decisions using instrumental variables and study the causal mechanisms of how the migration of adult children affects elderly parents' health.

HONOURS STUDENT LOCATED AT THE UNSW BUSINESS SCHOOL

OLIVER WOOD

SUPERVISORS:

Dr Jonathan Ziveyi and Dr Jennifer Alonso García

Pricing and hedging guaranteed minimum withdrawal benefits under a general Lévy framework using the COS method

The pricing and hedging of guaranteed minimum withdrawal benefits (GMWBs) has attracted a lot of academic attention over the past decade. While a variety of approaches to pricing GMWBs have been studied, the issue of computational time has been largely overlooked. This thesis uses the COS method, which allows for efficient computations and the whole range of Lévy processes to model asset movements. It is possible to incorporate

complex features of GMWBs into the framework, including dynamic policyholder behaviour. Local risk minimisation strategies are used to form optimal GMWB hedging portfolios with European options. Risk measures, such as the variance or value-at-risk of the hedging loss, are calculated with the COS method. The results find that the method is capable of much faster computational times than existing techniques, and provide a more extensive analysis of GMWB hedging strategies than exists in the literature.

PHD STUDENTS LOCATED AT THE CENTRE FOR RESEARCH ON AGEING, HEALTH AND WELLBEING, ANU

RICHARD ARTHUR

BSc Comp Sc UNSW, BSc Psych (Hons) ANU

SUPERVISOR:

Professor Kaarin J. Anstey

ADVISORS:

Dr Moyra Mortby, Dr Richard Burns and A/Professor Richard O'Kearney

Is anxiety a risk factor for cognitive ageing?

Little research exists on the relationship between anxiety and cognitive ageing. Some research has suggested anxiety predicts cognitive decline (CD) in older adults. Such an association may be

important because of the implications for treatment of anxiety, and potential slowing of cognitive ageing for some individuals. Using 12 years of data from the Personality and Total Health (PATH) Through Life project (among other resources), this study aims to investigate epidemiologically whether, and under what conditions, anxiety is associated with CD in older adults; to delineate possible neuropsychological mechanisms; and to describe possible clinical implications.

NATASHA GINNIVAN

BSc Psych UNSW, PGDip Psych Macq.

SUPERVISOR:

Professor Kaarin J. Anstey

ADVISORS:

Dr Kerry Sargent-Cox and A/Professor Kate O'Loughlin

Self-perceptions of ageing from a cross-cultural perspective: The differential impact of socio-cultural practices on identity and age-stereotypes

Due to differing social practices around elder respect in more collectivist cultures such as China, Japan and the Philippines, it is hypothesised in some research that older people in these cultures are less prone to the internalisation

RESEARCH TRAINING & MENTORING

of negative age stereotypes. Focus group data showed that older people in the Philippines rely on a more cohesive frame of reference for the social role of an older person than older people in Australia. Different participants in groups of seniors (Australians N = 66 aged 60-75 and Filipinos N= 15 aged 55 - 79) were randomly assigned to either one of two experimental conditions where there was a positive prime or a negative prime, or the control condition with no prime. The aim was to see whether a subtle prime commenting about age in either a positive or negative way would affect memory performance. Participants then took part in a survey on cultural attitudes and ageing. Results showed no significant differences in performances between experimental conditions, nor cultural differences in memory ability. However, results from the survey showed that there were significant differences between cultural attitudes towards ageing; namely elder respect was held to be of importance to the senior Filipinos in comparison with the Australians. Further, more in-depth statistical analysis has revealed from the survey

that one's cultural orientation predicts attitudes towards the psychological aspects of ageing. Those who were higher on collectivist orientation held more positive attitudes towards ageing. This supports Becca Levy's (Yale Public School of Health) stereotype embodiment theory which suggests that individuals internalise the surrounding culture's messages about ageing, across the lifespan, as they age. Overall, older Filipinos from this study showed significantly more positive attitudes towards ageing than the Australians in the study, and our statistical model showed that that this was accounted for by one's cultural orientation: collectivist versus individualist. This thesis was submitted on 15 September.

PUSHPANI HERATH
MBBS University of
Sri Jayawardenepura,
MSc UTexas, Arlington

SUPERVISOR:
Professor Kaarin J. Anstey
ADVISOR:
Dr Nicolas Cherbuin

Understanding the relationship between treatment of common chronic diseases and cognitive function

Dementia and cognitive impairment are becoming

two of the most important neurological disorders among the elderly. The proposed study was designed to examine the impact of long-term medical treatments for chronic diseases such as diabetes, hypertension, hypercholesterolemia, and depression on cognitive function and structural brain changes. This study is using data from the PATH Through Life Project. It contains four projects: 'Exploring the link between type 2 diabetes and diabetes medication with cognitive function'; 'The effect of statins on cognition, mild cognitive impairment and structural brain changes: evidence from the PATH Through Life Study'; 'Effects of use of NSAIDs on cognitive function and structural brain changes' and 'Effects of antidepressant use on cognitive function and structural brain changes'. All four studies have been completed and the results are being written up for publication. Exploring the link between type 2 diabetes and diabetes medication with cognitive function has already been published in *Biomedical Research International*.

LARA MORRIS
BSc Psych (Hons), MCLinPsych
SUPERVISOR:
Professor Kaarin J. Anstey
ADVISORS:
Dr Kim Kiely and
Dr Kerry Sargent-Cox

Adverse childhood experiences and lifestyle risk factors for chronic disease over the life course

This year the clustering of lifestyle risk factors (smoking, harmful alcohol use and physical inactivity) and the psycho-social determinants of multiple unhealthy behaviours have been examined. The project also explores whether the experience of childhood adversities increases the number of lifestyle risk factors for chronic disease in adulthood and if so, whether this is independent of later life socioeconomic, behavioural and psychosocial factors. Future plans are to extend this work to examine the effect of childhood adversity on cognition over the life course.

LILY O'DONOUGHUE-JENKINS
BA BSc Psych (Hons) ANU
SUPERVISOR:
Professor Kaarin J. Anstey

Cognitive impairment and service use: Translating research for policy

Now in her final year of her PhD Lily has had three papers accepted to a peer-reviewed journal and one paper currently in review. She has one further paper drafted for submission. One of these drafted papers examines the relationship between hospital admission and cognitive impairment. The second analyses the determinants of healthcare service use (GP visits, hospital use and Emergency Department presentation) in people with Mild Cognitive Disorders. All of these papers will be included in her final thesis.

QUANG TRINH
BA Sociology Vietnam National University, MSocSc Sociology National University of Singapore
SUPERVISOR:
Professor Hal Kendig
CO-SUPERVISORS:
Professor Peter McDonald, A/Professor Minh Huu Nguyen and Dr Vasoontara Yiengprugsawan

Ageing and intergenerational relationships in Vietnam

This thesis looks at population ageing in Vietnam in association with the socioeconomic context. It examines many aspects of the Vietnamese elderly's intergenerational relationships including living arrangements, intergenerational support

exchange, intergenerational affection, association and consensus. The Vietnamese elderly's life satisfaction and quality of life will also be analysed in comparison with other Asian countries using WHO SAGE-INDEPTH data. Progress was made on three chapters focused on Changes in Living Arrangements, Intergenerational Transfer and Life Satisfaction and Quality of Life which resulted in three oral presentations including at the 15th National Conference of Emerging Researchers in Ageing (full paper published in conference proceedings), the 49th Australian Association of Gerontology Conference (co-authored with Hal Kendig), and the Gerontological Society of America 2016 Annual Scientific Meeting in New Orleans (co-authored with Hal Kendig). One abstract has been accepted for the IAGG 2017 World Congress of Gerontology and Geriatrics in San Francisco.

HONOURS STUDENT LOCATED AT THE CENTRE FOR RESEARCH ON AGEING, HEALTH AND WELLBEING, ANU

SIDHANT CHOPRA
BSc (Psychology)

SUPERVISORS:
A/Professor Nicolas Cherbuin and Dr Marnie Shaw

Myelin matters: Using a novel in-vivo measure of myelination to investigate the relationship between ageing, myelination and processing speed

The highly myelinated nature of the human brain, as well as the vulnerability of myelin to degeneration in combination with a longer lifespan may underlie the vulnerability of our species to age-related neurocognitive disorders, including Alzheimer's disease. Assessing myelin content *in vivo* in humans has proven difficult. To address this, a new method of T1/T2 ratio, combining T1-weighted and T2-weighted MRI scans to assess myelin content and its association with processing speed was conducted. Scans from 261 mid-life participants (aged 48-54) and 236 older-age participants (aged 68-74) were randomly selected from a cohort of healthy community-dwelling

individuals. Myelin content was first compared to Diffusion Tensor Imaging (DTI) measures from the same participants. While DTI measures are sensitive to myelination, they are additionally influenced by density and diameter of axons in white matter. Multiple regression was used to investigate the association between myelin and cognitive processing speed, controlling for gender, education and age. Myelin content was positively correlated with DTI measures suggestive of high myelination, and negatively correlated with those suggestive of low myelination. This indicates that the new myelin is strongly correlated with an established measure of white matter integrity. Additionally, it was superior to DTI at differentiating high and low myelinated areas of the brain. However, myelination, as assessed with the T1/T2 ratio was not associated with measures of cognitive processing speed. In conclusion, the T1/T2 measure appears to be a good indicator of myelin content, but, in this sample, not a sensitive predictor of processing speed.

PHD STUDENTS LOCATED AT THE SCHOOL OF DEMOGRAPHY, ANU

JEOFREY B. ABALOS
BS Commerce University of Luzon, Master in Population Studies University of the Philippines Population Institute

SUPERVISOR:
A/Professor Heather Booth
CO-SUPERVISOR:
Professor Zhongwei Zhao

Changing health status and health expectancy among older persons in the Philippines

This thesis aims to understand how different factors influence the compression or expansion of morbidity among older persons in the Philippines. While there have been earlier studies on the changing health status of older Filipinos, these are mostly focused on the socioeconomic factors and do not take into account other important factors such as changing lifestyle, family support and health care utilisation. This research aims to address this gap by examining a broad array of factors that could influence the changing health status of older persons in the Philippines, with primary focus on the role of health care utilisation and family support. Data are drawn from a national survey on older

persons in the Philippines and the 2010 Census of Population and Housing.

MUHAMMAD ABSOR
MSR (Hons) ANU

SUPERVISOR:
Professor Peter McDonald
CO-SUPERVISORS:
Dr Iwu Utomo and Dr Arianne Utomo

Ageing in rural Indonesia: Filling the gaps to meet the bio-psychosocial-spiritual needs of older persons

This study examines the nature of ageing in rural Indonesia with a primary focus on bio-psycho-social-spiritual needs and functioning: how they are being met and the determinants of the wellbeing and vulnerability of older people. The study also aims to explore the influence of culture in determining care for older people and shaping their behaviour and status. It also examines the resilience of older people in facing their daily hardships across cultures. This study will be conducted in five communities representing five major ethnic groups in Indonesia (Javanese, Minang, Batak, Sundanese and Balinese) with differing cultural and economic characteristics. The researcher will employ situational analysis and

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policy approaches with mixed method data collections. The study forms part of an Australian National University Ageing project in Indonesia funded by the Australian Research Council, CEPAR and the ANU School of Demography.

BRIDGET BROWNE
BEc Macq., FIAA, FIA

SUPERVISOR:
A/Professor Heather Booth
CO-SUPERVISORS:
Professor Michael Sherris,
Dr Tim Higgins and Dr Anna Howe

Aged care in Australia: What place for long-term care insurance?

This research examines why there is no private, voluntary long-term care insurance product in Australia to support the costs of aged care. It also examines the variability in individual financial exposure to aged care costs and considers potential insurance product designs.

Following initial analysis of the Australian Institute of Health and Welfare's Pathways in Aged Care linkage dataset of 2003-04 (PIAC 03-04), a more complete dataset has been obtained, the extended PIAC database (PIAC 02-11). Analysis of this dataset is underway to establish transition rates between

care statuses and state-dependent life expectancies by age and sex. These results will be used to develop an underlying biometric basis for a long-term care insurance product in further work, and have much wider application to our understanding of outcomes for aged care recipients and should be of value to policymakers and practitioners in the aged care domain.

ALICE FALKNER
BA (Hons) MSocRes ANU
SUPERVISOR:
Professor Peter McDonald
CO-SUPERVISOR:
Dr Anne Evans

Dual caring in Australia: An examination of the experiences of people with multiple caring responsibilities

Informal care provided by family members is the most common form of care for people with disabilities, long-term health problems and the frail aged in Australia. Although there is a range of research focusing on the experiences of informal carers in Australia, there are some key areas that have been neglected. One such area is the study of informal carers who balance informal care with other child care responsibilities.

This thesis bridges the gap in knowledge about dual caring in Australia. In 2016, analysis, writing and editing were completed and the thesis was submitted in late November.

NERIDA HUNTER
*BA BCom Melb.,
MGovt & MComm Law ANU*
SUPERVISOR:
Professor James Raymer
CO-SUPERVISORS:
Professor Peter McDonald and
A/Professor Heather Booth

The geodemographic and life course dimensions of population ageing in Australia

This study examines demographic change in Australia over the period 1901 to 2011 and a future projection period of 2011 to 2031. It focuses on the population aged sixty-five years and over and how it varies across space and time by population size, structure, characteristics and life course. In 2016 thesis development was progressed and the candidate submitted the thesis for examination.

XIAOGUANG JIA
BS MS Fudan University
SUPERVISOR:
Professor Zhongwei Zhao
CO-SUPERVISOR:
A/Professor Heather Booth
ADVISOR:
A/Professor Adrian Hayes

A typology of marriage formation models: A game-theoretic and agent- based modelling study

Patterns of marriage can be recognised from datasets listing the characteristics of couples and individuals. However, such typical marriage datasets do not reveal how individuals search for partners. In various cultural and societal contexts, marriages usually involve two individuals with similar traits, such as age, ethnicity, education levels, socioeconomic status and physical appearance. Some of the existing literature is quick to attribute the observed patterns of positive assortative mating to individuals' conscious preferences for partners with similar traits. But such inference neglects what are often very complex mating processes and mating patterns. This study aims to develop a modelling typology to computationally specify the relationship between matching processes and matching outcomes. The central paradigm adopts the 'marriage market' notion and the 'game theory' viewpoint. Although the exploration is theoretical and methodological rather than empirical, this study will also provide some real

examples to illustrate how the modelling strategy works and contribute to a better of understanding marriage-related problems. In 2016 work progressed on the agent-based computational marriage models through integrating dozens of seminal marriage formation models using game theory and optimisation theory.

MAHIN RAISSI
BS MA Tehran
SUPERVISORS:
A/Professor Robert Ackland
and A/Professor Heather Booth
CO-SUPERVISOR:
Dr Lexing Xie

Online social networks and subjective wellbeing of older Australians: Network homogeneity, social capital and negative interactions

The project aims to understand the relationship between (online) social networks and subjective wellbeing of older Australians (50+) by examining the mechanisms and processes of behaviour transmission in social networks. As a component of the Social Networks and Ageing Project (SNAP), a Facebook application called Australian Seniors' Online Networks (AuSON) was developed and released in October 2012. AuSON collects information about participants' social

networks, social capital and wellbeing. Many Facebook users who are mainly Australian seniors (50+) or others who are friends with them have used AuSON. This thesis was submitted in April 2016.

PHD STUDENTS LOCATED AT THE CRAWFORD SCHOOL OF PUBLIC POLICY, ANU

ALIZA HUNT

*BA (Hons) Psychology, ANU,
BA (Hons) Asian Studies
Dip Modern Languages, Melb.*

SUPERVISORS:

Professor Peter McDonald and Professor Zachary Steel

CO-SUPERVISORS:

Professor Phil Batterham and Dr Steve McEachern

Ageing well in Indonesia: Meeting the mental health needs of elderly Indonesians

Indonesia has a population of 21 million persons aged 60-and-over and this number is projected to rise to 48 million in 2035. There has been little analysis of the policy ramifications for both government and service providers particularly in the area of mental health provision. A comprehensive understanding of the unmet health needs of Indonesia's elderly is essential for providing targeted service provision to those most vulnerable. From the international literature,

depression is the second highest cause of disability for all age groups worldwide. Although prevalence levels of depression in the U.S., U.K. and Australia are lower in community samples aged 60 years and over than the general population, preliminary estimates suggest the trend for Indonesia is in the opposite direction with this age cohort being almost twice as likely to be suffering probable depression/anxiety type symptoms compared with the general Indonesian population.

This thesis will present an analysis of the mental health needs of Indonesia's rapidly expanding ageing population using both existing national level datasets and a three-village survey of those aged 60 and over. Levels of depressive and anxiety symptoms and probable disorder will be reported and discussed; rates of cognitive disturbances will also be included embedded in a larger dialogue on complexities of cross-cultural assessment. In addition to prevalence estimates, predictions of mental illness and relationship with disability and utilised, available and ideal treatments will also be

described and analysed to better identify opportunities to fulfil unmet needs amongst the growing number of Indonesia's elderly.

MATTHEW KIDMAN

BA LLB Macq.

SUPERVISOR:

Professor Peter McDonald

CO-SUPERVISOR:

Professor Alex Frino

The impact of population ageing on the prices of domestic housing and equities in Australia

This thesis looked at the impact ageing will have on Australian house and equity prices between 2016 and 2050. Australia has approximately \$6 trillion invested in these two asset classes or about four times the annual gross domestic product. Previous studies, emanating mainly from the USA, have been inconclusive and any pricing forecasts have proven to be wildly inaccurate. The overwhelming belief is that ageing will have an impact on pricing of these assets. Core to this belief is that the large baby boomer cohort, those born between 1946 and 1964, bid up asset prices during their working lives. As they enter their post working lives they will similarly place downward

pressure on asset prices as they look to divest and fund their retirements. This theory is based upon the life-cycle hypothesis developed in 1954. Australia is a key country to study in this area. It represents the high population growth and gentle ageing model. There is a high probability that this population model will see support for asset prices even though the baby boomers are starting to retire. The thesis was submitted in June, 2016.

PHD STUDENT LOCATED AT THE COLLEGE OF BUSINESS AND ECONOMICS, ANU

ARM NAKORNTHAB

MA U.Va.

SUPERVISOR:

Dr Cagri Kumru

Annuities and estate taxation in an entrepreneurship model

There is an extensive literature exploring the reasons behind thin annuity markets, and a separate literature that analyses the implications of estate taxation. The literature is silent on the impact of estate taxation on annuity purchase. In this project, annuity buying decisions will be explored by employing a model that incorporates estate taxation, bequest motives, and

entrepreneurship, accounting for the correct wealth distribution. This project will contribute to our understanding of the annuity puzzle since estate taxation affects savings for the old. In sum, this computationally challenging project will extend our understanding of annuity buying decisions substantially.

PHD STUDENTS LOCATED IN THE FACULTY OF HEALTH SCIENCES, UNIVERSITY OF SYDNEY

JOHANNE ELIZABETH BRADY

BA (Hons) UNSW

SUPERVISOR:

A/Professor Kate O'Loughlin

CO-SUPERVISOR:

Dr Jennifer Smith-Merry

Meanings of Parkinson's disease in an Australian community setting from the perspectives of people diagnosed and partner-carers

This sociological study explores the effect of Parkinson's disease on a person's identity and forms of social interaction. The main empirical study constitutes part of a doctoral thesis that includes an analysis of other texts that construct social meanings of Parkinson's disease in society. Qualitative data was collected via interviews and

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focus groups with members (> 55 years of age) of nominated Parkinson's support groups in Sydney. An interpretive and constructive thematic analysis of the data has revealed varying social factors influence peoples' perceptions and meanings of ageing and the symptomology of Parkinson's disease. Nuanced meanings of Parkinson's disease in everyday life contexts have potential to inform the type of support that people diagnosed and partners/carers need to maintain their quality of life. This thesis is due for submission in February 2017.

CLAIRE O'CONNOR
BSc Med UWS, MOT (Hons) Syd.

SUPERVISOR:
Professor Lindy Clemson

CO-SUPERVISORS:
Dr Eneida Mioshi, Professor Henry Brodaty, A/Professor Olivier Piguet and A/Professor Kate O'Loughlin

Understanding behaviour and function in frontotemporal dementia (FTD): Developing better assessments and intervention approaches

This thesis explores the relationship between behaviour and functional ability across the behavioural and language variants of FTD. A feasibility trial has been conducted

of a Tailored Activity Program (TAP) specifically designed for FTD cohorts to improve activity engagement, reduce difficult behaviours in people with FTD, and alleviate carer burden. This manuscript is currently being drafted. Over the past year, oral presentations from the PhD project have been presented at an international (Toronto, Canada) and a domestic conference (Adelaide, SA), and a poster presentation given at a different international conference (Munich, Germany). Three manuscripts have now been published, and two others are about to be submitted for review in academic journals. This thesis is due for submission in March 2017.

DOROTHY DUDLEY
BBus UTS, MASS ACAP

SUPERVISOR:
A/Professor Kate O'Loughlin
ASSOCIATE SUPERVISOR:
Dr Vanessa Loh

Understanding personal goals in retirement and their relationship with life satisfaction: An Australian perspective

This sociological research project aims to understand the existence and nature of personal goals held by Australian retirees aged 55 to 90 years. It examines the

influence of personal goals on subjective wellbeing and their impact on successful ageing. A review of the literature and an initial phase of quantitative analysis employing the Household Income and Labour Dynamics in Australia 2011 dataset completed in 2014 informed the design of the primary qualitative research phase, and resulted in an oral presentation and written paper delivered at the 13th National Conference of Emerging Researchers in Ageing in 2014. The qualitative recruitment and fieldwork was completed in November 2015, comprising a series of individual and paired in-depth interviews with 60 participants from a range of suburbs in Sydney and Newcastle, with data analysis conducted throughout 2016 and planned to continue during 2017. Initial findings from the qualitative research were delivered as an oral presentation at the 49th Australian Association of Gerontology Conference in November 2016, and an additional abstract has been submitted to an international conference for 2017. A manuscript is currently being prepared for submission for review in an academic journal.

KYLIE WALES
BAppSc Occupational Therapy UWS
SUPERVISOR:
Professor Lindy Clemson
CO-SUPERVISORS:
A/Professor Natasha Lannin and Professor Glenn Salkeld

Measuring function and cost effectiveness in occupational therapy home discharge planning

Best practice guidelines for occupational therapy discharge planning have not been identified or evaluated for their clinical or cost effectiveness. In addition, a lack of information exists as to how function should be assessed. Improving function is a key outcome in occupational therapy discharge planning for older adults. A cost-effectiveness analysis of occupational therapy discharge planning has been completed on the NHMRC-funded HOME trial. A further two studies were conducted around the assessment of older adults, one a validation study conducted in a metropolitan hospital and the second a systematic review of 28 assessment tools that have previously been used with older adults to measure function. The systematic review has been published in *PLOS ONE* and the others are submitted and under consideration. This thesis was submitted 30 November.

