

ANNUAL REPORT 2017



UNSW
SYDNEY



Australian
National
University



THE UNIVERSITY OF
MELBOURNE



THE UNIVERSITY OF
SYDNEY



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**



Australian Government
Australian Research Council

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:



Australian Government

Department of Foreign Affairs and Trade

Department of Health

Department of Social Services

The Treasury



**Department
of Industry**



Treasury



medibank
For Better Health



WillisTowers Watson 

INTRODUCTION

THE AUSTRALIAN RESEARCH COUNCIL (ARC) CENTRE OF EXCELLENCE IN POPULATION AGEING RESEARCH (CEPAR) IS A UNIQUE COLLABORATION BETWEEN ACADEMIA, GOVERNMENT AND INDUSTRY, COMMITTED TO DELIVERING SOLUTIONS TO ONE OF THE MAJOR ECONOMIC AND SOCIAL CHALLENGES OF THE 21ST CENTURY.

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 Actuarial Science, Demography, Economics, Epidemiology, Psychology and Sociology.

Funded primarily by an initial seven-year grant from the Australian Research Council, with generous support from the collaborating universities and partner organisations, the Centre was established in March 2011 to undertake high impact independent multidisciplinary research and build research capacity in the field of population ageing.

Renewed funding awarded for an additional seven-year term from 2017-2023 will support an exciting new research program which will deliver comprehensive outcomes with the potential to secure Australia's future as a well-informed nation with world-best policy and practice for an ageing demographic.

This report comprises two parts. Part One reports on the structure and activities of the original centre which was in operation until 31 December 2017. Part Two focuses on the new Centre established on 28 September 2017.

OUR VISION

OUR VISION IS TO BE A GLOBALLY LEADING RESEARCH AUTHORITY ON POPULATION AGEING.

OUR MISSION

OUR MISSION IS TO PRODUCE AND PROMULGATE RESEARCH OF THE HIGHEST QUALITY TO OPTIMISE SOCIAL AND ECONOMIC OUTCOMES FOR AN AGEING WORLD.

DIRECTOR'S REPORT

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PROFESSOR JOHN PIGGETT

THIS IS THE LAST DIRECTOR'S REPORT I WILL WRITE TO COVER THE ACTIVITIES OF THE FIRST CEPAR, WHICH CLOSED IN DECEMBER AFTER SEVEN SUCCESSFUL YEARS. IT WAS THE FIRST ARC CENTRE OF EXCELLENCE IN THE SOCIAL SCIENCES, AND THE FIRST (AND STILL THE ONLY) SUCH CENTRE TO BE HOSTED BY A BUSINESS SCHOOL.

Its eight Chief Investigators, their post docs and PhD students, and the Associate Investigators that became attached to the Centre in its first seven years of operation made huge strides in research, engagement and mentoring: publishing more than 800 journal articles, of which almost half are in top tier journals; generating 44 PhD completions; presenting 140 invited talks at major international conferences and workshops; hosting hundreds of international visitors; and delivering several hundred government, business and community briefings. It is an extraordinary record, testament to the quality of the core team, outstanding professional support, and the rapidly rising profile of population ageing as one of the major social issues of the 21st century.

2011– 2017 HIGHLIGHTS FROM OUR ENGAGEMENT AND OUTREACH PROGRAM



DR JOSE-LUIS FERNANDEZ FROM THE LONDON SCHOOL OF ECONOMICS PRESENTS AT THE POLICY DIALOGUE JOINTLY HOSTED BY CEPAR AND THE CRAWFORD SCHOOL OF PUBLIC POLICY AT THE AUSTRALIAN NATIONAL UNIVERSITY IN 2012



EILEEN CRIMMINS, PROFESSOR OF GERONTOLOGY AT THE UNIVERSITY OF SOUTHERN CALIFORNIA, DELIVERS HER KEYNOTE ADDRESS AT CEPAR'S FIRST INTERNATIONAL CONFERENCE IN 2013

It is also a demonstration of the extraordinary power of scale in social sciences research. Large scale research funding of this kind has traditionally been the preserve of the STEM disciplines, and Medicine. With these CEPAR KPIs, we have shown that a similar scale of funding in the social sciences can deliver dramatic results. As well, scaled funding of this kind allows effective translation and engagement to be undertaken, thus generating much more research impact. Never has there been a greater need to generate a strong evidence base, and to have a recognised expert group contribute objectively to the policy debate. CEPAR has delivered on this within its domain.

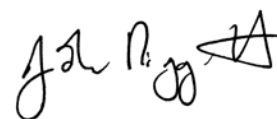
This is also the first report of the new CEPAR, which commenced operations at the end of September.

We have increased our Chief Investigators from eight to 12; have planned a more comprehensive program of translation, engagement, and mentoring activities; and multiplied our international networks, facilitated by our growing international reputation.

We are also aiming to build our connection to the Asian region. The extraordinary concentration of expertise around ageing within CEPAR has the potential to add real social value to the world's most rapidly ageing region. I am very keen to make new inroads into Asia, and to build genuine relationships with major research groups there. This process has already begun with the Australia-China Population Ageing Research Hub and the APRU Population Ageing Research Hub. And we have recently been given major resources by the UNSW Business School to take this further.

But we have a long way to go to make this initiative really fulfil its potential. It is one of the many fascinating challenges that will define CEPAR's contribution into the future.

I would like to take this opportunity to thank everyone who has contributed to the success of CEPAR over the last seven years and look forward to continuing to work with many of you as we take CEPAR to new heights over the next seven years.



John Piggott



NOBEL LAUREATE PROFESSOR JOSEPH E. STIGLITZ DELIVERS HIS CEPAR-HOSTED PUBLIC LECTURE IN 2014



SPEAKERS AT THE 2015 CEPAR PUBLIC FORUM ON INTERPRETING THE 2015 INTERGENERATIONAL REPORT

CHAIRMAN'S MESSAGE



MARC DE CURE

DEMOGRAPHIC CHANGE REMAINS ONE OF THE MOST CRITICAL ISSUES FACING THE WORLD IN THE 21ST CENTURY. CEPAR IS PRIVILEGED TO BE ABLE TO CONTINUE ITS RESEARCH INTO THIS ISSUE FOR ANOTHER SEVEN YEARS AS A RESULT OF A SECOND TERM OF ARC CENTRE OF EXCELLENCE FUNDING.

The Advisory Board held its last meeting in June and the first CEPAR completed its activities at the end of 2017. I'd like to take this opportunity to thank all our partners and their Board representatives over the last seven years. The Board continued to grow, develop and enhance its role as the champion of two-way engagement between the researchers and end-users of the research. This engagement process has contributed significantly to CEPAR's impact and is a significant legacy from the former CEPAR.

A new CEPAR Advisory Board has been established and I warmly welcome the new members. It is very well-positioned to take up the baton as champion of research impact.

THE YEAR THAT WAS

CEPAR seeks to maximise the impact from its research by engaging with partners and more broadly to gain insights into knowledge gaps; to provide input to government reviews and policy formulation and to the development of business product and service provision; to communicate ideas and findings through Research Briefs and presentations; and to share and explore issues through workshops and collaborative research activities.

There were a number of significant communication, engagement and partner collaboration events during 2017 which are covered elsewhere in this report. Some notable examples include:

- the CEPAR-sponsored Colloquium of Superannuation Researchers;
- the Workshop on Driving and Health;
- the Roundtable on Mature Labour Force Participation with Commonwealth and State governments, and business and community leaders;
- Discussions on the development of a proposed longitudinal survey on health and wealth for Australia;
- Submissions to the Commonwealth Treasury's Review of Retirement Incomes Policy, and to The Senate Enquiry into Superannuation; and
- Working with Treasury on the development of an Overlapping Generations Model, and with the Department of Social Security on intergenerational wealth transfers.

CEPAR also engaged internationally, inter alia, presenting research with the Wharton School, NetSPAR (Tilburg University), and Willis Towers Watson at the International Network for Pensions,

Aging and Retirement Research seminar at the OECD and presentations to APEC on the impact of demographic change on labour supply and economic growth in Asia.

THE NEW CEPAR

The new CEPAR has an even broader multidisciplinary research skill base presenting an exciting opportunity to leverage this with its accumulated knowledge base and scale, and a strong engagement model. Continuing to drive this over the next seven years will enable CEPAR to maximise its impact, and to provide valuable sector-wide learnings for world-class research engagement. The Advisory Board will oversee this activity in 2018 and is well equipped to do so with its expanded capability set and network of influence.

A considerable amount of work has already been undertaken with the new CEPAR partners to develop areas of potential interest, collaboration and input for our new research streams. Further work will be undertaken in 2018 bringing together the researchers, partners and other interested organisations at a topic or research stream level to ensure that we develop timely and even stronger interactions between researchers and government, business and community.

We are greatly appreciative of partner and other affiliated organisations for their support and engagement, and especially to their board representatives who generously give their time, insight and energy to addressing the challenges and the opportunities of demographic change and population ageing.

Marc de Cure



PART

1

2017 REPORT/**CE 11**

(CEPAR 2011 – 2017)

PART 1: CE 11

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ABOUT THE CENTRE

CEPAR CE11, FUNDED FROM 2011-2017, WAS 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, AND PARTNERSHIPS WITH MAJOR INTERNATIONAL UNIVERSITIES AS WELL AS AUSTRALIAN GOVERNMENT DEPARTMENTS AND BUSINESSES.

OBJECTIVES

The Centre was established to fulfil the following objectives:

- 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.

At the end of its first term of operation, CEPAR has established an exceptionally strong platform from which to launch the next Centre. High quality and innovative management and strong governance have complemented outstanding academic commitment and end-user engagement to achieve this. CEPAR research appeared in journals of the highest quality and reached the hands of the top levels of industry and government, both in Australia and internationally, facilitated by a deliberate and sustained engagement strategy.

Members of the CEPAR research community were regularly invited to participate in prestigious academic conferences as well as high profile public fora, often in a plenary or keynote capacity. A number of events were successfully organised which served to advance research thinking about population ageing, and raise the profile of the issue among CEPAR's research and end user constituencies. The Centre also made an important contribution to increasing national research capacity and its multi-faceted research training and mentoring program provided significant opportunities to early career researchers and research students across the nation and internationally.

2017 HIGHLIGHTS

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54 PROJECTS

126 JOURNAL PUBLICATIONS

AUSTRALIAN NATIONAL TRANSFER ACCOUNT (NTA) DATA AVAILABLE FOR THE FIRST TIME ON THE NTA WEBSITE WHICH PROVIDES ACCESS TO DATA BEING PRODUCED BY MORE THAN 60 COUNTRIES

MAJOR INTERNATIONAL RESEARCH SEMINAR AT THE OECD ORGANISED BY CEPAR AND OTHER MEMBERS OF THE INTERNATIONAL NETWORK FOR PENSIONS, AGING, AND RETIREMENT RESEARCH (INPARR)

25TH ANNUAL COLLOQUIUM OF SUPERANNUATION RESEARCHERS HOSTED BY CEPAR AND UNSW SCHOOL OF RISK AND ACTUARIAL STUDIES

THIRD CEPAR WORKSHOP ON POPULATION AGEING AND THE CHINESE ECONOMY HELD IN SYDNEY

SYMPOSIUM ON MORTALITY IN AUSTRALIA, MARKING THE 150TH ANNIVERSARY OF THE FIRST AUSTRALIAN LIFE TABLE, ORGANISED BY THE MELBOURNE SCHOOL OF POPULATION AND GLOBAL HEALTH IN ASSOCIATION WITH CEPAR

CEPAR LONGEVITY WORKSHOP HOSTED BY PWC IN SYDNEY

CEPAR-SPONSORED WORKSHOP ON DRIVING AND HEALTH HELD IN CANBERRA IN COLLABORATION WITH THE AUSTRALASIAN COLLEGE OF ROAD SAFETY, THE ANU CENTRE FOR RESEARCH ON AGEING, HEALTH AND WELLBEING AND COTA ACT

SENIOR RESEARCH FELLOW RAFAL CHOMIK AND CHIEF INVESTIGATORS JOHN PIGGOTT AND PETER MCDONALD COMMISSIONED BY THE AUSTRALIAN GOVERNMENT DEPARTMENT OF EMPLOYMENT TO WRITE A BRIEFING PAPER AND PRESENT AT A TWO-DAY APEC WORKSHOP IN VIETNAM FOCUSED ON THE DEVELOPMENT OF AN APEC LABOUR MOBILITY FRAMEWORK

16TH NATIONAL EMERGING RESEARCHERS IN AGEING CONFERENCE HELD IN PERTH

ADVANCED METHODOLOGY WORKSHOP ON DATA MINING IN THE SOCIAL SCIENCES HELD IN CANBERRA

CHIEF INVESTIGATOR MICHAEL SHERRIS AND ASSOCIATE INVESTIGATORS JOELLE FONG AND ADAM WENQIANG SHAO AWARDED THE 2017 AMERICAN RISK AND INSURANCE ASSOCIATION'S PATRICK BROCKETT AND ARNOLD SHAPIRO ACTUARIAL JOURNAL AWARD FOR THE PAPER 'MULTISTATE ACTUARIAL MODELS OF FUNCTIONAL DISABILITY'

CHIEF INVESTIGATOR MICHAEL KEANE AWARDED PRESTIGIOUS JOINT APPOINTMENT AT THE UNSW BUSINESS SCHOOL AND KING'S COLLEGE LONDON

A close-up photograph of two hands shaking in a firm grip. The hands are positioned centrally, with fingers interlaced. The skin tone is light. The background is a solid, dark grey. A large, white, stylized number '1' is superimposed over the right side of the handshake. The word 'SECTION' is written in white, uppercase, sans-serif font across the upper left portion of the image. At the bottom, a dark red horizontal band contains the text 'GOVERNANCE & STRUCTURE' in white, uppercase, sans-serif font.

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.

In 2017, two external committees supported strategic development as well as engagement between researchers, industry and government. The Scientific Advisory Committee and the Centre Advisory Board provided the Management Committee with external perspectives on the formulation of research programs, their implementation, and the dissemination of research outcomes.

SCIENTIFIC ADVISORY COMMITTEE

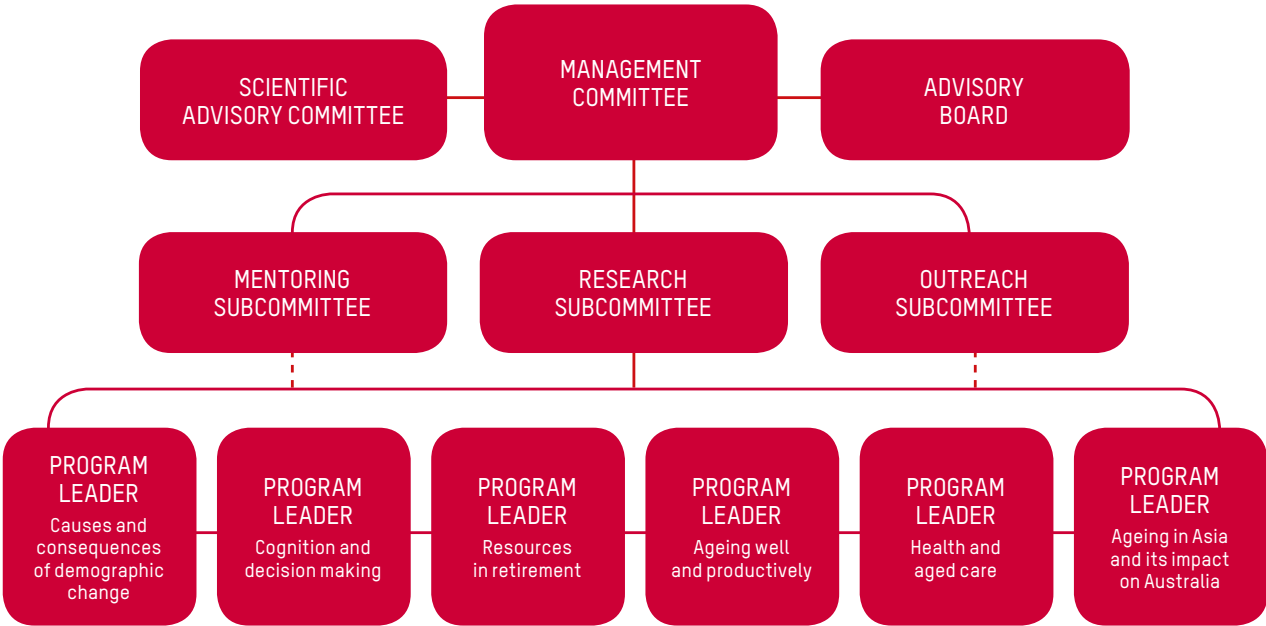
The Scientific Advisory Committee comprises a core group of international leaders in the area of population ageing, drawn from a range of fields reflecting the Centre’s multidisciplinary nature. It provides advice on the strategic direction of the Centre from a global perspective, with emphasis on research 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 Bloom is Clarence James Gamble Professor of Economics and Demography at the Harvard T.H. Chan School of Public Health and Director of

Harvard University’s NIH/NIA-funded Program on the Global Demography of Aging. Bloom received a BS in Industrial and Labor Relations from Cornell University in 1976, an MA in Economics from Princeton University in 1978, and a PhD in Economics and Demography from Princeton University in 1981. Bloom’s current research focuses heavily on the interplay of health, demographics, and economic growth and development, and also on the value of vaccination. Bloom has taught numerous courses on labor, health, and population and on statistics and econometrics. He has also published more than 450 articles, book chapters, and books, and is a founding co-editor of the *Journal of the Economics of Ageing*. In April 2005, Bloom was elected Fellow of the American Academy of Arts and Sciences. In 2015 he was named an Andrew Carnegie Fellow of the Carnegie Corporation of New York.



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 cross-country patterns of individual financial decision making given long-term commitments. Related research concerns the design and management of investment institutions including insourcing, out-sourcing, and offshoring, and the pricing and utilisation of financial services relevant to pension funds, endowments, and sovereign wealth funds. His most recent book *Institutional Investors in Global Markets* with Ashby Monk was 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 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

Merril Silverstein, PhD, 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.

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 2017, the Board met as a group on 1 June to discuss engagement initiatives and reflect upon the outcomes of the Centre’s research program and activities over the life of the centre.

In addition Senior Research Fellow Rafal Chomik presented a paper to the Advisory Board, ‘The Impact of Demographic Change on Labour Supply and Economic Growth: Can APEC Meet the Challenges Ahead?’ which was written by Chomik and Chief Investigators John Piggott and Peter McDonald for the ‘Workshop on the Development of an APEC Labour Mobility Framework’.

As well as the formal meeting, the Director and Chair met bilaterally with individual members on a number of occasions to discuss particular issues.

2017 ADVISORY BOARD MEMBERS

MARC DE CURE	Chair
MARK CORMACK	Deputy Secretary, Strategic Policy and Innovation Group, Department of Health
DAVID GRUEN	Deputy Secretary Economic, Department of the Prime Minister and Cabinet
CATHERINE NANCE	Partner, PricewaterhouseCoopers
PIP O’KEEFE	Lead Economist, Human Development, Asia Pacific, The World Bank
JENNY WILKINSON	Head, Retirement Income Policy Division, Commonwealth Treasury
SERENA WILSON PSM	Deputy Secretary, Department of Social Services
IAN YATES AM	Chief Executive, Council on the Ageing

CEPAR representatives participating in Board meetings

HAZEL BATEMAN	CEPAR Director of Research Engagement
ANNE GORDON	CEPAR Director of Operations
JOHN PIGGOTT	CEPAR Director



MARC DE CURE
BCom (Hons) UNSW, MWine
Quality UWS, FCA
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 establishing CEPAR and since then has provided critical input to the development of the Centre’s ongoing strategy and industry and government engagement activities. He has chaired both the Advisory Board and the Leaders’ Forum since inception.

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 key operating subsidiaries.

In professional services Marc was a senior Partner with PwC, including Chairman of the Australian Financial Services practice and Managing Partner of the Asia Pacific Risk Management practice, and was a Principal Advisor with Bain & Company.

Marc has been a member of the Business Advisory Council and the Executive Committee of the UNSW Business School since 2001 and was appointed as an Adjunct Professor at the UNSW Business School in 2015.

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's external committees.

In 2017, the Committee met on 15 March, 8 June and 4 December. 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 2017, the subcommittee met on 10 May and 16 November.

In 2017, 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

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 2017 consisted of the Centre Director, the Director of Operations, Associate Investigator Kate O'Loughlin, ERA representative Matthew Carroll, Senior Research Associate Shang Wu and PhD student Dorothy Dudley. The subcommittee met on 19 April and 30 November. The meeting on 30 November was combined with the CE17 Mentoring subcommittee meeting.

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.

Meetings, chaired by Chief Investigator Michael Sherris, were held on 6 April and 20 November. The meeting on 20 November was combined with the CE17 Research Translation and Outreach subcommittee meeting. Membership comprised the Centre Director, the Director of Operations, the Director of Research Engagement, CEPAR's Communications and Stakeholder Relationships Manager, and Senior Research Fellow Rafal Chomik.

STRUCTURE

NODES

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

The ANU node was based in the Centre for Research on Ageing, Health and Wellbeing, with Professor Kaarin Anstey serving as ANU Node Leader.

Professor Peter McDonald led the node at The University of Melbourne, based in the School of Population and Global Health.

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

All eight Chief Investigators (CIs) and many of the Centre’s Associate Investigators (AIs) were based at one of the four nodes. Within Australia, Associate Investigators were 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 comprised 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 were drawn from five world-class research organisations:

The University of Manchester

The University of Newcastle, United Kingdom

The Institute for Fiscal Studies

The Wharton School

The University of Pennsylvania

Through our internationally based Associate Investigators and joint research initiatives we were connected to the following key research institutions in 2017:

Asia-Pacific Economic Cooperation

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

South China Agriculture University

Southwestern University of Finance and Economics

Statistics Indonesia

Tsinghua University

United Nations Population Fund

University of Indonesia

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

CENTRE PERSONNEL

INDUSTRY AND GOVERNMENT PARTNERS

CEPAR CE11 was 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 included:

The Treasury

Department of Health

Department of Social Services

AMP

Medibank

NAB

PricewaterhouseCoopers

In addition, the Centre received support from the NSW Department of Industry's Science Leveraging Fund (SLF).

CHIEF INVESTIGATORS

Scientia Professor John Piggott

(Centre Director until 27 September whereupon he became Centre Director of CE17)

School of Economics

UNSW SYDNEY

Professor Peter McDonald

(Deputy Director)

School of Population and Global Health

THE UNIVERSITY OF MELBOURNE

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

Department of Political Economy

KING'S COLLEGE LONDON

Professor Hal Kendig

Centre for Research on Ageing, Health and Wellbeing

AUSTRALIAN NATIONAL UNIVERSITY

Professor Michael Sherris

(Centre Director from 28 September until 31 December)

School of Risk and Actuarial Studies

UNSW SYDNEY

Scientia Professor Alan Woodland

School of Economics

UNSW SYDNEY

PARTNER INVESTIGATORS

Professor Richard Disney

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

The 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

ASSOCIATE INVESTIGATORS¹

Dr Daniel Alai

School of Mathematics, Statistics and Actuarial Sciences

UNIVERSITY OF KENT

Professor Ross Anel

College of Behavioural and Community Sciences,

School of Aging Studies

UNIVERSITY OF SOUTH FLORIDA

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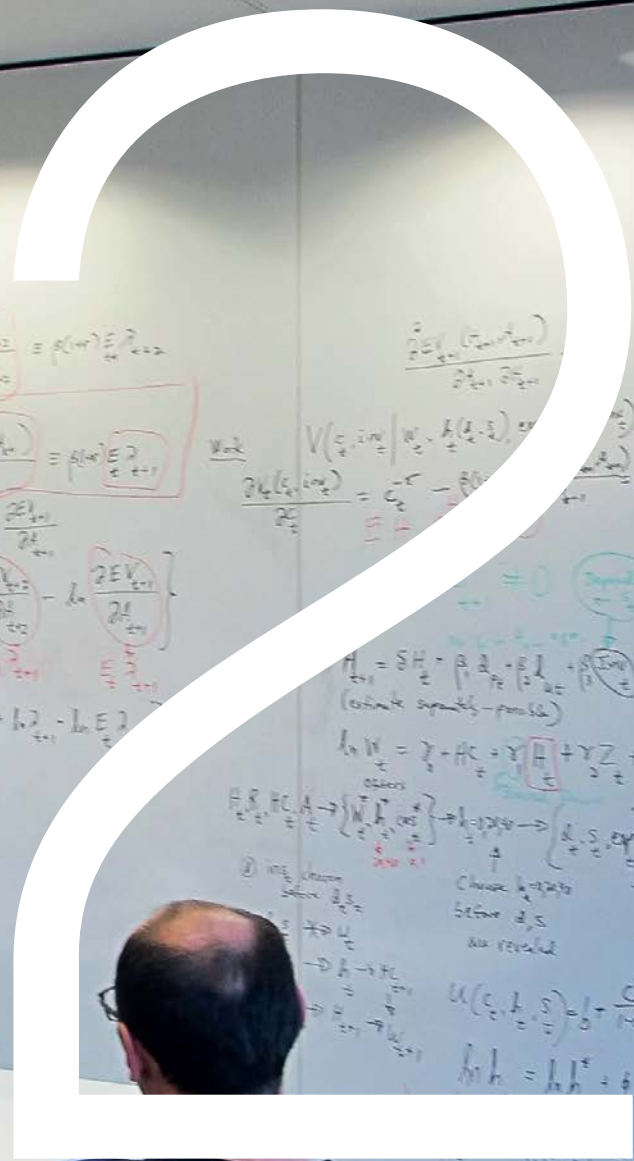
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CHIEF INVESTIGATOR MICHAEL KEANE WITH RESEARCH FELLOW
ELENA CAPATINA AND ASSOCIATE INVESTIGATOR FEDOR ISKHAKOV

RESEARCH & RESEARCH TRAINING

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

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This area of research focus (ARF) encompasses both demographic and macro type economic analysis of population change. The analysis of large asset pool types, such as housing and pension funds, also falls into this ARF, where their value or allocation is thought to be impacted by changes in demographic structure. Highlights in the ARF for 2017 include:

- **NATIONAL TRANSFER ACCOUNTS**

This CEPAR funded project joins Australia in an international collaboration involving 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 gain some sense of intergenerational fairness for policy. This broad initiative has unquestionably lifted the quality of analysis around intergenerational issues, both in Australia and around the world, and the National Transfer Accounts (NTAs) have now established UN protocols and procedures for their calculation, in much the same way as more conventional National Accounts have, thus facilitating international comparison. This ongoing work has now established Australian NTA datasets for a range of years starting in 1980. To deliver their full potential, the NTAs must be made publicly available. During 2017, the Australian NTAs for 2004 and 2009 were uploaded to the publicly available international NTA database, thus bringing Australia much more into line with other nations in the timely availability of these datasets. NTAs provide a powerful tool for policy analysis in areas where intergenerational transfers are important – for example, the Australian Department of Social Services has shown keen interest in their implications for the intergenerational impact of changing pension outlays.

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

Increasingly, pension liabilities, either for government employees or in the private sector, require for their solvency improved survival risk. Often, it is assumed that survival probabilities for large groups are independent of each other. But in practice, large groups of pension fund members may have commonalities that introduce dependencies – in these circumstances, pricing according to an independence assumption will undervalue risk, and expose large institutions to risk of insolvency. (It has been established that even small rates of interdependency can lead to large changes in aggregate risk.) This highly technical project takes account of changing distributions, such as the increasing frequency of extreme values such as is evidenced by super-centenarians, and investigates classes of distributions which might best take account of these phenomena.

- **HOUSING IN AN AGEING SOCIETY: A SIMULATION STUDY**

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, ageing societies in particular can benefit from efficient housing markets and high rates of home ownership. But home ownership shares differ quite substantially, ranging from around 44% in Germany (an “old” economy) to almost 70% in Australia, a relatively young economy. This project investigates the reasons for these differences, using a computable general equilibrium modelling approach. Population structure and dynamics, institutional differences, tax incentives and the market for mortgage loans are all taken into account. This work aims to shed light on an asset pool that is the largest in Australia.

POPULATION AGEING IN AUSTRALIA: FERTILITY, IMMIGRATION AND LABOUR FORCE

RESEARCHERS

PETER McDONALD
JEROMEY TEMPLE
MEIMANAT HOSSEINI-CHAVOSHI

The aim of this project is to provide continuous monitoring of demographic trends in Australia and analyse how these trends affect the labour force and other aspects of Australian life. A highlight of this project in 2017 was the organisation by the team of a symposium, Mortality in Australia, held in November in the Melbourne Town Hall at which eight papers were presented. The symposium also included a panel discussion on health policy in Australia as it affects older people. Public presentations are an important component of this project with 10 presentations being made to various audiences during 2017.

Based on CEPAR expertise in this field, Peter McDonald, during 2017, was a member of the Independent Assurance Panel set up to assess the quality of the 2016 Census of Population. The panel reported to the Australian Statistician providing public confidence for the use of the census results. The report is published on the Australian Bureau of Statistics website.

Also as part of this project, CEPAR-affiliated PhD scholar, Matthew Kidman, successfully completed his PhD degree at the Australian National University on the effects of population ageing on equity and housing markets (submitted 2016). He was supervised by McDonald and Temple. At the University of Melbourne, Marijan Jukic submitted his PhD thesis on modelling of the residential aged care system in Australia and Abul Rizvi commenced his PhD on the economic effects of immigration in Australia.

There were three publications for this project in 2017:

Temple, J. and McDonald, P. (2017). Population Ageing and the Labour Force: 2000-2015 and 2015-2030. *Australasian Journal of Ageing*, 36(4), 264-270.

McDonald, P. (2017). International Migration and Employment Growth in Australia, 2011-2016. *Australian Population Studies*, 1(1), 3-12.

McDonald, P. (2017). Population Ageing: A Demographic Perspective, in O'Loughlin, K., Browning, C. and Kendig, H. (Eds). *Ageing in Australia: Challenges and Opportunities*. (pp47-61). Springer.

Peter McDonald, during 2017, was a member of the Independent Assurance Panel set up to assess the quality of the 2016 Census of Population.

RESEARCHERS

JEROMEY TEMPLE
PETER McDONALD

External Collaborator

JAMES RICE (ANU)

This project has succeeded in producing six National Transfer Accounts (NTA) for Australia for the period, 1981 to 2010, two accounts in each of three decades. The project is part of the international NTA programme (www.ntaccounts.org). 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'.

In addition, the Australian accounts for 2003-04 and 2009-10 are supplemented with accounts of assets and liabilities (wealth). In 2017 the Australian accounts for 2003-04 and 2009-10 were uploaded to the international NTA website and are now accessible to any user.

The Australian team has joined an international team that will produce papers comparing NTA results across countries.

2017 was dedicated to the production and publication of papers based on the data and to the public release of the data. Four papers were published:

Temple, J., Rice, J. and McDonald, P. (2017). Mature Age Labour Force Participation and the Life-cycle Deficit in Australia: 1981-82 to 2009-10. *The Journal of the Economics of Ageing*, 10(2017), 21-33.

Temple, J., McDonald, P. and Rice, J. (2017). Net Assets Available at Death in Australia: An Extension of the National Transfer Account Methodology. *Population Review*, 56(2), 78-101.

Temple, J., Rice, J. and McDonald, P. (2017). Ageing and the Economic Life Cycle: The National Transfer Account Approach. *Australian Journal on Ageing*, 36(4), 271-278.

Rice, J., Temple, J. and McDonald, P. (2017). Public and Private Consumption across Generations in Australia. *Australasian Journal of Ageing*, 36(4), 279-285.

Two meetings were held with officials of the Department of the Treasury which included discussion of the potential uses of the Australian NTAs. Discussions were also held with users in the Department of Social Services. James Rice will commence a PhD degree at the University of Melbourne in 2018 that will entail analysis of NTA results.

In 2017 the Australian accounts for 2003-04 and 2009-10 were uploaded to the international NTA web site and are now accessible to any user.



ASSOCIATE PROFESSOR
JEROMEY TEMPLE

BA Population Studies
(Hons) BCom PhD
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ASSOCIATE PROFESSOR OF
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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 60 countries in the Asia-

Pacific, Americas, Europe and Africa with a total population in excess of six 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.

SUSTAINABLE AND EQUITABLE PENSIONS WITH MEANS TESTING

RESEARCHERS

GEORGE KUDRNA
CHUNG TRAN
ALAN WOODLAND

Fundamental demographic changes, resulting from population ageing, will have vast implications for most developed nations' economies and especially for their budgetary and pension policies. Governments around the world have responded by reforming their pension systems, a key objective being to improve long-term fiscal sustainability by limiting spending on public pensions and thus maintaining affordability to taxpayers.

This research project focuses on the means testing of public pensions as a response mechanism to population ageing. It is well known that a means tested pension system has a distinct feature, which tailors the level of pension benefits according to individual economic status. We argue that in the context of population ageing, this feature generates an automatic adjustment mechanism that (i) mitigates the pressing fiscal cost of an old-age public pension program; and (ii) redistributes pension benefits to those in need with shorter life expectancies.

To evaluate this mechanism, we employ an overlapping generations model with heterogeneous households and investigate several policy objectives. The first primary objective is to quantitatively analyse the role of means tested age pensions in facilitating the fiscal sustainability of the pension system in the context of population ageing. To this end, we focus on the design of the means testing rules, particularly the choice of taper rates at which the pension benefit is withdrawn based on a pensioner's income or assets. The second primary objective is to undertake the analysis under several different population ageing scenarios, since age pension policy reforms will have potentially different impacts depending on the nature of the population ageing process. Given that our model accounts for differences in mortality profiles by skill level, we also investigate the role of means testing in redistributing income from longer-lived richer households to shorter-lived poorer households. The third major objective is to focus on several classes of outcomes from the policy simulations, including the fiscal implications for governments, the macroeconomic implications, and the welfare and distributional implications.