JACQUELINE WESSON
BAppSc Occupational Therapy Cumberland College, MA Macq.
SUPERVISOR:
Professor Lindy Clemson
CO-SUPERVISORS:
Professor Henry Brodaty and Dr Simone Reppermund

Functional cognition in older adults with mild cognitive impairment or early dementia: Validity of the large Allen's Cognitive Level Screen (Version 5) (LACLS-5)

Assessment of everyday function is essential to distinguish between MCI and dementia diagnoses. The term 'functional cognition' links the two constructs of function and cognition and may serve to integrate the literature in both fields respectively. The LACLS-5 assesses functional cognition and has been validated in other clinical populations. This thesis explores its application to a community-based population-sample of older adults with MCI and early dementia. Methodology included a systematic review of performance-based measures to assess functional cognition (published), and cross-sectional study (published) and longitudinal study (submitted) examining validity and responsiveness of the LACLS-5. The thesis is due for submission in 2017.

LYNDA WOODWARD*BPhysio BSc Biotech (Hons)
N'cle (NSW)***SUPERVISOR:**
Professor Lindy Clemson**CO-SUPERVISORS:**
A/Professor Cathie Sherrington
and A/Professor Karen Willis**Exploring the perceptions
and experiences of older
people in the 'Stepping on
after hip fracture' program**

Using qualitative thematic analysis, the study aims to determine whether older men and women who have had a fall-related lower limb fracture have different experiences related with their journey after having a fall, acute treatments related with their fall and fracture, and pre and post participation in a long-term exercise self-management falls prevention program. Analysis continues on in-depth interviews with 17 men and 16 women, with preliminary findings suggesting that these older men and women do have differing experiences with certain aspects of this journey.

**PHD STUDENTS LOCATED AT
THE CENTRE FOR EDUCATION
AND RESEARCH ON AGEING,
UNIVERSITY OF SYDNEY****KATE MILLEDGE***BNutrition and Dietetics (Hons)
W'gong***SUPERVISOR:**
Dr Vasant Hirani**CO-SUPERVISORS:**
Professor Robert Cumming and
Dr Fiona O'Leary**Study of the inter-
relationships between
food choice, nutritional
status, oral health, frailty
and polypharmacy among
older Australian men**

This thesis aims to describe dietary intake, food choices, weight and body mass index (BMI) status of older men, and to investigate inter-relationships of these factors with the presence and type of Functional Tooth Units (FTUs) and periodontal disease markers. A systematic review on the inter-relationship between dietary intake of nutrients and Dentition/Periodontal disease markers is currently being undertaken. It will also include an analysis of the associations between dietary intake, oral health, frailty and poly-pharmacy using heat mapping. In 2016 data collection has been completed, with a total of 781 participants.

ROSILENE WAERN*BNut MND Syd., APD AN***SUPERVISOR:**
Professor Robert Cumming**CO-SUPERVISORS:**
Professor Margaret Allman-
Farinelli, Dr Vasant Hirani
and Dr Thomas G Travison**Geometric Framework and
nutrition in old age**

Nutritional intake is one of the most important modifiable factors affecting health in older age. This thesis used the geometric framework, generalised additive models and multiple regression models to assess the association between macronutrient intake (protein, fat and carbohydrate) and the following health outcomes: total energy intake, body mass index (BMI), percentage body fat, waist-to-hip ratio, insulin, total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, homeostatic model assessment for insulin resistance (HOMA-IR), number of medical conditions, SF12 (MCS and PCF), GDS and frailty score. The results showed that low protein intake was associated with higher total energy intake, higher BMI, higher percentage body fat, higher waist-to-hip ratios, higher insulin levels, and higher HOMA-IR. High protein

intake was associated with higher HDLc and triglycerides levels. Low carbohydrate intake was associated with poor body composition, whereas high carbohydrate intake was associated with better physical performance. Fat intake was increased when protein intake was low; however, fat intake had very little influence on any of the health outcomes investigated. In terms of dietary intake, it was found that only half of the participants met recommendations of ≥ 5 key nutrients and being born in Italy or Greece was associated with poor nutritional intake of key nutrients. This thesis was submitted in March 2016.

**PHD STUDENT LOCATED AT THE
MELBOURNE SCHOOL OF
POPULATION AND GLOBAL
HEALTH, UNIVERSITY OF
MELBOURNE****MARIJAN JUKIC***BA MSc Geography Zagreb,
MSc Demography Southampton,
PhD Demography and Social
Geography Zagreb***SUPERVISOR:**
Professor Peter McDonald**CO-SUPERVISOR:**
A/Professor Jeromey Temple**Modelling residential aged
care in Australia**

The research is currently looking at the system of residential aged care modelled by 5 models: (a) the probability of applying for care; (b) the probability of successful applications; (c) the probability of being admitted to residential care; (d) probabilities of changing disability levels; and (e) probability of exit from residential care. Comprehensive administrative and survey data will be utilised to explore potentially useful techniques for extracting transition probabilities (for key variables) and constructing a microsimulation model of residential aged care. A multi-state model of change of care needs has also been tested. The research results are expected to have

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important implications for the residential aged care policies in Australia in terms of providing a better understanding and more accurate projections for the future of aged care.

PHD STUDENTS LOCATED AT THE FLINDERS CENTRE FOR AGEING STUDIES, FLINDERS UNIVERSITY

VICTORIA ALLEN

BPsych (Hons) Flinders

SUPERVISOR:
Dr Tim Windsor

ASSOCIATE SUPERVISOR:
Professor Mary Luszcz

Daily stress and emotion regulation in younger and older adults: An intensive micro-longitudinal study

This project involves one large-scale study exploring age differences in emotion regulation and daily processes, and how such differences relate to psychological wellbeing, physical health, mental health, and interpersonal relationships/social support. An intensive micro-longitudinal design will be employed allowing relationships between key variables to be explored at daily, cross-sectional, and prospective levels. The project has received full ethics approval, and software for the project has been finalised. Initial stages of data collection

are completed with only collection of 12-month follow-up data remaining. Data analysis is ongoing.

RACHEL CURTIS

BPsych (Hons) Flinders

SUPERVISOR:
Dr Tim Windsor

CO-SUPERVISOR:
Professor Mary Luszcz

Do perceptions of control predict activity engagement in older adults?

Perceptions of control may contribute to older adults' ability to maintain their activity as they age, as individuals with high perceived control tend to engage in more difficult tasks and persist to overcome challenges. Longitudinal analysis of the German Ageing Survey showed reciprocal relationships between perceived control and social activity. In a similar vein, analysis of the Australian Longitudinal Study of Ageing showed that perceived control moderates the negative effects of functional disability on social activity. Daily fluctuations in self-efficacy have also been shown to be associated with fluctuations in physical and social activity. Data collection for an additional study examining the mechanisms behind these associations is in progress.

PHD STUDENTS LOCATED AT THE FACULTY OF HEALTH AND MEDICINE, UNIVERSITY OF NEWCASTLE

CASSIE CURRYER

BSocSc (Hons) N'cle, AdvDip Local & Applied Family History, UNE

SUPERVISOR:
Professor Julie Byles

CO-SUPERVISOR:
Professor Mel Gray

A view of home: Older people, housing and social policy in Australia

This thesis explores the nexus between aged care policies, housing, and choice in Australia. This study focuses on women who were born during the post second-world war baby boom and who are single and do not have children. While having children does not guarantee that support will be available, women who are childless may be potentially vulnerable to housing precariousness and unmet needs for care; or have unique needs and choices that have not been fully explored. Given the policy emphasis on ageing-in-place, consumer directed care and choice, greater knowledge of consumers' needs and preferences is vital to inform innovative development of housing and other services, and to improve aged care policy responsiveness.

PARIVASH EFTEKHARI

PhD TMU Iran

SUPERVISOR:
Professor Julie Byles

CO-SUPERVISOR:
Ms Peta Forder and
Dr Melissa Harris

Quality care in older Australian women with asthma

In 2016 the data analysis was completed for two chapters for Australian Longitudinal Study of Women's Health participants from the 1921-26 and 1946-51 cohorts and linked data with the MBS database. Health service use determinants from surveys were identified and Generalised Estimating Equations were performed for both cohorts based on their asthma status in both cohorts. The outcome of this study has been published as a short report and findings were presented at the 15th National Conference of Emerging Researchers in Ageing in Canberra in late 2016. The background and literature reviews for this thesis are in their final stages with the thesis expected to be submitted in mid-2017.

ADAM YATES

BSc MSc Clemson

SUPERVISOR:
Professor Julie Byles

CO-SUPERVISORS:
Professor Catherin D'Este and
Dr Paul Kowal

International obesity and socioeconomic status relative to absolute wealth

This thesis examines the influences of neighbourhoods on health behaviour and chronic disease distribution. It used the WHO Study of Ageing and Health (SAGE) data to engage in multiple social-epidemiology projects. In particular, in 2016 General Structural Equation Modelling has been used to explore interactions between health behaviour variables (alcohol consumption, smoking, diet, and physical exercise), biometric variables (BMI and waist-height ratio) and community level variables (neighbourhood social cohesion and 'relative wealth'). In 2016 the student has also continued to explore chronic disease and spatial location distributions in the SAGE data, notably for Ghana, South Africa, and India. This project is intended to look at disease cluster patterns which may better inform intervention policy and

highlight associations between chronic disease and environmental components (both structural/built and natural).

PHD STUDENT LOCATED AT THE JEFFREY CHEAH SCHOOL OF MEDICINE AND HEALTH SCIENCES, MONASH MALAYSIA

SARASWATHY VENKATARAMAN

BA Occup Therapy St Catherine's University, MSc Gerontol Syd.

SUPERVISOR:
Professor Helen Bartlett

CO-SUPERVISORS:
A/Professor Jennie Oxley,
A/Professor Louise Farnworth and
Professor Lesley Day

The overall aim of this research is to understand the potential factors associated with risk of falling among the older population residing in long-term aged care facilities and shelter homes in Malaysia, with a particular focus on the physical environmental factors and current fall prevention strategies. This thesis focuses on the influence of the environment upon the safety and wellbeing of its residents. Emphasis is given towards better understanding the current process utilised within long-term aged care environments to identify underlying physical hazards.

The study primarily involved exploring these aged care environments (indoors) and gaining a better understanding about how the environment along with its underlying hazards potentially influenced the wellbeing and safety of residents. Further aspects of modification types were considered for the purpose of ensuring safety during regular activity engagement undertaken by the residents. The PhD thesis is currently in the final stages with the view to submitting early in 2017.

A photograph of Peter McDonald, CEPAR Deputy Director, speaking at a podium. He is wearing a dark pinstriped suit, a light green shirt, and a red and blue plaid tie. He has glasses and is gesturing with his hands. The podium has a banner with Chinese characters and the English text 'EXTERNAL LINKAGES'. A large white number '3' is overlaid on the right side of the image.

SECTION

北京大学中美新园

EXTERNAL LINKAGES

CEPAR DEPUTY DIRECTOR PETER MCDONALD DELIVERING
HIS KEYNOTE ADDRESS AT THE 2016 APRU AGEING IN
THE ASIA-PACIFIC RESEARCH SYMPOSIUM IN BEIJING

INDUSTRY & GOVERNMENT LINKS

2016 WAS A BUSY YEAR FOR CEPAR WITH HIGHLIGHTS INCLUDING A NATIONAL ROUNDTABLE FOCUSED ON THE ESTABLISHMENT OF A LONGITUDINAL SURVEY FOR THE OLDER POPULATION, THE INAUGURAL INTERNATIONAL NETWORK FOR PENSIONS, AGING AND RETIREMENT RESEARCH CONFERENCE, AND THE ANNUAL COLLOQUIUM OF SUPERANNUATION RESEARCHERS.

Stakeholders from policy, business, academe and the wider community, assembled to discuss the possible establishment of a longitudinal survey for older cohorts in Australia at a CEPAR roundtable convened in February 2016.

Support for the initiative is strong and the roundtable provided a valuable opportunity for CEPAR to lead a national dialogue which is still ongoing.

Attracting researchers from around the world, the 24th Annual Colloquium of Superannuation Researchers focused on ways to help individuals make better superannuation decisions. Spearheaded by Associate Investigator Professor Hazel Bateman, the Colloquium featured papers on a range of topics as well as a panel comprising representatives of industry funds.

Also attracting major interest from international researchers, was the inaugural conference organised by the International Network for Pensions, Aging and Retirement Research. The Network, launched in 2016, is a collaboration between CEPAR, the Wharton School of the University of Pennsylvania, NetSPAR at Tilburg University, and the research office of Willis Towers Watson. Hosted by the OECD in Paris, the theme of the 2016 conference was 'Research Challenges for Global Pensions: Trends and Heterogeneity'.

A highlight of this year's workshop series was an event focused on Mid-life Employment: Determinants, Consequences, and Policy. The Hon Susan Ryan AO, Australian Human Rights Commissioner at the time the roundtable was convened, led a discussion on workplace flexibility, culture, and discrimination providing valuable insights and informing future research directions. Our annual workshop on Population Ageing and the Chinese Economy brought together academic experts, policymakers, and industry practitioners to discuss demographic change in China and its implications for policy and business practice.

Two public lectures, one focused on developing Age Friendly Communities and the other on pension reform and financial literacy attracted representatives from government, industry and the community, interested in hearing from visiting international experts hosted by CEPAR.

Throughout 2016 our researchers participated in a range of end-user engagement activities. Highlights included Peter McDonald's presentation of the results of his work on the National Transfer Accounts to the Department of Social Services in August; Kaarin Anstey's participation in the World Health Organisation's Consultation on the Global Dementia Observatory held in Geneva as well as the Governance Committee of the Global Council on Brain Health in Toronto in July; representation by John Piggott, Hal Kendig and Rafal Chomik at a series of policy roundtables convened by the Committee for Sustainable Retirement Incomes in April; and Kendig's participation in a roundtable focused on the renewal of the NSW Ageing Strategy.

Demonstrating CEPAR's international reach, John Piggott was invited to participate in a high level Policy Dialogue with the Indonesian Ministry of Finance in Jakarta, where he spoke on pension options and reform.

At CEPAR we are all looking forward to continuing to develop and contribute to collaborative research initiatives with local and global significance. By engaging with government and industry, we hope to influence policy and practice in Australia and throughout the region.

Professor Michael Sherris
Chair, Outreach
Subcommittee

INDUSTRY & GOVERNMENT LINKS

INFLUENCING POLICY AND PRACTICE

CEPAR personnel contributed to the development of government policy and business practice in a number of ways in 2016.

For example, CIs Piggott, McDonald, and Kendig together with Senior Research Fellow Chomik and Als Bateman and Ong participated in the Academy of Social Sciences in Australia/Committee for Sustainable Retirement Incomes (CSRI) Roundtables on Retirement Incomes held in April. John Piggott also delivered the Introductory Remarks at the CSRI Leaders Forum held in October.

Further contributions to the national discussion about the sustainability of retirement incomes included Director Piggott's participation in the AFR Banking and Wealth Summit plus Senior Research Fellow Ralph Stevens' presentation to PWC's Strategy& on sustainable retirement incomes policies.

At a national level, CI McDonald and Associate Professor Jerome Temple briefed the Department of Social Services on the National Transfer Accounts and

CI Anstey addressed the Department of Veteran Affairs' National Aged and Community Care Forum on the topic of challenges for ageing well. McDonald was also appointed to the Independent Assurance Panel for the 2016 Census of Population and Housing in November.

Engagement with the State Government included meetings with John Ajaka, NSW Minister for Ageing, and Coralee O'Rourke, Queensland Minister for Seniors; participation in a roundtable on the renewal of the NSW Ageing Strategy; and CEPAR Research Fellow Diane Hoskings' participation in a roundtable organised by the South Australian Health and Medical Research Institute and Alzheimer's Australia.

Internationally, CI Anstey was appointed as a member of the Governance Committee of the Global Council on Brain Health, Director Piggott spoke on pension options and reforms at a high level Policy Dialogue with the Indonesian Ministry of Finance in Jakarta in March and briefed the Inter-American Development Bank on CEPAR research on long-term care in Washington in October, and CI McDonald presented on 'Demographic Change in the Asian Century'

to the Council for Policy on Aging, Health and Population in Tehran. In May 2016 CI Sherris was elected to chair the AFIR/ERM Section of the International Actuarial Association (IAA) and participated in a number of IAA events including a Leaders' Forum held in St Petersburg in May.

Complete details of contributions in 2016 are listed on page 142-143.

EVENTS

ROUNDTABLE ON A LONGITUDINAL SURVEY FOR OLDER COHORTS

In February 2016, CEPAR assembled a range of key personnel from academe, government and the community to build a broad coalition of national support for an Australian longitudinal survey, focused on the ageing demographic.

Empirical social science research is importantly informed by surveys but Australia currently lacks what most other developed – and many emerging – economies now possess: a comprehensive longitudinal survey targeted at later life. For several years now, CEPAR has been working to establish an Australian survey instrument to address this gap – an Australian Survey on the

Ageing Population (ASAP) – and the roundtable provided an important forum to advance discussion.

Participants were briefed on current initiatives within government to coordinate and maximise the use of existing data led by the Australian Bureau of Statistics and the Department of Social Services' National Centre for Longitudinal Data; policy challenges and knowledge gaps; international longitudinal health and retirement survey initiatives; and the case for the establishment of such a survey in Australia.

Speakers included James P. Smith, one of the 'founding fathers' of this type of survey, and a Distinguished Professor of Labour Markets and Demographic Studies at RAND Corporation; the Australian Statistician, David Kalisch; Deputy Secretaries of the Departments of Social Services and Health, respectively Serena Wilson and Mark Cormack; Head of Commonwealth Treasury's Retirement Income Policy Division, Jenny Wilkinson; CEPAR Chief Investigator Professor Robert Cumming; and Professor Mark Western, Director of the Institute for Social Science Research, University of Queensland.

Over the course of the morning, a compelling case was built for such a survey which would facilitate the establishment of an integrated data set that enables the tracking of people from pre-birth to death, linking rich longitudinal survey data and administrative data. As a collaboration between academe and government, it would ensure enhanced exploitation of existing data and optimal research translation back into public policy. The data would greatly improve our understanding of individual behaviour, attitudes, expectations, and the context of decision-making. For example, the potential topics that could be investigated include determinants of health decline, how people prepare financially for retirement, how they respond to major health events, asset accumulation over time, and private health insurance uptake and its relationship to other expenses. The establishment of ASAP would also facilitate international comparisons and enable Australia to participate in the international research program focused on surveys of this type.

24TH ANNUAL COLLOQUIUM OF SUPERANNUATION RESEARCHERS

The 24th Annual Colloquium of Superannuation Researchers, co-hosted by CEPAR and the School of Risk and Actuarial Studies in the UNSW Business School, took place from 4 - 5 July 2016.

Almost 100 participants attended this annual event which brings together Australian and international academics, as well as representatives from government and industry to discuss and debate contemporary pension and superannuation issues.

Three keynote presenters and an industry panel addressed this year's theme of 'Retirement choices, saving decisions and member engagement'. CEPAR Partner Investigator

(PI) Professor Olivia S. Mitchell discussed Simplifying Choices in Defined Contribution Retirement Plan Design; PI Hanming Fang spoke on Life Insurance and Life Settlement; and CEPAR Distinguished Visitor Chris Phillipson discussed Extending Working Lives: Problems and Prospects for Older Workers.

A panel of industry experts comprising Mr Martin Stevenson (Senior Actuary, First State Super); Mr David Constable (Research Manager, Cbus Super) and Dr Suzanne Doyle (Head of Advice Process, State Plus) addressed the issue of understanding member behaviour and its implications for product development, information provision and advice.

The Colloquium also featured presentations by six CEPAR personnel which addressed a broad range of topics including sustainable retirement income policies and demand for income-indemnity long-term care insurance.

MID-LIFE EMPLOYMENT: DETERMINANTS, CONSEQUENCES, AND POLICY WORKSHOP

This workshop focused on determinants of employment in mid-life; links between mid-life employment, health and future cognition, and policy design for sustainable employment trajectories into old age.

Organised by CEPAR Research Fellows Elena Capatina and Diane Hosking, as a result of a discussion at the 2015 Early Career Researchers Retreat,

the workshop took place at UNSW on July 19.

The Hon Susan Ryan AO, Australian Human Rights Commissioner at the time of the event, joined experts drawn from the fields of Economics, Psychology, Demography, Medicine, Industrial Relations and Organisational Behaviour to debate current issues and challenges and identify future research priorities in this area. Issues addressed at the workshop included care and health, women's employment, career choice and employment in mid-life and workplace flexibility, culture and discrimination.



PROFESSOR OLIVIA S. MITCHELL
BA Harvard, MA PhD
Wisconsin-Madison
PARTNER INVESTIGATOR

Dr Olivia S. Mitchell is International Foundation of Employee Benefit Plans Professor, and Professor of Business Economics/Policy and Insurance/Risk Management, at the Wharton School of the University of Pennsylvania. She is also the Executive Director of the

Pension Research Council and the Boettner Center on Pensions and Retirement Research; is a Fellow of the Wharton Financial Institutions Center and the Leonard Davis Institute; and sits on the Board of the Penn Aging Research Center. Concurrently Dr Mitchell is a Research Associate at the National Bureau of Economic Research and a Co-Investigator for the Health and Retirement Study at the University of Michigan.

Dr Mitchell's main areas of research and teaching are international private and public insurance, risk management, public finance, and compensation and pensions. Her extensive publications (25 books and more than 180 articles) analyse pensions and healthcare systems, wealth, health, work, wellbeing, and retirement.

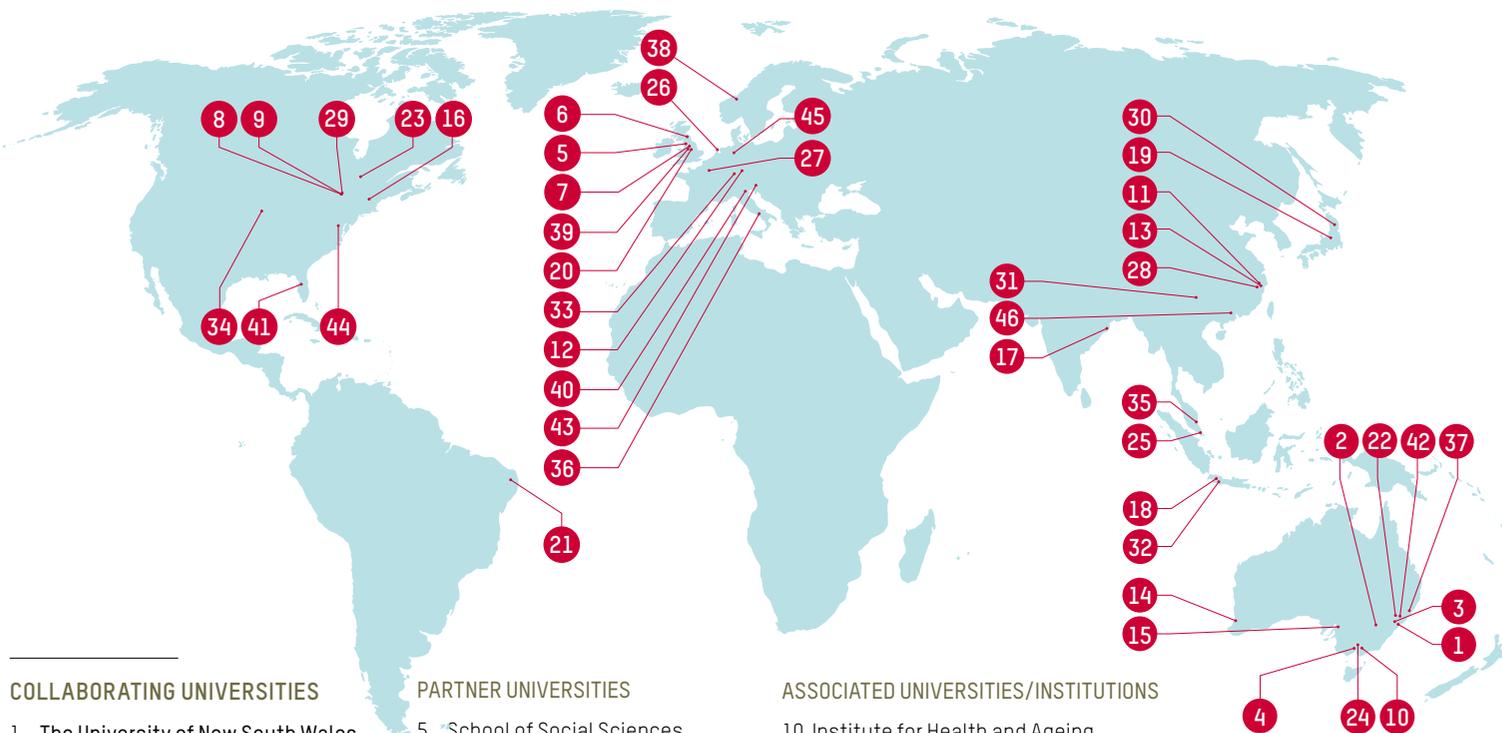
She served on President Bush's Commission to Strengthen Social Security and the US Department of Labor's ERISA Advisory Council. She has spoken for groups including the World Economic Forum; the International Monetary Fund; the Investment Company Institute; the White House Conference on Social Security; and the President's Economic Forum.

NATIONAL & INTERNATIONAL LINKS

THROUGHOUT 2016, CEPAR EMPLOYED A NUMBER OF STRATEGIES TO FORGE AND STRENGTHEN BOTH NATIONAL AND INTERNATIONAL LINKS. THESE INCLUDED JOINT PROJECTS AND INITIATIVES AS WELL AS INTERNATIONAL DELEGATIONS AND VISITS. LAUNCHING THE INTERNATIONAL NETWORK FOR PENSIONS, AGING, AND RETIREMENT RESEARCH WAS A KEY ACHIEVEMENT IN 2016,

AND WILL PROVIDE MAJOR OPPORTUNITIES TO LEAD INTERNATIONAL DISCUSSION IN THE FIELD.

REGIONALLY, THE FURTHER DEVELOPMENT OF CEPAR'S AUSTRALIA-CHINA POPULATION AGEING RESEARCH HUB AND THE APRU POPULATION AGEING RESEARCH HUB HAS ENHANCED OUR LINKS AND INCREASED OUR PROFILE IN THE ASIA-PACIFIC.



COLLABORATING UNIVERSITIES

- 1 The University of New South Wales
- 2 Australian National University
- 3 The University of Sydney
- 4 University of Melbourne

PARTNER UNIVERSITIES

- 5 School of Social Sciences
University of Manchester
- 6 Institute of Health and Society
University of Newcastle (UK)
- 7 School of Economics
University of Nottingham
- 8 Department of Economics
University of Pennsylvania
- 9 Wharton School
University of Pennsylvania

ASSOCIATED UNIVERSITIES/INSTITUTIONS

- 10 Institute for Health and Ageing
Australian Catholic University
- 11 Brookings-Tsinghua Centre for Public Policy
- 12 CESifo
- 13 Chinese Academy of Social Sciences
- 14 Curtin University
- 15 School of Psychology
Flinders University
- 16 Department of Global Health and Population (GHP)
Harvard University

ASSOCIATED UNIVERSITIES/
INSTITUTIONS (continued)

- 17 Indian Statistical Institute
- 18 Indonesian National Population and Family Planning Board
- 19 Institute for Economic Research Hitotsubashi University
- 20 Institute for Fiscal Studies
- 21 Instituto de Estudos de Saúde Suplementar (IESS)
- 22 Department of Economics Macquarie University
- 23 Michigan Retirement Research Center (MRRC)
- 24 School of Primary Health Care and Emerging Researchers in Ageing Initiative Monash University
- 25 Nanyang Business School Nanyang Technological University
- 26 NetSPAR
- 27 Organisation for Economic Co-operation and Development (OECD), Paris
- 28 Institute of Population Research and Research Centre for Ageing and Health Services Peking University
- 29 Gerontology Centre Pennsylvania State University
- 30 Research Institute for Policies on Pension and Ageing
- 31 Southwestern University of Finance and Economics
- 32 Statistics Indonesia
- 33 Department of Economics St Gallen University
- 34 Department of Psychology University of Kansas
- 35 Faculty of Economics and Administration University of Malaya
- 36 Centre for Studies in Economics and Finance University of Naples Federico II
- 37 Research Centre for Generational Health and Ageing The University of Newcastle (Australia)
- 38 Ragnar Frisch Centre for Economic Research University of Oslo
- 39 Nuffield College University of Oxford
- 40 Department of Economics University of Parma
- 41 School of Aging Studies University of South Florida
- 42 Centre for the Study of Choice University of Technology Sydney
- 43 Faculty of Economics University of Trieste
- 44 The World Bank
- 45 Wuerzburg University
- 46 College of Public Administration Zhejiang University

LAUNCHING THE INTERNATIONAL NETWORK FOR PENSIONS, AGING, AND RETIREMENT RESEARCH (INPARR)

Representatives from almost 50 countries gathered at the OECD Headquarters in Paris on 8 June 2016 to participate in a conference focused on research challenges for global pensions. The conference launched the International Network for Pensions, Aging, and Retirement Research (INPARR), a major international initiative spearheaded by CEPAR, The Pension Research Council at the Wharton School of the University of Pennsylvania, NetSPAR at Tilburg University, and Willis Towers Watson.

More than 140 delegates assembled for the event which featured a range of distinguished international speakers drawn from academe, government and industry. Speakers exploring the two major themes 'Pension Choice and Design: Trends and Heterogeneity' and 'How Aging Trends and Heterogeneity are Shaping the Future of Retirement', included: Julie Agnew (College of William and Mary) on Behavioural Research and

Pension Choice; Olivia S. Mitchell (Wharton) on Financial Literacy and Retirement Security; John Piggott (CEPAR) on Means Testing Public Pensions; James Nazroo (Manchester) on Ageing, Frailty and Wellbeing: Trends, Inequality, and Implications for Policy; Jessica Mosher (OECD) on Socio-economic Differences in Mortality and Retirement; Phyllis Borzi (US Department of Labor) on Pension Policy Challenges; Satoshi Shimizutani (Cabinet Office, Japan) on Ageing in Japan; and David McCarthy (National Treasury, South Africa) on Pension Designs for Encouraging Delayed Retirement.

The conference was the first in a series which aims to provide a major forum for international leadership on pensions. The inaugural conference demonstrated the demand for such a forum, with representatives from relevant government ministries around the globe including Australia, Austria, Colombia, France, Hungary, Israel, Japan, Latvia, the Russian Federation, Spain and Uganda; financial institution and pension regulatory authorities drawn from eight European, seven African, one South America and three Asia-Pacific nations; as well as

representatives from an impressive range of central banks, private firms and academic institutions, participating in the conference.

INPARR has as its mission the promotion and advancement of high-quality social science research on pensions, ageing, and retirement. With the OECD serving as the Secretariat, INPARR intends to organise a global annual research meeting; disseminate research through working papers, journals, and other media; elect INPARR Fellows recognising their contributions to the area; support and facilitate the development of junior researchers; develop a website highlighting resources in the area as well as social networks; and seek to develop affiliations with organisations, including policy groups, interested in pension research.

NATIONAL & INTERNATIONAL LINKS

NATIONAL LINKAGES

A number of initiatives and events in 2016 served to strengthen our links with key researchers and research groups nationally. These included the Roundtable on a Longitudinal Survey for Older Cohorts, held in February, which included representation from the ARC Centre of Excellence for Children and Families over the Life Course, the Centre for Aboriginal Economic Policy Research at ANU, the School of Population and Global Health at the University of Melbourne, the Australian Institute of Health and Welfare and the UNSW Social Policy Research Centre (see page 112 for full details). The event facilitated interactions between these important research groups and

provided a forum for discussion between researchers and relevant stakeholder groups. The 2nd Annual Workshop on Population Ageing and the Chinese Economy united national researchers focused on the issue, and the Workshop on Mid-life Employment: Determinants, Consequences, and Policy involved research groups from Curtin, Flinders, Macquarie and Melbourne universities as well as CEPAR and non-CEPAR affiliated researchers based at UNSW, ANU and the University of Sydney (see 113 for further information). In addition, CI Peter McDonald's move to the School of Population and Global Health at the University of Melbourne in July this year increased the

number of CEPAR Collaborating Organisations to four and presents an outstanding opportunity to connect with the School's multidisciplinary teams spanning the social sciences, ethics and medical humanities, and molecular and genetic epidemiology.

EXPANDING OUR LINKS WITH CHINA

Driving our engagement with China is CEPAR's Australia-China Population Ageing Research Hub which was established in 2015 with significant support from the UNSW Vice-Chancellor's Strategic Priority Fund. 2016 saw the expansion of the Hub into a large and very active research group. The Hub's research team now consists of four

full-time researchers based at UNSW: Senior Research Fellow Dr Katja Hanewald, Research Fellow Dr Bei Lu, and Senior Research Associates Drs Han Li and Shang Wu. Two research students are also part of the Hub: Xiaoyun Zhang is working on her PhD in Economics, and James Ma supports the Hub as research assistant on various projects. The whole team is led by John Piggott as the Hub's Director and by Partner Investigator Hanming Fang as the Hub's Scientific Director. Professor Fang visited the Hub in July-August 2016 to collaborate on several research projects.

A highlight of the Hub's activities in 2016 was the 2nd Annual Workshop on Population Ageing and the

Chinese Economy held in July 2016 on the UNSW campus. The first day of the workshop featured five presentations from renowned international experts and a lively roundtable discussion. The second day was reserved for presentations from PhD students and early career researchers from APRU universities in Australia and Asia, who presented their innovative projects and received feedback from senior experts and other workshop participants in a collegial and constructive atmosphere. The topics were varied and covered important current issues in population ageing with regard to the Chinese economy, including inequalities in public transfers in China; female



DR KATJA HANEWALD
MSc Econ PhD Humboldt-
Universität zu Berlin
SENIOR RESEARCH FELLOW

Katja Hanewald is a Senior Research Fellow in CEPAR's Australia-China Population Ageing Research Hub. Her research addresses risk management and insurance aspects of population ageing.

Her current research investigates ageing trends, the design of retirement financial products and optimal retirement financial decisions of older households in China.

Katja held academic positions at *Humboldt-Universität zu Berlin*, Germany (2008-2010), and at the University of New South Wales (2011-2013), and worked at the German Federal Ministry of Finance (2013-2015).

She was a CEPAR Associate Investigator from 2011-2015. She obtained her doctoral degree in Economics from *Humboldt-Universität zu Berlin* in November 2010.

'I am very grateful for the opportunity to extend my population ageing research to China within CEPAR's world-class research environment.'

labour force participation; migration; long-term care needs and financing; informal care; and the high Chinese savings rate.

The Hub pursues a multidisciplinary research program in four key areas which will deliver new insights into priority reform areas, and the policy strategies to best suit the changing economic and demographic structure. The four key areas are: mature labour force participation, retirement incomes and financial products, long-term care provision and insurance, and the role of housing in intergenerational wealth transfer and retirement support. Hub research was presented at several major conferences in China this year including the Workshop on Economics of Ageing and

Health (Shanghai, May 2016), the China Second Pillar Pension Reform Project Workshop (Beijing, June 2016), the Urbanization and Social Development Forum (Qingdao, June 2016), the 7th China International Conference on Insurance and Risk Management (Xi'an, July 2016), the Asia-Pacific Risk and Insurance Association 2016 Annual Conference (Chengdu, August 2016), the Ageing in the Asia-Pacific Research Symposium 2016 (Beijing, November 2016) and the 16th China Economics Annual Conference (Wuhan, December 2016).

Hub researchers visited key leading research institutions in China this year, including Peking University, the Chinese Academy of Social Sciences (CASS) and Renmin University. Xiaoyun Zhang

spent four weeks with the China Health and Retirement Longitudinal Study (CHARLS) at Peking University to advance her PhD research. Hub researchers also visited several Chinese government agencies, including the Social Welfare Division of the Ministry of Finance in Beijing and the Guangdong Bureau of Human Resources and Social Security.

Another major research initiative led by CI Hal Kendig and involving several CEPAR researchers, explores ageing in China and Australia. The project aims to provide insights into the ways in which life-span development and social change in China have influenced the development of policies to support the health, productivity and wellbeing of China's rapidly ageing population.

Preliminary findings were presented as Symposia at two significant conferences in 2016: 'Understanding the implications of ageing in China: A view from down under' at the Australian Association of Gerontology 49th Annual Conference in Canberra and 'Ageing in China: Challenges for the future' at the Gerontological Society of America Annual Scientific Meeting in New Orleans.

Other research undertaken by Kendig and CEPAR collaborators including Gong, Byles and Browning has focused on factors predicting health services use among older people in China; successful ageing among older people in China; and primary health care in China. In addition, CEPAR

Research Fellow Yiengprugsawan led a study providing comparative insights into the ways in which social and economic factors in China and India have influenced health and wellbeing among older adults.

Prestigious appointments at key institutions also serve to strengthen our links with China. These include CI McDonald's membership of the International Scientific Advisory Board of the Institute for Asian Demographic Research based at Shanghai University; John Piggott's Visiting Professorship at Zhejiang University; and Colette Browning's Honorary Professorship at Peking University.



PROFESSOR HANMING FANG

BA Fudan, MA Virginia,
PhD Pennsylvania

**PARTNER INVESTIGATOR AND
SCIENTIFIC DIRECTOR OF CEPAR'S
AUSTRALIA-CHINA POPULATION
AGEING RESEARCH HUB**

Hanming Fang is Class of 1965 Term Professor of Economics at the University of Pennsylvania and a Research Associate at the National Bureau of Economic Research (NBER) where he is also the

Director of its Chinese Economy Working Group.

Professor Fang is an applied microeconomist with broad theoretical and empirical interests focusing on public economics. His research covers topics ranging from discrimination, social economics, welfare reform, psychology and economics, to public good provision mechanisms, auctions, health insurance markets and population ageing.

He is currently working on issues related to insurance markets, particularly the interaction between the labour market and the U.S. health insurance reform as well as the interaction between insurance markets and population ageing. He also studies issues related to discrimination and affirmative action. He serves as a co-editor of the *International Economic Review*.

Professor Fang received his PhD in Economics from the University of Pennsylvania in 2000. Before joining the Penn faculty, he held positions at Yale University and Duke University.

NATIONAL & INTERNATIONAL LINKS

DEEPENING OUR ENGAGEMENT WITH INDONESIA

Like many other emerging economies, Indonesia, the world's fourth most populous nation, is confronting population ageing. It is at a particularly challenging stage of development to cope with demographic transition. More than half the labour force operates in the informal sector and major regional migration is leaving many older (and predominantly poor) people in the rural sector without effective family support for their later years. Two CEPAR projects, one ongoing and the other scheduled to commence in 2017, seek to assist with the development of policy responses in relation to these issues.

In 2016, significant progress was made on a unique project examining the life situations of Indonesians aged 60 plus living in villages where most of the younger generation (their children) have moved to the cities.

Led by CI Peter McDonald and AI Iwu Utomo, the project is funded primarily by an ARC Discovery grant with supplementary funding from CEPAR and the School of Demography, ANU. It also

has the support of the main government agencies in Jakarta, and of leading Indonesian universities.

Fieldwork was conducted in three villages in September 2015 and in seven villages in September 2016 resulting in around 3,000 survey interviews and 100 in-depth interviews. Data will be available for all 10 areas in December 2016. The fieldwork in September 2016 was filmed by a documentary film company based in Jakarta. Work has begun on the compilation of the documentary and the main research was implemented in 2016. The project also includes analysis of data on older people from the 2010 Census of Indonesia. The lead researchers have discussed first impressions with the Director of Health and Nutrition of the Indonesian National Planning Board. (See page 87 for further details about the project.)

In late 2016, CEPAR learnt that it was successful in securing UNSW-Indonesia Seed Research Funding for a project titled 'Sustainability and Social Security Reform in Indonesia'.

This seed project has two broad aims. First, it will analyse the proposed (and partially legislated) social

security reforms in the context of a macro economic model which explicitly recognises the formal-informal sector dynamics, population ageing, and how different paths of development will impact a succession of generations, which in the model overlap. Intergenerational interactions at any one point in time are thus captured, as well as interactions through time.

Second, the project will take the opportunity to explore other dimensions of social response to an ageing demographic confronting family separation between generations. Other projects, focused for example on aged care and health, may well emerge from this exploratory analysis.

The project, to be undertaken by CEPAR Director John Piggott and Research Fellow George Kudrna in collaboration with the University of Indonesia's Tri Budi Rahardjo and Muliadi Widjaja with deepen our collaboration with the Centre of Ageing Studies which Rahardjo directs, and the Department of Economics where Widjaja is based.

By early 2018, the aim is to have developed the collaboration to a point where CEPAR will be in a

position to apply for nationally competitive funding to carry the research program forward.

John Piggott's participation in a high level Policy Dialogue with the Indonesian Ministry of Finance in Jakarta in March, where he spoke on the topic of pension options and reform and social safety nets, further strengthened CEPAR's profile in and engagement with Indonesia.

CONSOLIDATING OUR LINKS WITH NETSPAR

In 2016 CEPAR and the Network for Studies on Pensions, Aging and Retirement (NetSPAR) continued their collaboration on a large-scale research program focused on mandatory pre-funded retirement income systems. Funded by the ARC, in collaboration with partners APG in the Netherlands and AMP and PwC in Australia, the project investigates the critical elements of retirement income design in two countries with established and high quality mandatory pre-funded systems: Australia and the Netherlands.

The project has two distinct parts. First, the team led by CEPAR CI Michael Sherris is investigating how retirement

income could be changed to enhance welfare. One project aims to develop a product which matches the optimal consumption for retired individuals while accounting for housing and health state transitions. However, this ideal product may not be welfare enhancing for all income levels. A second project looks at the impact of various popular product choices in the Netherlands and in Australia for different income levels when the market returns and mortality are stochastic.

Research shows that individuals rarely draw down their wealth as theoretical models would indicate. In the second part of the project the team led by CEPAR AI Hazel Bateman looks into behavioural aspects of retirement. One sub-project aims to identify preferences for pension products including annuities, lump sum or phased withdrawals. The second looks into why retirees hold on to their savings during retirement. Both are cross country experiments and are fielded jointly in the Netherlands and Australia.

Research visits have advanced the project. In 2016 CEPAR Research Fellow Jennifer Alonso García and AI Hazel Bateman

visited NetSPAR and NetSPAR Researcher Johan Bonekamp visited CEPAR. Further visits are planned in 2017 to ensure the successful completion of the project.

In addition to the joint project, NetSPAR also joined forces with CEPAR, Wharton and Willis Towers Watson to launch INPARR (see page 115).

DEVELOPING THE APRU POPULATION AGEING RESEARCH HUB

Launched in 2015 at UNSW, The Association of Pacific Rim Universities' (APRU) Population Ageing Research Hub brings together world class researchers from different disciplines and provides opportunities for increased research collaboration on the topic of population ageing in the region.

Hosted by CEPAR/UNSW for the period 2015 -2017, with Professor Piggott acting as Chair and Cls McDonald and Cumming serving as two of ten members on the Steering Group, the Hub is a key component of CEPAR's international linkages strategy.

Following the success of the Hub's inaugural symposium hosted at UNSW, this year's Ageing in the Asia-Pacific Research Symposium focused on Ageing, Innovation and Sustainable Development. Held in Beijing on 6-8 November, the event was jointly hosted by the APRU Population Ageing Research Hub and the Institute of Population Research at Peking University, and attracted almost 100

delegates from ten member economies. The two day event featured keynote presentations from CEPAR's Peter McDonald, Steering Group Deputy Chair Angelique Chan from Duke-NUS Medical School, and Yeh-Liang Hsu from Yuan Ze University, as well as a range of papers presented at specialised sessions focused on ageing and development; ageing and innovation; gerontology and social work; and health and

care. One of the key aims of the Hub is to provide career development opportunities for students and early career researchers.

To this end, the symposium devoted the second day to PhD student presentations and included a workshop on 'Ageing Related Research with a China Focus' targeted at early career researchers and convened by CEPAR's Dr Bei Lu. CEPAR sponsored a number of student bursaries in order to promote participation in the symposium.

The Hub also co-hosted, in collaboration with CEPAR's Australia-China Population Ageing Research Hub, the 2nd Annual Workshop on Population Ageing and the Chinese Economy.



PRIZE-GIVING CEREMONY AT APRU AGEING IN THE ASIA PACIFIC RESEARCH SYMPOSIUM



PROFESSOR ROBERT CUMMING
MBBS UNSW, MPH PhD Syd.
CHIEF INVESTIGATOR
AND UNIVERSITY OF SYDNEY
NODE LEADER

Robert Cumming is Professor of Epidemiology and Geriatric Medicine at the University of Sydney. He shares his time between the School of Public Health at the University of Sydney and the Centre for Education and

Research on Ageing (CERA) at Concord Hospital.

He has an international reputation for his research on osteoporosis, falls and fractures. His research on falls prevention in older people has had major impact on policy and practice in this important field. Much of his research brings together biological, psychosocial and medical aspects of ageing. In recent years he has extended

his work to the study of ageing and health in developing countries in Asia and sub-Saharan Africa.

He is currently the Chair of the National Dementia Guidelines Committee for the NHMRC Cognitive Decline Partnership Centre. He is a member of the Australian Institute of Health and Welfare's National Arthritis and Musculoskeletal Conditions Monitoring

Advisory Group and serves on the editorial board of *Osteoporosis International*. He is a Life Member of the Australasian Epidemiological Association.