In 2017, we finalised the development and calibration of the model and undertook the quantitative analysis of means tested pensions. Based on the simulation results, we show that more pronounced ageing scenarios with widening mortality gaps between high- and low-income groups of individuals strengthen the automatic adjustment role of means testing in providing sustainable and equitable pensions.

Based on the simulation results, we show that more pronounced ageing scenarios with widening mortality gaps between high- and low-income groups of individuals strengthen the automatic adjustment role of means testing in providing sustainable and equitable pensions.



DR CHUNG TRAN
BA Hanoi National
Economics University, PhD
Indiana University
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*.

SUSTAINABLE PENSION PLANS UNDER LIFETIMES DEPENDENCE STRUCTURES THAT ACCOUNT FOR LONGEVITY RISK

RESEARCHERS

DANIEL H. ALAI
MICHAEL SHERRIS

This project explores how to most appropriately model joint survival distributions and optimally calibrate them to data. The use of a multivariate distribution is founded on the observation that mortality improvements have introduced common factors that impact the survival probabilities of pools of lives. 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. To allow for the estimation of heavy-tailed phenomena, a quantile-based procedure is adopted. Given the anticipated continued increase of supercentenarians, the ability to calibrate models to data with extreme values is critical. The procedure we develop can incorporate an arbitrary number of quantiles with arbitrary levels; we investigate how to make these choices optimally.

The complexity of this research problem is significantly compounded when introducing features of censoring and truncation, which are common to the analysis of survival data. In insurance and pension funds, the full lifetimes of the individuals in the pool are usually not observed.

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.

The main application of interest is the bulk annuity; this product provides a benefit to a pool of survivors in proportion to its size. An unsophisticated modelling approach assumes the lives in the pool are independent. We argue that this approach leads to a significantly understated premium that could undermine the

solvency of bulk annuity providers. In past work, it has been shown that even a small level of dependence between lives can lead to a much higher uncertainty in the liabilities engendered by selling this product.

Finally, 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.

This research has produced an article in the *Scandinavian Actuarial Journal* (see page 106) and a working paper.



DR DANIEL H. ALAI
BMath Waterloo, PhD
ETH Zurich
ASSOCIATE INVESTIGATOR

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.

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

RESEARCHER

ALAN WOODLAND

External Collaborator

CHRIS STRICKLAND
(PREDICTIVE ANALYTICS GROUP)

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 and 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 2017, the programming and preliminary evaluation of a new algorithm for solving the life-cycle problem that was developed in 2016 was completed. This work provides the platform for a subsequent CE17 research project in Stream 4 which will fully evaluate and test this promising method. Once tested positively, it will be applied to the estimation and analysis tasks at hand.

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.

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, ageing societies in particular benefit from efficient housing markets and high rates of home ownership. Quite surprisingly, despite huge tax incentives in most industrialised countries, home ownership shares differ quite substantially, ranging from around 44% in Germany to almost 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?

This research project answers these questions by constructing 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. A model, programmed in Fortran, is constructed for both countries applying the same preferences and technologies. However, they will differ in their population dynamics, their fiscal and pension 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 not only consider long run steady state equilibrium effects of policy changes (as per existing literature), but also simulate the whole transition path in order to analyse intergenerational welfare changes. Second, our approach incorporates detailed demographic projections in both countries to study their impact on the housing market (compared to existing studies that employ a stationary demographic structure). Third, we quantify the aggregate efficiency effects of policy reforms by means of lump-sum compensation payments (existing studies deal only with distributional welfare consequences).

Although Australia has very high home ownership rates, Australian households have less financial assets and lower 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.

In the second half of 2017, George Kudrna visited the University of Wuerzburg in Germany for a month 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. A draft of the working paper was produced, which will be finalised in early 2018. The project is expected to produce several publications in leading peer-reviewed international journals.

...the consumption stream from housing assets provides an implicit insurance cover in retirement against both long-term care and longevity risks.

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 and cognitive health, and associated factors; 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; new research in this area develops health choice modules far more comprehensively.

Among this year's highlights are:

- **OLDER DRIVERS, TRANSPORT AND POLICY**
The ongoing research program on older drivers and transport policy continues to focus on developing evidence-based assessment tools, interventions and resources to improve older driver safety. This very practical program, aimed at gathering a strong evidence base around what is an increasingly controversial area of policy and regulation, will inform policymakers, practitioners and consumers. To take just a couple of examples: one study, conducted through 2017, aims to validate on-road assessment of older drivers against their everyday driving habits as measured with footage from dash cameras fitted to drivers' cars for a period of two weeks. The data will indicate how accurately an on-road driving assessment reflects an older driver's everyday driving skills. A second study, also undertaken in 2017, examines the cognitive predictors and moderators of everyday functioning in older adults – including driving skills. The study uses data from detailed

neurocognitive testing of PATH study participants, and measures of driving frequency, distance, crashes, as well as self-rated balance and informant-rated instrumental activities of daily living.

- **THE IMPACT OF DIETARY INTAKE ON MAINTENANCE OF COGNITIVE HEALTH**
The potential impact of diet on cognitive health in older age is a topic of tremendous interest to the general public and clinicians alike given the current lack of effective treatment for age-related cognitive decline and dementia. There is increasing evidence that both the Mediterranean Diet and the newly developed Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet are protective against cognitive decline and dementia in late-life. These diets are defined by non-processed plant-based foods and include fish, poultry, and olive oil, but limit red meat and desserts. In 2017 a study was undertaken to determine whether the MIND diet had any impact on cognitive health, on a sample of more than 1200 participants. After controlling for multiple demographic and health confounders, every one-point increase in MIND diet score was associated with a significant 15% decrease in the odds of developing cognitive impairment over 12 years, while the standard Mediterranean diet did not offer this kind of benefit. After further evaluation, these findings may contribute to the development of dietary guidelines for cognitive health.

- **HEALTH SHOCKS AND THE EVOLUTION OF CONSUMPTION AND INCOME OVER THE LIFE-CYCLE**
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 and equity in healthcare systems. To do this effectively, much greater realism must be introduced into life-cycle modelling. This project introduces medical conditions and expenditures, and relates health outlays and utilisation to education and human capital accumulation decisions. This modelling and estimation are important since they allow the accurate capture of expectations formation regarding the evolution of health and the degree of health risk they face throughout their lives. This goes towards explaining how health impacts individuals' economic decisions such as the allocation of resources between consumption, leisure, and work. In turn, understanding these interactions informs policy regarding health care provision.

RESEARCHERS

KIM KIELY
KAARIN ANSTEY

This research project 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 2017, our research focused on elucidating causal pathways between sensory loss and cognitive decline. An invited submission to a special issue of International Psychogeriatrics is currently under review. This editorial outlines the evidence showing that hearing loss is linked to cognitive decline, debates the assertion that hearing loss is therefore a modifiable risk-factor for dementia, and critically analyses the claim that hearing loss interventions may be effective interventions to reduce dementia risk. Other non-CEPAR funded components of the research program are ongoing, including longitudinal mediation analysis showing that disengagement from novel social activities explains much of the association between hearing decline and cognitive decline. This finding lends some support to the notion that hearing loss may be a modifiable risk-factor for cognitive deficits.

... 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.



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'.

Kim's research is orientated by a contextualised perspective to human development across the life course and is inherently interdisciplinary, spanning the fields of life-course epidemiology, social psychiatry, and gero-psychology. His 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 analyses of the determinants and outcomes of successful sensory aid use, and identifying mechanisms underlying sensory-related cognitive decline. He is developing a research program investigating social determinants and inequalities in health and working life expectancies.

RESEARCHERS

KAARIN ANSTEY
DIANE HOSKING
KIM KIELY

External Collaborator

RANMALEE ERAMUDUGOLLA (ANU)

The research program on older drivers and transport policy continues to focus on developing evidence-based assessment tools, interventions and resources to improve older driver safety. The outputs aim to inform policymakers, practitioners and consumers.

In 2017, progress has included publication of a paper characterising older drivers in the PATH Through Life study, and a paper examining the effect of cognitive training on cognitive functions known to predict driving safety in older adults. Other work includes a study aimed at validating on-road assessment of older drivers against their everyday driving habits as measured with footage from dash cameras fitted to drivers' cars for a period of two weeks. The data will indicate how accurately an on-road driving assessment reflects an older driver's everyday driving skills.

The findings will inform practitioners and will be used to develop better measures of the effectiveness of driver training programs. Further work has examined the cognitive predictors and moderators of everyday functioning in older adults – including falls risk and driving skills. The study uses data from detailed neurocognitive testing of PATH study participants, and measures of driving frequency, distance, crashes, falls, self-rated balance and informant-rated instrumental activities of daily living. Structural equation modelling approaches are then being applied to determine latent cognitive predictors of independent functioning in older adults. This project also included preliminary work on an evidence review and feedback to the ACT Government Justice and Road Safety Directorate

on their ACT Older Driver Handbook. This resource is provided by the Directorate to all ACT drivers aged over 70 years with their registration renewals.

On October 4 2017, CEPAR co-hosted a workshop for older drivers, Driving and Health: What You Need to Know, in conjunction with COTA ACT and the Australasian College of Road Safety ACT. This event included presentations from Professor Joanne Wood (QUT), CI Kaarin Anstey, Associate Professor Vanita Parekh (Fitness to Drive Clinic), Ewan Brown (COTA ACT), Simon Carroll (Capital Chemist) and the ACT Driver and Rehabilitation Services. It attracted many older drivers in the community as well as road safety practitioners and provided information on factors that predict safety, processes and policies around mandatory assessment and review.

The findings will inform practitioners and will be used to develop better measures of the effectiveness of driver training programs.

THE IMPACT OF DIETARY INTAKE ON MAINTENANCE OF COGNITIVE HEALTH

RESEARCHERS

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The potential impact of diet on cognitive health in older age is a topic of tremendous interest to the general public and clinicians alike given the current lack of effective treatment for age-related cognitive decline and dementia. There is increasing evidence that both the Mediterranean Diet and the newly developed Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) diet are protective against cognitive decline and dementia in late-life. These diets are defined by non-processed plant-based foods and include fish, poultry, and olive oil, but limit red meat and desserts. At the end of 2016, we reported that we were planning to evaluate the impact of the MIND diet on cognitive health in an Australian context given that studies to date have only been conducted in the United States and results do not necessarily generalise across cohorts or countries.

During 2017 we undertook analyses to test if the MIND diet was protective against 12-year incidence of cognitive impairment in 1,220 participants from the PATH Through Life study. Participants were aged 60-64, had dietary data available, and were free of cognitive impairment at baseline. Over 12 years, approximately 10% of this sample received a clinical diagnosis of cognitive impairment. After controlling for multiple demographic and health confounders, every one-point increase in MIND diet score was associated with a significant 15% decrease in the odds of developing cognitive impairment over 12 years. These results were presented at the Alzheimer's Association International Conference held in London in July. Subsequently, we also evaluated associations between the Mediterranean diet and 12-year incidence of cognitive impairment in the PATH 60s cohort. In common with findings from other studies in non-US samples, neither of the two Mediterranean diet scores were associated with incident cognitive impairment. Our findings provide preliminary evidence that in an Australian setting, the MIND diet captures intake of cognitively relevant foods more effectively than the Mediterranean diet and, after further evaluation, may contribute to the development of dietary guidelines for cognitive health.

The manuscript reporting this study has been submitted to the journal *Alzheimer's & Dementia*.

One of the pathways by which diet may impact on cognitive health is via long-term impact on vascular health. Poor diet and excessive alcohol intake increase the risk for elevated blood pressure that can damage the delicate network of blood vessels in the brain. Data from the Australian Diabetes Obesity and Lifestyle Study (AusDiab) provided the opportunity to analyse 12-year longitudinal associations between an unhealthy diet and change in both systolic blood pressure (sysBP) and pulse pressure (PP) in those over 50 years of age. We defined poor diet as total intake of 'discretionary' foods and drinks; i.e. those foods that are energy rich but nutrient poor including processed and fast food, snacks and sweets, and alcoholic beverages. Diet and blood pressure were assessed at three time points across the course of the study. Those with potential cognitive impairment were excluded due to greater likelihood of diet misreporting in this group. Total sample was n=939. On average, discretionary diet and alcohol intake decreased over time and both sysBP and PP increased.



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ASSOCIATE INVESTIGATOR

Ross Andel is a Professor in the School of Aging Studies at the University of Southern Florida (USF). His primary research interest is the investigation of modifiable risk factors for cognitive impairment including Alzheimer's disease and other types of dementia. He is particularly interested in the role of occupational environment in cognitive change and cognitive impairment, but he also studies other factors in this context including leisure activities, education, personality and dietary factors.

More recently, he has been involved in the search for clinical tools capable of identifying early signs of cognitive impairment. This includes collaboration with colleagues from the Czech Brain Ageing Study

where they target spatial navigation memory as a potential indicator of cognitive status. It also includes collaboration with the USF Health Byrd Alzheimer's Institute, specifically research on the use of the web-based memory monitoring system for older adults, the Cogstate Brief Battery.

He also works with colleagues from the Cognitive Aging and Neurophysiology of Aging Labs at USF where they conduct research aimed at helping older adults maintain their cognitive abilities.

In 2017, he was the recipient of the Fulbright Distinguished Chair in Humanities, Arts, and Social Sciences awarded to the Australian National University.

In linear mixed models adjusted for energy intake, multiple demographic/health variables and BP medication use, neither average discretionary diet nor average alcohol intake were associated longitudinally with blood pressure. We used latent class analyses to evaluate if people clustered into patterns of discretionary diet consumption and alcohol drinking over time. For both diet and alcohol, the best fitting model was for three stable classes of consumption; low, medium and high, although there was substantial variation within class in level of intake. The greatest proportion of the sample fell into the lowest category for both discretionary diet and alcohol. No class of discretionary diet consumption was associated with level or change in sysBP, but those who fell into the lowest category of alcoholic drinking showed significantly less increase in sysBP over 12 years. These findings will be submitted to the journal *Nutrition, Metabolism, Cardiovascular Diseases*.

As part of the diet and cognitive health project, we conducted a systematic review of the relationship between iron status and risk of incident cognitive decline or dementia. Iron deficiency has been robustly linked to poor cognitive functioning in children and young adults, but the relationship between iron status and cognition in older adults is complex. Ageing is associated with accumulation of iron in the brain that may contribute to neurodegeneration; and age-related inflammatory and cardiovascular chronic diseases have a bidirectional relationship with change in iron metabolism. Our review identified a lack of well-designed studies to adequately address these relations.

Measures of iron exposure and cognitive decline were diverse, and most studies did not control appropriately for metabolic confounders. Our systematic review concluded there is currently insufficient evidence to determine whether iron exposure influences cognitive decline during ageing. This manuscript is currently under review.

After controlling for multiple demographic and health confounders, every one-point increase in MIND diet score was associated with a significant 15% decrease in the odds of developing cognitive impairment over 12 years.



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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. 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

30

RESEARCHERS

KAARIN ANSTEY
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KERRY SARGENT-COX

This research focuses on understanding the complex range of factors that influence individual trajectories of cognitive development and cognitive decline in ageing. In 2017, we have initiated three systematic reviews.

In the absence of any disease modifying treatments for dementia, identifying modifiable risk factors to promote disease prevention is currently the only way to reduce predicted increase in dementia prevalence. Our first umbrella review evaluates the quality of evidence associated with key demographic, medical, lifestyle, and environmental risk factors in dementia.

Alzheimer's disease has been observed to be more prevalent among women, however why this is the case is not currently well understood. Our second systematic review evaluates how sex differences influence dementia risk factors.

The association of Apolipoprotein E with late-onset Alzheimer's disease (LOAD) and

cognitive endophenotypes in cognitive ageing has been widely investigated. There is increasing interest in evaluating the association of other LOAD risk loci with cognitive performance and decline, however, the results of these studies have been inconsistent and inconclusive. Our final systematic review of studies investigates the association of non-APOE LOAD risk loci with cognitive performance in older adults.

Extensive analysis of the most recent wave of data collection from the PATH Through Life Study 60+ cohort has also been conducted to evaluate the role of dementia risk scores on cognitive performance. In this analysis we first used confirmatory factor analysis, to construct three models of cognitive performance: 1) general cognitive ability 2) dementia related variance in cognitive performance and 3) cognitive domains representing verbal ability, episodic memory, executive function and processing speed. Second, based on our previous research projects, we developed a risk index composed of demographic, medical, lifestyle, and environmental factors, known as the ANU Alzheimer's disease risk index (ANU-ADRI) and a genetic risk score (GRS) composed of 25 genetic loci associated with increased risk of Alzheimer's disease (AD) in PATH.

We found that a higher ANU-ADRI score (representing increased risk of dementia) was associated with worse performance in general cognitive ability and more specifically in perceptual speed, executive function, episodic memory and verbal ability. Additionally, a stronger association was observed for dementia-related variance in cognitive task performance in comparison to variance in cognitive function unrelated to dementia processes. In contrast, a higher GRS (representing a higher genetic predisposition for developing AD) was associated only with dementia-related variance in cognitive task performance and episodic memory. These results provide additional support for using the ANU-ADRI across the cognitive spectrum in individual patient assessment to inform intervention and treatment strategies aimed at delaying dementia.

In other research, we also evaluated the role of the AD GRS with Mild Behavioural Impairment (MBI), which describes the emergence of later-life Neuropsychiatric Symptoms (NPS) and represents an at-risk state for cognitive decline and dementia and as a potential manifestation of prodromal dementia.



DR SHEA ANDREWS
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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*, and *Brain and*

Behavior. 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.

JOINT LABOUR SUPPLY AND RETIREMENT OF AUSTRALIAN COUPLES

RESEARCHERS

XIAODONG FAN
ALAN WOODLAND

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 publicly 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 formulate a dynamic model in which each couple decide collectively their hours worked in the labour market, while facing

uncertainty in individual survival and health conditions. This model is then econometrically estimated using data drawn from the Household, Income and Labour Dynamics in Australia (HILDA) panel data set. We carefully model relevant policies in Australia, including the income tax codes, the relevant tax offsets and, most importantly, the Age Pension and Pension Supplement.

We estimate the model using data drawn from the first 13 waves of the HILDA survey data, which is a national representative sample of Australian households. During 2017 we reformulated the model as a sequence of age-specific decisions and then undertook the estimation of the resulting model via the method of generalised simulated moments. Estimates of the parameters of the model have been obtained and are currently being evaluated.

This work lays the foundation for work to be undertaken in Stream Four of the CE17 research program, wherein it is proposed 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.

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.



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Xiaodong Fan was a CEPAR Research Fellow located in the UNSW Business School from September 2012 until May 2017. He joined the Centre after graduating with a PhD in Economics from the University of Wisconsin-Madison. Upon leaving CEPAR he took up a position as a Lecturer at Monash University.

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.

RESEARCHERS

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In 2017 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’. Research focused on how to help people with retirement decisions through financial advice and the development of new products.

The ARC Discovery Grant team (Bateman, Eckert, Iskhakov, Louviere and Thorp) used data from an incentivised discrete choice experiment (DCE) of choice of financial adviser to investigate confirmation bias and the ‘willingness to pay’ for financial advice. A working paper (Agnew et al. 2017) was presented at international conferences, including the Boulder Summer Conference on Consumer Financial Decision Making, and the RAND Behavioral Finance Conference in Washington DC, and is under review with a highly ranked journal.

The ARC Discovery Grant has also supported research on preferences for long-term care insurance (LTCI) in the form of a health-contingent income payment (Wu, Bateman, Stevens, Thorp). In 2017, three papers from this project were presented at international conferences, including the NetSPAR International Pension Workshop (Wu et al. 2016), the Annual Meeting of the American Risk and Insurance Association in Toronto, Canada (Wu et al. 2017a) and the NetSPAR Pension Day in Utrecht, the Netherlands (Wu et al. 2017b). Wu et al. 2017c was accepted on the program of the 2018 ASSA Conference in Philadelphia, January 2018. The four papers are based on a life-cycle model to investigate the role of a LTC income product in an optimal portfolio and/or an experimental survey of preferences for a LTCI income product. A key finding of the experimental work is that the proposed LTCI income product complements, rather than substitutes, high-level informal care and that access to the product could release precautionary savings for the purchase of longevity insurance.

Project outputs:

Agnew, J.R., Bateman, H., Eckert, C., Iskhakov, F., Louviere, J. and Thorp, S. (2017). Learning and Confirmation Bias: Measuring the Impact of First Impressions and Ambiguous Signals.

Wu, S., Stevens, R. and Bateman, H. (2016). Optimal Portfolio Choice with Health Contingent Income Products: The Value of Life Care Annuities. CEPAR Working Paper 2016/17.

Bateman, H., Stevens, R., Wu, S. and Thorp, S. (2017a). Reducing the Under-insurance Puzzle by Product Design: Experimental Evidence of Life Care Annuity Demand.

Wu, S., Bateman, H., Stevens, R. and Thorp, S. (2017b). Demand for Long-term Care Insurance: Matching Stated Preferences and Model Predictions.

Wu, S., Bateman, H., Stevens, R. and Thorp, S. (2017c). Long-term Care Income: Selection, Informal Care and Precautionary Savings.

RESEARCHERS

XU XIAO CHUN
MICHAEL KEANE

Australian housing policies such as negative gearing and housing supply have wide-ranging impacts on individuals and the wider economy. For most Australians, housing assets by far 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 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.

Funded primarily by an ARC Laureate Fellowship, 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 preliminary model has been developed, and after the model has been calibrated to Australian economic conditions, it will be used to analyse Australian housing policies such as negative gearing, capital gains and housing supply. A working paper will be produced in 2018.

Relatedly we will also look at the effects of the Australian superannuation scheme on the economy and its interactions with housing wealth. If households are unwilling, or not able, to offset compulsory superannuation contributions through reducing their other asset holdings or increasing their borrowings, superannuation significantly increases net saving.

Superannuation may also have a significant impact on Age Pension liabilities. Higher household wealth generated by superannuation can reduce the government's burden of supporting retirement income and thus shift the

country more towards a self-funded retirement system. On the other hand, retirees can use their superannuation funds to purchase housing assets which are exempt from means-testing.

Few studies look at both housing and superannuation simultaneously. It is important to consider both elements at the same time as they are the largest components of household wealth and can interact with each other to produce important implications for themselves and the wider economy. For example, superannuation defers consumption for workers while housing purchases bring forward consumption through borrowing. On the other hand, contributing to superannuation delays saving for a down payment for a home, thus delaying housing purchase.

The preliminary model has been developed using an overlapping generations model as a small open economy. Once the model is calibrated to Australian conditions, work can proceed towards a working paper in early 2018.



DR XU XIAO CHUN
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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.

RESEARCHERS

MICHAEL KEANE
XIANGLING LIU

For taxation and investment purposes, residential properties are classified as either owner-occupied or rental properties, with different tax regimes applying in different countries. In Australia, the family home is excluded from the income tax altogether, and is also exempt from the Age Pension means test. Because the Australian income tax does not quarantine business losses, interest payments and other costs relating to rental property can be deducted from taxable income. Where these costs exceed rental income, the property is said to be 'negatively geared'. The relation between these different forms of housing ownership is largely unexplored in the literature.

While little guidance is provided on the issue, the decisions are crucial to the wealth accumulation of households for which investment in housing constitutes a major component. The research is particularly timely with the net income effect induced by the tax advantage of the rental property currently under the spotlight in Australia, especially in terms of its possible contribution to the housing market boom.

This project studies household housing choice transitions by age and net wealth by developing a discrete life-cycle model of household consumption and portfolio choice in relation to the purchase of owner-occupied and rental properties. It assumes that a household with a stochastic income and access to a risk-free financial asset may purchase a family home for the consumption services it provides, and may also purchase a rental property for investment. The value of each property is defined by the number of bedrooms from 0 to 5. The real rate of return on housing follows a stochastic process. The constraints are: the household faces substantial housing equity risk, collateral requirements and liquidation cost in their investment.

In 2017, the model economy was calibrated, and a draft paper was written up.

The research is particularly timely with the net income effect induced by the tax advantage of the rental property currently under the spotlight in Australia, especially in terms of its possible contribution to the housing market boom.



DR XIANGLING LIU
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Xiangling Liu is a CEPAR Research Fellow located in the UNSW Business School. 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 and equity in healthcare systems.

First, to better understand how health shocks affect earnings and consumption, we develop a novel and comprehensive model of health over the life-cycle, recognising that health is a complex multi-dimensional concept. 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. Second, we study the interactions between health and human capital accumulation (learning-by-doing). These features are important in allowing the model to capture the degree to which, and the pathways through which, health

impacts earnings and consumption patterns. They are also very important in estimating the value of health insurance and social insurance.

This project also investigates the level of equity in the US health care system, studying socioeconomic status (SES) differences in medical spending conditional on insurance type, demographics, and specific medical conditions at the ICD-9 (Ninth Revision, International Classification of Diseases) level. Previous research documents inequities in specific settings, whereas we study equity at the national level.

We build and calibrate a life-cycle model with idiosyncratic health, earnings and survival risk where individuals make labour supply and asset accumulation decisions. Individuals accumulate human capital (experience) while working. We estimate 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; 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, we estimate 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, and work.

We currently have two working papers that are part of this project. The first focuses on the effects of health on earnings dynamics and the second studies SES inequities in medical expenditures in the US health care system. The papers will be finalised and submitted for publication in early 2018.

...it is becoming increasingly important to develop the tools needed for the design of effective policy aimed at improving health outcomes and equity in healthcare systems.



ASSOCIATE PROFESSOR
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RESEARCH FELLOW AND
ASSOCIATE INVESTIGATOR

Shiko Maruyama is an Associate Professor at the University of Technology Sydney (UTS) Business School. From 13 March until 16 June he was a CEPAR Research Fellow located at the UNSW node.

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 Department of Management and Strategy at the Kellogg School of Management and the Institute of Economic Research at Hitotsubashi University.

RESEARCHERS

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External Collaborators

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This project investigates 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). Ketchum 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 contribute to an understanding of these issues using an empirical methodology that relies on the rich administrative dataset developed in Ketchum 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 empirical approach moves beyond discrete choice models that assume homogeneity in preferences by utilising the Mixed-Mixed Multinomial Logit (MM-MNL) model framework. By restricting the preference parameters of one latent class to behave rationally (as per the theory), it is possible for the model to provide an

estimate of the proportion of individuals in the data who behave rationally as well as provide a posterior probability to each individual that they belong in this rational 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 also link a subset of these individuals to the Medicare Current Beneficiary Survey that measures enrollees' knowledge of how Part D works along with their wealth, education, and other demographics that further expand our understanding of choice behaviour across socioeconomic status. It is the first time the two datasets have been used together for academic research in this way.



DR TIMOTHY NEAL
BA BEc (Hons) Macq.,
PhD UNSW
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.

The model also recognises the longitudinal nature of the data (the sample contains the choice behaviour of individuals over multiple years) by explicitly modelling inertia. Not only does this improve the accuracy of the results, it allows us to investigate the circumstances that lead to plan changes over time and whether there is evidence of learning over the five-year period.

In 2017 the majority of the work on the project was completed and written into a preliminary draft paper. The preliminary results were presented at the Daniel McFadden 80th Birthday Conference, 28-29 July, at the University of South Carolina.

The remaining piece of the project is to use the estimates of the distribution of taste parameters, as well as the posterior class probabilities, to: assess the welfare consequences of several items including the observed departures from rational choice behaviour; assess restrictions on the choice sets and other interventions in the market; and predict 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 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.

The project is funded primarily by an ARC Laureate Fellowship.

... 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.

RESEARCHERS

ELENA CAPATINA
JAMES MA
(2015/2016 SUMMER SCHOLAR)

The US has a unique health care system where employer sponsored health insurance (ESHI) is the main source of health insurance for working age individuals. Yet one in four workers aged 25-40 were privately uninsured in 2010. It is generally believed that adverse selection contributed to a relatively large fraction of young, healthy and uninsured individuals. This partly motivated the Affordable Care Act (ACA) insurance mandate to require individuals to buy insurance or pay a fine.

Yet, there is no clear evidence in support of adverse selection in this market. In addition, contrary to predictions, several other health insurance markets have been found to exhibit either no selection or advantageous selection, meaning that those who have more insurance are in fact lower risk.

The aim of this paper is to study the role of asymmetric information in the decision to take up insurance among workers offered ESHI. The main question of interest is whether workers who decline ESHI and remain privately uninsured are significantly higher or lower risk than those who take up ESHI, conditional on the insurance costs faced and the types of health plans offered by their employers. This is important in order to better understand the characteristics of those lacking health insurance in the US and determine the likely effects of the ACA.

Data from the Medical Expenditures Panel Survey from 2001 to 2010 and from the National Longitudinal Survey of Youth '97 in 2010 is used. Controlling for firm and job characteristics that proxy for the choice of plans and premiums faced by workers, it was found that individuals aged 25-40 who decline ESHI and remain privately uninsured have significantly worse health and health behaviours than those who enrol. No correlation between health and insurance take up is found in the 41-64 age group. The advantageous selection among young employees is in part explained by education and family income, and by the fact that Medicaid crowds out ESHI for low socioeconomic status workers who have high health risk. Risk preferences contribute very little to selection.

The paper is under review in an Economics journal. The paper has been presented at several Australian and international workshops in 2017.

...it was found that individuals aged 25-40 who decline employer sponsored health insurance and remain privately uninsured have significantly worse health and health behaviours than those who enrol.

RESEARCHERS

ELENA CAPATINA
XIAODONG FAN

It is well known that married individuals are healthier and live longer than singles. While selection into marriage has been found to contribute to this relationship, current evidence suggests there is also a significant protective role of marriage on health. However, while on average marriage appears beneficial, relatively little is known regarding the distribution of the effect of marriage on health.

This project aims to shed light on how spousal characteristics influence own health, and how effects vary with an individual's own characteristics. We focus on the role of education. A vast literature documents a persistent association between own education and health, and we expect education to also play a central role in cross-spousal effects.

Specifically, we study how the spouse's education interacts with own educational attainment to affect own health, using various measures of health, including self-reported health, health behaviours, health transitions and mortality. Our findings are relevant for theories of health capital formation, returns to education, health inequality, and marriage market decisions.

Using data on married individuals from the Medical Expenditures Panel Survey (MEPS) and the Health and Retirement Study (HRS), we find that having a college educated spouse is strongly associated with better health, better health behaviours, better health transition, and lower mortality, after accounting for own education and demographics.

Four main mechanisms could lead to this association: (1) selection into marriage with a college educated spouse; (2) effects of spousal education on household level characteristics; (3) a correlation between spousal education and his/her health, which affects own health and behaviours; and (4) cross-productivity in health production between spouses. We use controls on own and family background, household characteristics, and spouse health to empirically quantify the contributions of mechanisms 1-3. We find that selection into marriage with a college educated wife explains a large fraction of the association between spousal education and better health for non-college educated males only. For all other groups, causal mechanisms dominate in importance. Therefore, there are significant returns to education through spousal health effects.

We currently have a draft working paper and have presented this paper at several Australian workshops and conferences. The paper will be finalised in the first half of 2018 and will be submitted to a peer reviewed Economics journal.

We find that selection into marriage with a college educated wife explains a large fraction of the association between spousal education and better health for non-college educated males only.

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. Highlights for this ARF include:

- **MANDATORY PRE-FUNDED RETIREMENT INCOME SCHEMES**

In collaboration with Netherlands-based NetSPAR, CEPAR researchers have been evaluating pre-funded retirement schemes – of which the Australian Superannuation Guarantee is an example – for best policy and practice. Both accumulation and decumulation phases are compared. The Netherlands and Australian systems differ in many respects, but most dramatically when it comes to drawdowns – Australia provides almost no structure and much flexibility, while the Netherlands sits at the opposite extreme. The project focuses on defaults, choice and decisions around retirement income provision and drawdown structures as well as insurance of retirement risks. The output produced can broadly be categorised around three main topics: qualitative findings, behavioural insights and quantitative considerations. As it matures and moves towards completion, this project is expected to generate new insights into the role of guidance – from compulsion through to free choice – in the context of pension schemes.

- **MANAGING LONGEVITY RISK**

Many projects in this stream relate to the management of longevity risk in one form or another. A series of projects, mostly executed by the Actuarial group in CEPAR, have tackled this issue, with papers ranging from issues of longevity-linked annuity design to reverse mortgages. Longevity linked annuities have received a lot of policy attention in recent years. The 2014 Australian Financial System Inquiry devoted much space to them. Two projects in this ARF focus on various aspects of these annuity types. The research being carried out in CEPAR on these products will go a long way to providing important insights into their strengths and weaknesses, and their interactions with other parts of the retirement income system.

Notional Defined Contribution (NDC) pensions continue to receive attention, both in this ARF and in ARF 6. This design has been adopted in one form or another in a number of countries now, but sustainability remains an issue. One project places these products into an Overlapping Generations framework to understand what designs will be sustainable in a more dynamic setting.

- **REVERSE MORTGAGE LOANS AND LONG-TERM CARE INSURANCE**

Long-term care (LTC) is the new frontier of policy categories being developed to address an ageing demographic. Several CEPAR projects, both in this ARF and elsewhere, focus on LTC design. LTC insurance, while offered in a number of countries, has rarely been seen as a successful product. An obvious way to finance LTC is with equity in an owner-occupied home, but thus far, product and regulatory designs to facilitate this match have been very clumsy. A project is being undertaken at CEPAR to better understand how reverse mortgage and home equity release structures might be used to make the use of home equity to finance LTC more flexible and affordable.

RESEARCHERS

MICHAEL SHERRIS
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This project has been developing material for a book focusing on financial and actuarial issues in post-retirement incomes including modelling longevity and health, drawdown strategies and products such as annuities, long-term care annuities and variable annuities. Topics under consideration include longevity and disability trends, basic models of mortality and heterogeneity as well as products such as life annuities and long-term care insurance. It will also cover recent developments in products such as enhanced and care annuities, pooled annuities, variable annuities and products combining long-term care insurance with other financial products. An overview of individual financing and risk decisions in using retirement income products will provide a background for the book. It will reflect existing institutional and regulatory structures and requirements and incorporate current research perspectives, although these are not the main focus of the book. Although research based, the book will 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 and will bring together research from the actuarial research program in CEPAR. A number of draft chapters have been prepared by Ermanno Pitacco.

Coverage of some of the chapters was reflected in the presentations at a CEPAR Longevity Research Forum held at UNSW on 'Research Issues in Modelling Longevity Risk with Applications: Current Perspectives and Future Directions' on February 16 2017. This Forum focused on current and future research on modelling of longevity risk with applications to the managing of longevity risk including costing and design of income stream products and long-term care insurance. Modelling of the risks covered all aspects of future survival and health status including actuarial and demographic models and methods. The sessions covered:

- Longevity risk: mortality models, trends, uncertainty, continuous and discrete time models, multi-population models, data sources and life expectancy presented by Michael Sherris;

- Health status: models of health status, functional disability, healthy life expectancy, morbidity compression and expansion, incorporating trend and uncertainty, and data analytics presented by Ermanno Pitacco; and
- Managing longevity and morbidity risk: individual risk management (variable annuities, risk sharing), and corporate risk management for insurer and superannuation funds (longevity swaps, derivatives, natural hedging) presented by Annamaria Olivieri.

Project output in 2017 included the CEPAR Working Paper 2017/06 by Ermanno Pitacco.

The project has been scoped and developed over a number of years and will bring together research from the actuarial research program in CEPAR.



PROFESSOR ANNAMARIA OLIVIERI

Degree in Business Economics, University of Parma, Degree in Actuarial Science and Statistics, University of Florence, PhD, University of Brescia
ASSOCIATE INVESTIGATOR

Annamaria Olivieri is Professor of Mathematical Methods for Economics, Actuarial Science and Finance in the Department of Economics and Management 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 Altling 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 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.

RESEARCHERS

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In 2017 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 researchers linked to this grant have consolidated various projects through regular research visits by members of the research teams. In 2017 CEPAR Senior Research Associate Jennifer Alonso García and Al Hazel Bateman visited NetSPAR in January and October and NetSPAR Researcher and CEPAR RA Johan Bonekamp visited CEPAR in April.

These projects focus on defaults, choice and decisions around retirement income provision and drawdown structures as well as insurance of retirement risks. The output produced can broadly be categorised around three main topics: qualitative findings, behavioural insights and quantitative considerations.

To help the development of the main project, a research paper has been developed by CEPAR Director John Piggott, Hazel Bateman and Ralph Stevens examining the institutional settings in Australia and the Netherlands. Here they compare the pension systems in the United Kingdom, Australia and the Netherlands. The output and insights of this research were key to providing an understanding of their design and how these can be exploited to address our research questions in the behavioural and quantitative projects. Despite their similarities (tax funded basic pension and quasi mandatory funded second pillar), their differences make them an interesting base to provide recommendations with regards to benefit design, choice and sustainability.

The second area of expertise that this project has contributed to is behavioural economics or finance. Research shows that individuals rarely draw down their wealth as theoretical models would indicate. More so, recent empirical studies show that many retirees hold on to their assets or even keep on saving well into their later years. To better design insurance products offered during retirement, insurers and policymakers need to understand the retirement savings preferences of people in retirement. CEPAR researchers Hazel Bateman, Jennifer Alonso García and Johan Bonekamp, together with

NetSPAR affiliated researchers Arthur van Soest and Ralph Stevens shed some light on this issue with an experimental survey. By doing so, they can capture not only which characteristics are associated with certain saving and spending behaviours, but also investigate whether individuals are sensitive to default drawdown requirements and would change their saving and spending accordingly. Furthermore, Hazel Bateman and Jennifer Alonso García together with industry partner Eduard Ponds, and Ralph Stevens will contribute to this area with an additional project where they aim to identify the impact of framing and preferences for pension products including annuities, lump sum and phased withdrawals. Experimental surveys were fielded in Australia and the Netherlands in June–July 2017.

Finally, this grant has greatly contributed to the area of life-cycle modelling and welfare analysis of existing or prospective pension paradigms. Cl Michael Sherris and Jennifer Alonso García have developed a framework where the Dutch and Australian setting, together with its current array of product choices, are analysed from a welfare perspective for heterogeneous individuals (varying degrees of income, mortality and risk preferences). They find that the state pension crowds out the demand for longevity insurance for low income individuals and the bequest motive greatly affects the preferred product portfolios in the Australian case.

CEPAR Research Fellow Mengyi Xu, together with Michael Sherris, Jennifer Alonso García and Al Adam Shao, also contributed to this grant by developing a life-cycle model for retiring individuals that considers housing assets, health and longevity risk as part of her PhD Thesis.

In 2017 this research was presented at the International Pension Workshop in Leiden; Financing Longevity: The Economics of Pensions, Health Insurance, Long-term Care and Disability Insurance at Stanford University; the Pension and Superannuation Seminar Series at UNSW; the PhD Meeting on Pensions 2017 at Tilburg University; the 25th Annual Colloquium of Superannuation Researchers in Sydney; the Long-term Care and Longevity Risk Workshop at UNSW; the SAFE meeting for EU officials in Brussels; the International Longevity Risk and Capital Markets Solutions Conference in Taipei; the Dutch Central Bank in the Netherlands; ICPM-NetSPAR Discussion Forum in Amsterdam; the Workshop on 'Household Finance and Retirement Savings' at the *Collegio Carlo Alberto*; the NetSPAR Pension Day in Utrecht; and the IAA LIFE Colloquium in Barcelona.

These projects have led to the following working papers:

CEPAR Working Paper 2017/13, Alonso-García, J. and Sherris, M. One Size Fits All? Drawdown Structures in Australia and The Netherlands;

CEPAR Working Paper 2017/19, Alonso-García, J., Bateman, H., Bonekamp, J., van Soest, A. and Stevens, R. Saving Preferences in Retirement: The Impact of Pension Policy Design and Health Status; and

CEPAR Working Paper 2017/20, Alonso-García, J., Bateman, H., Bonekamp, J. and Stevens, R. Retirement Drawdown Defaults: The Role of Implied Endorsement.

... 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.

RESEARCHERS

MICHAEL SHERRIS
CRAIG BLACKBURN
ANNAMARIA OLIVIERI

This project has considered longevity-linked life annuities, life annuities whose benefit is adjusted annually in face of the longevity experience. These products have been developed over recent years as a way of managing the longevity risk in conventional life annuities. The benefit is determined so that longevity losses and longevity profits are charged or distributed to annuitants, either fully or partially. Individuals willing to participate in mortality profits and losses in these products expect to gain a more favourable annuity rate. Pension funds and life insurers issuing these products face lower regulatory capital costs and less potential costs in providing the product. The project focuses on longevity risk.

This project has aimed to explore and understand the advantages of different longevity-linked product structures, both from the point of view of the annuitant and the annuity provider. The alternatives included are fixed-benefit life annuities, in which the longevity risk is fully borne

by the annuity provider, and Group Self-Annuitization annuities, in which all the longevity risk is borne by annuitants. Other methods of sharing longevity risk include annually varying the benefit amount depending on the performance of a given specified longevity index. The longevity index can reflect the insurer's annuitant portfolio, which is similar to a fully indemnity-based index, or a larger reference group such as a country's population. Variations in payments will reflect both the size of the annuitant pool as well as the longevity index used. Risk sharing can be based on an index of numbers alive, life expectation, or annuity values. The life expectancy and annuity values can be age-period based or cohort based, in which case they will take into account future expected mortality improvement.

Using models developed in prior research, preliminary analysis of a range of different risk sharing approaches has been considered. This has laid the foundations for extending the project in future research using more advanced cohort based mortality models.

This project has aimed to explore and understand the advantages of different longevity-linked product structures, both from the point of view of the annuitant and the annuity provider.



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ASSOCIATE INVESTIGATOR

Craig Blackburn is a CEPAR Associate Investigator and Senior Data and Modelling Analyst for the Royal London Group. He was previously a Research Fellow at CEPAR located in the UNSW Business School from May 2013 to March 2015.

His research interests include longevity modelling, pricing, and risk management, including the effects of Solvency II on an insurer's firm value. Craig has published articles in *Insurance: Mathematics and Economics*. His current research projects involve multiple cohort population modelling and hedging, and risk minimisation of longevity risk in an incomplete market.

MODELLING MULTIPLE POPULATION MORTALITY AND IMPLICATIONS FOR INSURER RISK MANAGEMENT

RESEARCHERS

MICHAEL SHERRIS
CRAIG BLACKBURN

This project developed a general framework for jointly estimating mortality rates of multiple populations using a cohort based, or forward mortality rate, model in a continuous time framework. The model extends the affine mortality models developed by Blackburn and Sherris (2013). We focus on two-population models initially since this provides a framework from which more general models can be developed.

In order to model these we define a deterministic volatility function for each population and then apply a finite dimensional realisation (FDR) to derive a joint state-space model for the mortality of the two populations. We define the volatility functions such that there is symmetric dependence along with shocks common to both populations. The FDR framework provides greater flexibility in designing suitable multi-population models over more conventional affine models. A conventional affine model with symmetric dependence does not have a simple closed-form survivor curve solution and must, generally, be estimated using numerical methods. The tractability of the FDR forward model permits a suitable Markovian state space model representation that yields closed-form survivor curves. The mortality forecasts for all ages are endogenously generated from the state space model. Since the model is Gaussian, there is the possibility of negative mortality rates and we limit the probability of negative mortality of the fitted and forecast mortality rates to 0.2%.

There is no market for longevity risk, hence the risk-neutral measure is not unique. We define one such measure to represent the best estimate cohort mortality process. Under the deterministic volatility function assumption, we define these processes through a change of measure, with the cohort's initial forward curve extracted from the state-space model forecasts. A non-unique risk-neutral measure can be defined for all cohorts in the state-space model. The model is estimated using Markov Chain Monte Carlo (MCMC) techniques.

We use the proposed joint population model to analyse the benefits of a cross population survivor swap contract; based on two similar populations. A life insurer with a portfolio of Australian male annuitants is able to, using a survivor swap based on either the Australian or Swedish male population, hedge their portfolio. For a large portfolio, the hedge effectiveness of a survivor swap based on the Australian population is 93%, while the hedge effectiveness of a swap based on the Swedish population is much lower at 9.9%. Analysing the 99.5% Value-at-Risk (VaR) of each survivor swap contract shows a reduction in solvency capital requirements can be achieved, even with a relative small hedge efficiency.

A life insurer with a portfolio of Australian male annuitants is able to, using a survivor swap based on either the Australian or Swedish male population, hedge their portfolio.

HOW CAN A CAUSE-OF-DEATH REDUCTION BE COMPENSATED IN THE PRESENCE OF HETEROGENEITY? A POPULATION DYNAMICS APPROACH

46

RESEARCHER

HÉLOÏSE LABIT HARDY

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When studying a large population such as a national population, it is well known that the population usually shows some heterogeneity, in the sense that individuals with different characteristics (such as gender, social characteristics and neighbourhood) can exhibit different demographic behaviours (different mortality and fertility rates). Taking into account individual characteristics for modelling mortality and population evolution, wherever possible, gives additional information.

A number of studies have demonstrated how the socioeconomic status of an individual significantly affects their mortality patterns, as well as cause-specific mortality. It is therefore critically important to understand and model the

mortality of a heterogenous population, which is an issue for intergenerational balance and of governmental interest.

Recent developments in multi-population modelling have improved the assessment and identification of trends of sub-populations mortality inside a national population, raising the question of consistency between sub-populations and global population mortality modelling. Hence, modelling population dynamics provides complementary insights on sub-populations evolution as well as on aggregated quantities.

This project combines population dynamics and cause-of-death mortality theories to study the interplay between population dynamics and mortality in a heterogeneous population. We show how changes in the population composition act on aggregate mortality quantities, for instance by taking into account interactions between mortality and past fertility. In particular we are interested in quantifying the impacts of cause-specific mortality changes in comparison with changes in a heterogeneous population composition.

Reducing or eliminating a cause-of-death may not necessarily result in an improvement of aggregated mortality rates or life expectancy if the composition of the population changes at the same time. We demonstrate how a cause-of-death reduction can be compensated in the presence of heterogeneity, which could lead to misinterpretations when assessing public policy impacts and/or for the forecasting of future trends. These findings are illustrated using a unique database obtained from the UK Office for National Statistics that contains information on cause-specific death rates by age, gender and deprivation level.

The results of this project will be reported in a CEPAR Working Paper in 2018.

...modelling population dynamics provides complementary insights on sub-populations evolution as well as on aggregated quantities.



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H  lo  se Labit Hardy commenced work as a CEPAR Senior Research Associate in the UNSW Business School in September 2016. She completed her PhD at the University of Lausanne in the department of Actuarial Science. She graduated from the French actuarial school *Institut de Science Financ  re et d'Assurances*.

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

'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.'

RESEARCHERS

MICHAEL SHERRIS
MENGYI XU
ADAM WENQIANG SHAO

This project examined 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 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.

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 home property 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 consumption cut 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 only cares 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. Several draft working papers are being finalised for this project.

The project uses simulations to assess the role of housing in financing retirement needs by considering the optimal time to buy a residential house.



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Mengyi Xu joined the UNSW Business School node of CEPAR as a Senior Research Associate in September 2017 after completing a PhD in Actuarial Studies at UNSW Sydney.

Her PhD thesis studies pre-retirement investment strategies and retirement planning in the presence of housing. Before starting her PhD, she obtained a Bachelor of Commerce (Honours) degree in actuarial studies from UNSW Sydney. She is a Fellow of the Institute of Actuaries Australia.

Her research interests include retirement financial products, pension fund management and longevity modelling. Her current research projects involve designing economic scenario generators and modelling old age mortality.

DEMAND FOR ANNUITIES AND LONG-TERM CARE INSURANCE WITH RECURSIVE UTILITY: IMPACT OF HOUSING

RESEARCHERS

MICHAEL SHERRIS
ADAM WENQIANG SHAO
JENNIFER ALONSO-GARCÍA
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There is a large literature on annuitisation of wealth at retirement ranging from theoretical models supporting full annuitisation at actuarially fair annuity prices to the impact of a range of factors on reducing annuity demand from bequests to behavioural factors. There is much less on long-term care insurance (LTCI) and the optimal purchase at retirement to cover aged care risks, especially in the presence of an annuitisation market. A key factor in assessing the demand for LTCI is the role of housing. This project aims to consider the demand for life annuities and LTCI in the presence of housing in a life-cycle model with recursive utility. Recursive utility is used to reflect that individuals have differing levels of risk aversion and willingness to substitute consumption over time, as measured by elasticity of intertemporal substitution (EIS). The widely-used power utility function has risk aversion equal to the reciprocal of EIS. Such a utility assumption has limitations in considering the demand for both LTCI as well as life annuities. These products have features of both an investment, that transfers wealth across time, as well as an insurance product transferring wealth between future good states to future bad states through the insurance mechanism. A recursive utility function breaks the link between risk aversion and EIS, and allows us to show their different impact on the optimal LTCI coverage and the optimal annuitisation rate.

Although full insurance is expected at actuarially fair prices, LTCI insures against uncertain healthcare costs and transfers consumption from early to late retirement. So retirees of higher risk aversion and/or higher EIS are likely to demand more coverage at fair risk-adjusted prices consistent with the individual preferences in the utility. Annuities smooth consumption over time and reduce precautionary savings to cover health expenditure, so retirees who are less willing to substitute consumption over time and/or are less risk averse may be expected to annuitise more at fair risk-adjusted prices. The interaction between the demand for life annuities and for LTCI is complex since life annuities may hedge some of the long-term care risks, leading to a reduced demand for LTCI. However, it is not clear what the impact of bequest motive will be on LTCI in the presence of life annuities.

Retirees have high home ownership rates, meaning a large fraction of their household wealth is held in the form of home equity. It is expected that home equity reduces the demand for LTCI since this illiquid asset can be used to fund long-term care costs. At the same time, home equity contributes to the bequest as an illiquid asset and may reduce the impact of bequest on demand for both life annuities and LTCI. Offsetting this is the illiquidity of home equity. So if it comprises a high proportion of wealth of a retiree, then they may be liquidity constrained and this will reduce the demand for both life annuities and LTCI.

The interaction between the demand for life annuities and for LTCI is complex since life annuities may hedge some of the long-term care risks, leading to a reduced demand for LTCI.

MODELLING LONG-TERM CARE INCORPORATING SYSTEMATIC UNCERTAINTIES IN HEALTH TRANSITION RATES

RESEARCHERS

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There has been an increased interest in modelling functional disability and long-term care (LTC) insurance. This has been driven by increased research into individual decision making in retirement in the presence of LTC risks and an increased interest in innovations in LTC insurance products such as life annuities that include LTC insurance. At the same time, systematic mortality improvement trends and higher levels of functional disability have placed strains on traditional LTC insurance products in countries such as the U.S., where such products have been regularly offered by insurers.

Multiple state functional disability models do not generally include systematic trend and uncertainty. These are important factors to take into account in modelling functional disability and LTC. We develop and estimate a multi-state latent factor intensity model for functional disability with transition and recovery rates depending on a stochastic frailty factor to

capture trend and uncertainty. We estimate the model parameters using US Health and Retirement Study (HRS) data between 1998 and 2012 with the Monte Carlo maximum likelihood estimation method.

The model estimation shows significant reductions in disability and mortality rates during this period in the HRS data and allows us to quantify uncertainty in transition rates arising from the stochastic frailty factor. In particular, recovery rates are very sensitive to the stochastic frailty. We can use the model to quantify uncertainty in the proportion of the population with differing levels of functional disability as well as future healthy, disability-free, life expectancy. The model estimates show an increase in expected future lifetimes as well as an increase in future healthy life expectancy determined from the estimated transition rates in the model. The proportion of lifetime spent in disability on average remains stable with no strong support in the data for either morbidity compression or expansion in this proportion. The model has widespread application in costing of government funded aged care and pricing and risk management of LTC insurance products.

Outputs include: Li, Z., Shao, W.A., and Sherris, M. (2017). The Impact of Systematic Trend and Uncertainty on Mortality and Disability in a Multistate Latent Factor Model for Transition Rates. *North American Actuarial Journal*, 1-17. doi: 10.1080/10920277.2017.1330157.

The model has widespread application in costing of government funded aged care and pricing and risk management of LTC insurance products.



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Adam is an Actuarial Consultant at Milliman and an Associate of the Society of Actuaries. 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

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RESEARCHERS

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This project considers the impact of housing and the availability of reverse mortgages and long-term care insurance (LTC) on a retiree's optimal portfolio choice and consumption decisions. Financing retirement income and LTC costs is becoming an increasingly important issue as individuals reach retirement with higher levels of savings and also as the government aims to constrain its budget commitments to aged pensions and LTC costs. Individuals have to increasingly consider how to finance their retirement income beyond the level of the means tested age pension and how to finance LTC needs beyond the government provided level. Housing plays an important role since most individuals reaching retirement have a high percentage of their wealth in home equity. This is an illiquid asset that can be used to fund LTC needs as an individual reaches an older age and needs to move into an aged care or retirement home. A reverse mortgage allows an individual to unlock equity in the home and to use this to finance additional consumption in retirement including LTC costs.

We consider an individual reaching retirement and the decision as to how much to borrow against their home equity, using a reverse mortgage, and how much LTC insurance to purchase to cover health care costs. To do this we use a multi-period life-cycle model that takes into consideration longevity risk, health shocks and house price risk. The solution of this optimal problem is computationally demanding. We develop and use an endogenous grid method along with a regression based approach to improve computational efficiency and avoid the curse of dimensionality that arises from the complexity of the optimisation with multiple states variables.

Our results show that there is a demand for borrowing against home equity since it produces higher consumption in earlier years and a reverse mortgage implicitly includes longevity insurance. Reverse mortgages complement LTC insurance since LTC insurance transfers wealth from healthy states to disabled states but reduces earlier consumption because of the payment of upfront insurance premiums. Housing is an illiquid asset that reduces the demand for LTC insurance for the wealthy and, because it meets bequest motives, reduces the impact of bequest on the demand for LTC insurance. We show how the highest welfare benefits come from a combination of both reverse mortgages and LTC insurance because of the strong complementary effects between them, highlighting the benefits of innovative products that bundle these two products together.

This research was written up as CEPAR Working Paper 2017/11.

Our results show that there is a demand for borrowing against home equity since it produces higher consumption in earlier years and a reverse mortgage implicitly includes longevity insurance.

SUSTAINABLE DESIGN OF NON-FINANCIAL DEFINED CONTRIBUTION IN A CONTINUOUS OVERLAPPING GENERATIONS MODEL

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Notional defined contribution (NDC) pension schemes have become a feasible alternative to classical pension paradigms in the last two decades. They are characterised by combining pay-as-you-go financing with a pension formula which depends on contributions and its returns. At retirement, the accumulated capital is converted into a lifetime income stream which considers the life expectancy of the cohort.

From a design viewpoint, the countries where NDCs have been implemented cannot guarantee sustainability due to the choice of notional return paid to the contributions and the indexation rate paid to pensions. We study sustainability by considering liquidity and solvency as proxies. Liquidity indicators inspect whether pension expenditures in one period are paid for solely by the contributions of the working-age population. Solvency, on the other hand, analyses whether the liabilities of the scheme are backed by assets which include financial assets, such as buffer

funds, and an estimated pay-as-you-go asset. We study how the scheme should be designed to achieve liquidity and solvency with a limited set of assumptions in a continuous overlapping generations model that increases traceability of the results.

We show that liquidity and solvency are obtained for the indexation and notional rate proposed. We note that both sustainability goals can be achieved when combining the rates presented. We apply these rates to a country experiencing a 'baby-boom' and find that adjusting for liquidity also renders the scheme quasi-actuarially fair, that is, the total retirement income payments are equivalent to the total contributions paid to the pension scheme. We show as well that NDCs with annuity payments reflecting future mortality improvements are less affected by the adjustments and pay lower but more stable payouts during retirement. Schemes abstracting from future longevity improvements pay higher initial pensions, benefiting the younger than average retirees whereas older than average retirees are less well-off than they would be under other annuity designs.

The results of this project have been reported in CEPAR Working Paper 2017/12: Alonso-García, J. and Devolder, P. Liquidity and Solvency in Pay-As-You-Go Defined Contribution Pension Schemes: A Continuous OLG Sustainability Framework.

Schemes abstracting from future longevity improvements pay higher initial pensions, benefiting the younger than average retirees whereas older than average retirees are less well-off than they would be under other annuity designs.



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Her research combines the areas of actuarial science and household, pension and quantitative finance to study the design, risk-sharing and financing of funded and pay-as-you-go retirement income schemes. Her past, current and future research projects are all developed 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 journals, including the *European Journal of Finance*, *Quantitative Finance*, *Insurance: Mathematics and Economics*, *Scandinavian Actuarial Journal* and the *ASTIN Bulletin*. Jennifer is currently involved in research projects on the financial decision making of households during retirement, welfare analysis of drawdown structures, as well as pricing and hedging guarantees embedded in variable annuities.

NOTIONAL DEFINED CONTRIBUTION SCHEMES AND HETEROGENEITY IN LONGEVITY: PROPOSALS FOR RE-DESIGN

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RESEARCHERS

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There is strong and rising empirical evidence that longevity is highly heterogeneous by key socioeconomic characteristics, including income status. This international evidence, currently available only for advanced economies, suggests that heterogeneity in longevity arises across many socioeconomic dimensions, is often sizable, is becoming more prevalent, and shows few signals of abating in the near future.

The scope and trend of such heterogeneity in longevity regarding measures of lifetime income creates a major concern for providers of life-time annuities not only for private insurance companies under voluntary and mandated funded defined contribution schemes but also for the rising number of countries that adopted or plan to adopt a non-financial defined contribution scheme. A positive relation between lifetime income and life expectancy at retirement amounts to a straight tax/subsidy mechanism when the average cohort life expectancy is

applied for annuity calculation as under Notional Defined Contribution (NDC) schemes. Such a regressive redistribution and ensuing labour market distortion puts into doubt the main features of the NDC scheme and calls for alternative benefit design to compensate for the heterogeneity.

This project explores, analytically and partially empirically, five key mechanisms of compensation and compares it to the status quo where lifetime annuities are based on the life table of the total population. The alternative designs are developed under a common formal model framework and include individualised annuities; individualised contribution rates/account allocations; a two-tier contribution structure with socialised and individual rate structure; and two supplementary approaches under the two-tier approach to deal with the distribution tails, and the distortions above a ceiling and below a floor. From the analysis we find two promising design options: Individualised annuities, and the two-tier contribution approach.

Compared to the status quo both design options succeed in reducing tax distortions. This happens through the approximation of the observed individual life expectancy with model-based estimated individual life expectancy, and perhaps more importantly through the de-pooling of life expectancy by gender when the calculations are made.

The results of this project are reported in CEPAR Working Paper 2017/18, Holzmann, R., Alonso-García, J., Labit-Hardy, H. and Villegas, A. NDC Schemes and Heterogeneity in Longevity: Proposals for Re-design.

From the analysis we find two promising design options: Individualised annuities, and the two-tier contribution approach.



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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 socioeconomic differences in mortality.

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

RESEARCHERS

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This project includes two sub projects. One focuses on the implications of mortality heterogeneity on pooled annuity funds and longevity linked annuities and the other on the impact of investment strategy for pooled annuity products. Pooled annuity funds share mortality and investment experience within the members of the pool, an example being the group self annuitisation, or GSA, product. However little analysis has been undertaken of the impact of mortality heterogeneity and risky investment returns on the performance of these pooled annuity funds. This project aims to address these aspects of the design of these products.

The first sub project studies the redistribution properties of longevity sharing retirement income products (LSRI) for populations with heterogeneous mortality. Mortality rates and indices such as life expectancy usually differ across sub-populations, for example, defined by gender, geographic area, or socioeconomic variables. The impact of differential mortality on the redistribution properties of both defined benefit and defined contribution pension schemes has been widely studied. For instance, it has been shown that differential mortality can induce an undesirable transfer of wealth away from lower socioeconomic groups with shorter life expectancy to higher socioeconomic groups with above average longevity.

The driving research question is whether it is possible to implement an 'actuarially fair' LSRI product? Issues to be considered are: What could be the impact of mortality heterogeneity on LSRI products? Can we design an actuarially fair LSRI product in the presence of heterogeneity? And what is the definition of fairness? Other related questions on the design of these LSRI products include: What is the optimal sharing of longevity risk between provider and annuitants? And what is the impact of mortality dependence – across generations and across individuals. The results show that more disadvantaged individuals are significantly worse off by participating in a GSA. This raises the question of what could be potential courses of action for 'minimising' the redistribution of wealth in pooled annuity funds.

The second sub project focuses on introducing equity investment into a pooled annuity fund and its impact on the payments to individuals in the pool including the joint impact of uncertain future mortality and uncertain future equity returns. Most pooled annuity funds invest in fixed interest investments in order to replicate the investment risk of a life annuity. However, individuals have a preference for some equity investments in their retirement portfolios and this can make such pooled annuity funds more attractive to

individuals. The question arises as to how much equity investment can be added to the fund without undermining the aim of providing a retirement income, while pooling both individual and aggregate mortality risk amongst members of the pool. In order to manage the equity risk it is also possible to implement investment risk management strategies including target volatility and downside protection strategies. These strategies can improve the risk return performance of the fund and assist in controlling the volatility of annuity income streams for individual members in the pool. An important aspect of risk in these pools is the performance at older ages where the number of members is smaller and where volatility can have a much larger impact on annuity income. These issues are addressed in this project.

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

54

RESEARCHERS

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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.

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 US. For these 20 cohorts, risk premiums of the common factors are assumed to be the same across cohorts, but risk premium of the factor for 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 for the first time 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 rate. In spite of the greater liquidity potential and the lower costs, 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 the UK as the domestic and foreign countries respectively, practical examples are presented to illustrate the value-based indices and the graphical basis risk metric.

Over the life of the project this research has produced three working papers as well as the PhD thesis of Yajing Xu.

The project has used the model to calibrate a price of longevity risk using the BlackRock CoRI Retirement Indexes.



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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 quantitative finance and actuarial journals such as *Insurance: Mathematics and Economics* and *Quantitative Finance*, among others, and has been presented at various international conferences.

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

RESEARCH PROJECTS

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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) examines 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, the number of mature age workers in Australia is expected to 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. This ARF focuses on this important dimension of the process of adjusting to an ageing population.

2017 highlights for this ARF include:

- **SOCIOECONOMIC DETERMINANTS OF HEALTH AND WELLBEING ACROSS THE LIFE COURSE**
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. For example, what is the impact of chronic disease on the wellbeing of baby boom cohorts, and how does it impact labour force participation? Does this experience differ between men and women? Are there differences in willingness to access health care services between these groups? Answers to these kinds of questions are important in policy formulation around access strategies and information campaigns about available services. 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. A cross cohort comparison of women in the Australian Longitudinal Study on Women's Health showed no change in workforce participation during the first half of working life, but only for women who had no children.

- **PRODUCTIVE AGEING**
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. Various dimensions of this issue are explored – in particular, the consequences of exit, with implications for isolation, has been an important finding.

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This project is based primarily on the Melbourne Longitudinal Studies on Healthy Ageing program (MELSHA), led by AI Browning and CI Kendig (with CEPAR support for analyses in 2016). 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 2017, Burns, Browning and Kendig published a paper focusing on living well with chronic disease, in *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 (including Kendig and CI Anstey) addresses the functional capacity to estimate mortality-risk in late-life, and is currently under review.

Browning and Kendig were involved in the analyses of the oral health data from MELSHA led by Mariño and a group of honours students from the University of Melbourne. The aim of the analyses was to examine changes in oral health over time and its relationship to general health and wellbeing.

Browning, Thomas, Enticott and Chapman have submitted for publication the 18 month follow up outcomes of a lifestyle intervention for older Chinese people with diabetes: Management of type 2 diabetes in China: The Happy Life Club, a pragmatic cluster randomized controlled trial using health coaches.

A paper led by Browning, with contributions by Enticott, Kendig, and Thomas titled 'Trajectories of ageing well among older Australians: A 16-year longitudinal study' was published in *Ageing & Society*.

Based on a systematic review of exercise interventions for falls in people with diabetes, Browning and colleagues are currently examining physical activity, falls, foot health and diabetes across time to determine causal relationships. Dual sensory loss was also a focus, and we are investigating changes in sensory loss over time and associated impacts on health and wellbeing.

The book *Ageing in Australia: Challenges and Opportunities*, edited by O'Loughlin, Browning and Kendig, drew on MELSHA in chapters on health status (AI Byles), primary health care (Browning and Thomas), community care (Yun-Hee Jeon and Kendig), and directions on ageing in Australia (Kendig).

... 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...



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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.

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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.

Browning, Kendig (and others) published three papers focusing on healthy ageing and ageing

well utilising data from The Melbourne Longitudinal Studies in Healthy Ageing (MELSHA) Program. Two were published in the *Encyclopedia of Geropsychology* and the other in *Ageing & Society*. Another paper, by Kendig, Gong, Cannon and Browning, also utilised MELSHA data to examine preferences and predictors of ageing in place among older Australians and was published in the *Journal of Housing for the Elderly*. Kendig, Gong and Cannon have a chapter that focuses on implementing age friendly cities in Australia in the book *Age Friendly Cities and Communities: A Global Perspective* (edited by Phillipson and Tine Buffel from the University of Manchester) which was published on 17 January 2018.

Majeed and others (including Kendig and Byles) published a paper in the *Journal of Aging and Health* exploring workplace participation patterns and chronic disease among middle-aged Australian men and women (born 1947-1951) over the life course. 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. A cross cohort

comparison of women in the Australian Longitudinal Study on Women's Health showed no change in workforce participation during the first half of working life, but only for women who had no children. Loh led a paper with Kendig and Nazroo 'Latent-growth models of occupational class trajectories, early-life influences, and later-life well-being', which is under review.

Socioeconomic dimensions of ageing are examined by a number of CEPAR collaborators in the book, *Ageing in Australia: Challenges and Opportunities*, edited by O'Loughlin, Browning, and Kendig, which was published mid-year. Bernard co-authored with Forder, Kendig, and Byles 'Residential mobility in Australia and the United States: A retrospective study' published in the foundation issue of *Australian Population Studies*. Vanhoutte with CEPAR collaborators has an article 'Selection, adaptation and cumulative advantage.

Later-life health and wellbeing of English migrants to Australia' under review for publication. Fine and Kendig have a chapter 'Normalizing old age and aged care: Social role valorization, care and international trends in ageing' in press.

(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.



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 program 'Frailty, Resilience and Inequalities in Later Life (fRaiLL)'

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.