NATIONAL & INTERNATIONAL LINKS

INTERNATIONAL VISITORS

The Centre hosted 25 international visitors in 2016. These visitors ranged from experts with distinguished reputations in their fields to early career researchers interested in developing research programs in the area of population ageing. They participated in a range of CEPAR events and activities, contributed to the development and execution of research projects, and brought an international perspective to bear on the research program.

Our visitors also contribute to our program of outreach to the wider community through distinguished lectures and public presentations. 2016 highlights included:

HANS FEHR

Every year CEPAR hosts a methodology workshop for early career researchers. This year's workshop on Computational Economics was given by Professor Hans Fehr from the University of Wuerzburg as part of a three month visit to the UNSW node. Professor Fehr's main research interests are in the field of quantitative public economics. In the past he has analysed the economic consequences of population ageing and various tax policy and social security reforms by means of computable general equilibrium models with overlapping generations.

Under Professor Fehr's guidance the workshop participants were provided with state of the art techniques for quantitative macroeconomic research.

Going forward they will be able to develop their own ideas and conduct their own policy analysis using the programming skills acquired.

ELSA FORNERO

Elsa Fornero is a Professor of Economics at the University of Turin, and the former Italian Minister of Labor, Social Policies and Equal Opportunities. Appointed to the position as part of the 'technocratic' government Professor Fornero conceived and drafted the pension reform and labour market reform that, by altering the medium and long term structure of Italian public finance and labour market, were fundamental to the subsequent lifting of the EU's excessive deficit procedure against Italy.

Professor Fornero visited CEPAR UNSW and ANU in October and presented a Public Lecture, 'Reform, information, education: A new paradigm for pension reform', in Canberra and a seminar on 'The Role of Financial Literacy in Public Pension Policies and Individual Retirement Decisions', in Sydney. In both presentations she argued that financial literacy has important implications not only for personal wellbeing, but also for economic reforms, and thus for collective wellbeing.

CHRIS PHILLIPSON AND TINE BUFFEL

'How do you Develop an Age Friendly Community?' was the title of a public lecture delivered by two leading UK experts based at Manchester University, Professor Christopher Phillipson and Dr Tine Buffel. Presented by COTA ACT and the ANU Centre for Research on Ageing, Health and Wellbeing (CRAHW), with the support of CEPAR, the public lecture explored mechanisms for turning the age-friendly dream into reality. Professor Phillipson reviewed the development and characteristics of age-friendly communities, outlined some European initiatives, and assessed the effectiveness of the age-friendly approach for improving the quality of life of older people. Dr Buffel



PROFESSOR ROBERT HOLZMANN
HONORARY PROFESSOR

Robert Holzmann holds the chair of Old Age Financial Protection at the University of Malaya in Kuala Lumpur, is a Research Fellow of IZA and CESifo, and a Fellow of the Austrian Academy of Science.

He also serves as a consultant on pensions, financial literacy and education, labour market and migration issues. From 1997 to 2011 he held various positions at the World Bank including Sector Director for Social Protection and Labor. Before joining the Bank he was a professor in Germany and Austria and senior economist at the IMF and OECD.

He has published 34 books and over 150 articles on social, fiscal and financial policy issues.

In 2016 Robert worked closely with Centre Director John Piggott on the preparation of a volume on tax and pensions to be considered for publication by MIT Press in 2017.

developed these themes in more detail, drawing on a research project which involved older people as co-investigators in researching the age-friendliness of their neighbourhood. She also highlighted some of the challenges and opportunities associated with involving community members themselves in research and action.

Phillipson also delivered one of the keynote addresses at this year's 24th Annual Colloquium of Superannuation Researchers. Professor Phillipson's presentation, 'Extending Working Life: Problems and Prospects for Older Workers', introduced a multi-disciplinary perspective to this year's colloquium. Professor Phillipson's visit was hosted

by CEPAR's ANU node in the CRAHW. Whilst in Canberra Professor Phillipson also participated in a public forum on Developing Age Friendly Communities hosted by COTA ACT, and worked closely with CI Kendig and his team on the project Socioeconomic Determinants of Health and Wellbeing across the Life Course.

JAMES P. SMITH
Distinguished Chair in Labor Markets and Demographic Studies at the RAND Corporation, Dr Jim Smith delivered the keynote address at CEPAR's roundtable on a longitudinal survey for older cohorts. Dr Smith was one of the founders of the Health and Retirement Survey (HRS) in the U.S. and has been instrumental in the design and implementation of

harmonised surveys around the world. His presentation, 'A National Longitudinal Survey on the Ageing Demographic: A Global Perspective', delivered an insight into the benefits of an HRS-style longitudinal survey for academics and policymakers in Australia.

CEPAR hosted visits from the following researchers in 2016:

DR DANIEL ALAI
University of Kent
25 August – 23 September

JOHAN BONEKAMP
NetSPAR
19 June – 15 July

DR TINE BUFFEL
University of Manchester
4-7 July

ASSOCIATE PROFESSOR VLADIMIR CANUDAS-ROMO
Max Planck Institute for Demographic Research
1 – 29 January

DR MARIA DEL CARMEN BOADO-PENAS
University of Liverpool
15 – 20 February

PROFESSOR HANS FEHR
Wuerzburg University
1 September – 15 December

PROFESSOR ELSA FORNERO
Collegio Carlo Alberto
17 – 21 October

ASSOCIATE PROFESSOR CHRISTIAN GASER
University of Jena
5 September – 16 September

PROFESSOR GARY HANSEN
University of California, Los Angeles
24 August – 5 September

SENIOR RESEARCH FELLOW ERIK HERNÆS
Frisch Centre
18 January – 29 February

PROFESSOR ROBERT HOLZMANN
University of Malaya
7 – 25 November

ASSOCIATE PROFESSOR MINCHUN HSU
National Graduate Institute for Policy Studies
24 – 31 August

PROFESSOR CAROL JAGGER
Newcastle University, UK
7 – 23 March

PROFESSOR ANSON JON
Ben Gurion University of the Negev
29 February – 21 April

DR ANDREW KINGSTON
Newcastle University, UK
7 – 23 March

PROFESSOR ZINOVII LANDSMAN
University of Haifa
24 August – 20 September

SANG BOONG LEE
National Pension Research Institute, Korea
28 June

ASSOCIATE PROFESSOR EILEEN LUEDERS
University of California, Los Angeles
5 – 16 September

PROFESSOR OLIVIA S. MITCHELL
The Wharton School
4– 8 July

MALINEE NEELAMEGAM
University of Southern Florida
1 January – 1 May

DR MIKE ORSZAG
Willis Towers Watson
21 – 25 March
5 – 21 October

PROFESSOR ALBERT PARK
Hong Kong University of Science and Technology
19 – 23 July



ERIK HERNÆS
Cand oecon Oslo
ASSOCIATE INVESTIGATOR

Erik Hernæs is a Senior Research Fellow at the Ragnar Frisch Centre for Economic Research at the University of Oslo, one of Norway's leading economics research centres. Erik's primary research interests are related to pension economics and he is

currently leading a project on evaluating the labour market effects of Norwegian pension reform.

After working at Statistics Norway, he became the inaugural Director of the Frisch Centre in 1999. He was one of the first researchers to organise administrative register data and use these for econometric analysis. This is now a major research focus of the Frisch Centre.

Erik has published on productivity, education, unemployment and retirement, in the *Scandinavian Journal of Economics*, *Oxford Bulletin of Economic Research*, *Journal of Pension Economics And Finance*, *Journal of Health Economics*, *Journal of Labor Economics* and in volumes published by the NBER, Kluwer, Edward Elgar and Routledge.

In 2016 he visited CEPAR for six weeks to work closely with Centre Director Piggott.

NATIONAL & INTERNATIONAL LINKS

DR RUTH PETERS

Imperial College, London
24 – 28 October

PROFESSOR CHRIS PHILLIPSON

University of Manchester
4 July – 6 August

DR MATTHEW PRINA

King's College, London
15 February – 11 March

PROFESSOR JAMES P. SMITH

RAND Corporation
22 – 27 February

YANAN ZHU

Zhejiang University
8 February – 26 June

INTERNATIONAL VISITS

CEPAR investigators were invited to visit a number of leading research institutions in 2016:

JENNIFER ALONSO-GARCÍA

University of Liverpool
4-8 April

NetSPAR

11-13 April

Universite Catholique de Louvain

12-23 September

HEATHER BOOTH

Max Planck Institute for Demographic Research
13 June – 19 August

ELENA CAPATINA

National Graduate Institute for Policy Studies
1-4 March

LINDY CLEMSON

Bosch Institute, Stuttgart
29 February – 4 March

PreventIT team- European collaboration, Lausanne
5-14 June

University of Illinois

1-6 August

Manchester University
10-14 August

Southampton University
15-31 August

Norwegian University of Science and Technology
31 August – 14 September

ROBERT CUMMING

Mongolian National University of Medical Sciences
23-24 June

KATJA HANEWALD

Renmin University of China
30 May

Peking University

1 June

ALIZA HUNT

McGill University
2 May – 7 June

University of Glasgow

30 June

King's College, London

5 July

BEI LU

Peking University
1 June

SHIKO MARUYAMA

Willis Towers Watson, Uruguay
21-25 April

PETER MCDONALD

Indonesian Ministry of National Development and Planning
2 February

CLAIRE O'CONNOR

University of East Anglia
19-20 September

JOHN PIGGOTT

Indonesian Ministry of Finance
6-9 March

Peking University

1 June

World Bank, Washington D.C.

24 October

MICHAEL SHERRIS

Nanyang Technological University
8-12 March

DR IWU UTOMO

Indonesian Ministry of National Development and Planning
2 February

ANDRÉS VILLEGAS

Universidad Nacional de Colombia
5 – 19 February

Universidad EAFIT

11-22 July

Universidad de Antioquia

4-8 July

Cass Business School, City,

University of London

5-16 September

VASOONTARA YIENPRUGSAWAN

World Health Organization
South East Asia Regional Office
9 – 11 November

XIAOYUN ZHANG

Peking University
6 November – 4 December



CHIEF INVESTIGATOR
ROBERT CUMMING ON
A FIELD TRIP IN THE GOBI
DESERT, MONGOLIA

ANNUAL REPORT 2015



Australian Government
Australian Research Council

ARC CENTRE OF
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PERFORMANCE INDICATORS & FINANCIAL STATEMENT

Australian Government
Australian Research Council

2016 KEY PERFORMANCE INDICATORS

MEASURE	2016 TARGET	2016 RESULT
RESEARCH FINDINGS		
Total research outputs	55	385
– Refereed journal articles	20	138
– Percentage appearing in top tier journals ⁶	30%	44%
Invited talks/papers/keynotes given at major international meetings	12	16
Commentaries about the Centre's achievements		
– Media releases	8	9
– Articles	6	56
RESEARCH TRAINING AND PROFESSIONAL EDUCATION		
Attended professional training courses for staff and postgraduate students	6	8
Centre attendees at all professional training courses	16	55
New PhD students working on core Centre research and supervised by Centre staff	6	4
New postdoctoral researchers recruited to the Centre working on core Centre research	0	7
New Honours students working on core Centre research and supervised by Centre staff	4	2
Postgraduate completions	7	11
Early Career Researchers working on core Centre research	9	22
Students mentored	150	750
Mentoring programs	2	6
INTERNATIONAL, NATIONAL AND REGIONAL LINKS AND NETWORKS		
International visitors and visiting fellows	11	27
National and international workshops held/organised by the Centre	2	6
Visits to overseas universities or organisations	8	30
Interdisciplinary research: Research projects and papers co-authored by writers with different disciplinary backgrounds	2	15

⁶ Percentage of publications, indexed in Scopus and/or the Australian Business Deans Council (ABDC) List of Top Quality Journals, included in the top 10% of journals by Scopus SciVal CiteScore Percentile or ranked by the ABDC as A or A*.

MEASURE	TARGET	RESULT
END-USER LINKS		
Government, industry and business community briefings	4	51
Public awareness programs	2	2
Currency of information on the Centre's website (number of updates per year)	10	Updated at least weekly
Website hits	8,000	44,249 page views
Public talks given by Centre staff	15	17
ORGANISATIONAL SUPPORT		
Annual cash contributions from Collaborating Organisations ⁷	\$938,250	\$906,585
Annual in-kind contributions from Collaborating Organisations	\$1,096,830	\$2,248,957
Annual cash contributions from Partner Organisations	\$150,000	\$150,000
Annual in-kind contributions from Partner Organisations	\$729,722	\$1,002,099
OTHER RESEARCH INCOME SECURED BY CENTRE STAFF ⁸		
– ARC Grants	\$250,000	\$976,626
– Other Australian Competitive Grants	\$250,000	\$1,419,724
– Other Commonwealth, State and Local Government Grants	\$125,000	\$253,017
– Industry/Private Sector Grants	\$125,000	\$151,638
Number of new organisations collaborating with, or involved in, the Centre	2	4
NATIONAL BENEFIT		
Contribution to the National Research Priorities and the National Innovation Priorities		
– Public conferences	2	3
– Government and industry briefings	4	51
– Communiqués etc	12	65

⁷ A cash contribution from the University of Melbourne to support 2016 activities will be made in 2017, following the finalisation of the Deed of Accession and Variation to formally include the University of Melbourne as a Collaborating University.

⁸ Includes all new grants awarded since the Centre's inception where a CEPAR Chief Investigator and/or Research Fellow is included in the research team as a Chief Investigator. Only 2016 income is shown.

RESEARCH OUTPUTS

A3 BOOK – EDITED

- 1 Kendig, H., McDonald, P. and Piggott, J. (Eds.) (2016). *Population Ageing and Australia's Future*. ANU Press for the Academy of Social Sciences in Australia.
- 2 Piggott, J. and Woodland, A. (Eds.) (2016). *Handbook of the Economics of Population Aging, Volume 1A*. Elsevier.
- 3 Piggott, J. and Woodland, A. (Eds.) (2016). *Handbook of the Economics of Population Aging, Volume 1B*. Elsevier.
- 4 Yienprugsawan, V., Healy, J. and Kendig, H. (Eds.) (2016). *Health Systems Responses to Population Ageing and Non-communicable Diseases in Asia. Vol 2 # 2*. World Health Organization.
- 5 Chomik, R. and Piggott, J. (2016). The Australian Retirement Income System: Lessons for the United States. In O.S. Mitchell and R.C. Shea (Eds.), *Reimagining Pensions: The Next 40 Years*. Oxford University Press.
- 6 Clemson, L. and Munro, J. (2016). Conceptual Model of Habit Reforming to Improve Balance and Prevent Falls. In A.N. Pachana (Ed.), *Encyclopaedia of Geropsychology*. (pp1-10). Springer.
- 7 Dobrescu, L.I. and Smith, J.P. (2016). The HRS around the World Surveys. In J. Piggott and A. Woodland (Eds.), *Handbook of the Economics of Population Aging, Volume 1B*. (pp991-1018). Elsevier.
- 8 Fang, H. (2016). Insurance Markets for the Elderly. In J. Piggott and A. Woodland (Eds.), *Handbook of the Economics of Population Aging, Volume 1A*. (pp237-310). Elsevier.
- 9 Gong, C. and Kendig, H. (2016). Ageing and Social Change in Australia. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp19-45). ANU Press for the Academy of Social Sciences in Australia.
- 10 Hosseini-Chavoshi, M. and Abbasi-Shavazi, M.J. (2016). Demographic Consequences of the 2003 Bam Earthquake in Iran. In H. James and P. Douglas (Eds.), *The Consequences of Disasters: Demographic, Planning and Policy Implications*. (pp110-126). Charles C Thomas Publisher.
- 11 Jefferson, T., Austen, S., Sharp, R., Ong, R., Adams, V. and Lewin, G. (2016). A Mixed Methods Approach to Investigating the Employment Decisions of Aged Care Workers in Australia. In F.S. Lee and B. Cronin (Eds.), *Handbook of Research Methods and Applications in Heterodox Economics*. (pp445-465). Edward Elgar.
- 12 Keane, M.P. and Thorp, S. (2016). Complex Decision Making: The Roles of Cognitive Limitations, Cognitive Decline, and Aging. In J. Piggott and A. Woodland (Eds.), *Handbook of the Economics of Population Aging, Volume 1B*. (pp661-710). Elsevier.
- 13 Kendig, H. and Browning, C. (2016). Social Research and Actions on Ageing Well. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp137-163). ANU Press for the Academy of Social Sciences in Australia.
- 14 Kendig, H., Healy, J., Lopez, A., Byles, J.E. and Yienprugsawan, V. (2016). About this Report. In V. Yienprugsawan, J. Healy and H. Kendig (Eds.), *Health Systems Responses to Population Ageing and Non-communicable Diseases in Asia. Vol 2 # 2*. (pp1-7). World Health Organization.
- 15 Kendig, H., McDonald, P. and Piggott, J. (2016). Introduction: A Multi-disciplinary Approach to Ageing. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp3-18). ANU Press for the Academy of Social Sciences in Australia.
- 16 McDonald, P. (2016). Ageing in Australia: Population Changes and Responses. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp65-83). ANU Press for the Academy of Social Sciences in Australia.
- 17 Mitchell, O.S. and Piggott, J. (2016). Workplace-linked Pensions for an Aging Demographic. In J. Piggott and A. Woodland (Eds.), *Handbook of the Economics of Population Aging, Volume 1B*. (pp865-904). Elsevier.
- 18 O'Connor, C.M. and Mioshi, E. (2016). Functional Disability and the Impact of Frontotemporal Dementia in Everyday Life. In B.C. Dickerson (Ed.), *Hodges' Frontotemporal Dementia, Second Edition*. (pp211-228). Cambridge University Press.
- 19 Ong, R. (2016). Financing Aged Care: The Role of Housing Wealth and Intergenerational Relationships. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp281-301). ANU Press for the Academy of Social Sciences in Australia.
- 20 Piggott, J. (2016). Population Ageing in Australia - National Policy Challenges and Future Directions. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp47-62). ANU Press for the Academy of Social Sciences in Australia.
- 21 Rafermacher, H., Browning, C. and Feldman, S. (2016). 'I Feel Very Happy that I Can Contribute to Society': Exploring the Project for Older People. In M. Cordella and H. Huang (Eds.), *Rethinking Second Language Learning: Using Intergenerational Community Resources*. Multilingual Matters.
- 22 Windsor, T.D., Curtis, R.G. and Luszcz, M.A. (2016). Social Engagement in Late Life. In H. Kendig, P. McDonald and J. Piggott (Eds.), *Population Ageing and Australia's Future*. (pp185-204). ANU Press for the Academy of Social Sciences in Australia.
- 23 Woodland, A. (2016). Taxation, Pensions, and Demographic Change. In J. Piggott and A. Woodland (Eds.), *Handbook of the Economics of Population Aging, Volume 1B*. (pp713-780). Elsevier.
- 24 Yienprugsawan, V., Byles, J., Kendig, H. and Healy, J. (2016). Functional Disability and the Impact of Frontotemporal Dementia in Everyday Life. In B.C. Dickerson (Ed.), *Hodges' Frontotemporal Dementia, Second Edition*. (pp211-228). Cambridge University Press.
- 25 Yienprugsawan, V., Healy, J., Kendig, H. and Byles, J. (2016). Reflections on Health Service Responses to NCDs in Older Populations. In V. Yienprugsawan, J. Healy and H. Kendig (Eds.), *Health Systems Responses to Population Ageing and Non-communicable Diseases in Asia. Vol 2 # 2*. (pp9-33). World Health Organization.
- 26 Yienprugsawan, V., Healy, J., Kendig, H. and Byles, J. (2016). Reflections on Health Service Responses to NCDs in Older Populations. In V. Yienprugsawan, J. Healy and H. Kendig (Eds.), *Health Systems Responses to Population Ageing and Non-communicable Diseases in Asia. Vol 2 # 2*. (pp111-126). World Health Organization.
- 27 Zhao, Z. (2016). The Development of Chinese Historical Demography since 1950. In A. Fauve-Chamoux, I. Bolovan and S. Sogner (Eds.), *A Global History of Historical Demography*. (pp193-211). Peter Lang.
- 28 Zhao, Z., Chen, W. and Jin, Y. (2016). Recent Mortality Trends in China. In C. Guilmoto and G. Jones (Eds.), *Contemporary Demographic Transformations in China, India and Indonesia*. (pp37-53). Springer.