Papers drawing from the HILDA Survey were presented in July at the International Association of Gerontology and Geriatrics (IAGG) World Congress in San Francisco by Gong, Kendig, and collaborators on informal caregiving among older Australians and predictors of paid work in later life in Australia. Kiely presented on healthy working life expectancies in Australia in relation to gender, education, and other markers of socioeconomic position. Findings show that education is an important moderator of difference in healthy working life expectancies between men and women, a paper on this topic is under review.

Yiengprugsawan published a paper on social networks and quality of life among older adults (with Kendig). The paper 'Impact of voluntary and involuntary job exits at mature ages on individual wellbeing' by Gong and Kendig was published in the *Australasian Journal of Ageing*, and has been presented at The Treasury and circulated in the Department of Employment. The related media release attracted considerable interest with Gong and Kendig featuring in several national radio and TV interviews as well as a number of media reports.

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.



PROFESSOR HAL KENDIG
AB UC Davis, MPI PhD USC,
FASSA
CHIEF INVESTIGATOR

Professor Kendig is a sociologist and gerontologist. He was 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 until 2018, whereupon he became an Emeritus Professor. 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 led the CEPAR Ageing Well, Ageing Productively Area of Research Focus over the life of the first centre, including collaborative projects on social inequalities over the life course, Australian Attitudes to Ageing, and other research on aged care and

men's health. Since 2016 he has led a collaborative ARC Discovery grant on ageing well in China. He is active in a number of policy advisory responsibilities in Australia and Asia.

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
KAKO CHOI

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.

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. Locations visited by the 238 participants across the seven-day period of monitoring were categorised into location types (e.g., parks; commercial locations; residential buildings).

Data collation and processing were completed in September 2017. We conducted preliminary analyses on the effects of environmental contextual variables, times of the day, and days of the week on the participants' activity levels and sedentary behaviours. We also established the extent to which the environmental characteristics of one's residential and workplace 'neighbourhoods' were associated with visitation and time spent in active recreational locations and with the likelihood of using active versus motorised travel.

Our preliminary findings indicate that higher levels of accessibility to parkland and retail/commercial destinations within 1km from home were associated with higher levels of moderate-to-vigorous physical activity but not with sedentary behaviour. Participants residing in areas with higher levels of dwelling density, greater percentages of retail/commercial land use and shorter distances to work (from home) had a higher probability of using active versus motorised travel. Participants living in areas with above-average retail land use were more likely to visit recreational facilities within walking distance from home and engage in moderate-to-vigorous physical activity in these facilities. Stronger associations between environmental variables, physical activity and modes of transport were observed on weekdays than on weekend days.

This study aims to examine associations of characteristics of the neighbourhood environment and areas surrounding other frequently visited destinations with physical activity and sedentary time.



PROFESSOR ESTER CERIN
BSc(Hons) Rijeka, MSc UQ,
PhD NYU (UK)
ASSOCIATE INVESTIGATOR

Ester Cerin is Professor of Physical Activity and Health in the Mary MacKillop Institute for Health Research 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 Behaviour, Environment and Cognition research program. She is a Deputy Editor-in-Chief of the *International Journal of Behavioral Nutrition and Physical Activity*.

RESEARCHERS

HAL KENDIG
KATE O'LOUGHLIN
RAFAT HUSSAIN
MERRIL SILVERSTEIN
COLETTE BROWNING
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 2017, the book *Ageing in Australia: Challenges and Opportunities* edited by Kate O'Loughlin, Colette Browning, and Hal Kendig was published, including a chapter on 'Attitudes to Ageing' (O'Loughlin and Kendig).

Building on the 2009-2010 Attitudes to Ageing in Australia (AAA) survey the research team designed a second round of the AAA survey

that was conducted in 2015-2017, with the final data collection becoming available mid-2017. The focus of the survey was 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 2015-2017 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, Hussain and Cannon co-authored three invited articles for the *Australasian Journal on Ageing*, which examine data from both the AAA 2009-2010 and 2015-2016 (preliminary data) surveys to address attitudes to intergenerational equity, age discrimination in the workplace and the perceptions of health-care professionals' treatment of older people. The findings were also presented at the International Association of Gerontology and Geriatrics (IAGG) World Congress in San Francisco.

Utilising the complete 2015-2017 AAA data, they further investigated the change in attitudes between the two AAA survey periods, along with the socioeconomic and political change including developments between the 2010 and 2015 Intergenerational Reports.

Hussain, O'Loughlin and Kendig utilised the 2015-2017 AAA survey to examine the media's portrayals of ageing in Australia. The findings were presented by Hussain at the Australian Association of Gerontology (AAG) Conference in November in Perth, and the authors expect to publish the paper in 2018. Cannon and Kendig also utilised the 2015-2017 AAA data to investigate perceptions of intergenerational conflict and life-long opportunities of the 'Millennial' cohort. This paper is under review.

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.



ASSOCIATE PROFESSOR
RAFAT HUSSAIN
MBBS Karachi, MPH North Carolina, PhD ANU
ASSOCIATE INVESTIGATOR

Rafat Hussain is a public health physician with qualifications in medicine, public health and epidemiology. Currently she works 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 is also engaged in 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 has presented 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.

We conducted a micro-longitudinal study to examine these questions, in which 38 younger (aged 17-25) and 44 older (aged 65 and over) adults 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, over 20 consecutive days. Three follow-up assessments concerned with life events, physical health, mental health, and psychological wellbeing were also 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 12 months following completion of daily measures.

Data collection is now complete, and PhD candidate Victoria Allen has been using the information obtained to examine age differences in stress exposure, affect, and the daily use of emotion-regulation strategies. Victoria presented results of the study at the International

Association of Gerontology and Geriatrics World Congress in San Francisco in July 2017, and the South Australian branch of the Australian Association of Gerontology Conference (SAGE) in 2017. Tim Windsor also presented findings in relation to self-regulation strategy use, daily pain and affect at the SAGE conference. Manuscripts for publication based on this project are currently being prepared, and the project has provided a foundation for Victoria Allen's PhD research which is due for completion in early 2018.

A key aim is to identify important markers of resilience by studying stress reactivity.



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 College of Education, Psychology and Social Work 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 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).

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 market work, or through taking on caring and volunteering roles. CEPAR research through 2017 focused on a number of important topics in this area of research focus (ARF) including:

- **LONG-TERM CARE INSURANCE**

Two papers in this ARF investigated long-term care (LTC). The first, by Ermanno Pitacco, a CEPAR AI, conducted sensitivity analysis around stand-alone LTC Insurance products, which only provide protection benefits, and found a significant degree of sensitivity with respect to the technical bases adopted in premium calculation. He then considered combined products, including LTC and life annuity benefits. These can be placed in the framework of living benefits, which extends the life annuity context. Annuities of this type which take account of pre-existing condition have also been analysed. Premiums of these kinds of products were found to be more robust.

A second approach is embodied in a major project led by Research Fellow Elena Capatina. She and her collaborators have built a choice model to determine how changes in family circumstances, and differences in peoples' concern with expenditure on LTC impact LTC insurance demand. The outcomes of this study are vital in providing evidence to start providers thinking about how to involve multiple generations of a family in the LTC insurance decision.

(LTC is a topic also treated in other ARFs; for example, long-term care insurance policy in China is reported in ARF 6.)

- **CHAMP AND DATA LINKAGE**

CHAMP is a major research initiative, one of the few detailed longitudinal studies of older men which focus on detailed health trajectories. A major task for the CHAMP team in 2017 was to establish data linkage between information collected from CHAMP men and large administrative databases. Such linkages considerably strengthen the power of survey data. This was successfully achieved, with data linkage between CHAMP and the NSW Admitted Patient Data Collection, the Australian Cancer Database and the National Death Index. It was then determined that during 10 years of follow-up, nearly all the CHAMP men were admitted to hospital and more than two thirds had at least one non-elective admission. Linkages between hospital admissions, frailty and dementia were also established. Dementia was found to be associated with increased admissions for injuries, mental health problems and infections. Frailty was associated with increased admissions for all 14 categories of disease in the International Classification of Diseases.

- **AUSTRALIA'S AGEING PRISON POPULATION**

A recently initiated project focuses on ageing prison populations. In recent years prison authorities have produced statistics indicating that the prisoner population is ageing much more rapidly than the general population. The last 15 years have seen a significant and progressive change in the age distribution of the Australian prison population. While the total prison population rose by 74 percent, the number of prisoners aged fifty and over rose by 160% and those aged 65+ increased by about 300%. Health costs are much higher for older prisoners, and the management of declining health, including cognitive health, is becoming a major issue. This research will initially provide for the first time some health cost projections for prisons. The project is part of a wider initiative examining the possibility of improved screening processes in prisons to identify health and disability occurrences.

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.

This 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 policies 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) came 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 Ka)].

2017 outcomes:

- UK Economic and Social Research Council Grant on Sustainable Care: Connecting People and Systems (awarded May 2017; £2.5M). CEPAR is an international partner on this project.
- *International Journal of Care & Caring* (Policy Press); completed first year of publication with three issues in 2017 and four planned for 2018.
- *Special issue of Journal of Cross-Cultural Gerontology on 'Older Workers and Caregiving in a Global Context'* (published September 2017; edited by O'Loughlin & Phillips) includes papers on older working carers from researchers in Australia, Ireland, UK, NZ, China, Singapore, and Sub-Saharan Africa. CEPAR researchers O'Loughlin, Loh, and Kendig contributed a paper on 'Carer characteristics and health, wellbeing and employment outcomes of older Australian baby boomers'.

- Two conference papers: one on the rights and recognition of family care to adults (O'Loughlin and Yeandle), as part of an invited Symposium on Connecting People and Systems: Challenges in Developing Sustainable Care, 7th Community, Work and Family Conference, 25-27 May 2017, Università Cattolica del Sacro Cuore, Milan; and the other on rights and recognition for carers (O'Loughlin, Yeandle), at the 7th International Carers Conference, 4-6 October 2017, Adelaide.

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.



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.

RESEARCHER

ERMANNO PITACCO

Long-term care (LTC) insurance covers are rather recent products, in the framework of health insurance. Stand-alone LTC Insurance products, which only provide protection benefits, have a significant degree of sensitivity with respect to the technical bases adopted in premium calculation. Numerical examples discussed in the paper 'Premiums for long-term care insurance packages: Sensitivity with respect to biometric assumptions' (2016) demonstrate this sensitivity. Further, market evidence shows a low propensity to purchase this type of product.

Because of this, a significant shift towards combined products has occurred. Combining LTC benefits with life annuity benefits seems particularly attractive, from both the insurer's and the client's perspective.

Combined products, including LTC and life annuity benefits, can be placed in the framework of living benefits, which extend the life annuity context. Special attention has then been placed on the study of life annuities and relevant benefit extensions (with respect to standard annuities). In particular, care annuities in the framework of underwritten (or special-rate) annuities, enhanced pensions (i.e., pensions with uplift in the case of LTC need) have been analysed.

This research has been written up in CEPAR Working Paper 2017/06.

The research was also presented, as an invited lecture, at the Department of Mathematics, Kyoto University, Japan.

Combining LTC benefits with life annuity benefits seems particularly attractive, from both the insurer's and the client's perspective.



PROFESSOR
ERMANNO PITACCO
ASSOCIATE INVESTIGATOR

Ermano 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 (IAA). In 2017 he became the treasurer of the AFIR/ERM Committee of the IAA.

Ermano is editor of the *Springer Actuarial* series, co-editor of the *European Actuarial Journal* and associate editor of a number of international journals.

RESEARCHER

ELENA CAPATINA

External Collaborators

GARY HANSEN

(UNIVERSITY OF CALIFORNIA, LOS ANGELES)

MINCHUNG HSU

(NATIONAL GRADUATE INSTITUTE
FOR POLICY 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

(especially the provision of informal care by spouses); 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.

In addition, previous research shows 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. Therefore, we model an LTC-state, family-type dependent utility function and allow for endogenous LTC expenditures. The novel aspect of our paper is to study policy related to LTC in a model where these two features, informal care provided by family and endogenous LTC expenditures, interact.

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.

The results have been presented at several international workshops and conferences in 2017.

The novel aspect of our paper is to study policy related to LTC in a model where these two features, informal care provided by family and endogenous LTC expenditures, interact.



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.'

RESEARCHERS

ROBERT CUMMING
HAL KENDIG
VASANT HIRANI
BEN HSU
KATE MILLEDGE

External Collaborators

FIONA BLYTH
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LOUISE WAITE
CLIVE WRIGHT
(ALL UNIVERSITY OF SYDNEY)

The Concord Health and Ageing in Men Project (CHAMP) has been running for more than 10 years. The study was designed to fill the gap in knowledge about the health of older men. Between 2005 and 2007, 1705 men aged 70 years and over living in the community around Concord Hospital in Sydney agreed to participate in CHAMP. Two-, five- and eight-year follow-up assessments have been completed and 82 papers based on CHAMP data have been published (or are in press) in peer-reviewed academic journals.

CHAMP is a multidisciplinary study of ageing in men, supported by multiple funding sources, with projects ranging from basic biological research into the ageing process through to investigations of psychosocial aspects of ageing. In the latter domain, a paper on health of older male caregivers was published in the *Australasian Journal on Ageing* in 2017. 11% of CHAMP men are caregivers, of whom 82% provide care for their partners. The study found that the physical health of male caregivers was the same as non-caregivers and there was also no difference in the prevalence of depression. However, caregivers were twice as likely to have anxiety symptoms. The implication of this finding is that community and health service providers should consider interventions to manage anxiety among older male caregivers.

In 2017 the first CHAMP oral health paper was accepted for publication, based on data collected from 614 men at the eight-year follow-up. All men were at least 78 years of age. The study found that only 15% of men had no teeth, which is in marked contrast to the situation several decades ago when most older Australians had no teeth at all.

About two-thirds of CHAMP men had had at least one tooth replaced by some sort of dental prosthesis: partial dentures, bridges, crowns or implants. Most men had some gum disease. Oral health practice in Australia will have to change to cope with the rapidly increasing burden of gum and dental problems, including maintenance of complex prostheses, among older Australians. Prevention will become increasingly important.

CHAMP started with a focus on the five geriatric syndromes: dementia, falls, polypharmacy (regular use of five or more medications), poor mobility and urinary incontinence. Urinary incontinence is the most neglected of these syndromes. In CHAMP, about 7% of men had urinary incontinence (leaking urine at least once a day) at the start of the study, increasing from 5% of men in their 70s to 15% of men aged 85 years and older. In 2017 a CHAMP paper was published that looked at what happened to men with incontinence over the next five years.



DR BENJAMIN HSU
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RESEARCH FELLOW

Benjamin Hsu joined CEPAR as a Research Fellow at the University of Sydney in 2016 to work 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.

About a third of them received either surgery or medications to treat their incontinence. Of the remaining men, about half became continent in the next two years and remained continent three years after that. This suggests that urinary incontinence is a transient condition in a significant percentage of older men.

Back pain, especially low back pain, is now recognised by the Global Burden of Disease Study as the number one cause of disability in the world. 2017 saw the first CHAMP paper on changes in back pain over time. 60% of men had low back pain at baseline, with 30% of these men saying that they had low back pain all or most of the time. Two years later, 60% of the men with low back pain at the start of the study still had it. Factors associated with persistent pain over two years were drinking alcohol and increased weight. Men from an English-speaking background were less likely to have persistent pain.

A major task for the CHAMP team in 2017 was to establish data linkage between information collected from CHAMP men and large administrative databases. This was successfully achieved, with data linkage between CHAMP and the NSW Admitted Patient Data Collection, the Australian Cancer Database and the National Death Index. During 10 years of follow-up, nearly all the CHAMP men were admitted to hospital and 68% of them had at least one non-elective admission. The first drafts of papers on the relationship between frailty and dementia and hospital admission have been completed. Dementia was associated with increased admissions for injuries, mental health problems and infections. Frailty was associated with increased admissions for all 14 categories of disease in the International Classification of Diseases.

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

A major task for the CHAMP team in 2017 was to establish data linkage between information collected from CHAMP men and large administrative databases.

UNDERSTANDING HEALTH CARE USE AND QUALITY OF LIFE FOR OLDER WOMEN WITH COMMON CARDIAC ARRHYTHMIA, IN PARTICULAR ATRIAL FIBRILLATION

RESEARCHERS

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This project assessed the quality of life and health care use by older people who have atrial fibrillation (AF), and other common cardiac arrhythmias (OCA). Atrial fibrillation is common, increases with age, and requires long-term treatment for a largely asymptomatic condition. Both AF, and the treatment of AF, carry high risk of poor outcomes, and can have large effects on people’s quality of life. In population terms, since AF is common, and because people live with AF for many years, the impact on people’s participation, productivity, and health care costs can be substantial.

This project used linked data for 3,735 women from the Australian Longitudinal Study on Women’s Health (ALSWH) who lived in NSW, the NSW Hospital Admitted Patient Data Collection,

and the National Death Index, to begin to examine some impacts of AF in terms of health care use and quality of life. The project is a prelude to a further study which will explore management options for women with AF, their use at a population level and over time, and the probabilities and utilities of different outcomes.

By the end of 2012, 973 of the original 3,735 women (26.1%) had been hospitalised with AF, with 407 women (10.9%) first diagnosed with AF between 2001-2004 (‘early onset’), 316 women (8.4%) first diagnosed between 2005-2008 (‘mid onset’), and 250 women (6.7%) first diagnosed with AF between 2009-2012 (‘late onset’). Only 227 women (6.1%) had never been hospitalised by the end of 2012, and a total of 1,469 women (39.3%) had died.

Women who had no recorded diagnosis of either AF or OCA had much fewer days in hospital per annum (mean=9 days, median=2 days in 2001) compared to women who had experienced an AF (mean=19 days, median=12 days) or women who had OCA (mean=22 days, median=8 days). Considering only women who went to hospital each year, the total length of stay in hospital was much higher overall, and differences between women with and without AF remained large.

AF was also associated with earlier death, and more rapid deterioration in physical function. Differences in mental health-related quality of life were not obvious.

These findings underscore the importance of AF as a major health issue for older Australian women, and the potential impact in terms of health care costs, lost productivity, and reduction in health-related quality of life.

Atrial fibrillation was also associated with earlier death, and more rapid deterioration in physical function. Differences in mental health-related quality of life were not obvious.



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ASSOCIATE INVESTIGATOR

Professor Julie Byles is Global Innovation Chair in Responsive Transitions in Health and Ageing at the University of Newcastle, Director of the Priority Research Centre for Generational Health and Ageing, 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.

Professor Byles is also Head of the International Longevity Centre – Australia (ILC-Aus), Chair of the International Association of Gerontology (Asia Oceania) Social Research and Planning sub-committee, and a frequent advisor to the World Health Western Pacific Region, and Department of Ageing and Life Course (Geneva), assisting with translation of evidence on health and ageing.

AUSTRALIA'S AGEING PRISON POPULATION: THE DEMOGRAPHIC SHIFT AND IMPLICATIONS FOR THE ECONOMIC AND SOCIAL COSTS OF CARE

RESEARCHERS

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One outcome of an ageing population can be seen in Australia's prisons where the rate of incarceration of prisoners over the age of 65 has increased by 300% since the turn of the century. However, general population ageing is only one contributing factor. The increased level of older offenders results from a combination of health and social determinants, societal and justice issues to do with the types of crimes committed, and changes to sentencing laws over the last few decades. Similar patterns of ageing offenders can be seen in the US, the UK, Canada and New Zealand, and other countries where there is rapid population ageing. In Japan, the world's oldest country, almost 20% of all crimes are committed by the elderly and this has resulted in a high population of older people in their prisons.

The cost implications of the prison populations' ageing demographic are not well understood. However, according to the Productivity Commission's Report on Government Services (2016), healthcare for prisoners of all ages is approximately 10% of their reported running costs with little information on the demographic breakdown of costs for offenders by age group.

The purpose of this project is to gain an improved appreciation of the funding implications of ageing prisoners. What are the current costs of housing older offenders, and what health care measures might be required? This will be drawn from existing literature. Further projections of health care costs with the rate of incarceration as seen over the last 15 years are also undertaken, to give guidance for policymakers confronting this unfolding change in demographic structure. A collaboration between the Kirby Institute's Justice Health Research group and the UNSW School of Public Health and Community Medicine has been formed, with ethics applications endorsed by NSW Justice Health and Forensic Mental Health Network to apply for prisoner health cost data. A poster on the demographic shift in Australia's prisoner population has been presented at an Oxford Institute of Population Ageing Emerging Researchers Conference on Demography, Ageing and Health in September 2017, and a working paper will be ready for publication in early 2018.

The increased level of older offenders results from a combination of health and social determinants, societal and justice issues to do with the types of crimes committed, and changes to sentencing laws over the last few decades.

USING DEEP MACHINE LEARNING TO MODEL/FORECAST CHANGES IN DAILY MORTALITY AMONG OLD PEOPLE

RESEARCHERS

ZHONGWEI ZHAO
YUAN ZHU

This project is part of a research program focused on daily mortality related issues, which includes investigating long-term mortality changes, especially changes in causes of death, and examining the interrelationship between changing weather conditions and seasonality of death, and its change over time. The project seeks to determine whether a better method can be developed to model and forecast variations in daily mortality.

In our previous investigation, we have noted that in epidemiological and statistical studies, Generalised Additive Model (GAM) and Autoregressive Integrated Moving Average (ARIMA) have been widely used to analyse the impact of environmental conditions on daily mortality (e.g., the health impact of heatwaves) or to model daily mortality changes.

In undertaking this research, we have not only used conventional statistical methods to analyse daily mortality data. A huge amount of time has also been spent (especially by Yuan Zhu) in developing several highly sophisticated artificial neural networks systems, testing these systems, and using them to model or forecast daily mortality variations.

The project compared modelled/forecasted results of daily death counts produced by GAM, ARIMA and Highway (one of the artificial neural network systems used in our study). The results produced by the Highway Networks are consistently better than the two conventional statistical methods. For example, for the 50 time periods that we used to test the Highway Networks and compare the three systems, the results produced by the Highway Networks are on average 7 per cent better (with smaller mean square of errors) than those obtained using ARIMA (which are better than those generated by GAM).

A presentation 'Using NeuroEvolution Deep Learning Forecast Daily Mortality Changes', summarising research findings of this and other related studies, was made at the International Union for the Scientific Study of Population (IUSSP) 2017 Conference held in Cape Town, and later featured in the IUSSP International Conference Newsletter.

This research project has now been completed. We are going to further revise the research report presented at the IUSSP conference and publish it in an international journal.

The project seeks to determine whether a better method can be developed to model and forecast variations in daily mortality.

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

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AREA OF RESEARCH FOCUS 6 AGEING IN ASIA AND ITS IMPACT ON AUSTRALIA

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. Increasingly, there is demand from international organisations for research into this issue. 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, as well as pan-Asian overviews. 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 2017 include:

- **AGEING IN IRAN**

Iran is one of the most rapidly ageing countries in central Asia, and is currently undergoing a massive regional migration. During 2017, this project has examined two aspects of this overall shift. First, a pilot survey was conducted to obtain some sense of the impact of rural out-migration on older rural residents – results suggest this is more dramatic than in countries such as Indonesia. Secondly, analysis of fertility decline, as the major component of population ageing in Iran, continued, with access to confidential data helping researchers to better understand why this decline is taking place.

- **THE ROLE OF HOME EQUITY FOR RETIREMENT FINANCIAL PLANNING IN CHINA**

Home equity release plans seem an obvious way to finance later life, but the market is very small. This study has undertaken surveys to determine household attitudes to these financial instruments. It is focused on China because China's older population is already the largest in the world and is rapidly growing. Results suggest that the demand for reverse mortgages is high among educated urban Chinese. Home owners aged 45-69 years are very interested in reverse mortgages and adult children aged 20-49 years would recommend the product to their parents. Participants in both samples mainly want to use reverse mortgage payments to live more comfortably in retirement and to pay for better medical treatments and better aged care services.

- **POLICIES FOR AN AGEING DEMOGRAPHIC IN ASIA/ COMPARATIVE AGEING IN ASIA**

A portfolio of projects has contributed to the policy debate in the Asian region, with specific projects ranging from detailed analysis of long-term care service delivery plans to international comparisons of labour mobility and productivity. Of particular note is the paper on the role of notional defined contribution structures as a component of retirement policy reform in China. Some of these projects were undertaken in response to requests by international bodies, such as APEC. This work complements the research project focused on comparative ageing in Asia, which emphasises health status and utilisation of services in Asian economies.

RESEARCHERS

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Funded primarily by an Australian Research Council Discovery Grant, this study sets out to investigate how the needs of older people (aged 60 years and over) are met in Indonesian villages that have experienced high rates of out-migration of the adult children of older people. The study involves both quantitative and qualitative data collections. The quantitative collection covered 10 villages across nine provinces (North Sumatra, West Sumatra, West Java, Banten, Yogyakarta, Central Java, East Java, Bali and East Nusa Tenggara) selected on the basis that they had an older age distribution due to high levels of out-migration of the children of the older persons.

All persons in the village aged 60 and over and their spouses, if aged 50–59, were interviewed, constituting a total of 2,559 persons. If the older person was unable to respond (about 9 per cent of older persons), the principal carer provided a

reduced set of information on their behalf. Household information was provided by the household head. In addition, interviews were conducted with 361 adult children living with the respondents and 273 adult children who had migrated to the cities. The villages include six where Islam is the dominant religion, three Christian villages and one Hindu village.

The quantitative information collected for the older respondents included: age, sex, marriage history, education, workforce participation, language, literacy, ethnicity, religion and religiosity, parental background, land ownership, details of children and their spouses, transfers and communication with children, extensive questions on physical and mental health status and use of health facilities, food consumption, social participation, and satisfaction with aspects of life. The height, weight and blood pressure of respondents were measured directly.

Qualitative interviews were conducted with approximately 100 respondents including older people and government officials and service providers at the village, regency, province and national levels with an emphasis upon policy directions.

Analysis of the data is in the early phase but, in January 2017, presentations on the data were given to the Indonesian National Planning Board and two policy briefs were published. A presentation was also made at a conference at the University of Singapore in April 2017. Results on who provides care to older people were presented at the International Population Conference in Cape Town in November 2017. A journal article entitled, ‘Social Engagement and the Elderly in Rural Indonesia’, has been accepted for publication in *Social Science and Medicine*. A workshop was held in August 2017 to prepare reports for each village in Bahasa Indonesia for feedback to the village and the regional government. The database is also being used by two PhD students, Muhammad Absor and Aliza Hunt, for their PhD research projects.

All persons in the villages aged 60 and over and their spouses if aged 50–59 were interviewed, a total of 2,559 persons.



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 the projects ‘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 (2010–2019); 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

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External Collaborators

TRI BUDI RAHARDJO
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Like many other Asian countries, Indonesia, the world's fourth most populous nation with more than 260 million people, is confronting pronounced population ageing. Falling fertility rates and increasing longevity will see its share of population aged 65 and over more than quadruple by 2100. This demographic transition is particularly challenging for Indonesia as more than half of its labour force operates in the informal sector and major regional migration is leaving many older people in the rural sector without effective family support for their later years. Various formal mechanisms have been proposed to address this unfolding dynamic, but little has been formulated explicitly, other than in the area of social security.

This research project, supported by UNSW Seed Funding, will provide new insights into the implications of Indonesia's demographic evolution and assess alternative policy

initiatives. It has two broad aims. First, using various data sources, it will document demographic, economic and pension policy developments in Indonesia, and provide some comparisons with other Southeast Asian economies. Second, it will analyse recently-legislated social security reforms in the context of a life-cycle general equilibrium model. Our model will explicitly recognise the formal-informal sector dynamics, ageing demographics with stochastic survival and interactions with endogenous human capital, and how different paths of development will impact a succession of generations in the future, which in the model overlap. We will assess a broad range of pension reforms against the criteria of long run fiscal sustainability, work and retirement incentives, and the adequacy and equity of retirement income policy.

The outcomes of this research will be presented at relevant academic and policy forums, and will provide a deeper understanding of implications of different policy reforms and, therefore, better inform future policy formation in Indonesia and other Southeast Asian economies considering reforming their pension system.

In the second half of 2017, during Muliadi Widjaja's visit to CEPAR, the data collection and the empirical analysis of sectoral, skill and gender division of labour in Indonesia were completed. A review of ageing trends and pension policies in the Southeast Asia region was drafted. Significant progress on the development and calibration of the model for Indonesia was also made.

Two publications are anticipated from this research project in 2018, one focused on model innovation and quantitative analysis, the other on policy analysis. They will be targeted at either a top tier modelling journal or a specialist journal focused on pensions and ageing.

Falling fertility rates and increasing longevity will see its share of population aged 65 and over more than quadruple by 2100.



DR GEORGE KUDRNA
MA Econ Tul Czech Republic,
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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 – 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 US Social Security Administration and for the NSW Treasury. He served as CEPAR Research Strand Coordinator for Causes and Consequences of Demographic Change. George is also a Fellow at the Global Labour Organization (GLO) and a Research Associate at the Centre for Applied Macroeconomic Analysis (CAMA).

RESEARCHERS

MEIMANAT HOSSEINI-CHAVOSHI
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During 2017, a pilot study was conducted in one selected province (Yazd) in Iran to replicate the Indonesian study on ageing in rural areas (see page 72). Compared with Indonesia, the effects of out-migration upon rural areas seemed more severe in Iran because of very high rates of out-migration of the younger generation. Village shops had been shut down and older residents were reliant on relatives bringing food and goods from outside the village. A new screening program for the physical and psychological status of older persons throughout the country was reported as a positive point by several interview respondents. However, the viability of maintaining rural health facilities is under government review, and some services had been closed. Technology-assisted medical help, for example, via the internet or smartphone, is not practical for less educated rural populations, such as in Iran and Indonesia, where older people are more likely to rely on the

support of family members for their everyday needs. Sources of funding for a full study are now being sought. The Ministry of Health provided access to its survey, a situational analysis of elderly health, conducted in Iran in 2014, enabling CEPAR Research Fellow Meimanat Hosseini-Chavoshi to undertake multivariate analysis for her paper on ageing and challenges for Iran's health system.

The project research team continued its work on fertility trends in Iran as the main component of population ageing. The researchers were granted access to the 2015 Iran Demographic and Health Survey records enabling the team to investigate fertility trends between 2010 and 2015. A paper based on this data set about the effects of women's education on parity progression patterns was drafted and presented at the 2017 International Population Conference in Cape Town. Following revision, this paper will be submitted in early 2018 for publication in a peer-reviewed journal. Estimates of fertility were also made based on the results of the 2016 Census of Iran (own-children method) and direct estimates from birth registration data.

Hosseini-Chavoshi took up a visiting fellowship at the Vienna Institute of Demography (VID) between May and August 2017 where she initiated a research study with a team at the VID led by Tomas Sobotka on cohort fertility and education using several Iranian census datasets. The output of the study includes a working paper to be published on the VID website and a journal article which has been submitted for publication. Two versions of this paper have been submitted for presentation at the 2018 Asian Population Conference and the 2018 European Population Conference.

...the effect of out-migration upon rural areas [is] severe in Iran because of very high rates of out-migration of the younger generations.



DR MEIMANAT HOSSEINI-CHAVOSHI

BS (Public Health) Isfahan University of Medical Sciences,
MA (Population Studies)
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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 past 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 research team.

MODELLING MULTI-STATE HEALTH TRANSITIONS IN CHINA: A GENERALISED LINEAR MODEL WITH TIME TRENDS

RESEARCHERS

KATJA HANEWALD

HAN LI

ADAM WENQIANG SHAO

As one of the most populous countries in the world, China is 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 projected 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.

To assist the development of formal aged care services as well as private market solutions in China, we developed 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). 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 was completed in May 2017 and the research was presented at several conferences and university research seminars domestically and internationally. These include the 2017 International Longevity Risk and Capital Markets Solutions Conference in Taipei, the 21st International Congress on Insurance: Mathematics and Economics in Vienna, the 1st International Conference on Econometrics and Statistics in Hong Kong, and research seminars at Peking University, Nankai University, Temple University and Monash University.

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.



DR HAN LI

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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 from the University of Melbourne and completed her PhD degree at Monash University.

Han has a broad range of research interests around longevity and mortality risks, population ageing and retirement financial products. Specifically, much of 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 the design of retirement income and aged-care products

for China and the pricing of mortality catastrophe bonds. Han's research has been published in top tier journals including *Insurance: Mathematics and Economics* and the *Journal of Forecasting*.

'Population ageing is not a problem that is far away from our daily life; it is happening in every corner of the world. How can we be better prepared for this dramatic demographic change? I hope my research in this area will provide valuable contributions to this big question and have an impact in the real world.'

RESEARCHERS

HAN LI
KATJA HANEWALD
SHANG WU
KEVIN KRAHE

This research investigates provincial-level healthy life expectancy in China. China has experienced rapid economic development and health improvements in its population. However, health inequalities across Chinese provinces are still large. Our aim is to provide new evidence on the development of regional health inequalities in China.

A major challenge for research in this area is the fact that detailed information on age-specific morbidity and mortality rates are often not available at the province level. In this project, we conduct a province-by-province study on healthy life expectancy (HLE) by introducing a multiple regression model. The model does not rely on age-specific regional morbidity data, but rather on longevity and socioeconomic variables that are widely available. The proposed 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 estimated the model using data from 139 countries in the years 1990, 2005 and 2013 from a number of international databases including the Global Burden of Disease Study, the World Bank and the Organisation for Economic Co-operation and Development (OECD). In this way, we can learn from other countries' experience and better predict HLE for Chinese provinces. Based on the proposed model, we calculated HLE for 31 provincial-level administrative regions in China in 2015. We found that inequalities in HLE continue to exist across provinces in China. In the case of both males and females, our results show that HLE varies by more than 10 years across Chinese provinces.

This project was completed in October 2017 and the results were presented at a number of conferences and universities including the 2017 International Longevity Risk and Capital Markets Solutions Conference in Taipei, the 21st International Congress on Insurance: Mathematics and Economics in Vienna, the 8th China International Conference on Insurance and Risk Management in Guilin, the 3rd Annual Workshop on Population Ageing and the Chinese Economy in Sydney, and the departmental weekly research seminar at Monash University.

The paper is currently under review at an international demographic journal. Undergraduate student Kevin Krahe provided research assistance on this project, partly funded by a Summer Research Scholarship.

We found that inequalities in healthy life expectancy continue to exist across provinces in China...our results show the HLE varies by more than 10 years across Chinese provinces.



DR SHANG WU

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Shang is a Senior Investment Analyst at First State Super and an Associate Investigator at CEPAR. Before joining First State Super, Shang worked as a Senior Research Associate at the Australia-China Population Ageing Research Hub in CEPAR.

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. When working at CEPAR, Shang's research focuses on retirement financial decisions of older households and pension reforms in China.

At First State Super, Shang is responsible for retirement outcome modelling. His analysis contributes to the development of post-retirement investment solutions, the design of the framework for financial advice and the development of Comprehensive Income Products for Retirement (CIPRS).

Shang 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.

RESEARCHERS

HAZEL BATEMAN
HANMING FANG
KATJA HANEWALD
SHANG WU

Population ageing is a global trend. Developed and developing countries alike need to find ways to finance the retirement income, health care and aged care costs for their growing older populations.

Given that older households typically hold a large fraction of their wealth as home equity, reverse mortgages – financial products that allow older home owners to liquidate and consume home equity without relocating – seem like a promising solution. However, reverse mortgage markets are small internationally.

In 2017 we were awarded funding from the University of Pennsylvania and Tsinghua University to conduct and analyse two large surveys on the demand for reverse mortgages in China. With these surveys we aim to: test how the demand for reverse mortgages varies according to the way in which the product is described – as a tool to increase own consumption, to finance better medical treatments and/or better aged

care services, to support children and/or grandchildren, or to have more financial flexibility in retirement; test whether the acceptance of home equity release differs between older home owners and adult children; and analyse the preferred use of reverse mortgage payments.

We focus on China because China's older population is already the largest in the world and is rapidly growing. China's private market for retirement income products and long-term care insurance is still immature, but the Chinese government wants to develop this market and has also permitted a pilot program for reverse mortgages. We describe a generic, flexible product design which addresses several factors that have been found to limit reverse mortgage demand.

The survey results suggest that the demand for reverse mortgages is high among educated urban Chinese. Home owners aged 45–69 years are very interested in reverse mortgages and adult children aged 20–49 years would recommend the product to their parents. Participants in both samples mainly want to use reverse mortgage payments to live more comfortably in retirement and to pay for better medical treatments and better aged care services.

First results have been presented at the Australasian Actuarial Education and Research Symposium at UNSW Sydney in December 2017. The project will be completed in 2018 and is expected to produce a working paper to be submitted to a leading international economics or insurance journal. The results of the project will inform the development of reverse mortgage markets in China and internationally.

The survey results suggest that the demand for reverse mortgages is high among educated urban Chinese.



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 US 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.

RESEARCHERS

XIAOYUN ZHANG
KATJA HANEWALD

External Collaborator

TESS STAFFORD
(UNSW)

China is facing two important demographic changes: rapid population ageing and large-scale rural-urban migration. The migrants leave behind older parents in the villages. However, there is only basic health and pension insurance for rural elderly and formal aged care services are underdeveloped. Therefore, many rural elderly rely on family members for financial and in-kind support.

This project investigates the causal effect of adult children's migration on the elderly's health in China, addressing the self-selection problem in adult children's decision to migrate. On the one hand, the health of the elderly parents could be improved because of the increased remittances from their migrant children. On the other hand, elderly parents' wellbeing could be reduced due to the limited connection between the migrated children and their parents. Thus, whether the net effect is positive or negative is an empirical question.

Using a panel data set constructed from the 2011 and 2013 waves of the China Health and Retirement Longitudinal Study (CHARLS), the study employs an instrumental variable (IV) strategy to account for the potential endogeneity in children's migration decisions. A novel IV – village-level sent-down youth numbers – is used as an exogenous source of variation in the likelihood of adult children's migration.

A strong first-stage result is confirmed in our research: villages that received a higher number of urban sent-down youths during the Cultural Revolution had higher rates of migration back to urban areas in 2011–2013. The results of the second stage show a positive effect of children's migration on their elderly parents' health. Children's migration decreases elderly parents' disability rates, increases their ability to perform activities of daily living (ADLs), and increases their mental health scores. Younger elderly and females benefit more from migration of a child.

Our results suggest that there may be benefits to further reducing barriers to migration and to continuing the reform of the household registration (*hukou*) system and the social security programs for rural-urban migrants.

There would also be a major benefit from improving the New Cooperative Medical Scheme and New Rural Pension System programs for rural populations.

This project has been presented at the Brown Bag Seminar at Jinan University in March 2017 and the Empirical Micro Seminar at UNSW Sydney in April 2017. A working paper will be submitted to the *Journal of Health Economics* in 2018.

This project investigates the causal effect of adult children's migration on the elderly's health in China.



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.

Previously, 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.'

ENVIRONMENTAL IMPACT ON OLD AGE MORTALITY IN EAST ASIA SINCE THE 1970S

RESEARCHER

ZHONGWEI ZHAO

As a part of a large study, this project aims to examine the temperature-mortality relationship in East Asia. It has been found that levels of daily mortality are closely related to changes in daily temperature and mortality has strong seasonality. In the early stage of our investigation, we have examined such seasonality in the 1970s, and found that older people were more vulnerable in the winter when more died of cardiovascular diseases. Some of these results have been reported in 'Daily mortality changes in Taiwan in the 1970s: An examination of the relationship between temperature and mortality', published by the *Vienna Yearbook of Population Research*.

However, such temperature-mortality relationships have not been constant, with considerable changes observed. This study is a continuation of our earlier research. It concentrates mainly on changes in the temperature-mortality relationship over time. Our analysis has revealed some very interesting results. These results have been presented at a seminar organised by the School of Demography

at the Australian National University, and several other universities. They have also been presented at a couple of international conferences including the International Union for the Scientific Study of Population (IUSSP) conference held in Cape Town, South Africa this year. The presentation entitled 'Understanding and Modelling Daily Mortality Changes' was made by Zhao, and others. It attracted attention at the conference, and was reported in the IUSSP International Conference Newsletter.

This project is now complete. We are going to further revise the research reports presented at the IUSSP conference and elsewhere, and to write a research paper addressing the long-term changes in the temperature-mortality relationship. We aim to publish the paper in a major international journal.

It has been found that levels of daily mortality are closely related to changes in daily temperature and mortality has strong seasonality.



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
BEI LU
RAFAL CHOMIK
PETER McDONALD

In 2017, the work related to this topic has involved greater connection with policy institutions and policymakers. The strands of work encompass aged care and pension policy in China; the impact of migration and labour policy throughout the APEC economies; and impacts of ageing in East Asia and the Pacific on public expenditure and growth. Completed papers also include two pieces of work by Research Fellow Bei Lu published in Chinese, giving wider access to our research findings than would otherwise be possible.

Long-term Care Policy in Qingdao

This ongoing project, takes advantage of detailed data from the pilot Long-term Care (LTC) Insurance Plan in Qingdao to analyse usage patterns and insurance alternatives. Two papers have been completed this year. The first focuses on documenting the Qingdao LTC Medical Insurance program in order to understand its recipient demographics and the determinants of cost

differentials for clients presenting with different patterns of disability, and to estimate a full-coverage LTC program cost in Qingdao. Information on Activities of Daily Living (ADL) status and mortality patterns in different care locations are used. Detailed data from the Qingdao program are used to build multi-logit models to analyse the exit patterns of clients from the Qingdao LTC system. Statistical estimation is then employed to assess costs. Findings reveal that about 10% of the program's clients received institutional care, while the rest received care at home or in other residential locations. More than 60% of recipients were aged eighty and above. For those who survived after twelve months in the program, exit ratios were only correlated with ages 80 and above, gender, and entry level of ADL scores. This recipient structure suggests that the LTC system, assuming current per unit costs, would only cost about 0.1% of local GDP. A companion paper analyses affordable comprehensive care insurance for disabled elderly in Qingdao.

China's Retirement Policy Reforms

Other research focused on China includes a paper presented at an international pension policy conference in Rome in October. The paper

analyses the potential expansion of the role of the Notional Defined Contribution (NDC) paradigm in the ongoing reforms of retirement provision in China. We conclude that while an increased presence of the NDC paradigm has the potential to increase aggregate welfare, especially in the large and active Urban Employee Pension Scheme (UEPS), sub-national heterogeneity limits the applicability of any universal pension system in China. In particular, some form of more traditional vesting may serve to enhance formal labour force participation, supporting China's future growth.

Demographic Change, Labour Supply and Economic Growth in APEC

APEC economies encompass a wide range of socioeconomic profiles – poor to rich, young to old, regulated to free market. These differences can be instructive for those seeking international policy lessons. They also create new opportunities for cooperation that have the potential to improve wellbeing across member economies. How economies and regions manage demographic change will define their success in what will be an 'ageing century'. We were commissioned by the Australian Government to write an overview paper on the role of demographic change on labour force and



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 research focuses on demographics, health, 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, China, the World Bank and academic institutions. She is currently participating in a

Chinese Key National Science Project, as well as a project focused on China's long-term care policy 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*. She also has published in Chinese newspapers, journals and books.

economic growth focused on APEC economies. The unifying framework to organise the issues revolved around a GDP accounting model in which economic growth was decomposed into the contribution of population, participation, and productivity. The modelling examined historic and projected demographic and macroeconomic trends to inform policy discussions and decisions. Amongst other findings, the analysis concluded that migration and mobility across APEC is important, contributing a 7% boost to aggregate GDP compared with a zero-mobility scenario. Increases in mature and female labour force participation are also important, as are measures to improve productivity.

Demographic Change and Fiscal Sustainability in East Asia and the Pacific

This work provides a systematic and quantitative comparison of the economic implications of the ongoing demographic transition in East Asia and the Pacific. It built on work that looked at APEC countries, making use of a simple yet powerful analytic device to allow the decomposition of impacts into those associated with demographic change itself, those that flow from transitions in labour force participation, and those that will be driven by changes in productivity growth.

The approach is bolstered by analysing the impact on government expenditure and the implied affordability of such expenditure given an expansion of the welfare system, demographic change and alternative growth scenarios. While abstracting from many important dynamics of societal ageing, the analysis provides a consistent basis for comparing the impacts of population ageing in various jurisdictions, and the relative efficacy of an important set of policy responses which could be deployed to accommodate demographic change. Commissioned by the UN, it is envisaged that this report will be finalised in early 2018.

Amongst other findings, the analysis concluded that migration and mobility across APEC is important, contributing a 7% boost to aggregate GDP compared with a zero-mobility scenario.



RAFAL CHOMIK
BEcFin UWA, MEc
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
(DEAKIN UNIVERSITY)

With the world's largest population in Asia, regional comparisons of drivers and consequences of rapid population ageing will provide opportunities to gain insight into the responses in countries at different levels of development and sociocultural background.

A three-year ARC Discovery project, 'Ageing in China and Australia: Promoting health, productivity and wellbeing', (led by Kendig, Browning, Byles, D'Este, Silverstein, Nazroo, and Thomas and with research support from Yiengprugsawan and Gong) is currently underway.

Preliminary findings were presented at a Symposium on 'Ageing China and Australia: Economic, social, and health implications' as part of the 2017 IAGG World Congress of Gerontology and Geriatrics. Kendig and Gong led an article 'Life course influences on later life health in China' with Yiengprugsawan, Silverstein and Nazroo published in *Social Science and Medicine Population Health*.

In 2017, Gong contributed as a Partner Investigator to a China Social Science Research Funding project on 'Health care utilization among older Chinese with chronic diseases and its impact on health care system reform', and a China Natural Science Research Funding project on 'Policy implications on the Chinese economy, environment and energy using simulation modelling'. Gong continued her research under an ARC Discovery Project based on the China Health and Retirement Survey (CHARLS) on future expected care (with Kendig and Silverstein) and paid work in later life (with Kendig and Nazroo).

Browning and Thomas continued their work on primary health care, and its financing in ageing China, as well as on chronic illness management in primary care settings in Shenzhen, China. Browning and Thomas are the Guest Editors for

a Special Research Topic on chronic illness and ageing in China for the *Frontiers in Public Health* to be published in July 2018.

Yiengprugsawan led a comparative publication entitled 'Reorienting health services to people with chronic health conditions in Malaysia, Sri Lanka and Thailand' (with Kendig, Healy, and in-country collaborators) and completed a book review on The World Bank's *Live Long and Prosper: Ageing in East Asia and Pacific* for the *Journal of Pension Economics and Finance*. Yiengprugsawan, D'Este, Byles, and Kendig submitted a manuscript on geographical inequalities in health among older Chinese based on the World Health Organization's Study on global AGEing and adult health (WHO-SAGE).

With the world's largest population in Asia, regional comparisons of drivers and consequences of rapid population ageing will provide opportunities to gain insight into the responses in countries at different levels of development and sociocultural background.



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.

In 2014 she was awarded a fellowship supported by the World Health Organisation Asia-Pacific Observatory on Health Systems and Policies to lead a comparative study on health system response to population ageing and non-communicable diseases. She was also the recipient of a 2016 Australian Endeavour Research Fellowship 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

LOOKING BACK OVER THE PAST SEVEN YEARS WE ARE VERY PROUD OF OUR CONTRIBUTION TO THE DEVELOPMENT OF RESEARCH CAPACITY IN THE FIELD OF POPULATION AGEING. WE HAVE SUPERVISED TO COMPLETION 58 RESEARCH STUDENTS AND PROVIDED OPPORTUNITIES FOR OVER A THOUSAND MORE NATIONALLY THROUGH THE CEPAR-SPONSORED EMERGING RESEARCHERS IN AGEING PROGRAM. IN ADDITION, WE HAVE EMPLOYED 37 RESEARCH FELLOWS OVER THE LIFE OF THE CENTRE AND HAVE PROVIDED CAREER DEVELOPMENT OPPORTUNITIES TO OTHER EARLY CAREER RESEARCHERS (ECRS) BOTH NATIONALLY AND INTERNATIONALLY.

One of the ways we support the development of ECRs is through dedicated workshops focused on skills and career development. Our annual four-day methodology workshop, focused this year on data mining in the social sciences, attracted both CEPAR-affiliated and non-affiliated young researchers keen to explore, interpret, and make sense of the ever-growing behavioural and social data streams. The theme of our other workshop, offered exclusively to CEPAR ECRs, was 'Producing High Impact Research' and covered a range of topics including grant application and publication strategies.

The theme of this year's Emerging Researchers in Ageing Conference was Digging for Gold: Building Success in Ageing Research. The theme was chosen to demonstrate to young researchers that policy influence, as well as high quality research, is essential to forging an academic career in this area. It showcased over 30 oral, poster and rapid-fire presentations from students working in the ageing field drawn from almost 20 universities.

In 2017 our summer scholarship program continued to be very popular. Designed to provide potential honours students with a taste of research by offering opportunities to work on short-term projects at CEPAR, the program attracted many applicants for both the 2016/17 and 2017/18 rounds.

The latest cohort contributed to a diverse range of CEPAR projects including research investigating the impact of tax on housing debt and equity, the relationship between life expectancy and socioeconomic factors, and the role of cognition and family support on the private health insurance decisions of older Australians.

In 2018, we look forward to welcoming and developing the skills of a new cohort of CEPAR students and ECRs as part of the new Centre.

Peter McDonald
Deputy Director

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 2017 also provided frequent occasions to engage with our industry and government partners. Our ECRs participated 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 2017, 24 research fellows were funded directly by Centre grants and, additionally, seven of our CEPAR Associate Investigators (AIs) were ECRs.

EARLY CAREER RESEARCHER CAREER DEVELOPMENT WORKSHOP

The focus of this year's ECR workshop was career development. Now in its third year this annual event gives ECRs an opportunity to meet, discuss their research in an informal setting, and learn from each other and from senior researchers. An organising committee consisting of five CEPAR



ECR METHODOLOGY WORKSHOP PARTICIPANTS AT ANU

RESEARCH TRAINING & MENTORING

research fellows put together a program suited to the needs of those participating.

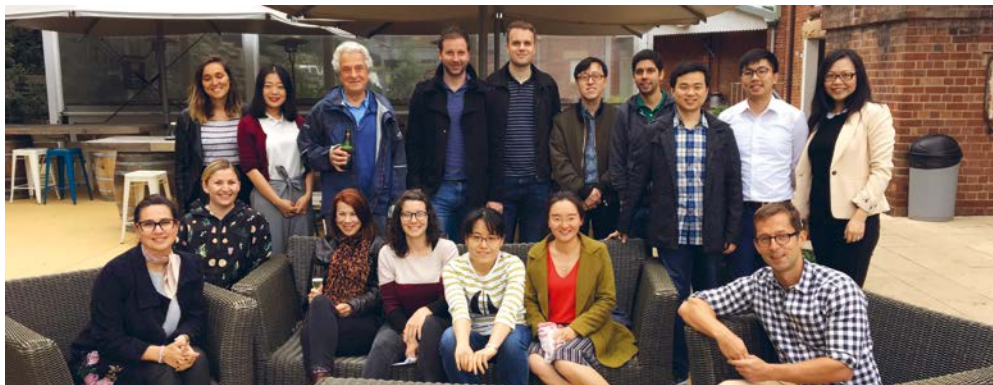
The program covered an introduction to CEPAR's 2018-2023 research program and sessions on grantsmanship, publication strategy and maximising research impact. The day began with an overview of CEPAR's future research program from Director John Piggott. Research Fellows working on some of CEPAR's larger externally funded projects also provided overviews. This workshop session was a great opportunity to highlight the scale and scope of research undertaken by the Centre's researchers.

John Piggott also spoke about research impact and, in particular, how ECRs can leverage their research to influence policymakers. CEPAR CI Robert Cumming, a 'Highly Cited Researcher' in the Clarivate Analytics Report in 2016, gave insights on how to increase citations, including the importance of researching significant topics and of being a good collaborator.

A highlight for many of the researchers was the strategic advice for winning external grants, presented by James Walsh from the UNSW Research Strategy Office.

EARLY CAREER RESEARCHER METHODOLOGY WORKSHOP

An advanced training workshop on 'Data Mining in Social Sciences' was hosted by the CEPAR ANU node in November 2017. Convened by CEPAR CI Kaarin Anstey and presented by Professor Nilam Ram from Pennsylvania State University, the workshop was designed to capitalise on the recent methodological advances that have made data science a major area of statistical research. The workshop was offered free of charge to both CEPAR and non-CEPAR affiliates, with 15 CEPAR travel bursaries awarded to interstate participants to assist with costs. As well as providing an opportunity for participants to advance their skills, it also offered a forum to network with other emerging researchers working



CEPAR PERSONNEL AT Q STATION SYDNEY FOR THE ECR CAREER DEVELOPMENT WORKSHOP

across the social sciences with psychologists, economists and demographers all attending.

In this four day workshop participants were introduced to foundational concepts and practices that support 'data mining' and researchers' ability to engage, apply, and interpret results from exploratory analyses.

It introduced the conceptual bases and strategies employed in exploratory data mining and reviewed a variety of analysis techniques and algorithms for unsupervised and supervised learning, use of training and test data, feature selection, and pattern recognition.



DR MIGUEL OLIVO
VILLABRILLE
Research Fellow
UNSW NODE

Miguel joined CEPAR in September 2017. His research focuses on the empirical estimation of individual decision-making models and its implications for economy-wide phenomena and demographics.

'The Centre has been great at providing me with opportunities to present my work at external and internal conferences and seminars, and build my research network. There are also opportunities for professional development, such as grant writing and application, which are very useful skills for a research career.'

'Working at the Centre has been a great experience. Not only professionally, but also at a personal level. I've had a good time interacting with people here.'

Miguel will be part of the new CEPAR Research Program in 2018 working on project 4.4 Retirement Policy Issues.

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 2017 the CEPAR ECR Travel Grant Scheme provided the opportunity for international collaboration and connection for CEPAR ECR Dr Shea Andrews. He used the funds to visit the Department of Psychology at the University of Alberta in Edmonton, Canada.

'The aim of the visit was to develop a project that facilitated the collaboration between two internationally recognised and methodologically similar longitudinal studies of ageing: the Canadian Victorian Longitudinal Study (VLS) led by Professor Roger Dixon and the Australian Personality and Total Health (PATH) Through Life project led by CEPAR CI Professor Kaarin Anstey. The aim of the project was to characterise the effect of genetic risk factors for Alzheimer's disease in normal cognitive ageing. The association of Apolipoprotein E (APOE) with late-onset Alzheimer's disease (LOAD) and cognitive endophenotypes of ageing has been widely investigated. As such, there is increasing interest in evaluating the association of other LOAD risk loci with cognitive performance and decline. The results of previous research studies have been inconsistent and inconclusive. In our project, we first conducted a narrative systematic review of studies investigating the association of non-APOE LOAD risk loci with cognitive performance in older adults. Second, we developed models to partition cognitive ability into dementia-related variance in cognitive task performance (δ) from variance that is unrelated to dementia processes (g). Using these models in both VLS and PATH we sought to evaluate whether Alzheimer's genetic risk loci were differentially associated with either δ or g .'

DR SHEA ANDREWS

Research Fellow
ANU node

ECR TRAVEL GRANT RECIPIENT



SHEA ANDREWS (SECOND FROM LEFT)
AND HIS LAB GROUP IN CANADA

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 2017 CEPAR or CEPAR-sponsored events such as the 25th Annual Colloquium of Superannuation Researchers, the Longevity Research Forum and the PwC Longevity 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 five PhD students in 2017 to assist with travel expenses.



VICTORIA ALLEN

PhD student
Flinders University
HDR STUDENT CONFERENCE
TRAVEL AWARD RECIPIENT

'In 2017 I was fortunate enough to receive funding from the CEPAR HDR Student Conference Travel Scheme to support my attendance at the 21st IAGG World Congress in San Francisco, California. At IAGG, I presented a poster entitled: 'Psychosocial Moderators of the Coupling of Stress and Negative Affect: A Micro-Longitudinal Study' based on the results of my PhD project which focuses on ageing and emotion regulation. I received valuable feedback from a number of leading researchers in the field regarding my PhD research which has assisted greatly in the preparation of publications and chapters that form the basis of my PhD dissertation. Exposure to international research in the realm of geriatrics and gerontology has been instrumental to my professional development in terms of strengthening my understanding of specialised methodological approaches relevant to my field of research, providing me with the opportunity to network and establish opportunities for future research collaboration, and allowing me to disseminate my research to an international audience. I am extremely grateful to CEPAR for the role they have played in supporting my attendance at this conference.'

RESEARCH TRAINING & MENTORING



AGNE VAICIUKEVICIUTE

PhD Exchange Student
VILNIUS GEDIMINAS
TECHNICAL UNIVERSITY
(VGTU), LITHUANIA.

As part of a bilateral agreement between UNSW and VGTU, CEPAR hosted a research visit from PhD student Agne Vaiciukeviciute from 6 October 2017 to 5 January 2018.

'As a PhD student, the exceptional opportunity to work with the experts at CEPAR over a three-month period has been a life changing experience. In particular I am thankful to my temporary supervisor Dr George Kudrna. Without him, my exchange would not have been possible. The knowledge and insightful comments that I've received while at CEPAR will be crucial to the successful completion of my PhD thesis. The skills and experience that I've acquired here will also benefit my future career opportunities. I am so grateful to be able to work at CEPAR and genuinely enjoyed the whole experience. I cannot imagine any better place to have conducted my exchange than CEPAR.'

HIGHER DEGREE RESEARCH TRAINING

41 HDR students were enrolled under the supervision of CEPAR Investigators and working on topics aligned with the Centre's research agenda in 2017. Details of their research theses are provided on pages 88-90. 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 2017 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 representative from peak bodies in the ageing field keen to play a role in supporting early career researchers.

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. In 2017 the conference, now in its 16th year, was hosted by Curtin University. The theme was *Digging for Gold: Building success in ageing research*. There were a range of topics that addressed this theme, including equity and equality, participation, relationships of care, biological aspects, neurological aspects, physical activity, impact of falls, built environment, and service use and planning. The conference featured 31 oral presentations, five poster presentations and the program published five full papers. ERA provided 23 bursaries to student presenters to support their attendance at the conference.

Millicent Cripe, a Fulbright Scholar working at the CEPAR University of Sydney Node, was one of four CEPAR students and affiliates who presented at ERA in 2017. Millicent presented her paper 'Aged Care Service Provision within Australia's Primary Health Network Model: A Case Study', based on the year-long research project she undertook in

Australia under the supervision of CEPAR AI Kate O'Loughlin.

'Without a doubt, the ERA conference in Perth was one of the highlights of my Fulbright year in Australia. As this year is my first experience doing a qualitative research project, it was very gratifying to get the chance to present in such a supportive setting. And I found that attending the conference really expanded my horizons and understanding of the diverse and fascinating work of Australia's emerging researchers. The conference was also a valuable networking opportunity and underscored the value of learning from your peers as well as from mentors.'



MILLICENT CRIFE

2017 Fulbright Scholar
UNIVERSITY OF SYDNEY
NODE VISITOR

This year's ERA-Australian Association of Gerontology (AAG) joint workshop was given by Dr Natasha Ayers from iPrep WA. She spoke about maintaining a work-life balance as a researcher.

Two post-conference workshops were focused on self-promotion opportunities for young researchers and were well attended:

- Using the media to market yourself (presented by A/Prof Daniel Gucciardi [Curtin University], Dr Fenella Gill [Curtin University and Princess Margaret Hospital for Children], and Ms Yasmine Phillips [Curtin University]); and
- Playing the game (presented by Dr Elissa Burton [Curtin University], A/Prof Anne-Marie Hill [Curtin University], and Dr Belinda Brown [Murdoch University]).

EMERGING RESEARCHERS IN AGEING VIRTUAL SEMINAR SERIES

The ERA Virtual Seminar series continued 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 2017: the first looked at successful policy and research collaborations in May, and the second focused on 'Participatory Action' research in November. ERA also collaborated with the AAG to run a joint webinar on alternative sources of research revenue in August which attracted 40 participants.

UNDERGRADUATE STUDENT ENGAGEMENT

SUMMER SCHOLARSHIP PROGRAM

The CEPAR Summer Scholarship Program at the UNSW node is now in its third year. 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 six awards. The successful students and their research projects were:

Aaron Wong

Taxation arbitrage and housing debt and equity

Benjamin Smagarinsky

The role of cognition and family support on the private health insurance decisions of older Australians

Helena Luo and Yabing Zou

Building a tax-benefit microsimulation model for China

Luke Zhou

Conditional life expectancy comparisons using a semi-parametric trending panel model approach

Samuel Thirurajah

Data analytics methods for mortality modelling and longevity risk management

The program is designed to provide students with a taste of working in a research centre and inspire them to pursue research studies.



HELENA LUO

Bachelor of Economics
(Honours) Student

SUMMER SCHOLARSHIP
RECIPIENT

'The summer research scholarship was an excellent opportunity for me to research a topic that I was very interested in, but had no experience with. Under the guidance of the CEPAR Research Fellows I learnt so much more than I expected and experienced how fun research can be.'

RESEARCH TRAINING & MENTORING

CEPAR AFFILIATED STUDENTS

CEPAR affiliated students work under the supervision of CEPAR Investigators on topics aligned with the Centre’s research agenda. In 2017 a total of 42 HDR students and one Honours student were affiliated with the Centre.

PHD COMPLETIONS

This year 12 HDR CEPAR affiliates submitted their theses for examination and/or graduated:

NATALIA ARANCO

Thesis: Education, health and fertility: Analysing interactions across countries and over time
Supervisors: Professor John Piggott and A/Professor Shiko Maruyama

JOHANNE ELIZABETH BRADY

Thesis: Meanings of Parkinson’s disease from the perspectives of people diagnosed and their partner-carers living in an Australian community setting
Supervisor: A/Professor Kate O’Loughlin
Co-supervisor: Dr Jennifer Smith-Merry

RACHEL CURTIS

Thesis: I think I can – The association between control beliefs and activity engagement in the second half of life
Supervisor: Dr Tim Windsor
Co-supervisor: Professor Mary Luszcz

PUSHPANI MENAKA HERATH

Thesis: Understanding the relationship between treatment of common chronic diseases and cognitive function
Supervisor: Professor Kaarin J. Anstey
Advisor: A/Professor Nicolas Cherbuin

MARIJAN JUKIC

Thesis: Modelling residential aged care in Australia: Entry and exit
Supervisor: Professor Peter McDonald
Co-supervisor: A/Professor Jeromey Temple

CLAIRE O’CONNOR

Thesis: Understanding behaviour and function in frontotemporal dementia: Developing better intervention approaches
Supervisor: Professor Lindy Clemson
Co-supervisors: Professor Eneida Mioshi, Professor Henry Brodaty, Professor Olivier Piguet and A/Professor Kate O’Loughlin

LILY O’DONOUGHUE-JENKINS

Thesis: Cognitive impairment and service use: Translating research for policy
Supervisor: Professor Kaarin J. Anstey

SARASWATHY VENKATARAMAN

Thesis: Exploring the physical environment in supporting older people in long-term care and shelter accommodation in the Klang Valley in Malaysia
Supervisor: Professor Helen Bartlett
Co-supervisors: A/Professor Jennifer Oxley, A/Professor Louise Farnworth and Professor Lesley Day

JACQUELINE WESSON

Thesis: Functional cognition in older adults with mild cognitive impairment or mild dementia: Validation of the large Allen’s Cognitive Level Screen
Supervisor: Professor Lindy Clemson
Co-supervisors: Professor Henry Brodaty and Dr Simone Reppermund

MENGYI XU

Thesis: Housing and retirement saving
Supervisor: Professor Michael Sherris
Co-supervisors: Dr Adam Wenqiang Shao and Dr Jennifer Alonso Garcíá

YAJING XU

Thesis: Cohort models of mortality and development of a tradeable longevity market
Supervisor: Professor Michael Sherris and Dr Jonathan Ziveyi
Co-supervisor: Professor John Piggott

XIAOYUN Z HANG

Thesis: Three essays on migration, health insurance and pension policies in China
Supervisors: Professor John Piggott, Dr Katja Hanewald and Dr Tess Stafford

PHD STUDENTS

In addition to those who submitted their PhD theses in 2017 the students listed below were also affiliated with CEPAR:

JEOFREY ABALOS

Thesis: Determinants of health status and health expectancy among older persons in the Philippines
Supervisor: Professor Heather Booth
Co-supervisor: Professor Zhongwei Zhao

MUHAMMAD ABSOR

Thesis: Ageing in rural Indonesia: Filling the gaps to meet the bio-psychosocial-spiritual needs of older persons
 Supervisor: Professor Peter McDonald
 Co-supervisors: Dr Iwu Utomo and Dr Arianne Utomo

VICTORIA ALLEN

Thesis: Daily stress regulation in younger and older adults: An intensive micro-longitudinal study
 Supervisor: Dr Tim Windsor
 A/Supervisor: Professor Mary Luszcz

RICHARD ARTHUR

Thesis: Is anxiety a risk factor in cognitive ageing?
 Supervisor: Professor Kaarin J. Anstey
 Advisors: Dr Richard A. Burns, Dr Moyra E. Mortby and Professor Richard O'Kearney

BIANCA BONOLLO

Thesis: New perspectives on health choices and social interactions
 Supervisor: A/Professor Loretti I. Dobrescu
 Co-supervisor: Professor John Piggott

CASSIE CURRYER

Thesis: A view of home: Older people, housing and social policy in Australia
 Supervisor: Professor Julie Byles
 Co-supervisor: Professor Mel Gray

ARPITA DAS

Thesis: Nutrient intake and its effects on health outcomes and mortality among older men living in Australia: The Concord Health and Ageing in Men Project
 Supervisor: Dr Vasant Hirani
 Co-supervisor: Professor Robert Cumming

DOROTHY DUDLEY

Thesis: Understanding personal goals in retirement and their relationship with life satisfaction - An Australian perspective
 Supervisor: A/Professor Kate O'Loughlin
 Co-supervisors: Dr Vanessa Loh and Dr Sophie Lewis

PARIVASH EFTEKHARI

Thesis: Quality care in older Australian women with asthma
 Supervisor: Professor Julie Byles
 Co-supervisors: Ms Peta Forder and Dr Melissa Harris

TIN LONG HO

Thesis: Retirement financial planning in China: The role of housing and new retirement financial products
 Supervisors: Professor Hazel Bateman, Dr Katja Hanewald and Professor Hanming Fang

ALIZA HUNT

Thesis: Ageing well in Indonesia: Meeting the mental health needs of elderly Indonesians
 Supervisors: Professor Peter McDonald, Professor Phil Batterham and Professor Zachary Steel
 Co-supervisor: Dr Steve McEachern

NEIL JEYASINGAM

Thesis: Attitudes to ageing: Factors contributing to optimal mental health in older persons
 Supervisor: A/Professor Kate O'Loughlin
 Co-supervisor: A/Professor Lynda Matthews

XIAO GUANG JIA

Thesis: An agent-based model of life course: Adaptive mating process embedded in dynamic social networks
 Supervisor: Professor Zhongwei Zhao
 Co-supervisor: Professor Heather Booth
 Advisor: A/Professor Adrian Hayes

SHUANGLAN (SHI ANNA) LI

Thesis: Investment strategies in pooled annuities
 Supervisor: Professor Michael Sherris
 Co-supervisors: Dr Andrés Villegas and Dr H  lo  se Labit Hardy

YULONG LI

Thesis: Health status, mortality heterogeneity and implications for post-retirement product innovation
 Supervisors: Professor Michael Sherris and Dr Jonathan Ziveyi
 Co-supervisor: Dr Andr  s Villegas

JANET MACCORA

Thesis: Gender differences in modifiable risk factors for cognitive decline in ageing
 Supervisor: Professor Kaarin J. Anstey

MITCHELL MCMASTER

Thesis: A randomised controlled trial of multidomain dementia risk reduction for mild cognitive impairment (BBL-MCI)
 Supervisor: Professor Kaarin J. Anstey
 Co-supervisors: Professor Linda Clare, Dr Sarang Kim and A/Professor Nicolas Cherbuin

RESEARCH TRAINING & MENTORING

KATE MILLEDGE

Thesis: Study of the inter-relationships between dietary intake, oral health, and frailty among older Australian men

Supervisor: Dr Vasant Hirani

Co-supervisors: Professor Robert Cumming and Dr Fiona O’Leary

CATHY MONRO

Thesis: The changing nature of aged care in Australia: Living Longer Living Better reforms and the impact on service providers and consumers

Supervisor: A/Professor Kate O’Loughlin

Co-supervisor: A/Professor Lee-Fay Low

ARM NAKORNTAB

Thesis: Annuities and estate taxation in an entrepreneurship model

Supervisor: Dr Cagri Kumru

MIJANUR RAHMAN

Thesis: Modelling trajectories to aged care service use among older Australian women

Supervisor: Professor Julie Byles

Co-supervisor: Professor Jimmy Efird

DAVID RODGERS

Thesis: Demographic change and optimal policy responses

Supervisor: Professor Alan Woodland

Co-supervisor: Dr George Kudrna

QUANG TRINH

Thesis: Ageing and intergenerational relationships in Vietnam

Supervisor: Professor Hal Kendig

Co-supervisors: Professor Peter McDonald, A/Professor Minh Huu Nguyen and Dr Vasoontara Yiengprugsawan

CHENG WAN

Thesis: The demand for hybrid longevity and health insurance products in China

Supervisors: Professor Hazel Bateman, Professor Hanming Fang and Dr Katja Hanewald

SHANNON WEBB

Thesis: The relationship between depressed mood and outcomes of cognitive training in older adults

Supervisors: Dr Damian Birney and Dr Amit Lampit

Co-supervisor: Dr Vanessa Loh

DANIEL WHEADON

Thesis: Demographic change and optimal policy response

Supervisor: Professor Alan Woodland

Co-supervisor: Dr George Kudrna

LYNDA WOODWARD

Thesis: The experience of older men and women on falling, recovery and participation in a long-term management program

Supervisor: Professor Lindy Clemson

Co-supervisors: A/Professor Cathie Sherrington and A/Professor Karen Willis

XIAO XU

Thesis: Variable annuity guarantee benefits - An integrated study of financial and actuarial valuations

Supervisor: Professor Michael Sherris

Co-supervisors: Dr Jennifer Alonso García and Dr Jonathan Ziveyi

ADAM YATES

Thesis: International obesity and socioeconomic status relative to absolute wealth

Supervisor: Professor Julie Byles

Co-supervisors: Professor Catherin D’Este and Dr Paul Kowal

DANDAN YU

Thesis: Collective household decision making

Supervisor: Professor Denzil Fiebig

Co-supervisor: Professor Denise Doiron

HONOURS STUDENT

In 2017 the following Honours student was affiliated with CEPAR:

IGOR BALNOZAN

Thesis: Drawdown behaviours in phased withdrawal retirement income products

Supervisor: A/Professor Anthony Asher

Co-supervisor: Professor Robert Kohn



SECTION

EXTERNAL LINKAGES

CENTRE DIRECTOR JOHN PIGGOTT AT THE UNITED NATIONS ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC (ESCAP) WORKSHOP ON SUSTAINABLE AND INCLUSIVE PENSIONS IN ASIA AND THE PACIFIC

INDUSTRY & GOVERNMENT LINKS

CEPAR ORGANISED A WIDE RANGE OF TRANSLATIONAL EVENTS THIS YEAR COVERING SUCH DIVERSE TOPICS AS MATURE LABOUR FORCE PARTICIPATION, DRIVING AND HEALTH IN LATER LIFE, LONGEVITY RISK, MORTALITY IN AUSTRALIA, AND RETIREMENT INCOME PLANNING.