C1 JOURNAL ARTICLES: ARTICLES IN SCHOLARLY REFEREED JOURNALS

- 1 Agnew, J.R., Bateman, H., Eckert, C., Iskhakov, F., Louviere, J., Satchell, S. and Thorp, S. (2016). First Impressions Matter: An Experimental Investigation of Online Financial Advice. *Management Science*. doi: 10.1287/mnsc.2016.2590. In press [available online December 2016].
- 2 Alai, D.H., Landsman, Z. and Sherris, M. (2016). Modelling Lifetime Dependence for Older Ages using a Multivariate Pareto Distribution. *Insurance: Mathematics and Economics*, 70, 272-285. doi: 10.1016/j.insmatheco.2016.06.016.
- 3 Alonso-García, J. and Devolder, P. (2016). Guarantee Valuation in Notional Defined Contribution Pension Systems. *Astin Bulletin: The Journal of the ASTIN and AFIR Sections of the International Actuarial Association*, 46(3), 677-707. doi: 10.1017/asb.2016.21.
- 4 Alonso-García, J. and Devolder, P. (2016). Optimal Mix between Pay-as-you-go and Funding for DC Pension Schemes in an Overlapping Generations Model. *Insurance: Mathematics and Economics*, 70, 224-236. doi: 10.1016/j.insmatheco.2016.06.011.
- 5 Andrews, S., Das, D., Cherbuin, N., Anstey, K.J. and Eastel, S. (2016). Association of Genetic Risk Factors with Cognitive Decline: The PATH Through Life Project. *Neurobiology of Aging*, 41, 150-158. doi: 10.1016/j.neurobiolaging.2016.02.016.
- 6 Anstey, K.J. and Ashby-Mitchell, K. (2016). ACT Health, Population Health Prevention & Protection and the ANU Collaborate to Address Chronic Disease. *ACT Population Health Bulletin*, 5(4), 13-14.
- 7 Arnold, B., Bateman, H., Ferguson, A. and Raftery, A. (2016). Partner Scale Economies, Service Bundling and Auditor Independence in the Australian Self-Managed Superannuation Fund Industry. *Auditing: A Journal of Practice and Theory*. doi: 10.2308/ajpt-51573. In press [available online August 2016].
- 8 Barker, A.L., Morello, R.T., Wolfe, R., Brand, C.A., Haines, T.P., Hill, K.D., Brauer, S.G., Botti, M., Cumming, R.G., Livingston, P.M., Sherrington, C., Zavarsek, S., Lindley, R.I. and Kamar, J. (2016). The 6-PACK Program to Decrease Fall Injuries in Acute Hospitals: A Cluster Randomised Controlled Trial. *British Medical Journal*, 352, h6781. doi: 10.1136/bmj.h6781.
- 9 Barnett, A., Cerin, E., Zhang, J.P.C., Sit, H.P.C., Johnston, J.M., Cheung, M.C. and Lee, R. (2016). Associations between the Neighbourhood Environment Characteristics and Physical Activity in Older Adults with Specific Types of Chronic Conditions: The ALECS Cross-sectional Study. *International Journal of Behavioral Nutrition and Physical Activity*, 13(53). doi: 10.1186/s12966-016-0377-7.
- 10 Barnett, A., van den Hoek, D., Barnett, D. and Cerin, E. (2016). Measuring Moderate-intensity Walking in Older Adults Using the ActiGraph Accelerometer. *BMC Geriatrics*, 16(211). doi: 10.1186/s12877-016-0380-5.
- 11 Bateman, H., Eckert, C., Iskhakov, F., Louviere, J., Satchell, S. and Thorp, S. (2016). Individual Capability and Effort in Retirement Benefit Choice. *Journal of Risk and Insurance*. doi: 10.1111/jori.12162. In press [available online August 2016].
- 12 Beaujot, R. and McDonald, P. (2016). Introduction: Comparative Demography of Canada and Australia. *Canadian Studies in Population. Demographic Trends in Canada and Australia: Special Issue Devoted to Graeme Hugo*, 43(1-2), 1-4.
- 13 Blackburn, C., Hanewald, K., Olivier, A. and Sherris, M. (2016). Longevity Risk Management and Shareholder Value for a Life Annuity Business. *ASTIN Bulletin*. doi: 10.1017/asb.2016.32. In press [available online November 2016].
- 14 Booth, H., Tickle, L. and Zhao, J. (2016). Epidemiologic Transition in Australia: The Last Hundred Years. *Canadian Studies in Population. Demographic Trends in Canada and Australia: Special Issue Devoted to Graeme Hugo*, 43(1-2), 23-47.
- 15 Burn, K., Dennerstein, L., Browning, C. and Szoek, C. (2016). Patterns of Social Engagement in the Transition to Later Life. *Maturitas*, 88, 90-95. doi: 10.1016/j.maturitas.2016.03.016.
- 16 Burns, R.A. (2016). Sex and Age Trends in Australia's Suicide Rate over the Last Decade: Something is Still Seriously Wrong with Men in Mid and Late-life. *Psychiatry Research*, 13(245), 224-229. doi: 10.1016/j.psychres.2016.08.036.
- 17 Burns, R.A., Butterworth, P. and Anstey, K.J. (2016). An Examination of the Long-term Impact of Job Strain on Mental Health and Wellbeing over a 12-year period. *Social Psychiatry and Psychiatric Epidemiology*, 51(5), 725-733. doi: 10.1007/s00127-016-1192-9.
- 18 Byles, J.E., Curry, C., Vo, K., Forster, P., Loxton, D. and McLaughlin, D. (2016). Changes in Housing among Older Women: Latent Class Analysis of Housing Patterns in Older Australian Women. *Urban Studies*. doi: 10.1177/0042098016661309. In press [available online August 2016].
- 19 Byles, J.E., Vo, K., Forster, P.M., Thomas, L., Banks, E., Rodger, B. and Bauman A. (2016). Gender, Mental Health, Physical Health and Retirement: A Prospective Study of 21,608 Australians Aged 55 to 69 Years. *Maturitas*, 87, 40-48. doi: 10.1016/j.maturitas.2016.02.011.
- 20 Byles, J.E., Vo, K., Mackenzie, L., Thomas, L. and Kendig, H. (2016). Partner Status and Mental and Physical Health of Independently Living Men Aged 70 Years and Older. *Australasian Journal on Ageing*, 35(2), 143-146. doi: 10.1111/ajag.12234.
- 21 Cerin, E., Rainey-Smith, S.T., Ames, A., Lautenschlager, N.T., Macaulay, S.L., Fowler, C., Robertson, J.S., Rowe, C.C., Maruff, P., Martins, R.N., Masters, C.L. and Ellis, K.A. (2016). Associations of Neighbourhood Environment with Brain Imaging Outcomes in the AIBL Cohort. *Alzheimer's & Dementia*. doi: 10.1016/j.jalz.2016.06.2364. In press [available online August 2016].
- 22 Cerin, E., Zhang, C.J.P., Barnett, A., Sit, C.P.H., Cheung, M.C.M., Johnston, J.M., Lai, P.C. and Lee, R.S.Y. (2016). Associations of Objectively-assessed Neighbourhood Characteristics with Older Adults' total Physical Activity and Sedentary time in an Ultra-dense Urban Environment: Findings from the ALECS Study. *Health and Place*, 42, 1-10. doi: 10.1016/j.healthplace.2016.08.009.
- 23 Cherbuin, N., Carey, L., Mortby, M. and Anstey, K.J. (2016). Predictors of Future Stroke in Adults 60-64 years Living in the Community. *World Journal of Neurology*, 6(1), 14-22. doi: 10.5316/wjn.v6.i1.14.
- 24 Chomik, R. and Piggott, J. (2016). Australian Superannuation: The Current State of Play. *The Australian Economic Review*, 49(4), 483-493. doi: 10.1111/1467-8462.12190.
- 25 Chomik, R., McDonald, P. and Piggott, J. (2016). Population Ageing in Asia and the Pacific: Dependency Metrics for Policy. *The Journal of the Economics of Ageing*, 8, 5-18. doi: 10.1016/j.jeoa.2016.05.002.
- 26 Christiani, Y., Byles, J.E., Tavener, M. and Dugdale, P. (2016). Exploring the Implementation of 'Poslansia', Indonesia's Community-based Health Program for Older People. *Australasian Journal on Ageing*, 35(3), e11-16. doi: 10.1111/ajag.12305.
- 27 Christiani, Y., Byles, J.E., Tavener, M. and Dugdale, P. (2016). Health Insurance Coverage among Women in Indonesia's Major Cities: A Multilevel Analysis. *Health Care for Women International*. doi:10.1080/07399332.2016.1253697. In press [available online October 2016].

RESEARCH OUTPUTS

- 28 Clemson, L., Lannin, N., Wales, K., Rubenstein, L.Z., Gitlin, L., Barris, S., Mackenzie, L. and Cameron, I.D. (2016). Occupational Therapy Pre-discharge Home Visits in Acute Hospital Care: A Randomized Trial. *Journal of the American Geriatrics Society*, 64(10), 2019-2026. doi: 10.1111/jgs.14287.
- 29 Clifford, A., Lang, L., Chen, R., Anstey, K.J. and Seaton, A. (2016). Exposure to Air Pollution and Cognitive Functioning across the Life Course - A Systematic Literature Review. *Environmental Research*, 147, 383-393. doi: 10.1016/j.envres.2016.01.018.
- 30 Clinical Practice Guidelines for Dementia in Australia Guideline Adaptation Committee. (including Clemson, L.). (2016). Clinical Practice Guidelines for Dementia in Australia: A Step Towards Improving Uptake of Research Findings in Health and Aged Care Settings. *Australasian Journal on Ageing*, 35(2), 86-89. doi: 10.1111/ajag.12330.
- 31 Curtis, R.G., Huxhold, O. and Windsor, T.D. (2016). Perceived Control and Social Activity in Midlife and Older Age: A Reciprocal Association? Findings from the German Ageing Survey. *The Journals of Gerontology, Series B: Psychological and Social Sciences*. doi: 10.1093/geronb/gbw070. In press [available online June 2016].
- 32 Curtis, R.G., Windsor, T.D., Mogle, J.A., and Bielak, A.A.M. (2016). There's more than Meets the Eye: Complex Associations of Daily Pain, Physical Symptoms, and Self-efficacy with Activity in Middle and Older Adulthood. *Gerontology*. doi: 10.1159/000450786. In press [available online October 2016].
- 33 Dabbs, E. and Kumru, C. (2016). How Well Does the Australian Aged Pension Provide Social Insurance? *Australian Economic Papers*, 55(3), 192-211. doi: 10.1111/1467-8454.12070.
- 34 Dark, L., Clemson, L. and Balandin, S. (2016). Communication Changes Experienced by Adults with Cerebral Palsy as they Age. *International Journal of Speech-Language Pathology*, 18(6), 521-532. doi: 10.3109/17549507.2016.1143976.
- 35 De Luca, K., Parkinson, L., Byles, J.E., Lo, T., Pollard, H. and Blyth, F. (2016). The Prevalence and Cross-sectional Associations of Self-reported Neuropathic Pain among Older, Community-dwelling Women with Arthritis. *Pain Medicine*. doi: 10.1093/pm/pnv111. In press [available online February 2016].
- 36 Dobrescu, L.I., Fan, X., Bateman, H., Newell, B.R., Ortmann, A. and Thorp, S. (2016). Retirement Savings: A Tale of Decisions and Defaults. *The Economic Journal*. doi: 10.1111/eoj.12447. In press [available online November 2016].
- 37 Dobson, A.J., Byles, J.E. and Brown, W.J. (2016). The Nurses' Health Study and the Australian Longitudinal Study on Women's Health: Providing Infrastructure for Public Health Research. *The American Journal of Public Health*, 106(9), 1533-1534. doi: 10.2105/AJPH.2016.303352.
- 38 Dolja-Gore, X., Harris, M., Kendig, H. and Byles, J. (2016). Patterns of Hospitalization Risk for Women Surviving into Very Old Age: Findings from the Australian Longitudinal Study on Women's Health. *Medical Care*. doi: 10.1097/MLR.0000000000000636. In press [available online August 2016].
- 39 Eftekhari, P., Forder, P.M., Majeed, T. and Byles, J.E. (2016). Impact of Asthma on Mortality in Older Women: An Australian Cohort Study of 10413 Women. *Respiratory Medicine*, 119, 102-108. doi: 10.1016/j.rmed.2016.08.026.
- 40 Eramudugolla, R., Price, J., Chopra, S., Amoy, Z. and Anstey, K.J. (2016). Comparison of a Virtual Older Driver Assessment with an On-road Driving Test. *Journal of the American Geriatrics Society*. doi: 10.1111/jgs.14548. In press [available online October 2016].
- 41 Farag, I., Howard, K., O'Rourke, S., Ferreira, M., Lord, S., Close, J., Vogler, C., Dean, C., Cumming, R.G. and Sherrington, C. (2016). Health and Social Support Services in Older Adults Recently Discharged from Hospital: Service Utilisation and Costs and Exploration of the Impact of a Home-exercise Intervention. *BMC Geriatrics*, 16(82). doi: 10.1186/s12877-016-0254-x.
- 42 Gaille-Arnold, S. and Sherris, M. (2016). International Cause-specific Mortality Rates: New Insights from a Cointegration Analysis. *ASTIN Bulletin*, 46(1), 9-38. doi: 10.1017/asb.2015.24.
- 43 Gonçalves-Bradley, D.C., Lannin, N.A., Clemson, L.M., Cameron, I.D. and Shepperd, S. (2016). Discharge Planning from Hospital. *Cochrane Database of Systematic Reviews*, 1, CD000313. doi: 10.1002/14651858.CD000313.pub5.
- 44 Gong, C.H., Kendig, H. and He, X. (2016). Factors Predicting Health Services Use among Older People in China: An Analysis of China Health Ageing and Retirement Longitudinal Survey 2013. *BMC Health Services Research*, 16(63). doi: 10.1186/s12913-016-1307-8.
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- 132 Yasar, S., Schuchman, M., Peters, J., Anstey, K.J., Carlson, M.C. and Peters, R. (2016). Relationship Between Antihypertensive Medications and Cognitive Impairment: Part 1. Review of Human Studies and Clinical Trials. *Current Hypertension Reports*, 18(8), 67. doi: 10.1007/s11906-016-0674-1.
- 133 Yiengprugsawan, V., Leach, L., Berecki-Gisolf, J., Kendig, H., Harley, D., Seubsman, S. and Sleight, A.C. (2016). Caregiving and Mental Health among Workers: Longitudinal Evidence from a Large Cohort of Adults in Thailand. *Social Science and Medicine - Population Health*, 2, 149-154. doi: 10.1016/j.ssmph.2016.01.004.
- 134 Zanjari, N., Sharifian Sani, M., Hosseini-Chavoshi, M., Rafiey, H. and Mohammadi, F. (2016). Perceptions of Successful Ageing among Iranian Elders: Insights From a Qualitative Study. *The International Journal of Aging and Human Development*, 83(4), 381-401. doi: 10.1177/0091415016657559.
- 135 Zhang, T., Shaw, M., Humphries, J., Anstey, K.J. and Cherbuin, N. (2016). Higher Fasting Plasma Glucose is Associated with Striatal and Hippocampal Shape Differences: The 2 Sweet Project. *BMJ Open Diabetes Research and Care*, 4, e000175. doi: 10.1136/bmjdr-2015-000175.
- 136 Zhao, J., Booth, H., Dear, K. and Jow-Ching Tu, E. (2016). Cardiovascular Mortality Sex Differentials in Selected East Asian and Western Populations. *Journal of Epidemiology & Community Health*. doi:10.1136/jech-2015-206577. In press [available online April 2016].
- 137 Zhao, Z., Zhu, Y. and Tu, E.J.-C. (2016). Daily Mortality Changes in Taiwan in the 1970s: An Examination of the Relationship between Temperature and Mortality. *Vienna Yearbook of Population Research*, 14, 71-90. doi: 10.1553/populationyearbook2015s71.
- 138 Zhu, R. (2016). Retirement and its Consequences for Women's Health in Australia. *Social Science and Medicine*, 163, 117-125. doi: 10.1016/j.socscimed.2016.04.003.
- C2 JOURNAL ARTICLES: REFEREED JOURNAL, OTHER CONTRIBUTION**
- 1 Anstey, K.J., Eramudugolla, R., Lautenschlager, N.T. and Wood, J. (2016). Guest Editorial: Road Safety in an Ageing Population: Risk Factors, Assessment, Interventions, and Future Directions. *International Psychogeriatrics*, 28(3), 349-356. doi: 10.1017/S1041610216000053.
- 2 Byles, J.E. (2016). Whose Assessment is it Anyway? Editorial on Health, Healthy Lifestyles, and Health Examinations among the Older People in Taiwan. *Australasian Journal on Ageing*, 35, 3. doi: 10.1111/ajag.12327.
- 3 Dobrescu, L.I. (2016). Book Review: Discoveries in the Economics of Aging. *Journal of Pension Economics and Finance*, 15(1), 113-115. doi: 10.1017/S1474747215000116.
- 4 du Toit, S.H.J. and O'Connor, C.M. (2016). Modified Activities Acted as a Mediator to Facilitate Engagement and Address the Needs and Personal Preferences of People with Dementia. Summary of Trahan, A.M., Kuo, J., Carlson, M.C. and Gitlin, L.N (2014). A Systematic Review of Strategies to Foster Activity Engagement in Persons with Dementia. *Occupational Therapy Journal*, 62(6), 453-454. doi:10.1111/1440-1630.12246.
- 5 Iskhakov, F., Lee, J., Rust, J., Schjerning, B. and Seo, K. (2016). Comment on Constrained Optimization Approaches to Estimation of Structural Models. *Econometrica*, 84(1), 365-370. doi: 10.3982/ECTA12605.
- C5 UNPUBLISHED REPORTS**
- 1 Alonso-García, J., del Carmen Boado-Penas, M. and Devolder, M. (2016). Adequacy, Fairness and Sustainability of Pay-As-You-Go-Pension-Systems: Defined Benefit versus Defined Contribution. CEPAR Working Paper Series 2016/22.
- 2 Alonso-García, J., and Rosado-Cebrian, B. (2016). The Effect of Labour Transitions on Public Pension Financing: A Case Study for Spain. CEPAR Working Paper Series 2016/21.
- 3 Bateman, H., Dobrescu, L.I., Newell, B.R., Ortmann, A. and Thorp, S. (2016). Flicking the Switch: How Fee and Return Disclosures Drive Retirement Plan Choice. CEPAR Working Paper Series 2016/15.
- 4 Bishnu, M., Kumru, C. and Nakornthab, A. (2016). Optimal Inheritance Tax under Temptation. CEPAR Working Paper Series 2016/16.
- 5 Booth, H., Tickle, L. and Zhao, J. (2016). Epidemiologic Transition in Australia - The Last Hundred Years. CEPAR Working Paper Series 2016/14.
- 6 Chomik, R. (2016). Sustainable Development Goals, Population Ageing and Social Security in Asia. CEPAR Working Paper Series 2016/23.
- 7 Chomik, R. and Piggott, J. (2016). A Note on the Treatment of Assets in Australian Age Pension Means Test. CEPAR Working Paper Series 2016/01.
- 8 Chomik, R. and Piggott, J. (2016). Retirement Income Adequacy: Concepts and Measurement. CEPAR Working Paper Series 2016/02.
- 9 Genser, B. and Holzmann, R. (2016). The Taxation of Internationally Portable Pensions: Fiscal Issues and Policy Options. CEPAR Working Paper Series 2016/09.
- 10 Jung, J. and Tran, C. (2016). Social Health Insurance: A Quantitative Exploration. CEPAR Working Paper Series 2016/12.
- 11 Jung, J., Tran, C. and Chambers, M. (2016). Aging and Health Financing in the US: A General Equilibrium Analysis. CEPAR Working Paper Series 2016/18.
- 12 Kudrna, G. (2016). Population Ageing and Housing: Policy Implications. CEPAR Working Paper Series 2016/13.
- 13 Kudrna, G. (2016). The Effects of Changing the Age Pension Means Test: A Lifecycle Model Simulation. CEPAR Working Paper Series 2016/05.
- 14 Kudrna, G. and Tran, C. (2016). Comparing Budget Repair Measures for a Small Open Economy with Growing Debt. CEPAR Working Paper Series 2016/24.
- 15 Kumru, C. and Nakornthab, A. (2016). Annuity and Estate Taxation in an Entrepreneurship Model. CEPAR Working Paper Series 2016/03.
- 16 Li, Z., Shao, A.W. and Sherris, M. (2016). The Impact of Systematic Trend and Uncertainty on Mortality and Disability in a Multi-State Latent Factor Model for Transition Rates. CEPAR Working Paper Series 2016/04.
- 17 McDonald, P. (2016). Migration and its Effects on Population Growth and Composition. CEPAR Working Paper Series 2016/20.

- 18 Pitacco, E. (2016). High Age Mortality and Frailty. Some Remarks and Hints for Actuarial Modeling. CEPAR Working Paper Series 2016/19.
- 19 Tran, C. and Ma, C. (2016). Fiscal Space under Demographic Shift. CEPAR Working Paper Series 2016/25.
- 20 Wu, S., Bateman, H. and Stevens, R. (2016). Optimal Portfolio Choice with Health-contingent Income Products: The Value of Life Care Annuities. CEPAR Working Paper Series 2016/17.

OTHER OUTPUTS

- 1 Abalos, J. (August 2016). Poster Presentation. Cross-national Differences in Living Arrangements among Older Persons in Southeast Asia. The 2016 European Population Conference. Mainz, Germany.
- 2 Abalos, J. (June 2016). Poster Presentation. Regional Differences in Functional Difficulty and Health Expectancy among Older Persons in the Philippines. 28th REVES Meeting. Vienna, Austria.
- 3 Ayuso, M., Bravo, J.M. and Holzmann, J. (November 2016). Addressing Longevity Heterogeneity in Pension Scheme Design and Reform. IZA Discussion Paper Series DP No. 10378.
- 4 Ayuso, M., Bravo, J.M. and Holzmann, J. (July 2016). On the Heterogeneity of Longevity among Socio-economic Groups: Scope, Trends and Implications for Earnings-Related Pension Programs. IZA Discussion Paper Series DP No. 10060.
- 5 Chomik, R. (2016). The Constellations of Demography. CEPAR Fact Sheet.
- 6 Eramudugolla, R., Kiely, K.M., Price, P. and Anstey, K.J. (2016). Interventions to Enhance Driving Skills in Older Adults Aged 65 years and Above: A Randomised Controlled Trial of Efficacy. Report for the NRMA Road Safety Trust.
- 7 Holzmann, R. (March 2016). Employee's Provident Fund Data for Evidence-based Social Protection Policies on Malaysia. SSRN Working Paper No. 2016-1.
- 8 Hosking, D. (April 2016). Poster Presentation. Informant-reported Cognitive Decline and Life-engagement in the PATH Through Life Study. Cognitive Ageing Conference. Atlanta, USA.
- 9 Hosseini-Chavoshi, M. and McDonald, P. (September 2016). Poster Presentation. Determinants of Aging Living Arrangements in Australia. The 2016 European Population Conference. Mainz, Germany.
- 10 Hsu, B. (November 2016). Poster Presentation. Community-dwelling Men with Dementia are at High Risk of Fracture: The Concord Health and Ageing in Men Project. IOF Regionals 6th Asia Pacific Osteoporosis Meeting. Singapore.
- 11 Jiang, D. and Hosking, D. (November 2016). Poster Presentation. Volunteering Benefits Life Satisfaction and Cognitive Functioning in Elderly. 49th AAG Conference. Canberra, Australia.
- 12 Kiely, K.M., Mortby, M.E. and Anstey, K.J. (July 2016). Poster Presentation. Sensory Loss in Older Adults at Risk of Cognitive Impairment Predicts Neuropsychiatric Symptom Related Distress Among their Immediate Family Members. Alzheimer's Association International Conference. Toronto, Canada.
- 13 Louviere, J., Bateman, H., Thorp, S. and Eckert, C. (2016). Developing New Financial Literacy Measures to better Link Financial Capability to Outcomes. Report for Financial Literacy Australia.
- 14 O'Connor, C.M., Clemson, L., Kaizik, C., Daveson, N., Hodges, J.R., Hsieh, S., Piguat, O. and Mioshi, E. (August 2016). Poster Presentation. Distinct Neuropsychiatric Subtypes of Behavioural Variant FTD have Different Functional Profiles. 10th International Conference on Frontotemporal Dementias. Munich, Germany.
- 15 Sargent-Cox, K. and Anstey, K.J. (2016). Women's Health and Wellbeing in the ACT. Report prepared for the ACT Office of Women.
- 16 Xu, M., Sherris, M. and Shao, A.W. (September 2016). Poster Presentation. Housing and Retirement Financing: Optimal Time to Buy a Residential Home. UNSW Business School 2016 Student Research Fair. Sydney, Australia.
- 17 Zanjari, N., Sharifian, M., Hosseini-Chavoshi, M., Rafiey, H. and Mohammadi, F. (September 2016). Poster Presentation. The Dimensions of Successful Ageing in Iran: Structure and Agency. The 2016 European Population Conference. Mainz, Germany.

E1 CONFERENCE – FULL WRITTEN PAPER – REFEREED PROCEEDINGS

- 1 Curryer, C. (November 2016). Ageing-in-place and the Risks Associated with Housing in Later Life. *Proceedings of The Australian Sociological Association (TASA) Conference, Cities and Successful Societies*. Melbourne, Australia, 39-45.
- 2 Curryer, C. (October 2016). 'Remember, I Live with my Mother': The Housing Circumstances of Women Baby Boomers in Australia. *Proceedings of the 15th National Conference of Emerging Researchers in Ageing*. Canberra, Australia, 42-44.
- 3 Neal, T. (June 2016). Multidimensional Parameter Heterogeneity in Panel Data Models. *Proceedings of the 22nd Panel Data Conference*. Perth, Australia.
- 4 Trinh, Q. (October 2016). Life Satisfaction of Older People: The Case of Vietnam. *Proceedings of the 15th National Conference of Emerging Researchers in Ageing*. Canberra, Australia, 59-62.

E4 UNPUBLISHED CONFERENCE PRESENTATIONS

- 1 Abalos, J. (March 2016). Provision of Care and Exchange of Support among Older Persons in the Philippines. Long-term Care for Elderly in ASEAN Plus Three. Singapore.
- 2 Abalos, J. (November 2016). Explaining Regional Variations in Health Expectancy in the Philippines. Australian Population Association Biennial Conference 2016. Sydney, Australia.
- 3 Abalos, J. (October 2016). Living Arrangements of Older Persons in the Philippines: Patterns and Determinants. 15th National Conference of Emerging Researchers in Ageing. Canberra, Australia.
- 4 Alonso García, J. and Devolder, P. (March 2016). Optimal Mix between Pay-as-you-go and Funding in a Multi-generational Overlapping Generations Model. Mathematical and Statistical Methods for Actuarial Sciences and Finance. Paris, France.
- 5 Alonso García, J. and Wood, O. (December 2016). Pricing and Hedging Guaranteed Minimum Withdrawal Benefits under a General Levy Framework using the COS Method. The Quantitative Methods in Finance 2016 Conference. Sydney, Australia.

RESEARCH OUTPUTS

- 6 Alonso García, J., del Carmen Boado-Penas, M. and Devolder, P. (2016). Economic and Demographic Risks for Pay-as-you-go Pension Schemes: Defined Benefit versus Defined Contribution. *Mathematical and Statistical Methods for Actuarial Sciences and Finance*, April, Paris, France and the 3rd European Actuarial Journal Conference, September, Lyon, France.
- 7 Anstey, K.J. (November 2016). Cognitive and Brain Ageing: How Does Diet Matter? Nutrition Society of Australia Annual Scientific Meeting. Melbourne, Australia.
- 8 Anstey, K.J. (December 2016). Dementia Risk Reduction Trials Involving Diet and Physical Activity. 2016 International Congress of Behavioral Medicine. Melbourne, Australia.
- 9 Anstey, K.J. (May 2016). Dementia Collaborative Research Centre: Early Diagnosis and Prevention – Overview and Update. NNIDR Australian Dementia Forum. Brisbane, Australia.
- 10 Anstey, K.J. (November 2016). Reimagining our Future for Driving in Later Life. 49th AAG Conference. Canberra, Australia.
- 11 Appannah, A., Enticott, J., Browning, C. and Walsh, A. (November 2016). Community Health Service needs of Centenarians. 49th AAG Conference. Canberra, Australia.
- 12 Barnett, A., Cerin, E., Zhang, C., Sit, C., Johnston, J., Cheung, M. and Lee, R. (November 2016). Associations between the Neighbourhood Environment Characteristics and Physical Activity in Older Adults with Specific Types of Chronic Disease States. 6th International Congress on Physical Activity and Public Health. Bangkok, Thailand.
- 13 Barnett, D., Van Cauwenberg, J., Nathan, A. and Cerin, E. (2016). Built Environmental Correlates of Older Adults' Overall Physical Activity: An Updated Systematic Review. World Congress on Active Ageing. June, Melbourne, Australia and the 6th International Congress on Physical Activity and Public Health, November, Bangkok, Thailand.
- 14 Bateman, H. (March 2016). Managing the Transition. Post Retirement Conference. Sydney, Australia.
- 15 Bateman, H. (October 2016). The Power and Limitations of Defaults to Change a Nations' Savings Behaviour. NZ-OECD Global Symposium on Financial Education. Auckland, New Zealand.
- 16 Bateman, H., Dobrescu, L.I., Newell, B., Ortmann, A. and Thorp, S. (2016). Flicking the Switch: How Prescribed Disclosures Drive Retirement Plan Choice. 45th Conference of Economists, July, Adelaide, Australia and Mopact International Workshop: Financial Literacy and Pension-related Communication for better Retirement and Long-term Financial Decisions, September, Turin, Italy.
- 17 Bei, L. (May 2016). Australian Superannuation: 20 Years of Experience and Reforms. Second Pillar Pension in China: Professional Annuity Workshop. Beijing, China.
- 18 Bei, L. (September 2016). Changes in the Disability Prevalence and Health Life Expectancy of the Elderly Population in China from 2000-2010. 38th Australian Conference for Health Economists. Fremantle, Australia.
- 19 Bei, L. and Zhu, Y. (June 2016). ADLS and LTC System Mortality: Case in Qingdao. Urbanization and Social Development Forum. Qingdao, China.
- 20 Bonekamp, J. (July 2016). Gradual Retirement of Men in the Netherlands: Analysis of Trends with an Age-period-cohort Model. 24th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 21 Bonollo, B. (February 2016). Formal vs Informal Care in Old Age: The Role of Social Ties. 13th Annual CEPAR Summer Workshop in the Economics of Health and Ageing. Sydney, Australia.
- 22 Booth, H. (April 2016). Epidemiologic Transitions and Mortality Differentials in Twentieth Century Australia. Workshop on Heterogeneity in Mortality. Canberra, Australia.
- 23 Booth, H. (November 2016). Coherent Forecasting with Standards. Biennial Conference of the Australian Population Association. Sydney, Australia.
- 24 Booth, H. (November 2016). Population Ageing and its Challenges in Asia. Biennial Conference of the Australian Population Association. Sydney, Australia.
- 25 Brady, J. (July 2016). Bodies Ageing with and without Parkinson's Disease. 3rd Forum of Sociology: The Futures We Want: Global Sociologies and the Struggle for a Better World. Vienna, Austria.
- 26 Burns, R. (November 2016). Reassessing Quality of Life in the Fourth Age. 49th AAG Conference. Canberra, Australia.
- 27 Butterworth, P. (July 2016). Effects of Work Characteristics on Health and Wellbeing. Mid-life Employment: Determinants, Consequences, and Policy Workshop. Sydney, Australia.
- 28 Byles, J.E. (November 2016). Capitalising on Longitudinal Data to Evaluate Aged Care. 49th AAG Conference. Canberra, Australia.
- 29 Byles, J.E., D'Este, C. and Yiengprugsawan, V. (November 2016). Regional Variations in Self-rated Health and Independence among Older Chinese. The Gerontological Society of America's 69th Annual Scientific Meeting. New Orleans, USA.
- 30 Byles, J.E. (April 2016). Staying Connected in Later Life. 2016 U3E Network Conference. Belmont, Australia.
- 31 Byles, J.E. and Powers, J. (May 2016). 'From Womb to Tomb': A Lifetime of Longitudinal Data. Reaping the Benefits: Australian Longitudinal Study on Women's Health Scientific Meeting. Newcastle, Australia.
- 32 Capatina, E. and Fan, X. (September 2016). College Spouse, Healthy Life. 38th Australian Conference for Health Economists. Fremantle, Australia.
- 33 Cerin, E., Barnett, A., Barnett, D., Nathan, A. and Van Cauwenberg, J. (November 2016). Which Factors of the Built Environment Influence Recreation Physical Activity Levels Among Older Adults? 6th International Congress on Physical Activity and Public Health. Bangkok, Thailand.
- 34 Cerin, E., Barnett, D., Barnett, A., Van Cauwenberg, J. and Merom, D. (June 2016). Neighbourhood Environments and Active Ageing: A Sampler of Research across the Globe using Different Methods. World Congress on Active Ageing. Melbourne, Australia.
- 35 Cerin, E., Zhang, C.J.P., Barnett, A., Sit, C.P.H., Cheung, M.C.M., Johnston, J.M., Lai, P.C. and Lee, R.S.Y. (June 2016). Associations of Objectively-assessed Neighbourhood Characteristics with Older Adults' Physical Activity and Sedentary Time in an Ultra-dense Urban Environment: Findings from the ALECS Study. International Conference on Geographies of Health and Living in Cities: Making Cities Healthy for All. Hong Kong, China.
- 36 Chopra, S. (October 2016). Mapping Differences in Brain Myelin between Midlife and Early-old Age. 15th National Conference of Emerging Researchers in Ageing. Canberra, Australia.
- 37 Clemson, L. (July 2016). Community Based Fall Prevention: Embedding Balance and Strength in Daily Life Activity. ExPAAC Symposium Academy of Geriatric Physiotherapists. Indianapolis, USA.
- 38 Curry, C. (November 2016). Re-imagining Relationships: The Experience of Childlessness in Later Life. 49th AAG Conference. Canberra, Australia.

- 39 Curtis, R.G., Huxhold, O. and Windsor, T.D. (November 2016). Social Activity in Midlife and Older Age: A Cause or Outcome of Perceived Control? Findings from the German Ageing Survey. The Gerontological Society of America's 69th Annual Scientific Meeting. New Orleans, USA.
- 40 Dudley, D. (November 2016). The Busy-ness of Retirement: Personal Goals, Diaries and To-do Lists. 49th AAG Conference. Canberra, Australia.
- 41 Eftekhari, P. (October 2016). Medical Service Utilization among Australian Older Women with Asthma. 15th National Conference of Emerging Researchers in Ageing. Canberra, Australia.
- 42 Fang, H. (July 2016). Life Insurance and Life Settlement. 24th Annual Colloquium of Superannuation Researchers. Sydney Australia.
- 43 Fang, H. (July 2017). The Roles of Housing in Retirement Income Security in China. Annual Workshop on Population Ageing and the Chinese Economy. Sydney, Australia.
- 44 Fiebig, D. (February 2016). From Big to Smart Data: Health Care mix in Response to Health Shocks. 13th Annual CEPAR Summer Workshop in the Economics of Health and Ageing. Sydney, Australia.
- 45 Gong, C. and Kendig, H. (November 2016). Health Impacts on Ageing Workers in Australia and China. 49th AAG Conference. Canberra, Australia.
- 46 Gong, C. and Kendig, H. (October 2016). Impacts of Voluntary and Involuntary Job Exits at Mature Age on Individual Wellbeing: Evidence from HILDA. The Longitudinal Data Conference. Canberra, Australia.
- 47 Haffner, M., Ong, R. and Wood, G. (May 2016). Housing Wealth and Aged Care: Issues and Options. Housing Wealth and Welfare Conference. Amsterdam, The Netherlands.
- 48 Hanewald, K. (2016). Trends in Retirement Incomes of Older Chinese. Urbanization and Social Development Forum, June, Qingdao, China, 24th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia, 7th China International Conference on Insurance and Risk Management, July, Xi'an, China and the Asia-Pacific Risk and Insurance Association 2016 Annual Conference, July, Chengdu, China.
- 49 He, C. and Fan, X. (August 2016). Multi-market Simultaneous Search: Theory and Application. 69th European Meeting of the Econometric Society. Geneva, Switzerland.
- 50 Hoang, C. and Booth, H. (November 2016). Intergenerational Support in the Context of Socio-economic Change in Vietnam. 49th AAG Conference. Canberra, Australia.
- 51 Hosking, D. (July 2016). Mid-life Employment and Late Life Cognition Functioning. Mid-life Employment: Determinants, Consequences, and Policy Workshop. Sydney, Australia.
- 52 Hosking, D. (November 2016). Informant-reported Cognitive Decline and Life-engagement in the PATH Study. 49th AAG Conference. Canberra, Australia.
- 53 Hosseini-Chavoshi, M. (May 2016). Fertility Projection in Iran: A New Approach to Measurement of Fertility. The 2016 ICRHC. Tehran, Iran.
- 54 Hosseini-Chavoshi, M. (November 2016). Ageing and Health System in Iran. Health Systems for Ageing Societies in Asia and the Pacific Workshop. Melbourne, Australia.
- 55 Hosseini-Chavoshi, M. and Abbasi-Shavazi, M.J. and McDonald, P. (September 2016). Fertility Regulation in Iran: An Analysis of Reproductive Life History and Synthetic Parity Progression Ratios. The 2016 European Population Conference. Mainz, Germany.
- 56 Hosseini-Chavoshi, M. and McDonald, P. (June 2016). Analysis of Fertility Trends using Three Parameters: Age, Parity and Interval since Previous Birth: The Case of Iran. Human Fertility Database Symposium. Berlin, Germany.
- 57 Hunt, A. (June 2016). Measuring the Mental Health Needs of Elderly Indonesians. Mental Health and Cultural Diversity International Conference: Exploring Transformative Practices and Service Models. Leicester, UK.
- 58 Hunt, A. and Villegas, A. (2016). Mortality Improvement Rates: Modelling and Parameter Uncertainty. Second International Congress on Actuarial Science and Quantitative Finance, June, Cartagena, Colombia and the 20th International Congress on Insurance: Mathematics and Economics, July, Atlanta, USA.
- 59 Hussain, R. (November 2016). Perceptions of Ageing: Older People and Healthcare Professionals. 49th AAG Conference. Canberra, Australia.
- 60 Iskhakov, F. (June 2016). An Analysis of the Australian Social Security System using a Life-Cycle Model of Labor Supply with Asset Accumulation and Human Capital. International Association for Applied Econometrics 2016 Annual Conference. Milan, Italy.
- 61 Iskhakov, F. (June 2016). Estimating Discrete-Continuous Choice Models: The Endogenous Grid Method with Taste Shocks. 22nd International Conference on Computing in Economics and Finance. Bordeaux, France.
- 62 Iskhakov, F. (October 2016). Effects of Taxes and Safety Net Pensions on Life-Cycle Labor Supply, Savings and Human Capital: The Case of Australia. Longitudinal Data Conference 2016. Canberra, Australia.
- 63 Jukic, M. (November 2016). Life Expectancies of Persons in Residential Aged Care. 49th AAG Conference. Canberra, Australia.
- 64 Keane, M.P. (July 2016). Mid-life Employment and the Changing Demographic Structure. Mid-life Employment: Determinants, Consequences, and Policy Workshop. Sydney, Australia.
- 65 Kendig, H. (June 2016). Understanding the Living Longer, Living Better Initiatives. International Federation on Ageing. Brisbane, Australia.
- 66 Kendig, H. (November 2016). Attitudes towards Inter-generational Equity and Social Change. 49th AAG Conference. Canberra, Australia.
- 67 Kiely, K. (November 2016). Productive and Healthy Working Life Expectancies in Australia. 49th AAG Conference. Canberra, Australia.
- 68 Kiely, K. (November 2016). Sensory Impairment and Neuropsychiatric Symptoms. 49th AAG Conference. Canberra, Australia.
- 69 Kiely, K. (October 2016). Healthy Working Life Expectancies in Australia. The Longitudinal Data Conference. Canberra, Australia.
- 70 Kiely, K., Mortby, M.E. and Anstey, K.J. (July 2016). Sensory Loss and Neuropsychiatric Symptoms in Older Adults at Risk of Cognitive Impairment. Alzheimer's Association International Conference. Toronto, Canada.
- 71 Kumru, C. and Nakornthab, A. (2016). Annuities and Estate Taxation in an Entrepreneurship Model. European Meeting of the Econometric Society, August, Geneva, Switzerland and Asian Meeting of the Econometric Society, August, Kyoto, Japan.
- 72 Li, H. (September 2016). Semi-parametric Extensions of the Cairns-Blake-Dowd model: A One-dimensional Kernel Smoothing Approach. International Mortality and Longevity Symposium 2016. London, UK.
- 73 Lu, B. (July 2016). ADLs and Exit Probability of Long Term Care Insurance: A Case Study. 24th Annual Colloquium of Superannuation Researchers. Sydney, Australia.

RESEARCH OUTPUTS

- 74 Lu, B. (November 2016). Intergenerational Transfers and Informal Care to Disabled Elderly Persons in China: Evidence from CHARLS. The 7th APRU Research Symposium on Ageing in the Asia-Pacific. Beijing, China.
- 75 Magnani, E. (July 2016). Organizational Changes and Workers' Training. Mid-life Employment: Determinants, Consequences, and Policy Workshop. Sydney, Australia.
- 76 McDonald, P. (April 2016). Women as Agents in Fertility Decision-making, 1870-1920. 2016 Annual Meeting of the Population Association of America. Washington D.C., USA.
- 77 McDonald, P. (March 2016). Trends in International Migration to Australia, with Reference to Caring Occupations. ASSA Workshop on Gender, Migration and the Provision of Social Care. Sydney, Australia.
- 78 McDonald, P. (November 2016). An Overview of Population Ageing in Asia. 49th AAG Conference. Canberra, Australia.
- 79 McDonald, P. (October 2016). Longitudinal Panel Surveys and their Relevance to Policy Making. Longitudinal Data Conference 2016. Canberra, Australia.
- 80 McDonald, P. (October 2016). Panel: Where to From Here – The Future View of Longitudinal Data. Longitudinal Data Conference 2016. Canberra, Australia.
- 81 McDonald, P. (October 2016). Population Policies in Asia. Asian Population Forum. Shanghai, China.
- 82 McGann, M., Ong, R., Bowman, D., Duncan, A., Kimberley, H. and Biggs, S. (June 2016). A Gendered Analysis of Age Discrimination among Older Jobseekers in Australia. International Federation on Ageing. Brisbane, Australia.
- 83 Meyer, C., Browning, C. and Appannah, A. (November 2016). Diversity Training for Community Aged Care Workers - The Journey from Theory to Practice. The Gerontological Society of America's 69th Annual Scientific Meeting. New Orleans, USA.
- 84 Meyer, C., Ogrin, R., Al-Zubaidi, H., Appannah, A., McMillan, S., Barrett, E. and Browning, C. (November 2016). Diversity Training for Health and Aged Care Workers: An Interdisciplinary Meta-narrative Approach. The Gerontological Society of America's 69th Annual Scientific Meeting. New Orleans, USA.
- 85 Milledge, K. (October 2016). Associations between Nutrient Intake and Composition of Functional Tooth Units in Older Men: The Concord Health and Ageing in Men Project. 15th National Conference of Emerging Researchers in Ageing. Canberra, Australia.
- 86 Mitchell, O.S. (July 2016). Simplifying Choices in Defined Contribution Retirement Plan Design. 24th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 87 Neal, T. (July 2016). Multidimensional Parameter Heterogeneity in Panel Data Models. 2016 Australasia Meeting of the Econometric Society. Sydney, Australia.
- 88 Oberos, M.A.C. and Abalos, J. (August 2016). Labour Force Participation of Older Persons in the Philippines: Trends, Patterns and Correlates. European Population Conference 2016. Mainz, Germany.
- 89 O'Connor, C.M., Clemson, L., Brodaty, H., Hodges, J.R., Piguët, O., Gitlin, L.N. and Mioshi, E. (October 2016). The Tailored Activities Program (TAP): Experiences from the Australian Trial. Forward Thinking: Innovatively Working with People with Dementia Forum, Occupational Therapy Australia. Adelaide, Australia.
- 90 O'Connor, C.M., Clemson, L., Hornberger, M., Leyton, C.E., Hodges, J.R., Piguët, O. and Mioshi, E. (July 2016). The Longitudinal Interplay of Behavioral Symptoms and Functional Decline in Frontotemporal Dementia. Alzheimer's Association International Conference. Toronto, Canada.
- 91 O'Loughlin, K. (November 2016). Age Discrimination in the Workplace: The More Things Change... 49th AAG Conference. Canberra, Australia.
- 92 Ong, R. (November 2016). Housing Wealth and Age Care - Policies Compared. 49th AAG Conference. Canberra, Australia.
- 93 Phillipson, C. Buffel, T. and Kendig, H. (Brisbane 2016). A Political Economy Interpretation of Land Use and Transport Investment in Canberra. International Federation on Ageing. Brisbane, Australia.
- 94 Piggott, J. (June 2016). Challenges of an Ageing Demographic: A Developed Country's Perspective. Urbanization and Social Development Forum. Qingdao, China.
- 95 Piggott, J. (November 2016). Superannuation: Where to From Here. 49th AAG Conference. Canberra, Australia.
- 96 Pitacco, E. (July 2016). High Age Mortality and Frailty. Some Remarks and Hints for Actuarial Modelling. 51st Actuarial Research Conference. Minneapolis, USA.
- 97 Pitacco, E. (June 2016). ERM and QRM in Life Insurance and Life Annuities. Croatian Actuarial Conference 2016. Zagreb, Croatia.
- 98 Trinh, Q. (November 2016). Financial and Practical Support from Adult Children to Older Parents in Vietnam. The Gerontological Society of America's 69th Annual Scientific Meeting. New Orleans, USA.
- 99 Sargent-Cox, K. (November 2016). The Burden of Age. 49th AAG Conference. Canberra, Australia.
- 100 Sherris, M. (January 2016). Managing Retirement Risks with Reverse Mortgage Loans and Long Term Care Insurance. Western Risk and Insurance Association Annual Meeting. Wailea, USA.
- 101 Sherris, M., Li, Z. and Shao, A.W. (July 2016). The Impact of Systematic Trend and Uncertainty on Mortality and Disability in a Multi-State Latent Factor Model for Transition Rates. Asia-Pacific Risk and Insurance Association 2016 Annual Conference. Chengdu, China.
- 102 Sherris, M., Papagerogiou, N. and Reeves, K. (May 2016). Equity Investing with Targeted Constant Volatility Exposure. AFIR ERM Colloquium of the International Actuarial Association. Edinburgh, UK.
- 103 Sherris, M., Shao, A.W. and Chen, H. (July 2016). To Borrow or Insure? Long Term Care Costs and the Impact of Housing. 24th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 104 Silverstein, M., Gong, C. and Kendig, H. (November 2016). Perceived Future ADL Care Support and its Impact on Psychological Wellbeing among Older Chinese. 2016 GSA Annual Scientific Meeting. New Orleans, USA.
- 105 Stevens, R. (July 2016). Sustainable Retirement Income Policies in an Ageing Society: Lessons from the UK, Australia and the Netherlands. 24th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 106 Thøgersen-Ntoumani, C., Ntoumanis, N., Burton, E., Hill, K., Cerin, E. and Biddle, S. (June 2016). The Residents in Action Trial (RIAT): Promoting Walking, Less Sitting, and Better Mental Health in Residents in Retirement Villages. World Congress on Active Ageing. Melbourne, Australia.
- 107 Trinh, Q. (November 2016). Vietnamese Older People's Material Contributions in Ageing Population Context. 49th AAG Conference. Canberra, Australia.
- 108 Utomo, I. (November 2016). Meeting the Needs of Older Persons in Winong, Giriasih and Salo in Rural Indonesia: Research and Policy Approaches. 49th AAG Conference. Canberra, Australia.