Retirement income arrangements were in the spotlight at both the International Network for Pensions, Aging and Retirement international research seminar and the 25th Annual Colloquium of Superannuation Researchers. 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 2017 research seminar was Pension Foresight: Envisaging Retirement Income Plans of the Future. The event attracted more than 100 delegates drawn from academe, government and industry and featured a range of distinguished international speakers. Equity, sustainability and adequacy of retirement income arrangements were the focus of this year's annual Colloquium jointly hosted by CEPAR and the UNSW School of Risk and Actuarial Studies. As in previous years, the Colloquium attracted strong participation from industry and government, with almost 100 delegates gathering for the two-day event held in Sydney.

Longevity and mortality were the focus of another two events attracting significant interest from end users. Almost 50 researchers and industry practitioners gathered in Sydney in February for the CEPAR Longevity Workshop hosted by our

Partner Organisation, PWC, to hear from CEPAR experts on this important topic. And in November, a symposium to commemorate the 150th anniversary of the publication of the first Australian Life Table, was organised by the Melbourne School of Population and Global Health in association with CEPAR to examine past, present and future mortality in Australia.

In Canberra, a CEPAR-sponsored workshop on driving and health provided much-needed information for ageing drivers, their families and professionals in the field; our Workshop on Mature Labour Force Participation opened by the Age Discrimination Commissioner, The Honourable Dr Kay Patterson AO, attracted major interest from government, community groups and academe; and our joint workshop with the Commonwealth Treasury on fiscal policy modelling provided an opportunity for sharing research and knowledge between CEPAR researchers and representatives from Treasury, the Department of Social Services, the Parliamentary Budget Office and the Department of Prime Minister and Cabinet.

Throughout 2017 our researchers participated in a range of end-user engagement activities where CEPAR research was translated to inform policymakers and business practitioners, both nationally and internationally. Highlights are included in this section and a full list of activities appears on pages 122-123.

As we expand our partnerships and reach with the new Centre we look forward to further developing and contributing to collaborative research initiatives with the potential to have significant local and global impact.

Professor Michael Sherris
Chair, Outreach Subcommittee

EVENTS

MATURE LABOUR FORCE PARTICIPATION WORKSHOP

In October 2017 CEPAR held a workshop on Mature Labour Force Participation in Canberra. Delivering the opening address at the workshop, the Age Discrimination Commissioner, the Honourable Dr Kay Patterson AO, spoke of the importance of translating research outcomes into government policy and business practice. This was echoed by representatives of the Commonwealth and State Governments who identified knowledge gaps where research was needed to inform policy development.

The workshop included presentations from a number of CEPAR researchers including Senior Research Fellows Jeromey Temple and Rafal Chomik who gave a macro-demographic overview of the issue and insights at the State and Territory level. Chief Investigators from CE11 and CE17 also spoke. CIs Kaarin Anstey and Marian Baird provided insights into what influences mature age workforce engagement and CI Sharon Parker spoke about how industry and government can encourage mature workforce participation. The need to shift the narrative about older workers and the behaviour of organisations was discussed by Council on the Ageing's Chief Executive, Ian Yates, who formed part of a panel to discuss knowledge gaps and policy initiatives.

25TH ANNUAL COLLOQUIUM OF SUPERANNUATION RESEARCHERS

The 25th 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 6-7 July 2017.

Commemorating its silver jubilee, the annual colloquium attracted a wide range of participants including Australian and international academics and representatives from government and industry to discuss and debate contemporary pension and superannuation issues. The theme of



MATURE LABOUR FORCE PARTICIPATION WORKSHOP SPEAKERS.

(L-R) IAN YATES (COTA), CARMEL O'REGAN (DEPT. OF EMPLOYMENT), BOB GREGORY (CEPAR), KAARIN ANSTEY (CEPAR), MICHAEL GADIEL (NSW TREASURY), SHARON PARKER (CEPAR), MARIAN BAIRD (CEPAR)



(L-R) JENNY WILKINSON (TREASURY), DAVID BELL (MINE WEALTH + WELLBEING), MARC DE CURE (CEPAR) AND OLIVIA S. MITCHELL (WHARTON) PARTICIPATE IN A PANEL ON CIPRS AT THE 25TH ANNUAL COLLOQUIUM OF SUPERANNUATION RESEARCHERS

this year's event was 'Equity, Sustainability and Adequacy of Retirement Incomes'.

With that in mind David Knox, the founder of the Colloquium, and current Senior Partner at Mercer, opened the colloquium and reflected on 25 years of superannuation in Australia. Two keynote speakers were also featured; CEPAR Partner Investigator (PI) Professor Olivia S. Mitchell discussed Putting the Pension Back in 401(k) Plans: Optimal Versus Default Longevity Income Annuities; and Professor Nicholas Barr, of the London School of Economics, spoke on Reforming Pensions in Chile – and Lessons from Other Countries.

A panel of experts comprising Jenny Wilkinson (Commonwealth Treasury), David Bell (Mine Wealth + Wellbeing), Olivia S. Mitchell (Wharton), and CEPAR Advisory Board Chair Marc de Cure kicked off day two with a discussion of Comprehensive Income Products for Retirement (CIPRs), a new initiative from The Treasury designed to offer retirement flexibility, and provide greater protection against investment and longevity risk.

Nine additional CEPAR personnel presented their research at this year's event, addressing a broad range of topics including intergenerational wealth sharing, delaying the pension age in China, and mortality modelling.



PROFESSOR
OLIVIA S. MITCHELL
BA Harvard, MA PhD
Wisconsin-Madison
PARTNER INVESTIGATOR

Dr Olivia S. Mitchell is the 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; 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 served as a Co-Investigator for the Health and Retirement Study at the University of Michigan from 1990-2017.

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 (over 230 books and 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.

INDUSTRY & GOVERNMENT LINKS

FISCAL POLICY MODELLING WORKSHOP

Researchers and policymakers came together to share research and knowledge at the CEPAR/Treasury Joint Workshop on Fiscal Policy Modelling held in Canberra on August 14.

The aim of the workshop was to better understand how the development of an overlapping generations (OLG) model within Treasury could aid long-term planning and policy formulation.

The day featured presentations by both CEPAR and Treasury officials on OLG models, as well as other models. Following the workshop, CEPAR Senior Research Fellow George Kudrna, who presented on the effects of fiscal consolidation in Australia, using an OLG model, was invited to join the Treasury steering committee providing oversight of their Overlapping Generations for Australia (OLGA) model.

As well as representatives from Treasury and DSS, the workshop also attracted participants from the Parliamentary Budget Office and the Department of Prime Minister and Cabinet.



SPEAKERS AT THE 2017 CEPAR PwC LONGEVITY WORKSHOP

LONGEVITY WORKSHOP HOSTED BY PwC

PwC has been a CEPAR partner since its inception in 2011. In this time the Centre and PwC have joined together to hold a number of workshops on a range of retirement issues. In February 2017 the workshop, organised by CEPAR in conjunction with the International Actuarial Association Mortality Working Group, was held at PwC's Sydney offices and included presentations from CEPAR Chief, Partner and Associate Investigators as well as Research Fellows.

Spearheaded by CI Michael Sherris, the workshop highlighted a range of actuarial research being undertaken by Centre personnel. Presentations included 'High-age Mortality and Frailty', 'Impact of Systematic Trend and Uncertainty on Mortality and Disability Transition Rates', 'Multi-state Actuarial Model of Functional Disability' and 'Longevity and Health – Can We Have Both?'



PROFESSOR CAROL JAGGER
BSc MSc Leeds,
PhD Leicester
PARTNER INVESTIGATOR

Carol Jagger is the AXA Professor of Epidemiology of Ageing in the Institute of Health and Society, Newcastle University, UK and Deputy Director of the Newcastle University Institute for Ageing, UK. She is a Fellow of the Royal Statistical Society and Gerontological Society of America, is a Member of the British Geriatrics Society and a Chartered Scientist. In 2014 she was awarded an honorary fellowship by the Institute and Faculty of Actuaries.

Her research spans the demography and epidemiology of ageing with a focus on trajectories of mental and physical functioning, and determinants of healthy active life expectancy. She is the leading UK researcher on healthy life

expectancy, and has advised the Office for National Statistics and the Scottish Public Health Observatory on Healthy Life Expectancy, has provided evidence to various government committees, including a review of trends in life and healthy life expectancy for the Foresight Ageing project. She brings to the Centre statistical and epidemiological expertise particularly in cross-national comparative analyses, healthy life expectancy and its determinants and consequences, and simulation modelling of disease and disability. In 2017 she spoke at the CEPAR Longevity Research Workshop hosted by PwC.

INFLUENCING POLICY AND PRACTICE

In addition to participating in CEPAR outreach events, CEPAR personnel contributed to the development of government policy and business practice in a number of ways in 2017.

Highlights included presentations by Michael Keane to the Commonwealth Treasury on the effects of taxation on labour supply and human capital; Peter McDonald to the Department of Social Services on immigration, ageing and the Australian labour force; Kaarin Anstey to the Department of Health on the prevention of dementia and promotion of cognitive health; and presentations by Michael Sherris, Jonathan Ziveyi and Jennifer Alonso-García to AMP on variable annuities and retirement product innovation.

Demonstrating CEPAR's influence in Asia, Rafal Chomik, John Piggott and Peter McDonald were commissioned by the Australian Government's Department of Employment to write a briefing paper and present at a two-day APEC workshop held in Vietnam focused on the development of an APEC Labour Mobility Framework. Peter McDonald was invited to brief the Indonesian National Planning Board on the health status of older people in selected rural villages in Indonesia and Meimanat Hosseini-Chavoshi presented to the Iranian Government on fertility transition and population policy. Hazel Bateman shared insights on Australian pension policy and investment at the China Ageing Finance Forum in Shenzhen and at the Effectiveness of Government Social Security Programs in Developing Asia Workshop in Jakarta and John Piggott spoke at *The Economist's* Business of Longevity Summit held in Hong Kong in October. And late in 2017 CEPAR was commissioned by the United Nations to write a report on 'Population ageing and fiscal sustainability in East Asia and Pacific', which will be delivered early in 2018, co-authored by Chomik, Piggott and Bei Lu.

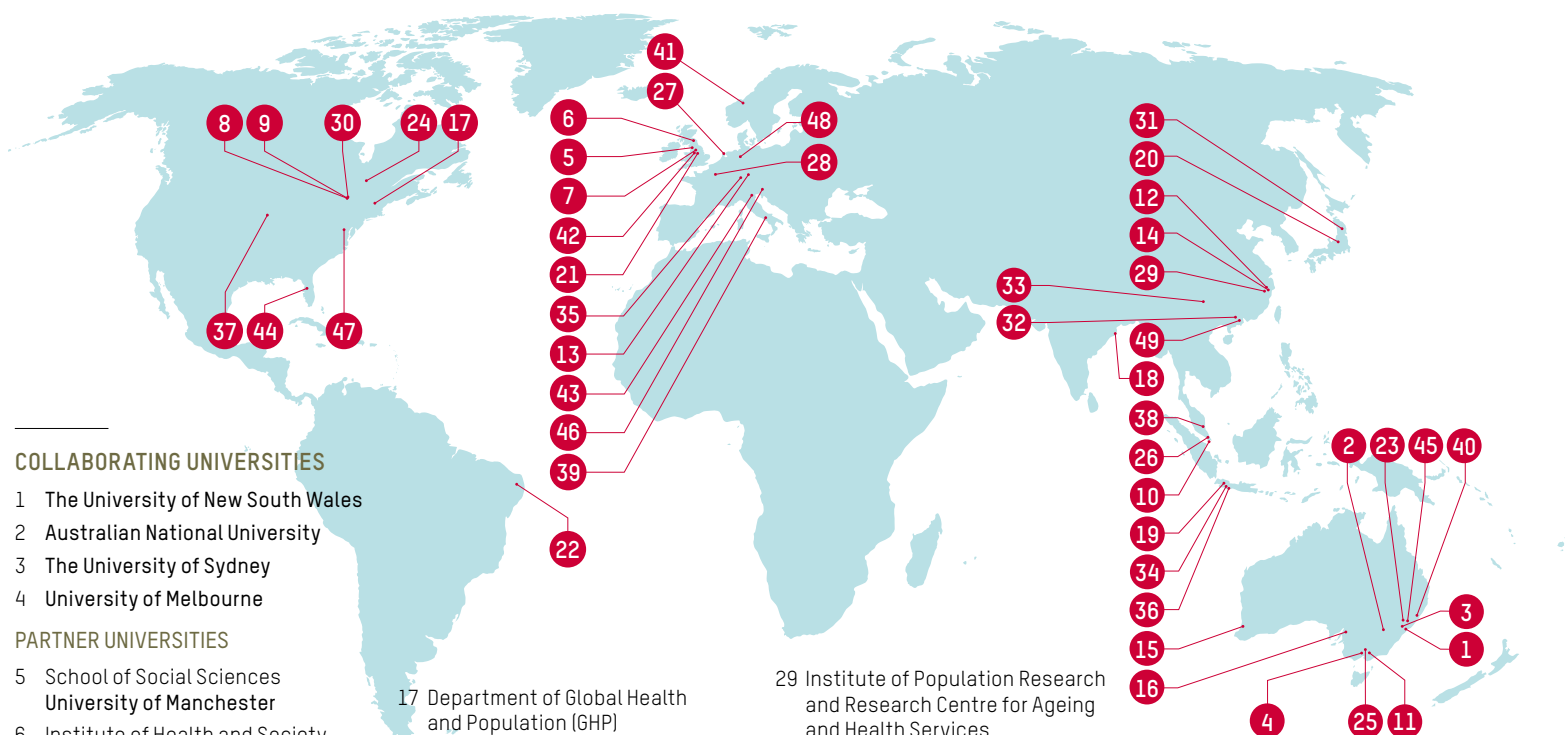
The World Health Organisation invited Kaarin Anstey to participate in a meeting in Geneva on the WHO's 'Global Action Plan on Public Health Response to Dementia 2017-2025' and invited Piggott to be a member of the WHO Expert Group on the Economics of Health and Ageing. George Kudrna addressed the Czech National Bank on demographic change and fiscal policy responses and Bateman presented to the International Centre for Pension Management Discussion Forum in Amsterdam on optimal DC designs, based on a cross-country study involving Australia and the Netherlands.

Complete details of contributions in 2017 are listed on pages 122-123.



JOHN PIGGOTT AT *THE ECONOMIST'S* BUSINESS OF LONGEVITY SUMMIT

NATIONAL & INTERNATIONAL LINKS



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 Asia-Pacific Economic
Corporation
- 11 Institute for Health and Ageing
Australian Catholic University
- 12 Brookings-Tsinghua Centre for
Public Policy
- 13 CESifo
- 14 Chinese Academy of Social
Sciences
- 15 Curtin University
- 16 School of Psychology
Flinders University

- 17 Department of Global Health
and Population (GHP)
Harvard University
- 18 Indian Statistical Institute
- 19 Indonesian National Population
and Family Planning Board
- 20 Institute for Economic Research
Hitotsubashi University
- 21 Institute for Fiscal Studies
- 22 Instituto de Estudos de
Saúde Suplementar (IESS)
- 23 Department of Economics
Macquarie University
- 24 Michigan Retirement
Research Center (MRR)
- 25 School of Primary Health Care
and Emerging Researchers in
Ageing Initiative
Monash University
- 26 Nanyang Business School
Nanyang Technological University
- 27 NetSPAR
- 28 Organisation for Economic
Co-operation and Development

- 29 Institute of Population Research
and Research Centre for Ageing
and Health Services
Peking University
- 30 Gerontology Centre
Pennsylvania State University
- 31 Research Institute for Policies on
Pension and Ageing
- 32 Department of Labour
and Social Security
South China Agriculture University
- 33 Southwestern University of
Finance and Economics
- 34 Statistics Indonesia
- 35 Department of Economics
St Gallen University
- 36 University of Indonesia
- 37 Department of Psychology
University of Kansas
- 38 Faculty of Economics
and Administration
University of Malaya
- 39 Centre for Studies in
Economics and Finance
University of Naples Federico II

- 40 Research Centre for Generational
Health and Ageing
The University of Newcastle
- 41 Ragnar Frisch Centre for
Economic Research University of Oslo
- 42 Nuffield College
University of Oxford
- 43 Department of Economics
University of Parma
- 44 School of Aging Studies
University of South Florida
- 45 Centre for the Study of Choice
University of Technology Sydney
- 46 Faculty of Economics
University of Trieste
- 47 The World Bank
- 48 Wuerzburg University
- 49 College of Public Administration
Zhejiang University

THROUGHOUT 2017, 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.

THE SECOND INTERNATIONAL NETWORK FOR PENSIONS, AGING, AND RETIREMENT RESEARCH SEMINAR TOOK PLACE IN 2017, REINFORCING OUR ABILITY TO LEAD INTERNATIONAL DISCUSSION IN THE FIELD. REGIONALLY, THE FURTHER DEVELOPMENT OF CEPAR'S AUSTRALIA-CHINA POPULATION AGEING RESEARCH HUB AND THE SUCCESS OF THE APRU POPULATION AGEING RESEARCH HUB HAS ENHANCED OUR LINKS AND INCREASED OUR PROFILE IN THE ASIA-PACIFIC.

THE INTERNATIONAL NETWORK FOR PENSIONS, AGING, AND RETIREMENT RESEARCH (INPARR)

The International Network for Pensions, Aging, and Retirement Research (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.

For the second year the network, spearheaded by CEPAR, The Pension Research Council at the Wharton School of the University of Pennsylvania, NetSPAR at Tilburg University, and Willis Towers Watson, has organised a major international seminar at OECD Headquarters in Paris. Taking place on June 21, the conference saw over 120 participants from 47 countries come together to hear from pension experts and explore this year's theme of 'Pension Foresight: Envisaging Retirement Income Plans of the Future'.

Speakers addressing this topic included: Pablo Antolin (OECD), Monika Büttler (University of St Gallen), and John Piggott (CEPAR) on Mapping Out Future Pension Scenarios; Raimond Maurer (Frankfurt University), Amy Kessler (Prudential), Peter Braumueller (Financial Market Authority Austria), and Luis Valdes (Principal International) on Pension Protection; Rafal Chomik (CEPAR), James Banks (University of Manchester), and Robert Palacios (World Bank) on Pensions and the Future Labor Market; and Edward Cannon (University of Bristol), Nick Barr (LSE), Moshe Milevsky (York University) and Marike Knoef (Leiden University) on Pension Design of the

Future. The Keynote address, 'The Future of (Partially) Funded Pensions', was given by Josh Rauh from Stanford University.

Individuals planning for retirement are expected to think long into the future to prepare for their needs. At the same time, changes in technology, demography, and even geography mean that pensions and retirement income designs and approaches of the future will themselves evolve considerably over time. This event provided a window into the latest thinking and research, shedding light on where pension plans and designs are headed in the future and challenges to their future sustainability and efficiency.

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 Director Piggott acting as Chair and CIs McDonald and Cumming serving as two of ten members on the Steering Group, the Hub has been a key component of CEPAR's international linkages strategy.

2017 marked the Hub's busiest year to date as well as the final year CEPAR/UNSW acted as hub host. This year's symposium took place on the 11-13 October in Singapore, hosted by the Centre for Aging Research and Education at Duke-NUS. The conference attracted over 200 participants from industry, government and academe. It explored different ways of defining and measuring resilience as well as ways to enhance resilience at all levels, including physical, psychological and social, in older adults and their families.

NATIONAL & INTERNATIONAL LINKS

The Hub also co-hosted, in collaboration with CEPAR's Australia-China Population Ageing Research Hub, the 3rd Annual Workshop on Population Ageing and the Chinese Economy (see below). The final event of 2017 was a three-day workshop for young gerontologists. The APRU Workshop for Junior Gerontologists: 'Action Research for Age-Friendly Community' was hosted by the University of Tokyo and took place November 9-11. It was targeted at junior gerontologists currently working or wishing to work in the field of community ageing and action research and offered an opportunity for participants to network with other junior researchers from communities interested in establishing an age-friendly society. CEPAR sponsored a number of student bursaries to all three APRU events in order to promote participation from young researchers.

This year for the first time the Hub undertook a commissioned research report. The report, 'The Impact of Demographic Change on Labour Supply and Economic Growth: Can APEC Meet the Challenges Ahead?', was commissioned by the Australian Government's Department of Employment. Senior Research Fellow Chomik collaborated with CIs McDonald and Piggott to write the report and CI Piggott presented the work at the APEC Workshop on the Development of an APEC Labour Mobility Framework in Nha Trang, Vietnam on February 18.

From 2018 the Hub will be hosted by Keio University in Japan. Professor Atsushi Seike will take over the duties of Steering Group Chair. CEPAR will remain actively involved in the Hub with CIs Piggott, Cumming and McDonald all remaining on the Steering Group.



(L-R) RAFAL CHOMIK (CEPAR), CHRISTINA SCHOENLEBER (APRU), JOHN PIGGOTT (CEPAR) AND ALBERT PARK (HKUST) AT THE WORKSHOP ON THE DEVELOPMENT OF AN APEC LABOUR MOBILITY FRAMEWORK

CONTINUING OUR CONNECTION 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.

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 research topics addressed by the Hub include: ageing trends, long-term care, mature labour force participation, and retirement income, financial products and housing.

The Hub continued to expand in 2017 with the addition of two PhD students funded under UNSW's prestigious Scientia Scheme: Tin Long Ho and Cheng Wan, both supervised by the team of Al Hazel Bateman, PI Hanming Fang, and Senior Research Fellow Katja Hanewald. PhD student Xiaoyun Zhang submitted her thesis in 2017. The whole team is led by John Piggott as the Hub's Director and by Hanming Fang as the Hub's Scientific Director. Professor Fang visited the Hub in July 2017, hosted two visits of Hub researchers (Senior Research Fellow Katja Hanewald in March 2017 and Research Fellow Han Li in October 2017), and met with hub members in China to collaborate on several research projects and build connections.

Hub researchers visited key leading research institutions in China this year, including Peking University, Nankai University, Renmin University, Fudan University and the Central University of Finance and Economics. PI Fang will take up the role of Dean of the School of Entrepreneurship and Management, ShanghaiTech University in January 2018 in addition to continuing his Visiting Professor appointments at Peking University and Fudan University, providing major opportunities for connection and collaboration. In 2018 the Hub will be expanded with assistance from a large grant awarded by the UNSW Business School.

Hub research was presented at several major international conferences this year including the: 13th International Longevity Risk and Capital Markets Solutions Conference; 8th China International Conference on Insurance and Risk Management; and 21st International Congress on Insurance: Mathematics and Economics.

Now in its third year, the Annual Workshop on Population Ageing and the Chinese Economy was held in July 2017 on the UNSW campus. The workshop attracted 35 participants who came together for an exciting two-day program. The first day of the workshop featured six

presentations from renowned international experts and a roundtable discussion with a panel featuring Hub researchers Fang and Lu as well as Al Bateman and Dr Mike Orszag, Head of Global Research at Willis Towers Watson. The second day was reserved for presentations from nine PhD students or early career researchers from APRU universities in Australia and Asia, who presented their projects and received feedback from senior experts and other workshop participants in a collegial and constructive atmosphere.

Presentations included 'Retirement and Grandchild Care in Urban China', 'Challenges of Urbanization on the Pension System', and 'The Impact of Long-Term Care Policy on Family Elder Care Costs in China'.

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 at a Symposium on 'Ageing China and Australia: Economic, social, and health implications' to the 2017 IAGG World Congress of Gerontology and Geriatrics.

Prestigious appointments at key institutions also serve to strengthen our links with China. In addition to Fang's appointment as Dean at ShanghaiTech University 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.

EXPANDING 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 seek to assist with the development of policy responses in relation to these issues.

In 2017 the team, led by CI Peter McDonald, continued its survey of over 2,500 Indonesia villages over the age of 60 as part of their ongoing project, 'Meeting the Needs of Older Persons in Rural Indonesia' (see page 72 for further details). 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.

Analysis of the quantitative and qualitative data collected during fieldwork in 2015 and 2016 began this year and presentations on the data were given to the Indonesian National Planning Board, including the publication of two policy briefs.

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' (see page 73 for further details).

This project was 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. Two reciprocal visits took place in 2017 as part of this project. Kudrna visited the University of Indonesia in April and Widjaja visited UNSW in November. Data work has been completed and a working

model has been calibrated to a rich set of data. A policy paper, summarising ageing trends, pensions systems, and reform in Indonesia has also been drafted.

Kudrna and Piggott intend to visit the University of Indonesia in early 2018 to finalise the policy and research papers and further engage with the university and the government. The team has submitted an ARC Discovery Grant application building on this research in 2018.

DEEPENING OUR RELATIONSHIP WITH NETSPAR

In 2017 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.

Three key subprojects in the areas of retirement income policy, life-cycle modelling and behavioural economics have been progressed in 2017. Firstly, Director John Piggott, together with Al Hazel Bateman and former Senior Research Fellow Ralph Stevens compared the pension systems in the United Kingdom, Australia and the Netherlands to determine best policy practice. Informed by these findings, CI Michael Sherris led a team to assess welfare-enhancing drawdown strategies in Australia and the Netherlands. The team analysed the interaction of the state pension with products offering varying degrees of flexibility and longevity protection and provided insights into the role of long-term care in the decumulation of retirement wealth.

NATIONAL & INTERNATIONAL LINKS

Recent empirical studies show that many retirees hold on to their assets or even keep on saving well into their later years. Al Bateman led a team that considers behavioural aspects in financial decision making during retirement. The researchers use experimental surveys as a tool to understand retirement saving preferences of people during retirement and to assess whether individuals who are about to retire are sensitive to default drawdown requirements.

The progress made on these projects has been made possible with regular visits that have been promoted by CEPAR's Director, John Piggott, and NetSPAR's Scientific Director, Theo Nijman. In 2017 Johan Bonekamp visited UNSW from NetSPAR for a month. CEPAR Research Fellow Jennifer Alonso Garcíá and Al Hazel Bateman both visited NetSPAR in October. Various academic reports have been a result of these visits and continuous collaboration.

In addition to the joint project, NetSPAR continued to collaborate with CEPAR, Wharton and Towers Willis Watson in the International Network for Pensions, Aging, and Retirement Research (see page 97).

NATIONAL LINKAGES

A number of initiatives and events in 2017 served to strengthen our links with key researchers and research groups nationally. In November CEPAR and the School of Population and Global Health, at the University of Melbourne, ran a conference on Mortality in Australia. The Conference celebrated the 150th Anniversary of the First Australian Life Table. It featured presentations from CEPAR researchers from three of our four nodes and attracted an audience of government, industry and academe. The 3rd Annual Workshop on Population Ageing and the Chinese Economy (detailed on page 98), continued to unite national researchers focused on the issue, whilst the Mature Labour Force Workshop held in Canberra in October (detailed on page 92), brought together federal and state government bureaucrats as well as industry and community leaders to discuss this increasingly important topic. The Annual Summer Workshop on the Economics of Health and Ageing in December featured research from CEPAR and non-CEPAR researchers from UNSW, UTS, the University of Sydney and Monash University, as well as some international academics. The Pension and Superannuation Seminar Series, jointly hosted by CEPAR and the

School of Risk and Actuarial Studies at UNSW, attracts speakers and participants from a variety of national and international universities, including the CEPAR nodes as well as Tilburg University, Macquarie University and Boston University. Industry representatives also present at, and attend, the fortnightly seminars.

INTERNATIONAL VISITORS

The Centre hosted 28 international visitors in 2017. 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.

Some of the visitors who contributed to our events in 2017 include:

SEVERINE ARNOLD

A long-time collaborator with Cl Sherris, Severine Arnold is Professor in Actuarial Studies at the University of Lausanne in Switzerland. She visited Sydney in February 2017 and presented at the PWC Longevity Workshop on the topic 'Insights



PROFESSOR ROBERT
HOLZMANN
MEc Graz, PhD Vienna
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 November 2017 Robert visited the centre to work closely with Centre Director John Piggott on the finalisation of a volume on tax and pensions to be published by MIT Press in 2018.

from Modelling Old-age Mortality and Heterogeneity'. Her research focuses on longevity risk and mortality modelling, with a particular interest in cause-specific mortality rates. She is currently the project leader on a three-year research project on cause-specific mortality interactions.

NICHOLAS BARR

Whilst visiting CEPAR in July 2017, Nicholas Barr, Professor of Public Economics at LSE, gave the keynote addresses at the 25th Annual Colloquium of Superannuation Researchers and the 3rd Annual Workshop on Population Ageing and the Chinese Economy. He also spoke at the INPARR Seminar in Paris, which CEPAR co-organised. The heart of his work is an exploration of how market failures can both explain and justify the existence of welfare states. He is a member of the Editorial Board of the *International Social Security Review* and an Associate Editor of *CESifo Economic Studies*, the *Australian Economic Review* and the *Journal of the Economics of Ageing*.