- 109 Villegas, A. (September 2016). On Bayesian Two-Population Mortality Models for the Assessment of Bases Risk in Longevity Hedges. International Mortality and Longevity Symposium 2016. London, UK.
- 110 Villegas, A., Millossovich, P. and Kaishev, V.K. (July 2016). StMoMo: An R package for Stochastic Mortality Modelling. 51st Actuarial Research Conference. Minneapolis, USA.
- 111 Wesson, J. (May 2016). 'Falls Prevention outside the Box' Creative Interventions for People Living with Dementia. NSW Falls Prevention Network Forum. Sydney, Australia.
- 112 Windsor, T.D. and Hunter, M. (June 2016). What Makes People Resilient to Negative Life Events? Results from a Survey of Older South Australians. World Elder Abuse Awareness Day Conference. Adelaide, Australia.
- 113 Wu, S., Bateman, H., Stevens, R. and Thorp, S. (2016). Demand for Income-Indemnity Long Term Care Insurance: Determinants and Interplay with Annuitization Choices. Boulder Summer Conference on Consumer Financial Decision Making, May, Boulder, Colorado and 24th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia.
- 114 Wu, S., Bateman, H., Stevens, R. and Thorp, S. (August 2016). Long-term Care Risk, Income Streams and Late in Life Savings. American Risk and Insurance Association Annual Meeting 2016. Boston, USA.
- 115 Xu, M. (April 2016). Mortality Heterogeneity and Systematic Mortality Improvement. Australian National University Workshop on Heterogeneity in Mortality. Canberra, Australia.
- 116 Xu, M., Sherris, M. and Shao, A. (2016). Housing and Retirement Financing: Optimal Time to Buy a Residential Home. 51st Actuarial Research Conference, July, Minneapolis, USA, 20th International Congress on Insurance: Mathematics and Economics (IME), July, Atlanta, USA, 24th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia.
- 117 Xu, X. (July 2016). Effects of Superannuation on Housing, Wealth and the Age Pension. 24th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 118 Yiengprugsawan, V. (August 2016). Social Capital and Quality of Life among Older Chinese: Evidence from the WHO Study on Global Ageing and Adult Health. 2016 China Road Conference. Newcastle, Australia.
- 119 Yiengprugsawan, V. (November 2016). Health Service Responses and Preparedness for Non-Communicable Diseases in Older Populations: Case Studies of Sri Lanka and Thailand. Health Systems for Ageing Societies in Asia and the Pacific Workshop. Melbourne, Australia.
- 120 Yiengprugsawan, V. (November 2016). Socioeconomic Influence on Quality of Life among Older Chinese. 49th AAG Conference. Canberra, Australia.
- 121 Yiengprugsawan, V. and Seubsman, S. (November 2016). Studying the Thai Health-risk Transition. 49th AAG Conference. Canberra, Australia.
- 122 Zhang, X. (2016). Female Labour Force Participation and Informal Care in Rural China. The Impact of the New Cooperative Medical Scheme. Annual Workshop on Population Ageing and the Chinese Economy, July, Sydney, Australia and 24th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia.
- 123 Zhang, X. (2016). Health Insurance and Female Labour Force Participation in Rural China. The 7th APRU Research Symposium on Ageing in the Asia-Pacific, November, Beijing, China and The 16th China Economics Annual Conference, December, Wuhan, China.
- 124 Zhao, Z. (April 2016). A Closer Examination of Summer Mortality Peaks in Taiwan. Xi'an University – Stanford University Summer Forum. Stanford, USA.
- 3 Bateman, H. (December 2016). Promoting Savings and Boosting Long Term Savings: The Superannuation/Private Pension Scheme in Australia. International Forum on Economic Development and Public Policy. Bali, Indonesia.
- 4 Bateman, H. (July 2016). Pension Reforms in Australia and China: Comparisons and Lessons. The Fourth Annual Workshop of Economic and Political Studies – Ageing and its Implications: China and the World. Beijing, China.
- 5 Bateman, H. (June 2016). Adjustment of Eligibility Age for Public Pension Systems. Tokyo Fiscal Forum (IMF), Fiscal Policy for Long Term Growth and Sustainability in Ageing Societies. Tokyo, Japan.
- 6 Cerin, E. (June 2016). Urban Spaces and Active Ageing: A National and International Agenda. World Congress on Active Ageing. Melbourne, Australia.
- 7 Chomik, R. (October 2016). Population Ageing and Social Security in Asia. United Nations Expert Group Meeting on Changing Population Age Structures and Sustainable Development. New York, USA.
- 8 Clemson, L. (February 2016). Lifestyle – Integrated Functional Exercise Program to Reduce Falls. European Union Falls Festival: Implementation of Innovation into Policy and Practice. Bologna, Italy.
- 9 McDonald, P. (November 2016). Ageing in Rural Areas of Pacific Rim Countries. The 7th APRU Research Symposium on Ageing in the Asia-Pacific. Beijing, China.
- 10 Piggott, J. and Chomik, R. (June 2016). Targeting Pensions: Who is Affected? Research Challenges for Global Pensions: Trends and Heterogeneity. Paris, France.
- 11 Piggott, J. (September 2016). Income, Family and Changing Values. HelpAge Asia-Pacific Regional Conference on Ageing 2016. Hanoi, Vietnam.
- 12 Piggott, J. and Chomik, R. (October 2016). Long Term Care Concepts, Trends and Reforms: A view from Australia. Long Term Care in Latin America Workshop. Washington D.C., USA.
- 13 Pitacco, E. (April 2016). Guarantees and Product Design in Life & Health Insurance. 2nd European Congress of Actuaries. Bruxelles, Belgium.
- 14 Pitacco, E. (June 2016). Mortality at Very Old Ages. Some Remarks and Hints for Actuarial Modelling. International Workshop on Perspectives on Financial and Actuarial Modelling. Fisciano, Italy.
- 15 Pitacco, E. (September 2016). Heterogeneity in a Life Annuity Portfolio. Modeling Issues and Risk Assessment. 3rd European Actuarial Journal Conference. Lyon, France.
- 16 Sherris, M., Shao, A.W. and Chen, H. (2016). To Borrow or Insure? Long Term Care Costs and the Impact of Housing. 7th China International Conference on Insurance and Risk Management, July, Xi'an, China and Second International Congress on Actuarial Science and Quantitative Finance, June, Cartagena, Colombia.

INVITED PRESENTATIONS TO MAJOR INTERNATIONAL MEETINGS

- 1 Anstey, K.J. (June 2016). Sex Differences in the Epidemiology of Dementia. Australia and New Zealand Society of Geriatric Medicine 2016 Annual Scientific Meeting. Cairns, Australia.
- 2 Anstey, K.J. (May 2016). Population Health Approaches to Cognitive Health Promotion and Dementia Risk Reduction. 2016 Conference on Promoting Healthy Brain Aging and Preventing Dementia: Research and Translation. Banff, Canada.

RESEARCH OUTPUTS

SEMINAR PRESENTATIONS

- 1 Alonso García, J. (April 2016). Guarantee Valuation in Unfunded Pension Schemes. Amsterdam School of Economics Seminar Series. Amsterdam, The Netherlands.
- 2 Alonso García, J. (September 2016). Economic and Demographic Risks for Pay-as-you-go Pension Schemes: Defined Benefit versus Defined Contribution. LPMA Seminar. Paris, France.
- 3 Alonso García, J. (September 2016). Guarantee Valuation in Unfunded Pension Systems. CEFRA Seminar. Lyon, France.
- 4 Andel, R. (May 2016). Occupation and Cognitive Health. CRAHW Seminar Series. Canberra, Australia.
- 5 Burns, R. (April 2016). The Futility of Between-Nation Wellbeing Comparisons. CRAHW Seminar Series. Canberra, Australia.
- 6 Byles, J.E. (October 2016). 19-90: A Long View of Life from the Australian Longitudinal Study on Women's Health. Taipei Medical University Seminar. Taipei, Taiwan.
- 7 Byles, J.E. (October 2016). A Woman's Work is Never Done: A Life Course Approach to Women, Work and Caring. University of Tasmania Seminar. Hobart, Australia.
- 8 Capatina, E. (2016). Selection in Employer Provided Health Insurance. Pensions and Superannuation Seminar Series, April, Sydney, Australia, UNSW Economics Empirical Micro Workshop, April, Sydney Australia and CRAHW Seminar Series, April, Canberra, Australia.
- 9 Capatina, E. (December 2016). Selection in Employer Provided Health Insurance. GRIPS Economics Seminar. Tokyo, Japan.
- 10 Capatina, E. (October 2016). Why a College Spouse Brings Healthy Life? Pensions and Superannuation Seminar Series. Sydney, Australia.
- 11 Capatina, E., Maruyama, S. and Keane, M. (November 2016). Health and Earning Dynamics. UNSW Economics Internal Seminar. Sydney, Australia.
- 12 Chomik, R. (March 2016). A Statistical Portrait of the Older Australian. Suncorp Retirement Solutions Workshop. Sydney, Australia.
- 13 Curryer, C. (June 2016). A View of Home: The Housing and Social Circumstances of Childless Women in Later Life. Research Higher Degree Symposium. Newcastle, Australia.
- 14 Curryer, C. (October 2016). 'Remember, I Live with my Mother': The Housing Circumstances of Women Baby Boomers in Australia'. Research Centre for Generational Health & Ageing Seminar. Newcastle, Australia.
- 15 Falkiner, A. (April 2016). Dual Care in Australia: Investigating the Predictors and Impacts of Combining Informal Care with Other Child Care Responsibilities. School of Demography PhD Final Seminar. Canberra, Australia.
- 16 Haffner, M., Ong, R. and Wood, G. (May 2016). Housing Wealth and Aged Care: Issues and Options. Housing Governance Group, Delft University. Delft, The Netherlands.
- 17 Holzmann, R. (November 2016). Heterogeneity in Longevity: Dimensions, Scope, and Implications for Pension System Design and Reform. Pensions and Superannuation Seminar Series. Sydney, Australia.
- 18 Hosking, D. (October 2016). Informant-reported Cognitive Decline and Activity Engagement Across Four Years in a Community Sample. CRAHW Seminar Series. Canberra, Australia.
- 19 Hosseini-Chavoshi, M. (June 2016). Childbearing in Iran: A Model of Forecasting birth. National Institute of Population Research. Tehran, Iran.
- 20 Hunt, A. (July 2016). Measuring the Mental Health Needs of Elderly Indonesians. Institute of Social Studies, Erasmus University. Rotterdam, The Netherlands.
- 21 Iskhakov, F. (2016). Recursive Lexicographical Search: Finding all Markov Perfect Equilibria of Finite State Directional Dynamic Games. Department of Economics, University College London, January, London, UK, Department of Economics, University of Massachusetts, January, Amherst, USA, Department of Economics, Concordia University, January, Montreal, Canada, Research School of Economics Seminar, ANU, February, Canberra, Australia, International College of Economics and Finance (ICEF), Higher School of Economics, September, Moscow, Russia and New Economic School, September, Moscow Russia.
- 22 Iskhakov, F. (May 2016). An Analysis of the Australian Social Security System using a Life-Cycle Model of Labor Supply with Asset Accumulation and Human Capital. Pensions and Superannuation Seminar Series. Sydney, Australia.
- 23 Iskhakov, F. (September 2016). A Dynamic Model of Vehicle Ownership, Type Choice, and Usage. Department Seminar, Higher School of Economics. St Petersburg, Russia.
- 24 Iskhakov, F. (September 2016). Nested Recursive Lexicographical Search: Structural Estimation of Dynamic Directional Games with Multiple Equilibria. Centre for Computational Economics Seminar. Copenhagen, Denmark.
- 25 Kudrna, G., Tran, C. and Woodland, A. (April 2016). Facing Demographic Challenges: Pension Cuts or Tax Hikes. QUT School of Economics and Finance. Brisbane, Australia.
- 26 McDonald, P. (August 2016). Health Systems and Population Ageing. Lecture to the Master of Public Health. Melbourne, Australia.
- 27 McDonald, P. (July 2016). The Demography of Ageing. Lecture to the Master of Ageing Course. Canberra, Australia.
- 28 O'Donoghue Jenkins, L. (November 2016). Using and Evaluating Evidence: Policy Makers vs Researchers. Emerging Researchers in Ageing Workshop. Canberra, Australia.
- 29 Silverstein, M., Gong, C. and Kendig H. (2016). Perceived Availability of Future Care and Psychological Wellbeing of Older Adults in China. CRAHW Seminar Series. Canberra, Australia.
- 30 Trinh, Q. (October 2016). Older People's Contributions in an Ageing Vietnam. CRAHW Seminar Series. Canberra, Australia.
- 31 Villegas, A. (February 2016). A Comparative Study of Two Population Models for the Assessment of Basis Risk in Longevity Hedges. Primeras Jornadas de Actuaría y Finanzas. Manizales, Colombia.
- 32 Wu, S. (November 2016). Demand for Long-term Care Insurance: Can a Rational Life-cycle Model with Calibrated Individual Utility Parameters Explain Stated Preferences? Pensions and Superannuation Seminar Series. Sydney, Australia.
- 33 Wu, S., Bateman, H., Stevens, R. and Thorp, S. (March 2016). Demand for Long-term Care Insurance: Matching Stated Preferences and Model Predictions. School of Risk and Actuarial Studies PhD Seminar, UNSW. Sydney, Australia.
- 34 Yiangprugsawan, V. (July 2016). Juggling Family Care and Work – The Impact on Carer's Mental Health. Policy Institute, King's College. London, UK.
- 35 Yiangprugsawan, V., Healy, J. and Kendig, H. (December 2016). Health Service Responses for Non-communicable Diseases in Older Populations: Case Studies of Sri Lanka and Thailand. CRAHW Seminar Series. Canberra, Australia.
- 36 Zhang, X. (September 2016). Health Insurance and Female Labour Force Participation in Rural China. Empirical Micro Seminar Series, School of Economics, UNSW. Sydney, Australia.

In 2016, CEPAR continued to develop all available platforms to spotlight its research achievements. The centre also hosted and supported numerous events to acknowledge these successes.

Our social media following grows. CEPAR's Twitter feed continues as an important platform for interacting with peer researchers, organisations and individuals in ageing research, policy development and service delivery.

RADAR

RADAR - The Regional Australia Database for Ageing Research - developed by CEPAR researchers, was launched in July of 2016. It is an interactive tool for accessing a wide range of demographic and economic indices about population and ageing research from national down to regional levels. RADAR was written in Excel with Visual Basic for Applications (VBA) and presents data in table and graph form. This is easily exported into another application to work with the information in more detail.

The tool, available from the CEPAR website, has been downloaded almost 200 times since going live in July.

WEBSITE AND PUBLICATIONS

The CEPAR website has had 44,249 page views in 2016 with over 55% of those being from first time visitors. Not surprisingly, the largest spikes of traffic followed the announcement of CEPAR's renewed ARC funding and the launch of RADAR.

Popular publications include the CEPAR Working Paper Series and the latest fact sheet, *The Constellations of*

Demography, which traces the global distribution of age groups from 1950-2050.

The website is CEPAR's key platform for:

- CEPAR announcements
- Accessing research publications including
 - Research Briefs and
 - Fact sheets
- Promoting and reporting on CEPAR events
- Accessing media releases and independent media coverage
- Downloading publications, including annual reports

- Identifying staff and their areas of research interest
- Employment and scholarship opportunities

MEDIA FOCUS

The July issue of HRMonthly Magazine featured John Piggott explaining the impact of age discrimination in the workplace where 40 to 45 is the cut off age for recruitment. John makes the clear point that if we are living longer, we will work for longer. The issue draws on other areas of CEPAR research, including Resources in Retirement, Ageing Well and Productively and Cognition and Decision Making. The multi-disciplinary nature of the Centre means the media calls on our researchers regularly for comment on a range of issues about population ageing. This boosts the profile of the centre and offers a broader understanding of our key research areas.



An article in the *Australian Financial Review* ('Family home target of aged care policy') by our Senior Research Fellow Rafal Chomik, urges us to think differently about the family home in retirement where vast real estate wealth could be unlocked to help meet the aged care funding gap. And Professor Kaarin Anstey, ANU Director, Centre for Research on Ageing, Health and Wellbeing, provided some reassurance to the ABC Melbourne's Drive listeners that forgetfulness is a normal part of ageing.

PRINT (NEWSPAPERS AND MAGAZINES)

The Australian Financial Review
Richer on death than retirement
11 January 2016
featuring John Piggott

East Asia Forum
Tackling China's demographic challenges
20 January 2016
featuring Zhongwei Zhao

The Courier Mail and The Adelaide Advertiser
Pensioners need fair share
15 January 2016
featuring CEPAR Research

The Canberra Times
International student numbers boom but Canberra below average on migrants
27 February
featuring Peter McDonald

The Adelaide Advertiser
More new Australian mums delay having babies until their 40s to establish their careers
9 April 2016
featuring Peter McDonald

The Canberra Times
ANU's new Centre of Research Excellence in Cognitive Health first of its kind in Australia
13 June 2016
featuring Kaarin Anstey

HRMonthly Magazine
No country for old men (or women)
July 2016 featuring John Piggott

The Age
Live well, stay well
8 August 2016 featuring Hal Kendig

The Australian Financial Review
Don't let superannuation reform become a revenue grab
20 August 2016
featuring John Piggott

The Sydney Morning Herald
Five reasons we don't have a retirement savings crisis
4 September 2016
featuring CEPAR Research

The Australian Financial Review
Family home target of aged care policy
9 September 2016
featuring Rafal Chomik

Australian Ageing Agenda
Divergent views on bold reform proposals
1 October 2016
featuring Hal Kendig

InPsych Magazine
Reducing dementia risk by targeting lifestyle factors in midlife
December 2016
featuring Kaarin Anstey

RADIO AND TELEVISION

2UE Mornings
Reluctance to spend superannuation savings means many Australians die richer than the day they retire
11 January 2016
featuring CEPAR Research

ABC Radio National Breakfast with Fran Kelly
Talking tax reform: The Henry Tax Review
10 February 2016
featuring John Piggott

774 Drive with Rafael Epstein
How to remember names
21 March 2016
featuring Kaarin Anstey

Weekend Today Show Nine News
The CHAMP study
16 April 2016
featuring Robert Cumming

WIN News Canberra and WIN News Orange
The ANU will trial a new dementia risk program
29 April 2016
featuring Kaarin Anstey

101.5FM Radio Adelaide
Communicating with people with dementia
10 August 2016
featuring Claire O'Connor

2SER 107.3
Communicating with people with dementia
16 August 2016
featuring Claire O'Connor

ABC South East NSW
Breakfast with Simon Lauder: Interview with John Piggott
12 September 2016

ABC Radio South East NSW
Breakfast Show: Suicide in older men
7 October 2016
featuring Richard Burns

ONLINE

SBS News
What will Australia's population look like in 2050?
12 January 2016
featuring Peter McDonald

The Conversation
How people mis-read risk in their super product disclosures and what it could mean for their returns
17 February 2016
featuring Hazel Bateman

ABC News
Keen to improve your memory? It might be as simple as ABC, expert explains
1 March 2016
featuring Kaarin Anstey

The Saturday Paper
The CHAMP study into geriatric male health
19 March 2016
featuring Robert Cumming

ABC News
Lifestyle to ward off dementia best started decades before old age
23 March 2016
featuring Kaarin Anstey

Policy Forum
Bare branches - China's surplus men
22 April 2016
featuring Heather Booth

Policy Forum
Live long, prosper and multiply?
22 April 2016
featuring Heather Booth

News.com.au
Company tax, jobs and the 30-year wait
10 May 2016 featuring George Kudrna and Alan Woodland

Business Think
Budget 2016: Are we heading in the right direction?
18 May 2016
featuring John Piggott

Domain
Australians are entering twilight years with \$150,000 of mortgage debt: ING Direct
9 June 2016 featuring Rachel Ong

The Conversation
Lack of housing choice frustrates would-be downsizers
7 June 2016 featuring Rachel Ong

Your Mortgage
Mortgage debt continues to plague Australians entering their twilight years
10 June 2016 featuring Rachel Ong

YourLifeChoices
Older Australians are entering retirement more than \$158,000 in debt
10 June 2016 featuring Rachel Ong

Australian National Review
Australians are entering their twilight years with \$150,000 of mortgage debt
14 June 2016 featuring Rachel Ong

YourLifeChoices
Superannuation - where did it go wrong?
6 July 2016
featuring CEPAR Research

The NeuRA blog
How to best manage the behavioural changes in frontotemporal dementia
11 July 2016
featuring Claire O'Connor

Reuters
To prevent falls, it may pay off to remodel the house
14 July 2016
featuring Lindy Clemson

Australian Ageing Agenda
Data insights forum highlights effects of aged care reforms
21 July 2016 featuring Hal Kendig

The Conversation
Let's talk about the family home ... and the pension means test
25 July 2016 featuring Rachel Ong

YourLifeChoices
Age Pension: why pension age should vary
28 July 2016 featuring CEPAR Event

The Conversation
Answering the same questions over and over: how to talk to people with dementia
9 August 2016
featuring Claire O'Connor

Science Daily
From pollution to caffeine intake: Researcher reveals dementia risks
 19 August 2016
 featuring Kaarin Anstey

Financial Standard
Vulnerable clients easily manipulated: Study
 24 August 2016
 featuring Hazel Bateman

YourLifeChoices
Is our retirement income system really broken?
 25 August 2016
 featuring John Piggott

BusinessThink
Head of School to take on Deputy Director role at CEPAR
 13 September 2016
 featuring Hazel Bateman

The Senior
Funds support vital ageing research
 19 September 2016
 featuring CEPAR Research

BusinessThink
Financial advice: Can we guard against bad experts?
 21 September 2016
 featuring Hazel Bateman

The Conversations
FactCheck Q&A: Are one in three age pensioners living under the poverty line?
 26 September 2016
 featuring Rafal Chomik

InTheBlack
Fighting ageism: The often overlooked benefits of older workers
 1 October 2016
 featuring John Piggott

HealthTimes
How to talk to people with dementia
 12 October 2016
 featuring Claire O'Connor

ARChway
The lengthening life
 12 October 2016
 featuring CEPAR Research

Startsat60
The shifting goal posts of the retirement age in Australia
 19 October featuring Rafal Chomik

BusinessThink
Which questions add up to financial literacy?
 16 November 2016
 featuring Hazel Bateman

Open Forum
The impact of population ageing and immigration on the Australian housing market
 2 December 2016
 featuring George Kudrna

END USER LINKS

PRESENTATIONS TO GOVERNMENT, INDUSTRY AND THE BUSINESS COMMUNITY

- 1 Anstey, K.J. (December 2016). Using Long-term Cohort Data to Inform Policy and Healthcare: 12 Years of the PATH Through Life Project. Australian Health and Hospital Association, National Data Collaboration Network Meeting. Canberra, Australia.
- 2 Anstey, K.J. (November 2016). Adding Health to Years: Challenges for Ageing Well. National Aged and Community Care Forum, Australian Government Department of Veteran Affairs. Canberra, Australia.
- 3 Anstey, K.J. (July 2016). Monitoring Risk Factors. World Health Organisation Stakeholder Consultation on the Global Dementia Observatory. Geneva, Switzerland.
- 4 Hunt, A. (October 2016). Towards an SOP for the Management of Depression in the Elderly. Presentation for Local Healthcare Workers and Government at the Center for Public Mental Health, University of Gadjah Mada. Yogyakarta, Indonesia.
- 5 McDonald, P. (April 2016). Drivers of Change Affecting the Future of Adequacy. ASSA/CSRI Roundtable: Retirement Income Adequacy and the Interaction with Aged Care and Health Care. Canberra, Australia.
- 6 McDonald, P. (June 2016). Demographic Change in the Asian Century. Presentation to the Council for Policy on Ageing, Health and Population. Tehran, Iran.
- 7 Ong, R. (February 2016). Securing Our Future: Meeting the Challenges of WA's Ageing Population. Age Friendly Interagency Group (AFIG). Perth, Australia.
- 8 Ong, R. (May 2016). Future: Meeting the Challenges of WA's Ageing Population. Local Government Managers' Association WA Network Age Friendly Communities Forum. Perth, Australia.
- 9 Piggott, J. (June 2016). Evidence-based Policy: Connecting with Government Decision Makers. ARC Centre Directors Forum. Sydney, Australia.
- 10 Piggott, J. (March 2016). Pension Options and Reform (BJPS – Labour), Social Safety Nets. High Level Policy Dialogue with the Indonesian Ministry of Finance. Jakarta, Indonesia.
- 11 Sherris, M. (May 2016). Longevity Risk Research at CEPAR. Presentation to International Actuarial Association Mortality Working Group. St Petersburg, Russia.
- 12 Stevens, R. (June 2016). Sustainable Retirement Income Policies in an Ageing Society. Presentation to Strategy8. Sydney, Australia.
- 13 Temple, J. and McDonald, P. (August 2016). Australian National Accounts, 1980–81 to 2009–10. Department of Social Services. Canberra, Australia.
- 14 Utomo, I. and McDonald, P. (February 2016). Preliminary Findings: Ageing in Rural Indonesia Study. Ministry of National Development and Planning. Jakarta, Indonesia.
- 15 Xu, X.C. (August 2016). Effects of Superannuation on Housing, Wealth and the Age Pension. Commonwealth Treasury Seminar. Canberra, Australia.