MIKE ORSZAG

The Head of Global Research for Willis Towers Watson, Mike Orszag visited CEPAR multiple times in 2017. During his July visit he contributed to the 3rd Annual Workshop on Population Ageing and

the Chinese Economy as a member of the expert panel on 'Retirement Policy Reform'. In addition to his role at Willis Towers Watson, the global actuarial, broking and human resources firm, he is also a founding editor of the *Journal of Pension Economics and Finance* (Cambridge University Press in conjunction with the OECD and IOPS) and a co-editor of the *Oxford Handbook of Pensions and Retirement Income*. He is a member of a number of scientific advisory boards including the Boston College Center for Retirement Research and the Kiel Institute of the World Economy.

NILAM RAM

Every year CEPAR hosts a methodology workshop for early career researchers (for full details see page 84). This year's presenter was Professor Nilam Ram from Pennsylvania State University. Nilam's current research interests have grown out of a history of studying change. He studies how short-term changes (e.g., processes such as learning, information processing, etc.) develop over the course of the life span and how intraindividual change and variability study designs (e.g., measurement bursts) might contribute to our knowledge base. Current projects include examinations of: age-related change in children's self-regulation; cyclic patterns in the day-to-day progression of

adolescents' and adults' emotions; and change in cognition and wellbeing during old age.

CEPAR hosted visits from the following researchers in 2017:

DR DANIEL ALAI

University of Kent
30 August - 20 September

PROFESSOR SEVERINE ARNOLD

University of Lausanne
15 - 17 February

PROFESSOR NICHOLAS BARR

London School of Economics
6 - 12 July

DR ALEXANDER BOHNERT

Friedrich Alexander University Erlangen - Nuremberg
12 September - 5 October

JOHAN BONEKAMP

NetSPAR
13 March - 9 April

ASSISTANT PROFESSOR YI CHEN

Jinan University
29 June - 13 July

PROFESSOR LINDA CLARE

University of Exeter
25 October - 3 November

SENIOR RESEARCH FELLOW ERIK HERNÆS

Ragnar Frisch Centre for Economic Research
1 January - 20 February
6 November - 31 December



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 Public Economics*, *Journal of Labor Economics* and in volumes published by the NBER, Kluwer, Edward Elgar and Routledge. In 2017 Erik visited the centre in January and November to work with the Director John Piggott on a project focused on transitions to retirement.

NATIONAL & INTERNATIONAL LINKS

PROFESSOR ROBERT HOLZMANN
University of Malaya
19 November - 3 December

YOUWEI HOU
Zhejiang University
5 September - 15 December

PROFESSOR SELAHATTIN IMROHOROGLU
USC Marshall
11 - 21 December

PROFESSOR CAROL JAGGER
Newcastle University UK
13 February - 10 March

DR PETAR JEVTIC
Arizona State University
6 - 10 November

DR ANDREW KINGSTON
Newcastle University UK
13 February - 10 March

PROFESSOR MIRKO KRAFT
Coburg University
20 - 24 February

PROFESSOR PAUL S.H LAU
University of Hong Kong
3 - 14 July

PROFESSOR ALBERT MA
Boston University
4 - 12 October

PROFESSOR OLIVIA S. MITCHELL
Wharton School
1 - 8 July

PROFESSOR ANNAMARIA OLIVIERI
University of Parma
13 - 17 February

DR MIKE ORSZAG
Willis Towers Watson
7 - 10 February
3 - 12 July
17 - 26 November

PROFESSOR ERMANNO PITACCO
University of Trieste
14 - 17 February
3 - 10 December

ASSOCIATE PROFESSOR RENUKA SANE
National Institute of Public Finance and
Policy, New Delhi
1 - 10 February

PROFESSOR MERRIL SILVERSTEIN
Syracuse University
14 - 21 January

PROFESSOR IAN TONKS
University of Bath
1 - 21 March

AGNE VAICIUKEVICIUTE
Vilnius Gediminas Technical University
8 October - 31 December

DIVYA VANOH
University of Malaysia
8 - 26 May

DR MULIADI WIDJAJA
University of Indonesia
13 - 24 November

DR MINGXU YANG
Zhejiang University
23 June - 23 September

INTERNATIONAL VISITS

CEPAR investigators were invited
to visit a number of leading research
institutions in 2017:

JEOFREY ABALOS
International Institute for Advanced
Systems Analysis
1 June - 31 August

DANIEL ALAI
University of Haifa
27 April - 17 May

JENNIFER ALONSO GARCÍA
NetSPAR
09 - 17 October
Catholic University of Leuven
18 - 20 October
University of Barcelona
25 - 27 October

SHEA ANDREWS
University of Alberta
27 August - 7 October

KAARIN ANSTEY
University of Malaysia
1 - 4 August

HAZEL BATEMAN
NetSPAR
2 - 27 October
Dutch Central Bank
9 - 13 October

HEATHER BOOTH
Institut national d'études démographiques
24 - 27 November

ELENA CAPATINA
UCLA
26 September - 30 October

HANMING FANG
Fudan University
14 - 27 December

KATJA HANEWALD
University of Pennsylvania
6 - 17 March

Fudan University
17 - 18 July
Peking University
25 - 29 September

Nankai University
26 September
Renmin University
27 September

MEIMANAT HOSSEINI-CHAVOSHI
Vienna Institute of Demography
19 April - 30 June

ALIZA HUNT
University of Gadjah Mada
1 January - 1 September
McGill University
29 September - 11 December

GEORGE KUDRNA
Frisch Centre at University of Oslo
28 February - 3 March
University of Indonesia
17 - 21 April
Czech National Bank
6 - 7 June
University of Wuerzburg
17 September - 20 October
University of Lausanne
25 - 27 October

HÉLOÏSE LABIT HARDY
University of Lausanne
16 - 25 January
3 - 31 October (various dates)
University of Paris VI
18 - 20 January
25 - 27 October

HAN LI
University of Pennsylvania
1 - 14 October
University of Iowa
15 - 21 October
Central University of Finance and
Economics
18 - 25 November

BEI LU
Zhejiang University
12 - 17 December
Fudan University
17 - 19 December

TIMOTHY NEAL
Institute for Fiscal Studies
18 November - 17 December

KATE O'LOUGHLIN
University of Sheffield
22 May - 23 June
University of Stirling
3 - 4 July
University of Alberta
10 - 21 July

MICHAEL SHERRIS
York University
29 March - 4 April
University of Parma
26 April - 5 May

SHANG WU
Peking University
25 July
Nankai University
26 July

XIAOYUN ZHANG
Institute for Economic and Social Research,
Jinan University
1 March - 1 April

SECTION

REPORT 2016

Australian
National
University



THE UNIVERSITY OF
MELBOURNE



Australian Government
Australian Research Council

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RESEARCH**

PERFORMANCE INDICATORS & FINANCIAL STATEMENT

KEY PERFORMANCE INDICATORS

MEASURE	2017 TARGET	2017 RESULT
RESEARCH FINDINGS		
Total research outputs	55	345
– Refereed journal articles	20	126
– Percentage appearing in top tier journals ²	30%	44%
Invited talks/papers/keynotes given at major international meetings	12	19
Commentaries about the Centre’s achievements		
– Media releases	8	8
– Articles	6	50
RESEARCH TRAINING AND PROFESSIONAL EDUCATION		
Attended professional training courses for staff and postgraduate students	6	8
Centre attendees at all professional training courses	16	75
New PhD students working on core Centre research and supervised by Centre staff	6	12
New postdoctoral researchers recruited to the Centre working on core Centre research	0	2
New Honours students working on core Centre research and supervised by Centre staff	4	1
Postgraduate completions	7	12
Early Career Researchers working on core Centre research	9	23
Students mentored	150	750
Mentoring programs	2	5
INTERNATIONAL, NATIONAL AND REGIONAL LINKS AND NETWORKS		
International visitors and visiting fellows	11	28
National and international workshops held/organised by the Centre	2	8
Visits to overseas universities or organisations	8	40
Interdisciplinary research: Research projects and papers co-authored by writers with different disciplinary backgrounds	2	23

² 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	50
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	9,000	52,326 page views
Public talks given by Centre staff	15	16
ORGANISATIONAL SUPPORT		
Annual cash contributions from Collaborating Organisations	\$938,250	\$997,819
Annual in-kind contributions from Collaborating Organisations	\$1,096,830	\$2,192,939
Annual cash contributions from Partner Organisations	\$150,000	\$150,000
Annual in-kind contributions from Partner Organisations	\$729,722	\$1,002,002
OTHER RESEARCH INCOME SECURED BY CENTRE STAFF ³		
– ARC Grants	\$250,000	\$545,526
– Other Australian Competitive Grants	\$250,000	\$1,225,414
– Other Commonwealth, State and Local Government Grants	\$125,000	\$0
– Industry/Private Sector Grants	\$125,000	\$313,498
Number of new organisations collaborating with, or involved in, the Centre	2	3
NATIONAL BENEFIT		
Contribution to the National Research Priorities and the National Innovation Priorities		
– Public conferences	2	5
– Government and industry briefings	4	50
– Communiqués etc	12	58

³ 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 2017 income is shown.

RESEARCH OUTPUTS

A3 BOOK – EDITED

- 1 O’Loughlin, K., Browning, C. and Kendig H. (Eds.) (2017). *Ageing in Australia: Challenges and Opportunities*. Springer.

B BOOK CHAPTERS

- 1 Bateman, H., Chomik, R. and Piggott, J. (2017). Retirement Income. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp149-172). Springer.
- 2 Browning, C., Davis, J. and Thomas, S. (2017). Primary Health Care and Older People. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp225-237). Springer.
- 3 Browning, C. and Kendig, H. (2017). Melbourne Longitudinal Studies on Health Ageing (MELSHA). In A.N. Pachana (Ed.), *Encyclopedia of Geropsychology*. Springer Online. Available 31 January 2017. doi: 10.1007/978-981-287-082-7_362.
- 4 Browning, C., Thomas, S., Ory, M. and Kendig, H. (2017). Healthy Ageing. In A.N. Pachana (Ed.), *Encyclopedia of Geropsychology*. Springer Online. Available 31 January 2017. doi: 10.1007/978-981-287-082-7_323.
- 5 Byles, J. E. (2017). Health and Ageing. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp63-81). Springer.
- 6 Ching, A., Erdem, T. and Keane, M. (2017). Empirical Models of Learning Dynamics: A Survey of Recent Developments. In B. Wierenga and R. van der Lans (Eds.), *Handbook of Marketing Decision Models*. (pp223-258). Springer.
- 7 Holzmann, R. (2017). La Fase de Percepción de los Pagos de las Pensiones: Tendencias, Problemas, Principales Desafíos y Papel de Gobierno. In E.L. Carranza, A. Melgunizo and D. Tuesta (Eds.), *Ideas para una Reforma de Pensiones*. (pp297-340). Universidad de San Martín de Porres.
- 8 Jeon, Y-H. and Kendig, H. (2017). Care and Support for Older People. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp239-259). Springer.
- 9 Kendig, H. (2017). Australian Developments in Ageing: Issues and History. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp13-27). Springer.
- 10 Kendig, H. (2017). Directions and Choices on Ageing for the Future. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp263-279). Springer.

- 11 Mackinley, E. and Burns, R.A. (2017). Baby Boomer Ageing and Spirituality: Same or Different. In E. Mackinley (Ed.), *The Spiritual Dimension of Ageing*, Second Edition. (pp76-103). Jessica Kingsley Publishers.
- 12 McDonald, P. (2017). Population Ageing: A Demographic Perspective. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp47-61). Springer.
- 13 O’Loughlin, K. and Kendig, H. (2017). Attitudes to Ageing. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp29-45). Springer.
- 14 O’Loughlin, K., Browning, C. and Kendig H. (2017). Introduction: Challenges and Opportunities. In K. O’Loughlin, C. Browning and H. Kendig (Eds.), *Ageing in Australia: Challenges and Opportunities*. (pp1-10). Springer.
- 15 Windsor, T.D. (2017). Self-Forgiveness in Older Adulthood. In L. Woodyatt, E.L. Worthington, M. Wenzel, and B.J. Griffin (Eds.), *Handbook of the Psychology of Self-Forgiveness*. (pp327-340). Springer International Publishing.
- 16 Windsor, T.D (2017). Late Life Transitions. In A.N. Pachana (Ed.), *Encyclopedia of Geropsychology*. Springer Online. Available 31 January 2017. doi: 10.1007/978-981-287-082-7_169.
- 17 Windsor, T.D., and Luszcz, M.A. (2017). Australian Longitudinal Study of Aging (ALSA). In A.N. Pachana (Ed.), *Encyclopedia of Geropsychology*. Springer Online. Available 31 January 2017. doi: 10.1007/978-981-287-082-7_41.
- 18 Zhao, Z., Jia, H. and Zhao, J. (2017). Health Inequalities, Medical Insurances and Financial Medical Assistances. In B. Carrillo, J. Hood and P. Kadetz, (Eds.), *Handbook of Welfare in China*. (pp98-122). Edward Elgar Publisher.

C1 JOURNAL ARTICLES: ARTICLES IN SCHOLARLY REFEREED JOURNALS

- 1 Alai, D.H. and Landsman, Z. (2017). Lifetime Dependence Models Generated by Multiply Monotone Functions. *Scandinavian Actuarial Journal*. doi: 10.1080/03461238.2017.1405840. In press [available online November 2017].
- 2 Allen, V.C. and Windsor, T.D. (2017). Age Differences in the Use of Emotion Regulation Strategies Derived from the Process Model of Emotion Regulation: A Systematic Review. *Ageing & Mental Health*. doi: 10.1080/13607863.2017.1396575. In press [available online November 2017].

- 3 Alonso-García, J., Boado-Penas, M.D.C. and Devolder, P. (2017). Adequacy, Fairness and Sustainability of Pay-as-You-Go-Pension-Systems: Defined Benefit Versus Defined Contribution. *European Journal of Finance*. doi:10.1080/1351847X.2017.1399429. In press [available online November 2017].
- 4 Alonso-García, J., Boado-Penas, M.D.C. and Devolder, P. (2017). Automatic Balancing Mechanisms for Notional Defined Contribution Accounts in the Presence of Uncertainty. *Scandinavian Actuarial Journal*. doi: 10.1080/03461238.2017.1304984. In press [available online March 2017].
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C2 JOURNAL ARTICLES: REFEREED JOURNAL, OTHER CONTRIBUTION

- 1 Hanewald, K. (2017). Book Review: King William's Tontine: Why the Retirement Annuity of the Future Should Resemble its Past. *Journal of Pension Economics and Finance*, 16(2), 267-269. doi: 10.1017/S1474747217000075.
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- 9 Gudkov, N., Ignatieva, K. and Ziveyi, J. (2017). Pricing of GMWB Options in Variable Annuities under Stochastic Volatility, Stochastic Interest Rates and Stochastic Mortality via the Componentwise Splitting Method. CEPAR Working Paper Series 2017/4.
- 10 Hanewald, K., Li, H. and Shao, A.W. (2017). Modeling Multi-state Health Transitions in China: A Generalized Linear Model with Time Trends. CEPAR Working Paper Series 2017/10.
- 11 Holzmänn, R., Alonso García, J., Labit Hardy, H. and Villegas, A. (2017). NDC Schemes and Heterogeneity in Longevity: Proposals for Redesign. CEPAR Working Paper Series 2017/18.
- 12 Kang, B. and Ziveyi, J. (2017). Optimal Surrender of Guaranteed Minimum Maturity Benefits under Stochastic Volatility and Interest Rates. CEPAR Working Paper Series 2017/5.

C5 UNPUBLISHED REPORTS

- 1 Alonso García, J. and Devolder, P. (2017). Liquidity and Solvency in Pay-As-You-Go Defined Contribution Pension Schemes - A Continuous OLG Sustainability Framework. CEPAR Working Paper Series 2017/12.
- 2 Alonso García, J. and Sherris, M. (2017). One Size Fits All? Drawdown Structures in Australia and The Netherlands. CEPAR Working Paper Series 2017/13.
- 3 Alonso García, J., Bateman, H., Bonekamp, J. and Stevens, R. (2017). Retirement Drawdown Defaults: The Role of Implied Endorsement. CEPAR Working Paper Series 2017/20.
- 4 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (2017). Saving Preferences in Retirement: The Impact of Pension Policy Design and Health Status. CEPAR Working Paper Series 2017/19.
- 5 Alonso García, J., Wood, O. and Ziveyi, J. (2017). Pricing and Hedging Guaranteed Minimum Withdrawal Benefits Under a General Levy Framework Using the COS Method. CEPAR Working Paper Series 2017/02.
- 6 Capatina, E. (2017). Selection in Employer Provided Health Insurance. CEPAR Working Paper Series 2017/1.
- 7 Capatina, E., Keane, M. and Maruyama, S. (2017). Socio-Economic Disparities in US Healthcare Spending: The Role of Public vs. Private Insurance. CEPAR Working Paper Series 2017/16.
- 8 Chomik, R., Piggott, J. and McDonald, P. (2017). The Impact of Demographic Change on Labour Supply and Economic Growth: Can APEC Meet the Challenges Ahead? CEPAR Working Paper Series 2017/3.
- 13 Kudrna, G. (2017). The Norwegian Pension Reform: An External Perspective. CEPAR Working Paper Series 2017/7.
- 14 Li, H., Hanewald, K. and Wu, S. (2017). Estimating Healthy Life Expectancy: A Province-by-Province Study for China. CEPAR Working Paper Series 2017/14.
- 15 Lu, B., Mi, H., Zhe, Y. and Piggott, J. (2017). Sustainable Health Care System in Ageing China: A Case Study of Regional Practice in China. CEPAR Working Paper Series 2017/9.
- 16 Lu, B., Piggott, J. and Zheng, B. (2017). The Notional and the Real in China's Retirement Reforms. CEPAR Working Paper Series 2017/17.
- 17 Pitacco, E. (2017). Life Annuities: Products, Guarantees, Basic Actuarial Models. CEPAR Working Paper Series 2017/6.
- 18 Shao, A.W., Chen, H. and Sherris, M. (2017). To Borrow or Insure? Long Term Care Costs and the Impact of Housing. CEPAR Working Paper Series 2017/11.
- 19 Thorp, S., Bateman, H., Dobrescu, I., Newell, B.R. and Ortmann, A. (2017). Flicking the Switch: Simplifying Disclosures to Improve Retirement Plan Choices. CEPAR Working Paper Series 2017/21.
- 20 Tran, C. and Wender, S. (2017). On the Marginal Excess Burden of Taxation in an Overlapping Generations Model. CEPAR Working Paper Series 2017/15.
- 21 Wu, S., Bateman, H., Stevens, R. and Thorp, S. (2017). Income-Indemnity Long-Term Care Insurance: Selection, Informal Care, and Precautionary Savings. CEPAR Working Paper Series 2017/8.

RESEARCH OUTPUTS

OTHER OUTPUTS

- 1 Abalos, J.B. and Oberos, M.A. (October 2017). Poster Presentation. Labour Force Participation of Older Persons in the Philippines: Trends, Patterns and Correlates. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
- 2 Abbasi-Shavazi, M., Hosseini Chavoshi, M., Sadeghi, R. and McDonald, P. (October 2017). Poster Presentation. Irregular Migration to Europe and Australia: The Case of Afghans in Iran. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
- 3 Allen, V. and Windsor, T. (July 2017). Poster Presentation. Psycho-Social Moderators of the Coupling of Stress and Negative Affect: A Micro-Longitudinal Study. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 4 Andrews, S.J., Mortby, M.E., Ismail, Z. and Anstey K.J. (July 2017). Poster Presentation. Alzheimer's Genetic Risk Score Linked to Mild Behavioral Impairment. Alzheimer's Association International Conference 2017. London, UK.
- 5 Anstey, K.J. and Varendran, R. (July 2017). Poster Presentation. Non-Pharmacological Management of Sleep Disturbance in Patients with Dementia in Care Facilities. Alzheimer's Association International Conference 2017. London, UK.
- 6 Brady, J. and O'Loughlin, K. (July 2017). Poster Presentation. Australian Lives Altered by Parkinson's Disease: Work, Retirement and Care. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 7 Brodaty, H., Heffernan, M., Singh, M., Valenzuela, M., Andrews, G., Lautenschlager, N.T., Anstey, K.J., Maeder, A., Jorm, L., McNeil, J., Ginige, A., Chau, T. and Sachdev, P.S. (July 2017). Poster Presentation. Maintain Your Brain: A Randomised Controlled Trial of an Internet-Based Multi-Component Lifestyle Intervention to Prevent Cognitive Decline and Dementia. Alzheimer's Association International Conference 2017. London, UK.
- 8 Byles, J.E., Mishra, G., Hockey, R., Adane, A., Chan, H., Dolja-Gore, X., Forde, P., Harris, M., Majeed, T., Loxton, D. and Tooth, L. (June 2017). Use, Access to, and Impact of Medicare Services for Australian Women: Findings from the Australian Longitudinal Study on Women's Health. Report to the Australian Government Department of Health.
- 9 CEPAR. (July 2017). CEPAR Submission on Development of a Framework for Comprehensive Income Products for Retirement. Sydney, Australia.
- 10 Cherbuin, N. (June 2017). Poster Presentation. Playing Music is Key to Keeping Our Brain Young and Sharp. Organisation for Human Brain Mapping 2017 Conference. Vancouver, Canada.
- 11 Cherbuin, N., Shaw, M., Franke, K., Anstey, K.J. and Gaser, C. (July 2017). Poster Presentation. A Global Measure of Brain Age is More Sensitive than Hippocampal Volume in Predicting Incident Mild Cognitive Impairment in Community-Living Individuals. Alzheimer's Association International Conference 2017. London, UK.
- 12 Dudley, D., O'Loughlin, K. and Loh, V. (July 2017). Poster Presentation. Goal-Setting Typologies Evident Among Community-Dwelling Australian Retirees. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 13 Ee, N. (November 2017). Poster Presentation. Understanding the Brain Trainer. 16th National Conference of Emerging Researchers in Ageing. Perth, Australia.
- 14 Farrow, M., Klekociuk, S., Ward, D., Vickers, J., Ellis, K. and Anstey, K.J. (July 2017). Poster Presentation. Assessing Alzheimer's Disease Risk Online: Is Memory Performance Associated with Risk Factor Exposure? Alzheimer's Association International Conference 2017. London, UK.
- 15 Ginnivan, N. (September 2017). Poster Presentation. Australia's Ageing Prisoner Population: The Demographic Shift and Implications for the Economic and Social Costs of Care. Emerging Researchers Conference 'Demography, Ageing and Health'. Oxford, UK.
- 16 Harding, S., Jackson Pulver, L., McDonald, P., Morrison, P., Trewin, D. and Voss, A. (June 2017). Report on the Quality of 2016 Census Data. Report to the Australian Bureau of Statistics.
- 17 Hosking, D.E., Eramudugolla, R. and Anstey, K.J. (July 2017). Poster Presentation. The MIND Diet and 12-year Incidence of Cognitive Impairment in an Australian Context. Alzheimer's Association International Conference 2017. London, UK.
- 18 Hosseini-Chavoshi, M. (2017). Age Structure Transitions and Demographic Window in Iran: Opportunities and Challenges. Report by Ministry of Cooperatives, Labour, and Social Welfare, Iran.
- 19 Hosseini-Chavoshi, M. (2017). Fertility Transition and Childbearing in Iran. Chapter in Population Transition in Iran. Research Report by the NIPR and UNFPA in Iran.
- 20 Kendig, H., O'Loughlin, K., Hussain, R. and Cannon, L. (July 2017). Poster Presentation. Australian Attitudes and Policies on Intergenerational Equity: Impacts of Social Change. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 21 Kiely, K. M. (July 2017). Poster Presentation. Gender and Educational Differences in Healthy Working Life Expectancies in Australia. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 22 Kudrna, G. (2017). The Norwegian Pension Reform: An External Perspective. Commissioned Research Paper Prepared for Fafo Research Foundation and Frisch Centre, Norway.
- 23 Li, H., Hanewald, K. and Wu, S. (July 2017). Poster Presentation. Estimating Healthy Life Expectancy: A Province-by-Province Study for China. 21st International Congress on Insurance: Mathematics and Economics. Vienna, Austria.
- 24 Maccora, J., Andrews, S. and Anstey, K.J. (2017). Poster Presentation. Gender Differences in Cognitive Reserve across the Life Course, 16th National Conference of Emerging Researchers in Ageing, November, Perth, Australia, and the Emerging Researchers Conference 'Demography, Ageing and Health', September, Oxford, UK.
- 25 McMaster, M., Clare, L., Kim, S., Torres, S., D'Este, C., and Anstey, K.J. (July 2017). Poster Presentation. A Protocol for a Randomised Controlled Trial of Multidomain Dementia Risk Reduction for Mild Cognitive Impairment. Alzheimer's Association International Conference 2017. London, UK.
- 26 Merom, D., Mathiew, E., Cerin, E., Morton, R., Anstey, K.J., Sherrington, C., Lord, S., and Cumming, R.G. (July 2017). Poster Presentation. Social Dancing to Reduce Falls in Older Adults – A Cluster Randomised Controlled Trial. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 27 Milledge, K.L., Cumming, R.G., Wright, F., Blyth, F., Naganathan, V., Le Couteur, D.G. and Hirani, V. (July 2017). Poster Presentation. Functional Tooth Unit Composition and Nutrient Intakes: The Concord Health and Ageing in Men Project. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 28 Mortby, M.E., Eramudugolla, R., Burns, R.A., Ismail, Z. and Anstey, K.J. (July 2017). Poster Presentation. Mild Behavioral Impairment: What Are The Risk Factors? Alzheimer's Association International Conference 2017. London, UK.
- 29 O'Loughlin, K., Kendig, H., Hussain, R. and Cannon, L. (July 2017). Poster Presentation. Perceptions and Experiences of Workplace-Based Age Discrimination in Australia. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 30 Ong, R. (August 2017). Housing Futures in Australia: An Intergenerational Perspective. Chapter 4 in Committee for Economic Development of Australia, Housing Australia, CEDA, Melbourne

- 31 Trinh, Q., Kendig, H. and Yiengprugsawan, V. (July 2017). Poster Presentation. Changes in Living Arrangements of Vietnamese Older Adults. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 32 Utomo, I., McDonald, P., Cahyadi, N. and Utomo, A. (October 2017). Poster Presentation. Who Cares? Older People and their Carers in Rural Indonesia. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
 - 33 Wister, A., Kendig, H., Mitchell, B., Fyffe, I. and Loh, V. (July 2017). Poster Presentation. Multimorbidity, Health and Ageing in Canada and Australia. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 34 Wood, G., Cigdem-Bayram, M. and Ong, R. (July 2017). Australian Demographic Trends and Implications for Housing Assistance Programs. Final Report No. 286, Australian Housing and Urban Research Institute, Melbourne.
 - 35 Yiengprugsawan, V. and Steptoe, A. (July 2017). Poster Presentation. Prospective Analyses of Pain and Physical Functioning in the English Longitudinal Study of Ageing. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
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- ### E1 CONFERENCE – FULL WRITTEN PAPER-REFEREED PROCEEDINGS
- 1 Wesson, J. (July 2017). Functional Cognition in Older Adults with MCI and Dementia: Validity of the Large Allen's Cognitive Level Screen-5. *Proceedings of the Occupational Therapy Australia 27th National Conference*. Perth, Australia.
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- ### E4 UNPUBLISHED CONFERENCE PRESENTATIONS
- 1 Abalos, J.B. (October 2017). Gender Differences in Functional Difficulty and Health Expectancy among Older Persons in Indonesia and the Philippines. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
 - 2 Absor, M. (November 2017). The Effect of Ethnicity and Culture on Living Arrangement, Behaviour, and Care of Older Persons among four Major Ethnic Groups in Rural Indonesia. 16th National Conference of Emerging Researchers in Ageing. Perth, Australia.
 - 3 Agnew, J.R., Bateman H., Eckert, C., Iskhakov, F., Louviere, J. and Thorp, S. (May 2017). Learning and Confirmation Bias: Measuring The Impact Of First Impressions and Ambiguous Signals. Boulder Summer Conference on Consumer Financial Decision Making. Boulder, USA.
 - 4 Alai, D.H. and Landsman, Z. (2017). Lifetime Dependence Modelling using a Generalized Multivariate Pareto Distribution. 21st International Congress on Insurance: Mathematics and Economics, July, Vienna, Austria and the Actuarial Teachers and Researchers Conference, July, Canterbury, UK.
 - 5 Allen, V. (June 2017). Onward and Upward: Effects of Age and Cognitive Resources on Emotion Regulation in Daily Life. SA Gerontology Conference 2019. Adelaide, Australia.
 - 6 Alonso García, J. and Sherris, M. (October 2017). One Size Fits All? Drawdown Structures in Australia and The Netherlands. IAA LIFE Colloquium. Barcelona, Spain.
 - 7 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (2017). Saving Preferences in Retirement: The Impact of Mandatory Annuitization, Flexibility and Health Status. Australasian Actuarial Education and Research Symposium, December, Sydney, Australia and the IAA LIFE Colloquium, October, Barcelona, Spain.
 - 8 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (August 2017). Saving Preferences in Retirement: The Impact of Pension Policy Design and Health Status. Long Term Care and Longevity Risk Workshop. Sydney, Australia.
 - 9 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (2017). A Cross Country Study of Saving and Spending in Retirement. 25th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia and the Collegio Carlo Alberto Workshop on Household Finance and Retirement Savings, October, Turin, Italy.
 - 10 Alonso García, J., Wood, O. and Ziveyi, J. (2017). Pricing and Hedging Guaranteed Minimum Withdrawal Benefits under a General Lévy Framework using the COS Method. 25th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia, ASTIN/AFIR-ERM Colloquium, August, Panama City, Panama and the 21st International Congress on Insurance: Mathematics and Economics, July, Vienna, Austria.
 - 11 Anel, R., Butterworth, P., Cherbuin, N. and Anstey, K.J. (July 2017). Retirement and Trajectories of Change in Speed of Information Processing. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 12 Anstey, K.J. (December 2017). Gender Differences in the Prevalence of Mental Health and Cardiovascular Risk Factors in Three Cohorts Assessed over 12 Years: The PATH Through Life Study. Society for Mental Health Research Conference. Canberra, Australia.
 - 13 Anstey, K.J. (October 2017). Barriers and Enablers: What Influences Mature Age Workforce Engagement? Workshop on Mature Labour Force Participation. Canberra, Australia.
 - 14 Arnold, S. and Labit Hardy, H. (January 2017). Cause-of-Death Mortality and Socio-Economic Status: A Study of a Portfolio Dynamics. Perspectives on Actuarial Risks in Talks of Young Researchers 2017. Ascona, Switzerland.
 - 15 Ashby-Mitchell, K. (July 2017). Population Attributable Risk of Dementia in Two Caribbean Countries. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 16 Bateman, H. (August 2017). Flexible Long Term Care Insurance: An Experimental Study of Demand. Long Term Care and Longevity Risk Workshop. Sydney, Australia.
 - 17 Bateman, H., Fang, H., Hanewald, K. and Wu, S. (December 2017). The Role of Home Equity for Retirement Financial Planning in China. Australasian Actuarial Education and Research Symposium. Sydney, Australia.
 - 18 Bateman, H., Stevens, R., Wu, S. and Thorp, S. (August 2017). Reducing the Underinsurance Puzzle by Product Design: Experimental Evidence for Life Care Annuities. ARIA Annual Meeting. Toronto, Canada.
 - 19 Browning, C., Thomas, S., Yang, H., Zeqi, Q. and Chapman, A. (July 2017). Primary Health Care in China: Addressing Chronic Illness Management in Older People. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 20 Byles, J.E. (July 2017). Home and Care: Analysis of 12 Years of Data from the Australian Longitudinal Study on Women's Health. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 21 Byles, J.E. (July 2017). Responding to Generational Change in Older People's Needs: A Case Study of Policy Reform. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
 - 22 Byles, J.E. (July 2017). Setting the Scene: Overview of Regional Data on Ageing and Health. Regional Meeting on Ageing and Health in the Western Pacific. Manila, Philippines.