BRIEFINGS, COMMITTEE MEMBERSHIPS AND PARTICIPATION IN ROUNDTABLE AND PANEL DISCUSSIONS

- 1 Anstey, K.J. (July 2016). Invited Participant on World Health Organisation Consultation on the Global Dementia Observatory. Geneva, Switzerland.
- 2 Anstey, K.J. (July 2016). Member: Global Council on Brain Health. Attended Governance Committee Meeting for the Global Council on Brain Health convened by the American Associations of Retired Persons and Age UK. Toronto, Canada.
- 3 Anstey, K.J. (March 2016). Alzheimer's Australia Dementia Research Foundation Board Meeting. Australia.
- 4 Anstey, K.J. (2016). Member, ACT Dementia Advisory Group for ACT Health. Canberra, Australia.
- 5 Anstey, K.J. (May 2016). Expert Advisor for the Alberta Canada State Dementia Research Plan. Canada.
- 6 Anstey, K. J. (2016). Member, National Strategic Framework for Chronic Conditions Consultation Group. Commonwealth Department of Health. Canberra, Australia
- 7 Anstey, K.J. (April 2016). Expert Advisor to Australian College of General Practice on Dementia Risk Reduction for the 'Red Book'.
- 8 Anstey, K.J. (2016). Expert Advisor to the Australian Institute of Health and Wellbeing on Contribution of Vascular Diseases and Risk Factors to the Burden of Dementia in Australia. Canberra, Australia.
- 9 Bateman, H. (April 2016). ASSA/CSRI Roundtable: Post Retirement - Making Income the Goal. Sydney, Australia.
- 10 Chomik, R. (April 2016). ASSA/CSRI Roundtable: Retirement Income Adequacy and the Interaction with Aged Care and Health Care. Canberra, Australia.
- 11 Cumming, R. (February 2016). Discussant: An Australian Longitudinal Study of Ageing. Roundtable on a Longitudinal Survey for Older Cohorts. Canberra, Australia.
- 12 Hosking, D. (August 2016). Roundtable: South Australian Health & Medical Research Institute and Alzheimer's Australia ACT. Canberra, Australia.
- 13 Keane, M.P. (July 2016). Roundtable Participant: Future Research Priorities for Mid-life Employment Research. Mid-life Employment: Determinants, Consequences, and Policy Workshop. Sydney, Australia.
- 14 Kendig, H. (April 2016). ASSA/CSRI Roundtable: Retirement Income Adequacy and the Interaction with Aged Care and Health Care. Canberra, Australia.
- 15 Kendig, H. (April 2016). Roundtable on the Renewal of the NSW Ageing Strategy. Sydney, Australia.
- 16 Kendig, H. (August 2016). Panel: Review of Aged Care Reforms: What are the Data Saying? Canberra, Australia.
- 17 McDonald, P. (July 2016). Roundtable Participant: Future Research Priorities for Mid-life Employment Research. Mid-life Employment: Determinants, Consequences, and Policy Workshop. Sydney, Australia.
- 18 McDonald, P. (November 2016). Appointed to the Independent Assurance Panel for the 2016 Census of Population and Housing.
- 19 Ong, R. (2016). Member: Inquiry Panel into Housing Policies, Labour Force Participation and Economic Growth. Australia.
- 20 Ong, R. (April 2016). ASSA/CSRI Roundtable: Retirement Income Adequacy and the Interaction with Aged Care and Health Care. Canberra, Australia.
- 21 Piggott, J. (April 2016). ASSA/CSRI Roundtable: Post Retirement - Making Income the Goal. Sydney, Australia.
- 22 Piggott, J. (April 2016). Roundtable: Retirement Incomes, Retirement Outcomes. AFR Banking and Wealth Summit. Sydney, Australia.
- 23 Piggott, J. (February 2016). Roundtable on a Longitudinal Survey for Older Cohorts. Canberra, Australia.
- 24 Piggott, J. (June 2016). Briefed Coralee O'Rourke, QLD Minister for Seniors on CEPAR Research. Brisbane, Australia.
- 25 Piggott, J. (June 2016). Briefed Susan Ryan, Age and Disability Discrimination Commissioner on Australian Survey on the Ageing Population. Sydney, Australia.
- 26 Piggott, J. (March 2016). Briefed Anna Howe, AAG Special Interest Group Convenor on CEPAR Research. Sydney, Australia.
- 27 Piggott, J. (March 2016). Invited Participant: RBA Conference on Structural Change in China: Implications for Australia and the World. Sydney, Australia.

- 28 Piggott, J. (May 2016). BusinessThink Federal Budget Roundtable. Sydney, Australia.
- 29 Piggott, J. (October 2016). Briefed Inter-American Development Bank on CEPAR Research Program. Washington, D.C., USA.
- 30 Piggott, J. (October 2016). Briefed John Daley, Grattan Institute on CEPAR Research. Sydney, Australia.
- 31 Piggott, J. (October 2016). Briefed World Bank on CEPAR Research Program. Washington D.C., USA.
- 32 Piggott, J. and Capatina, E. (June 2016). Briefed John Ajaka, NSW Minister for Ageing on CEPAR Research. Sydney, Australia.
- 33 Piggott, J. and de Cure, M. (April 2016). Briefed Mark Cormack, Department of Health on CEPAR Research.
- 34 Piggott, J. and de Cure, M. (February 2016). Briefed Louise du Pre-Alba, AustralianSuper on CEPAR Research. Sydney, Australia.
- 35 Piggott, J. and de Cure, M. (January 2016). Briefed Shaun Larkin, HCF on CEPAR Research. Sydney, Australia.
- 36 Sherris, M. (May 2016). Elected to Chair of the AFIR/ERM Section of the International Actuarial Association and attended Council Meeting, Leaders Forum and Mortality Working Group of the International Actuarial Association. St Petersburg, Russia.

PUBLIC TALKS

- 1 Anstey, K.J. (March 2016). Ticking off Dementia Prevention: What do we Know and Where are we Going with Prevention? Brain Awareness Week 2016: Advances in Dementia. The Latest Science. Canberra, Australia.
- 2 Bateman, H. (October 2016). Discussant: Reform, Information and Education: A New Paradigm for Pension Reform. Public Lecture, Crawford School of Public Policy. Canberra, Australia.
- 3 Booth, H. (February 2016). The Process of Population Ageing and its Challenges in Asia. Oxford Institute of Population Ageing. Oxford, UK.
- 4 Byles, J.E. (October 2016). Generational Changes in Health and Wellbeing Over the Last 20 years. State Department of Health. Perth, Australia.
- 5 Cerin, E. (June 2016). Minding the Environment for Cognitive Health. Minding our own Business: Launch of the Centre of Research Excellence in Cognitive Health. Canberra, Australia.
- 6 Cherbuin, N. (June 2016). Minding our Brains for Cognitive Health. Minding our own Business: Launch of the Centre of Research Excellence in Cognitive Health. Canberra, Australia.
- 7 Hosking, D.E. (March 2016). What's on Your Plate? Diet and Dementia Risk. Brain Awareness Week 2016: Advances in Dementia. The Latest Science. Canberra, Australia.
- 8 Kendig, H., Gong, C.H., Cannon, L. and Browning, C. (September 2016). Preferences and Predictors of Ageing in Place: Longitudinal Evidence from Melbourne Australia. ACT AAG Divisional Meeting. Canberra, Australia.
- 9 Kiely, K. (February 2016). Separated from Things and People: Making Sense of Vision and Hearing Loss as Determinants of Cognitive Decline. Flinders Centre for Ageing Studies, Flinders University. Adelaide, Australia.
- 10 Kiely, K. (March 2016). Sights and Sounds. Brain Awareness Week 2016: Advances in Dementia. The Latest Science. Canberra, Australia.
- 11 McDonald, P. (June 2016). Demographic Change in the Asian Century. Health Network Systems Centre. Tehran, Iran.
- 12 McDonald, P. (June 2016). Fertility and Childbearing in Iran. National Institute of Population Research. Tehran, Iran.
- 13 McDonald, P. (May 2016). Immigration and Employment in Australia. International CEO Forum. Sydney, Australia.
- 14 Piggott, J. (July 2016). ARC Centre of Excellence in Population Ageing Research. UNSW Foundation Lunch. Sydney, Australia.
- 15 Piggott, J. (October 2016). The CSRI Leadership Forum Introductory Remarks. CSRI Leadership Forum. Canberra, Australia.
- 16 Zhao, Z. (April 2016). Temperature-Mortality Relationship. Lanzhou University, China.
- 17 Zhao, Z. (April 2016). Demography of China's 1958-1961 Famine. Lanzhou University, China.

CENTRE FINANCE

CONSOLIDATED FINANCIAL STATEMENT 2011-2016

INCOME	2011(\$)	2012(\$)	2013(\$)	2014(\$)	2015(\$)	2016(\$)	
ARC Centre Grant distributed as follows:							NOTE 1
University of New South Wales	1,203,350	1,344,910	1,287,115	1,326,010	1,349,778	1,683,473	
Australian National University	313,000	330,162	582,759	600,372	611,108	310,748	
University of Sydney	312,000	329,107	101,872	104,952	106,829	108,645	
ARC Post Award Funding distributed as follows:							
University of New South Wales		205,026	205,026	40,026	40,026	35,026	
Australian National University		255,000	340,000	85,000			
NSW Science Leveraging Fund distributed as follows:							
University of New South Wales		160,674	119,704				
University of Sydney		186,935	63,065				
University of New South Wales	678,000	678,000	678,000	678,000	678,000	678,000	
Australian National University	130,250	13,730	350,420	221,380	221,380	189,835	
University of Sydney	130,000	130,000	38,900	38,750	38,750	38,750	
Department of Families, Housing, Community Services and Indigenous Affairs	50,000						
Department of Innovation, Industry, Science & Research			44,000	- 11,205			
Department of Health and Ageing	45,455						
Commonwealth Treasury	50,000	50,000	50,000	50,000	50,000	50,000	NOTE 2
Medibank	50,000		36,364		- 1,563		
AMP	50,000	50,000	50,000	50,000	50,000	50,000	
PwC			50,000	50,000	50,000	50,000	
Emerging Researchers in Ageing Conference							
Registration Fees	10,255						
Sponsorship	6,382	- 2,000					
Academy of Social Sciences Australia		6,500					
Research Institute for Policies on Pension and Aging, Japan			56,000				
CEPAR International Conference Registration Fees			10,848				
UNSW Contestable Funds / Strategic Funds			27,226	195,371	351,831	679,693	
Superannuation Colloquium Registration Fees				23,164	22,742	22,300	
Association of Asia Pacific Rim Universities (APRU)						9,361	
Total Income	3,028,692	3,738,044	4,091,299	3,451,820	3,568,881	3,905,831	

NOTE 1: As a result of Peter McDonald's move from the Australian National University to the University of Melbourne on July 1 2016, Q3 and Q4 payments from the University of New South Wales to the Australian National University and the University of Melbourne were delayed. These distributions will be made in 2017 and reflected in the 2017 financial statement.

NOTE 2: A total of \$250,000 was received in 2013, covering the period 2013-2017. \$50k is reported for 2016.

Expenditure	2011(\$)	2012(\$)	2013(\$)	2014(\$)	2015(\$)	2016(\$)
Salaries	813,109	2,254,769	3,358,535	2,695,560	2,775,390	2,883,156
Scholarships		105,324	124,475	126,163	101,737	105,157
Travel	63,487	291,975	568,550	324,959	363,765	405,354
Emerging Researchers in Ageing initiative: annual contribution	60,000	69,803	54,771	50,783	85,850	70,098
Events	25,250	60,387	100,684	56,371	36,869	55,340
Other research related expenses	16,852	37,766	83,099	46,131	34,445	36,813
Recruitment and relocation expenses	16,935	47,648	5,344	8,636	26,409	33,936
Centre administration, consumables and I.T. maintenance	30,418	38,507	36,156	30,364	28,606	42,774
Equipment	16,738	49,336	24,743	9,391	40,287	22,969
Website, branding and marketing	48,403	94,800	86,273	67,805	50,150	50,853
Total Expenditure	1,091,192	3,050,315	4,442,631	3,416,163	3,543,508	3,706,449
Opening balance at the beginning of the year	-	1,937,500	2,625,229	2,273,897	2,309,554	2,334,928
Closing balance as at the year end	1,937,500	2,625,229	2,273,897	2,309,554	2,334,928	2,534,310

ESTIMATES OF FUTURE INCOME & EXPENDITURE

INCOME

The Centre's main source of funds in 2017 will continue to be the Australian Research Council (ARC). The administering and collaborating organisations, as well as the partner organisations will continue to make contributions at their contracted rates. UNSW will provide in 2017 an additional \$631,650 to support research personnel associated with the CEPAR research hub focused on population ageing in China plus \$50,000 supplementary support for research fellows based in CEPAR who are funded by a Laureate Fellowship grant. In total, we estimate 2017 Centre income to be around \$4 million.

EXPENDITURE

In 2017 the Centre plans to continue to fund a number of successful initiatives implemented in previous years as well as expand its engagement with stakeholders and the wider community. Salaries for ECRs will continue to account for a large portion of the Centre budget. We anticipate that we will spend about \$4.8 million in total, of which approximately \$3.8 million will be allocated to salaries and scholarship stipends. The activities described below will draw on 2017 income as well as funds carried forward from 2016.

PERSONNEL

It is anticipated that the Centre will spend approximately \$3.3 million in 2017 on research personnel, most of whom will be ECRs.

It is expected that 14 students will be supported by CEPAR scholarships in 2017 at a total cost of \$75,000. This includes scholarships for undergraduate and PhD students.

MENTORING OPPORTUNITIES FOR ECRS AND STUDENTS

CEPAR will continue to support the Emerging Researchers in Ageing (ERA) initiative in 2017 as well as offer workshops/master classes for ECRs and PhD students.

Funds will continue to be made available to support PhD student conference participation and provide opportunities for both research fellows and PhD students to spend time at one of our international partner organisations with the aims of enhancing their career experience, and building links between these key international hubs of ageing research and the next generation of researchers.

The anticipated cost of these initiatives in 2017 is approximately \$170,000.

SUPPORT FOR PARTNER AND ASSOCIATE INVESTIGATORS

Funds will continue to be made available to support the involvement of our partner and associate investigators in the research program. It is anticipated that approximately \$130,000 will be spent in 2017 on travel and research assistance to support the development and execution of collaborative research projects.

OUTREACH AND DISSEMINATION OF RESEARCH FINDINGS

Conferences and workshops showcase the Centre's research, increase our international footprint, and provide opportunities for our industry partners to engage with the Centre. A joint policy dialogue hosted in conjunction with the Crawford School of Public Policy; the 25th Annual Colloquium of Superannuation Researchers; the second annual conference of the International Network for Pensions, Aging and Retirement Research; plus a number of workshops and roundtables are some of the events planned for 2017.

Leading international experts will visit the Centre under CEPAR's Distinguished Visitor Program and funds will be available for CEPAR personnel to visit international partners and present research findings at major conferences.

A research brief on retirement incomes aimed at the wider community will be published in the first half of 2017. It is expected that these activities will be supported by a combination of industry and collaborating university funds. Total estimated expenditure for outreach activities in 2017 is \$380,000.

OTHER

About \$560,000 will be spent on supporting the operation of the Centre. This includes salaries for administrative personnel, equipment, materials and other costs associated with the running of the Centre.

An estimated additional \$190,000 will be spent on other research related activities.

NEW GRANTS

NEW GRANTS AWARDED TO RESEARCH TEAMS WHICH INCLUDED CEPAR CHIEF INVESTIGATORS

KENDIG, H., D'ESTE, C., THOMAS, S., BYLES, K., BROWNING, C. AND NAZROO, J.
ARC Discovery Grant:

Ageing in China and Australia: Promoting health, productivity and wellbeing

Total amount awarded:
\$369,900

MCDONALD, P., SPARROW, R. AND UTOMO, I.
ARC Discovery Grant:

Meeting the needs of older people in Indonesia

Total amount awarded:
\$427,700

ANSTEY, K.J., LAUTENSCHLAGER, N., SACHDEV, P., CERIN, E., SHAW, J., CHERBUIN, N., ELLIS, K., MCCRAE, I. AND CLARE, L.
NHMRC Centre of Excellence grant:

Centre of Excellence in Cognitive Health

Total amount awarded:
\$2,499,871

ANSTEY, K.J.
NHMRC Principal Research Fellowship:

Research to reduce cognitive decline and optimise ageing well

Total amount awarded:
\$753,300

BUTTERWORTH, P., ANSTEY, K.J., CHERBUIN, N., MCKETIN, R., BURNS, R., LEACH, L., SLADE, T. AND MCNAMEE, P.
NHMRC Project Grant:

Mental health and the PATH to midlife

Total amount awarded:
\$707,823

BRODATY, H., VALENZUELA, M., SACHDEV, P., MCNEIL, J., MAEDER, A., LAUTENSCHLAGER, N., JORM, L., FIATARONE SINGH, M., ANSTEY, K.J. AND ANDREWS, G.

NHMRC targeted calls for research grant:

Maintain your brain

Total amount awarded:
\$6,467,000

ANSTEY, K.J.
ACT Health Epidemiology Branch:

Project development of a NHMRC Partnership protocol for studying health impacts of socio-economic disadvantage

Total amount awarded:
\$31,609

UTOMO, I. AND MCDONALD, P.
Ford Foundation Indonesia:

Transition to adulthood in Jakarta

Total amount awarded:
\$214,000

ANSTEY, K.J. AND CHERBUIN, N.
Discovery Translation Fund Project:

Development of tools to assess and reduce risks of Alzheimer's disease for wide use online by health care providers

Total amount awarded:
\$50,000

NEW GRANTS AWARDED TO RESEARCH TEAMS INCLUDING CEPAR ASSOCIATE INVESTIGATORS ON TOPICS RELATED TO POPULATION AGEING

EARL, J. AND BATEMAN, H.
ARC Discovery Grant:

Is it just a matter of time? Why some people plan and others do not

Total amount awarded:
\$209,500

BUTTERWORTH, P.
ARC Discovery Grant:

Welfare reform and welfare stigma: Scroungers, slackers and bludgers?

Total amount awarded:
\$601,150

KAHEY, L., CLEMSON, L., MCCLUSKEY, P., RAMULU, P., IVERS, R. AND TIEDEMANN, A.
NHMRC Project Grant:

PlaTFORM: PrevenTing Falls in a high risk, vision impaired population through specialist ORientation and Mobility services: a randomised trial

Total amount awarded:
\$773,768

WINDSOR, T.D.
Flinders University - Social and Behavioural Sciences - Faculty Research Grant:

Emotion regulation in younger and older adulthood: Examining subtypes of cognitive change

Total amount awarded:
\$8,000

AWARDS, PRIZES AND RECOGNITION

KIMBERLY ASHBY-MITCHELL

Best Student Oral Presentation at the Caribbean Public Health Agency's Annual Health Research Conference

HEATHER BOOTH

Appointed Associate Member of Nuffield College, University of Oxford

ROBERT CUMMING

Named in the list of Highly Cited Researchers (international) in 2016

CASSIE CURRYER

The Australian Sociological Association (TASA) Postgraduate Conference Scholarship, 2016

LORETTI ISABELLA DOBRESCU

Business School Staff Excellence Awards: 2016 John Prescott Outstanding Teaching Innovation Award

Gold Medal, Social Science category, Wharton School's 'Reimagine Education' Education Awards

DENZIL FIEBIG

Business School Staff Excellence Awards: 2016 Bill Birkett Award for Teaching Excellence

KATJA HANEWALD

Bob Altig von Geusau Prize for Best Contribution to the ASTIN Bulletin

UNSW ARC SilverStar Award DECRA Application

ALIZA HUNT

Endeavour Post Graduate Award, Jamie Mackie Scholarship Awardee

HAL KENDIG

Awarded Honorary Life Membership of the Australian Association of Gerontology for 'outstanding contribution to the Australian Association of Gerontology'

ERMANN PITACCO

Elected vice co-chairman of the Mortality Working Group of the International Actuarial Association

MARIA PILAR RIOSECO LOPEZ

2016 Price Prize for Best Doctoral Thesis

ADAM SHAO, JOELLE FONG AND MICHAEL SHERRIS

North American Actuarial Journal Best Paper 2016

MICHAEL SHERRIS

Elected Chair of the AFIR/ERM Section of the International Actuarial Association

QUANG TRINH

Best paper 15th Emerging Researchers in Ageing Conference



2016 PRICE PRIZE WINNER MARIA PILAR RIOSECO LOPEZ (FAR RIGHT) WITH FELLOW CEPAR STUDENTS MAHIN RAISSI (FAR LEFT) AND CUC HOANG, AND SUPERVISOR A/PROFESSOR HEATHER BOOTH

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