RESEARCH OUTPUTS

- 23 Byles, J.E. (November 2017). Woman's Work: A Life Course Approach to Women, Work and Caring. 50th AAG Conference. Perth, Australia.
- 24 Byles, J.E. (October 2017). Housing for Older Australians: Changing Capacities and Constrained Choices. International Ageing Urbanism Colloquium 2017. Singapore.
- 25 Byles, J.E., Dolja-Gore, X., Nair, K., Tavener, M., Chojenta, C. and Mishra, G. (July 2017). Uptake and Effectiveness of Preventive Health Assessments: A Study of 11,726 Older Australian Women. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 26 Capatina, E., Hansen, G. and Hsu, M. (2017). Reforming Medicaid Long Term Care Insurance. 17th Society for the Advancement of Economic Theory Conference, June, Faro, Portugal and the 2017 Society for Economic Dynamics Annual Meeting, June, Edinburgh, Scotland.
- 27 Capatina, E., Keane, M. and Maruyama, S. (2017). Health Shocks and the Evolution of Consumption and Income over the Life-cycle. 17th Society for the Advancement of Economic Theory Conference, June, Faro, Portugal, Workshop of the Australasian Macroeconomics Society, August, Canberra, Australia and the Australasian Society of Labour Economics Inaugural Conference, December, Canberra, Australia.
- 28 Chen, Y. and Zhang, X. (2017). When Mommies Become Nannies: The Effects of Parental Retirement Across Generations. 2017 International Symposium on Contemporary Labor Economics, December, Guangzhou, China and the 25th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia.
- 29 Chomik, R. (October 2017). Macro-Demographic Context of Mature-age Labour Force Participation across States and Territories. Workshop on Mature Labour Force Participation. Canberra, Australia.
- 30 Cole, J. and Cherbuin, N. (June 2017). Predicting Measures of Healthy Ageing and Mortality Using Neuroimaging. Organisation for Human Brain Mapping 2017 Conference. Vancouver, Canada.
- 31 Curtis, R.G., and Windsor, T.D. (November 2017). Why is Self-Efficacy Positively Associated with Activity in Older Adults? 50th AAG Conference. Perth, Australia.
- 32 Curtis, R.G., Huxhold, O. and Windsor, T.D. (June 2017). Perceived Control and Social Activity in Midlife and Older Age: A Reciprocal Association? SA Gerontology Conference 2018. Adelaide, Australia.
- 33 Dow, B. and Temple, J. (November 2017). Violence, Mental Health and Ageing in Indigenous Communities. 50th AAG Conference. Perth, Australia.
- 34 Fang, H. (July 2017). Overview of the Australia-China Population Ageing Research Hub. 3rd Annual Workshop on Population Ageing and the Chinese Economy. Sydney, Australia.
- 35 Fang, H. and Chen, K. (July 2017). The Role of Housing in Intergenerational Wealth Transfer in a Rapidly Growing Economy: The Case of China. 25th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 36 Fong, J.H., Shao, A.W. and Sherris, M. (February 2017). Multi-State Actuarial Models of Functional Disability. CEPAR Longevity Workshop Hosted by PWC. Sydney, Australia.
- 37 Glasson, E., Hussain, R., Dye, D. and Bittles, A. (July 2017). Trends in Aging for People With Down Syndrome: A 56-Year Cohort Study in Western Australia. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 38 Gong, C. (July 2017). Healthcare Utilization among Older People in China: Insurance Type, Out-of-Pocket Payment and Children's Contribution. 3rd Annual Workshop on Population Ageing and the Chinese Economy. Sydney, Australia.
- 39 Gong, C., Kendig, H. and Silverstein, M. (July 2017). Comparative Study of Caregiving in China and Australia. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 40 Hanewald, K. and Neal, T. (July 2017). Measuring Life Satisfaction of Older Chinese: A Comparison of Methods. 3rd Annual Workshop on Population Ageing and the Chinese Economy. Sydney, Australia.
- 41 Hanewald, K., Li, H. and Shao, A.W. (2017). Modeling Multi-State Health Transitions in China: A Generalized Linear Model with Time Trends. 13th International Longevity Risk and Capital Markets Solutions Conference, September, Taipei, Taiwan, Australasian Actuarial Education and Research Symposium, December, Sydney, Australia, 21st International Congress on Insurance: Mathematics and Economics, July, Vienna, Austria and the 1st International Conference of Economics and Statistics, June, Hong Kong, China.
- 42 Hosking, D.E., Eramudugolla, R. and Anstey, K.J. (July 2017). The MIND Diet Protects against Cognitive Impairment in an Australian Setting. Nutrition and Metabolism' Professional Interest Association of the International Society to Advance Alzheimer's Research and Treatment. London, UK.
- 43 Hsu, B., Merom, D., Blyth, F.M., Naganathan, V., Handelsman, D.J. and Cumming, R.G. (July 2017). Temporal Relationship between Physical Activity, Exercise Intensity, and Mortality in Older Men. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 44 Hunt, A. and Villegas, A. (2017). Mortality Improvement Rates: Modelling and Parameter Uncertainty. ASTIN/AFIR-ERM Colloquium, August, Panama City, Panama, Society of Actuaries Living to 100 Conference, January, Orlando, USA and the Australasian Actuarial Education and Research Symposium, December, Sydney, Australia.
- 45 Hussain, R., Kendig, H., Cannon, L. and O'Loughlin, K. (July 2017). Are Health Professionals Ageist? Insights from Australian Survey of Social Attitudes. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 46 Hussain, R., O'Loughlin, K. and Kendig, H. (November 2017). Media Portrayals of Ageing: Insights from a Nationally-Representative Australian Survey. 50th AAG Conference. Perth, Australia.
- 47 Hussain, R., Wark, S., Janicki, M., Parmenter, T. and Knox, M. (July 2017). Burden of Chronic Disease for Older Australians with Intellectual Disability. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 48 Jagger, C. (February 2017). Longevity and Health – Can We Have Both? CEPAR Longevity Workshop Hosted by PWC. Sydney, Australia.
- 49 Keane, M. and Iskhakov, F. (2017). Effects of Taxes and Safety Net Pensions on Life-cycle Labor Supply, Savings and Human Capital: The Case of Australia. Inaugural conference of Asian and Australasian Society of Labour Economics December, Canberra, Australia and the International Pension Workshop 2017, January, Amsterdam, The Netherlands.
- 50 Keane, M., Neal, T., Ketcham, J. and Kuminoff, N. (August 2017). Evaluating Consumers' Choices of Medicare Part D Plans. Long Term Care and Longevity Risk Workshop. Sydney, Australia.
- 51 Kiely, K. M. (2017). Understanding the Association between Financial Hardship and Cognitive Decline in the PATH through Life. 50th AAG Conference, November, Perth, Australia and the Society for Mental Health Research Conference, December, Canberra, Australia.
- 52 Kim, S. and Mortby, M. (July 2017). Dementia-Related Stigma, Cultural Diversity, and Help Seeking Intentions. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 53 Kingston, A., Byles, J.E., Anstey, K.J. and Jagger, C. (July 2017). Impact of Obesity on Active and Cognitive Impairment: Free Life Expectancies in Older Australians. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.

- 54 Kowal, P. and Byles J.E. (July 2017). A Summary of Current Aging Research in Sub-Saharan Africa. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 55 Labit Hardy, H., Kaakai, S., Arnold, S. and El Karoui, N. (2017). How a Cause-of-death Reduction can be Compensated in Presence of Heterogeneity? A Population Dynamics Approach. 25th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia and the IAA LIFE Colloquium, October, Barcelona, Spain.
- 56 Li, H. and O'Hare, C. (September 2017). Semi-Parametric Extensions of the Cairns-Blake-Dowd Model: A One-Dimensional Kernel Smoothing Approach. 13th International Longevity Risk and Capital Markets Solutions Conference. Taipei, Taiwan.
- 57 Li, H., Hanewald, K. and Wu, S. (2017). Estimating Healthy Life Expectancy: A Province-by-Province Study for China. 13th International Longevity Risk and Capital Markets Solutions Conference, September, Taipei, Taiwan, 8th China International Conference on Insurance and Risk Management, July, Guilin, China and the 3rd Annual Workshop on Population Ageing and the Chinese Economy, July, Sydney, Australia.
- 58 Li, T., Sherris, M. and Shao, A.W. (February 2017). Impact of Systematic Trend and Uncertainty on Mortality and Disability Transition Rates. CEPAR Longevity Workshop Hosted by PWC. Sydney, Australia.
- 59 Lu, B. (August 2017). What Will Be the Effects of Ageing on the Chinese Economy? CAMA/Treasury Conference 2017. Canberra, Australia.
- 60 Lu, B. (July 2017). China Pension Reform Updates. 25th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 61 Lu, B., Piggott, J. and Zheng, B. (September 2017). The Notional and the Real in China's Retirement Reforms. Non-Financial Defined Contribution Schemes (INDC): Facing the Challenges of Marginalization and Polarization in Economy and Society. Rome, Italy.
- 62 McDonald, P. (October 2017). Ageing, Immigration and Health Expenditure. Australian Nursing & Midwifery Federation Biennial Conference. Hobart, Australia.
- 63 McDonald, P. and Hosseini Chavoshi, M. (October 2017). Analysis of Fertility Trends using Three Parameters: Age, Parity and Interval since Previous Birth: The Case of Iran. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
- 64 McDonald, P. and Moyle, H. (October 2017). Women as Agents in Fertility Decision-Making: Australia, 1870-1910. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
- 65 Milledge, K., Cumming, R.G. Wright, F., Blyth, F., Naganathan, V., Le Couteur, D. and Hirani, V. (2017). Dietary Intake of Nutrients and Periodontal Health: The CHAMP Study. 50th AAG Conference, November, Perth, Australia, IUNS 21st International Congress of Nutrition, October, Buenos Aires, Argentina and the Dietetic Association of Australia 34th National Conference, May, Hobart, Australia.
- 66 Monro, C. (November 2017). A Historical Overview of Aged Care Policy Development in Australia. 50th AAG Conference. Perth, Australia.
- 67 Nazroo, J., Gong, C. and Kendig, H. (July 2017). Paid Work in Later Life in China and Australia: Evidence from CHARLS and HILDA. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 68 O'Donnell, J., Utomo, I. and McDonald, P. (October 2017). Premarital Sex and Pregnancy in Greater Jakarta. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
- 69 Olivieri, A. (February 2017). Frailty and Risk Classification for Life Annuities. CEPAR Longevity Workshop Hosted by PWC. Sydney, Australia.
- 70 Olivieri, A. (February 2017). Managing Longevity (and Morbidity) Risk. CEPAR Longevity Research Forum at UNSW. Sydney, Australia.
- 71 Olivo Villabrille, M. (December 2017). Assortative Marriages and Household Income Inequality. Australasian Society of Labour Economics Inaugural Conference. Canberra, Australia.
- 72 Piggott, J. (October 2017). ASSA, the ARC, and Large Scale Research Funding for the Social Sciences. ASSA Annual Symposium. Adelaide, Australia.
- 73 Pitacco, E. (December 2017). Teaching Life Annuities: Focus on Critical Aspects. Australasian Actuarial Education and Research Symposium. Sydney, Australia.
- 74 Pitacco, E. (February 2017). Health Status. CEPAR Longevity Research Forum at UNSW. Sydney, Australia.
- 75 Pitacco, E. (February 2017). High-age Mortality and Frailty: Implications for Actuarial Modeling. CEPAR Longevity Workshop Hosted by PWC. Sydney, Australia.
- 76 Shao, A.W., Chen, H. and Sherris, M. (August 2017). To Borrow or Insure? Long Term Care Costs and the Impact of Housing. Long Term Care and Longevity Risk Workshop. Sydney, Australia.
- 77 Sherris, M. (February 2017). Longevity Risk: Mortality Models, Trends, Uncertainty, Continuous and Discrete Time Models, Multi-Population Models, Data Sources, Life Expectancy – Recent Key Publications, Working Papers and New Directions. CEPAR Longevity Research Forum at UNSW. Sydney, Australia.
- 78 Temple, J. (November 2017). Labour Force Behaviour of Older Indigenous Australians. 50th AAG Conference. Perth, Australia.
- 79 Temple, J. (October 2017). Mature Age Labour Force Participation and Supply in Australia. Workshop on Mature Labour Force Participation. Canberra, Australia.
- 80 Utomo, A., McDonald, P., Utomo, I., Cahyadi, N. and Sparrow, R. (March 2017). Social Engagement and the Elderly in Rural Indonesia. International Conference on Contextualizing Productive Ageing in Asia. Singapore.
- 81 Villegas, A., Bajekal, M. and Haberman, S. (July 2017). Modelling Mortality by Cause of Death and Socio-Economic Stratification: An Analysis of Mortality Differentials in England. 25th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 82 Villegas, A., Millossovich, P. and Kaishev, V. (February 2017). StMoMo: An R Package for Stochastic Mortality Modelling. CEPAR Longevity Workshop Hosted by PWC. Sydney, Australia.
- 83 Wesson, J. (October 2017). Functional Cognition and Everyday Practice: Reaching Our Potential. South East Sydney LHD Annual Occupational Therapy Forum. Sydney, Australia.
- 84 Windsor, T.D. (June 2017). Knowing When to Hold 'em and When to Fold 'em: Goal Adjustment, Daily Pain and Well-Being in Older and Younger Adults. SA Gerontology Conference 2017. Adelaide, Australia.
- 85 Wu, S., Bateman, H., Stevens, R. and Thorp, S. (October 2017). Demand for Long-term Care Insurance: Matching Stated Preference and Model Predictions. NetSPAR Pension Day 2017. Utrecht, the Netherlands.
- 86 Wu, S., Hanewald, K. and Fang, H. (2017). Delaying the Public Pension Age in China: Implications for Labour Supply and Individual Welfare. 25th Annual Colloquium of Superannuation Researchers, July, Sydney, Australia, 3rd Annual Workshop on Population Ageing and the Chinese Economy, July, Sydney, Australia and the China International Conference on Insurance and Risk Management 2017, July, Guilin, China.
- 87 Xu, M. (January 2017). Portfolio Insurance Strategies for Target Annuitisation Funds. Perspectives on Actuarial Risks in Talks of Young Researchers 2017. Ascona, Switzerland.
- 88 Xu, M., Alonso García, J., Shao, A.W. and Sherris, M. (2017). Housing, Long-Term Care Insurance, and Annuities with Recursive Utility. International Longevity Risk and Capital Markets Solutions Conference, September, Taipei, Taiwan and the Long-Term Care and Longevity Workshop, August, Sydney, Australia.

RESEARCH OUTPUTS

- 89 Xu, M., Alonso García, J., Shao, A.W. and Sherris, M. (October 2017). Demand for Annuities and Long-term Care Insurance with Recursive Utility: Impact of Housing. NetSPAR Pension Day 2017. Utrecht, the Netherlands.
- 90 Xu, M., Sherris, M. and Shao, A.W. (2017). Housing and Retirement Financing: Optimal Time to Buy a Residential Home. Actuaries Summit, May, Melbourne, Australia and the Western Risk & Insurance Association 51st Annual Meeting, January, Santa Barbara, USA.
- 91 Xu, Y., Sherris, M. and Ziveyi, J. (December 2017). Market Price of Longevity Risk for A Multi-Cohort Mortality Model with Application to Longevity Bond Option Pricing. UNSW-Macquarie University Workshop: Risk: Modelling, Optimization and Inference. Sydney, Australia.
- 92 Yeandle, S. and O'Loughlin, K. (July 2017). Recognition and Rights in Family Care to Adults: Policy Framing. 7th Community, Work and Family Conference. Milan, Italy.
- 93 Yeandle, S. and O'Loughlin, K. (October 2017). Rights and Recognition for Carers: Opportunities and Risks in a Rights Based Approach to Policy Framing. 7th International Carers Conference. Adelaide, Australia.
- 94 Yiengprugsawan, V., D'Este, C. and Byles, J.E. (July 2017). Geographical Variations in Health, Disability, and Activities of Daily Living Among Older Chinese. 21st International Association of Gerontology and Geriatrics World Congress. San Francisco, USA.
- 95 Yu, D. (2017). Spousal Decision-making over Financial Transfers to Respective Parents. 14th Annual Summer Workshop organized by the UNSW Health Economics Group, December, Sydney, Australia and the 3rd Annual Workshop on Population Ageing and the Chinese Economy, July, Sydney, Australia.
- 96 Zhang, X. (July 2017). Health Insurance, Informal Care and Female Labor Force Participation in Rural China. 12th World Congress of the International Health Economics Association. Boston, USA.
- 97 Zhang, X., Hanewald, K. and Stafford, T. (July 2017). Rural-Urban Migration and the Health of Elderly Parents in China. 25th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 98 Zhao, Z. and Zhu, Y. (October 2017). Using NeuroEvolution Deep Learning Forecast Daily Mortality Changes. 28th International Population Conference of the International Union for the Scientific Study of Population. Cape Town, South Africa.
- 99 Ziveyi, J., Sherris, M. and Xu, Y. (2017). Cohort and Value-Based Multi-Country Longevity Risk Management. 21st International Congress on Insurance: Mathematics and Economics, July, Vienna, Austria and the ASTIN/AFIR-ERM Colloquium, August, Panama City, Panama.

INVITED PRESENTATIONS TO MAJOR INTERNATIONAL MEETINGS

- 1 Anstey, K.J. (August 2017). Cognitive Changes in Normal Ageing and the Transition to Cognitive Impairment: Considerations Regarding Education, Age, and Measures. i-Sihat 2017. Kuala Lumpur, Malaysia.
- 2 Anstey, K.J. (August 2017). Brain Games or Fish Oils? What is the Evidence Factors that Reduce Risk of Dementia? i-Sihat 2017. Kuala Lumpur, Malaysia.
- 3 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (January 2017). A Cross Country Study of Saving and Spending in Retirement. NetSPAR International Pension Workshop. Leiden, the Netherlands.
- 4 Alonso García, J. and Sherris, M. (April 2017). One Size Fits All? Drawdown Structures in Australia and the Netherlands. Financing Longevity: The Economics of Pensions, Health Insurance, Long-term Care and Disability Insurance. Stanford, USA.
- 5 Chomik, R., Piggott, J. and McDonald, P. (2017). The Impact of Demographic Change on Labour Supply and Economic Growth, International Conference on Applied Economics and Policy, August, Kuala Lumpur, Malaysia, UNESCAP Workshop on Sustainable and Inclusive pensions in Asia and the Pacific, June, Bangkok, Thailand and the Workshop on the Development of an APEC Labour Mobility Framework, February, Nha Trang, Vietnam.
- 6 Anstey, K.J. (August 2017). Preventing Dementia – The Influence of Mental Health, Chronic Disease and Lifestyle. International Mental Health Conference. Gold Coast, Australia.
- 7 Holzmman, R., Alonso García, J., Labit Hardy, H. and Villegas, A. (October 2017). Alternative Designs of NDC Schemes to Address Heterogeneity in Longevity. Third International Conference on Non-financial (Notional) Defined Contribution (NDC) Pension schemes. Rome, Italy.
- 8 Horneff, V., Maurer, R. and Mitchell, O.S. (July 2017). Putting the Pension Back in 401(k) Plans: Optimal vs Default Longevity Income Annuities. 25th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 9 Keane, M., Neal, T., Ketcham, J. and Kuminoff, N. (July 2017). Evaluating Consumers' Choices of Medicare Part D Plans. Conference in Honor of Daniel McFadden's 80th Birthday, USC Schaeffer Center for Health Policy and Economics. Los Angeles, USA.
- 10 Keane, M. and Iskhakov, F. (August 2017). Effects of Taxes and Safety Net Pensions on Life-cycle Labor Supply, Savings and Human Capital: The Case of Australia. Conference on Implementation of Structural Dynamic Models: Methodology and Applications. London, UK.
- 11 Kudrna, G. (February 2017). The Norwegian Pension Reform: An External Perspective. 10th Anniversary of Norwegian Pension Forum. Norway, Oslo.
- 12 Lu, B. (June 2017). Long-term Care Insurance in China – the Case of Qingdao. 2017 Annual Forum on China's Primary Healthcare Reform and Community Medical Services. Beijing, China.
- 13 Lu, B. (May 2017). Australia Long-term Care System: Implications for China. 6th National Nursing Home Conference. Shandong, China.
- 14 Lu, B. (May 2017). Challenges in an Ageing China. International Conference on Social Work in Ageing and Urbanization - International Experience and China Development. Hangzhou, China.
- 15 Lu, B. (May 2017). Australian LTC Policy and Practice. The Seventh Chinese Nursing Home Presidents Conference. Qinzhou, China.
- 16 Lu, B., Yang, M. and Liu, X. (April 2017). The Dynamics of Chinese Elders' Health Status from 2000–2010: Evidence from SSAPUR. Financing Longevity: The Economics of Pensions, Health, Long-term Care and Disability Insurance. Stanford, USA.
- 17 McDonald, P. (July 2017). Immigration, Ageing and the Labour Force in Australia. 2017 Economic and Social Outlook Conference. Melbourne, Australia.
- 18 Piggott, J. (May 2017). Opening Address. Social Work in Health Aging and Urbanization—International Experience & China Development Conference. Hangzhou, China.
- 19 Wu, S., Bateman, H. and Stevens, R. (January 2017). Optimal Portfolio Choice with Health-Contingent Income Products: The Value of Life Care Annuities. NetSPAR International Pension Workshop. Leiden, the Netherlands.

SEMINAR PRESENTATIONS

- 1 Alai, D.H. and Landsman, Z. (2017). Lifetime Dependence Modelling using a Generalization of Multivariate Pareto Distributions. Cass Business School Seminar, February, London, UK and the Financial and Actuarial Mathematics Seminar, March, Liverpool, UK, RSFAS seminars, September, Canberra, Australia.
- 2 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (2017). A Cross Country Study of Saving and Spending in Retirement. Pensions and Superannuation Seminar Series, April, Sydney, Australia and the PhD Meeting on Pensions 2017, June, Tilburg, the Netherlands.
- 3 Alonso García, J. and Tang, Q. (2017). Utility Indifference Pricing of a Coupon-Yielding Bond. AFI Seminar, October, Leuven, Belgium and the Riskcenter Seminar, October, Barcelona, Spain.
- 4 Alonso García, J., Bateman, H., Bonekamp, J., Stevens, R. and van Soest, A. (October 2017). Saving Preferences in Retirement: The Impact of Mandatory Annuitization, Flexibility and Health Status. The Dutch Central Bank, Amsterdam, the Netherlands.
- 5 Andrews, S. (July 2017). Predicting Cognitive Decline in Ageing: Genetic, Environmental and Lifestyle Risk Factors. Center for Cognitive Ageing and Cognitive Epidemiology. Edinburgh, UK.
- 6 Bateman, H. (April 2017). Flicking the Switch: How Prescribed Disclosures Drive Retirement Plan Choice. University of Western Australia (Finance and Accounting) Seminar. Perth, Australia.
- 7 Bateman, H., Wu, S., Stevens, R. and Thorp, S. (2017). Income-Indemnity Long-term Care Insurance: Selection, Informal Care and Precautionary Savings. Maastricht University (Finance Discipline) Seminar, October, Maastricht, the Netherlands and the Macquarie University Applied Finance and Actuarial Studies Seminar, August, Sydney, Australia.
- 8 Booth, H. (May 2017). Demographic Research on Ageing and Longevity: A Road Less Travelled. School of Demography Seminar. Canberra, Australia.
- 9 Capatina, E. (April 2017). Consumption and Labor Supply with Partial Insurance. Sydney Macroeconomics Reading Group. Sydney, Australia.
- 10 Capatina, E., Hansen, G. and Hsu, M. (2017). Reforming Medicaid Long Term Care Insurance. Pensions and Superannuation Seminar Series, June, Sydney, Australia and the UNSW Macro Workshop, June, Sydney, Australia.
- 11 Hanewald, K., Li, H. and Shao, A.W. (2017). Modeling Multi-State Health Transitions in China: A Generalized Linear Model with Time Trends. Research Seminar, Department of Risk Management and Insurance, September, Beijing, China, Research Seminar, School of Finance, September, Tianjin, China, Research Seminar, School of Mathematical Sciences, September, Tianjin, China and the Robert A. Hedges Research Seminar Series, March, Philadelphia, USA.
- 12 Hosseini-Chavoshi, M. (April 2017). Fertility Regulation Dynamics in Iran. National Institute of Population Research. Tehran, Iran.
- 13 Hosseini-Chavoshi, M. and Abbasi-Shavazi, M. (June 2017). Cohort Perspective of Fertility Transition in Iran: The role of Education. VID Colloquium. Vienna, Austria.
- 14 Hunt, A. (December 2017). Advocacy and Fieldwork in Indonesia. Concordia University Psychology Lab Group. Montreal, Canada.
- 15 Hunt, A. (December 2017). MINI Musings: Understanding Depression in Indonesian Elderly. Culture and Mental Health Research Unit, Jewish Hospital, McGill University. Montreal, Canada.
- 16 Hunt, A. (November 2017). In Search of Depression: Scaling Up in Indonesia. Culture and Mental Health Research Unit, Jewish Hospital, McGill University. Montreal, Canada.
- 17 Keane, M. and Iskhakov, F. (2017). Effects of Taxes and Safety Net Pensions on Life-cycle Labor Supply, Savings and Human Capital: The Case of Australia. The Discipline of Business Analytics, The University of Sydney Business School Seminar Series April, Sydney, Australia and the Berlin Applied Micro Seminar, February, Berlin, Germany.
- 18 Kiely, K. (May 2017). Healthy Working Life Expectancies. ANU CEPAR Seminar Series. Canberra, Australia.
- 19 Kudrna, G. (April 2017). Facing Demographic Challenges. Research Seminar, University of Indonesia. Jakarta, Indonesia.
- 20 Kudrna, G. (March 2017). Norway and Australia's Pension Systems: A Comparative Analysis. Research Seminar, Frisch Centre. Oslo, Norway.
- 21 Kudrna, G. (October 2017). Sustainable and Equitable Pensions with Means Testing. DSA Research Seminar. Lausanne, Switzerland.
- 22 Kudrna, G. (September 2017). Means Testing Public Pensions under Population Ageing. Pensions and Superannuation Seminar Series. Sydney, Australia.
- 23 Li, H. (November 2017). Applying Modern Econometric Techniques to Mortality Modeling. Research Seminar, School of Insurance. Beijing, China.
- 24 Li, H. (November 2017). Studying Actuarial Sciences in Australia. Research Seminar, School of Insurance. Beijing, China.
- 25 Li, H. (October 2017). All About Mortality Modeling. Research Seminar, Department of Statistics and Actuarial Science. Iowa City, USA.
- 26 Li, H. and O'Hare, C. (May 2017). Semi-Parametric Extensions of the Cairns-Blake-Dowd Model: A One-Dimensional Kernel Smoothing Approach. Pensions and Superannuation Seminar Series. Sydney, Australia.
- 27 Li, H., Hanewald, K., Shao, A.W. and Wu, S. (March 2017). Research on Population Ageing in China. Department of Econometrics and Business Statistics Seminar Series. Melbourne, Australia.
- 28 Liu, E. and Shao, A.W. (May 2017). The Members' Default Utility Function (MDUF). Pensions and Superannuation Seminar Series. Sydney, Australia.
- 29 Lu, B. (May 2017). China Pension Reforms: Recent Updates and Implications. Pensions and Superannuation Seminar Series. Sydney, Australia.
- 30 McDonald, P. (February 2017). Income, Expenditure and Wealth: Intergenerational Perspectives. Ageing Workforce Workshop. Melbourne, Australia.
- 31 McDonald, P. (September 2017). Immigration, Ageing and the Labour Force in Australia. Centre for Social Impact Research Seminar. Melbourne, Australia.
- 32 Olivo Villabril, M. (2017). Assortative Marriages and Household Income Inequality. Melbourne Institute Brown Bag Seminar, November, Melbourne, Australia and the Pensions and Superannuation Seminar Series, November, Sydney, Australia.
- 33 O'Loughlin, K. (June 2017). Caring & Ageing: International Perspectives on Family and Workplace Challenges. International Seminar, Centre for International Research on Care, Labour and Equalities (CIRCLE). Elmfield, UK.
- 34 Piggott, J. (May 2017). Centre of Excellence in Population Ageing Research. ARC Seminar Series. Canberra, Australia.
- 35 Pitacco, E. (September 2017). Long-term Care Insurance Premiums: Sensitivity Analysis. Department of Mathematics, Kyoto University.
- 36 Sane, R. (February 2017). The Indian Pension Reform Story: Where are We? Pensions and Superannuation Seminar Series. Sydney, Australia.
- 37 Zhang, X., Hanewald, K. and Stafford, T. (2017). Rural-Urban Migration and the Health of Elderly Parents in China. Empirical Micro Workshop UNSW School of Economics, April, Sydney, Australia and the Brown Bag Seminar, March, Jinan University, Guangzhou, China.

WEBSITE AND EXPLAINER VIDEOS

In 2017 CEPAR took a number of steps to increase its outreach to the community and enhance its profile through the media.

Our website continues to be a key element of our public profile, showcasing the Centre's research and activities. In 2017, a complete overhaul of the Centre's website was undertaken with the generous assistance of the UNSW Business School's Digital and Creative Solutions team. The site was rebuilt to reflect the new approaches to web browsing and increased capabilities of the platform.

The site's page views continued to increase in 2017 with over 52,000 views. Over 58% of those were from new users. The new website also saw a spike in traffic with over 5,000 page views in the week following the website launch. Events, Working Papers and Researcher Profiles remain the top three most viewed sections of the site.

A series of research explainer videos were also produced in 2017. Each video focuses on a single CEPAR researcher and their research. Twelve videos have been produced so far, which are proving very popular with web users. The videos provide snapshots of current CEPAR research and are a great entry point for journalists or interested community members.

REGIONAL AUSTRALIA DATABASE FOR AGEING RESEARCH (RADAR)

RADAR remains an important free tool CEPAR provides to the public. 2016 Census Data is now being reviewed by the RADAR team led by CI McDonald at the University of Melbourne. It will be incorporated into the program and released on the website soon.

DRIVING AND HEALTH WORKSHOP

A highlight of our event calendar in 2017 was the *Driving and Health: What You Need to Know* Workshop organised by our ANU node, based in the Centre for Ageing, Health and Wellbeing, in

conjunction with COTA ACT and the Australasian College of Road Safety (ACRS). The event, held on October 4 in Canberra, attracted older drivers in the community who were looking to learn about some of the latest research findings on health and driving from experts in this field. Attendees were also provided with information on assistance available for those who wished to continue driving, alternative transport options, and where to get information and support.



KAARIN ANSTEY AND ERIC CHALMERS (ACRS)
AT THE DRIVING AND HEALTH WORKSHOP

PUBLIC RELEASE OF NATIONAL TRANSFER ACCOUNT DATA

In November 2017, Australian National Transfer Account (NTA) data were made publicly available for the first time on the National Transfer Accounts website.

Constructed by CEPAR Chief Investigator Professor Peter McDonald, CEPAR Associate Professor Jeromey Temple, and James Rice, the Australian NTAs for 2003-04 and 2009-10 were published on the website which provides access to data being produced by more than sixty countries.

NTAs show how various resources, both time and money, flow between age cohorts. The

data quantify how people at each age acquire and use economic resources to meet their current material needs, to share with others, and to provide for the future. Importantly they offer 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.

'We anticipate that the release of these reports will encourage the use of Australian data in international comparative studies,' said Professor McDonald.

'Our work on the NTAs, which is ongoing, has now established 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.'

The next NTA report is currently being prepared. It will cover the period 2015-16 and should be ready for publication in the second half of 2018.

To view the report of the National Transfer Account for 2003-4 and 2009-10 visit www.ntaccounts.org

COMMUNICATIONS, EDUCATION & COMMUNITY OUTREACH

120

PRINT (NEWSPAPERS AND MAGAZINES)

The Guardian

Debate: Is the new means test for the aged pension fair?

3 January 2017 – featuring Rafal Chomik

The Sydney Morning Herald

Golden age: Centenarians and the secrets of healthy long life

3 January 2017 – featuring John Piggott

Australian Financial Review

GDP boost can come from better informed workers

29 April 2017 – featuring John Piggott

The Sydney Morning Herald

Political divide threatens 'big heart' solution on NDIS

11 May 2017 – featuring Hal Kendig

The Advertiser

Proper planning leads to more positive retirement

29 May 2017 – featuring Heather Booth

The New Daily

Why we need Bunnings-style work for older Australians

12 June 2017 – featuring Hal Kendig

City News Canberra

Dementia risk reduction in mild cognitive impairment

27 June 2017 – featuring Kaarin Anstey

New Scientist

England will need over 71,000 extra care home places by 2025

15 August 2017 – featuring Carol Jagger

The Daily Mail

Britain's care home crisis: How the nation needs another 190,000 extra places by 2035 to cope with soaring number of elderly people

16 August 2017 – featuring Carol Jagger

The Telegraph

Lancet: more than 70,000 extra care home places needed by 2025

16 August 2017 – featuring Carol Jagger

The Sun

Pensioner panic: Extra 189,000 care home places will be needed by 2035 to cope with the ageing population, study warns

16 August 2017 – featuring Carol Jagger

The Financial Times

UK facing shortfall of 71,000 care home places

16 August 2017 – featuring Carol Jagger

The Guardian

UK needs 71,000 more care home places in eight years, study predicts

16 August 2017 – featuring Carol Jagger

Science Magazine

Analysis of China's one-child policy sparks uproar

18 October 2017 – featuring Zhongwei Zhao

Australian Ageing Agenda

Growing old without children: Aged care's sleeper issue

19 October 2017 – featuring Cassie Curryer

The Sydney Morning Herald

Australian life expectancy hits all-time high

27 October 2017 – featuring Peter McDonald

The Sydney Morning Herald

Life expectancy. From 45 to 82 years, we've come a long way

6 November 2017 – featuring CEPAR Event

The Sydney Morning Herald

Comment: If you want to live even longer, you might not like what you have to do

16 November 2017 – featuring Philip Clarke and Peter McDonald

RADIO AND TELEVISION

2UE The Daily Drive

The ageing workforce and finding work

15 February 2017 – featuring John Piggott

2UE The Daily Drive

Should stamp duty be scrapped for retirees?

23 March 2017 – featuring John Piggott

2UE The Daily Drive

Are older Australians worse off than in other countries?

27 April 2017 – featuring Rafal Chomik

Talking Lifestyle Radio: Second Career

Older workers could contribute billions of dollars to GDP

8 May 2017 – featuring John Piggott

2UE The Daily Drive

Intergenerational wealth transfers from baby boomers to their children

24 May 2017 – featuring John Piggott

Channel Nine News, 2CC Canberra, ABC Radio Canberra

Dementia risk reduction in mild cognitive impairment

30 June 2017 – featuring Kaarin Anstey

BBC World News - Impact

Dementia prevention

20 July 2017 – featuring Kaarin Anstey

ITV News

Thousands of new care homes needed for growing older population

16 August 2017 – featuring Carol Jagger

BBC Radio 4 Today

A research study predicts that more than 71,000 extra places for those with substantial care needs will be needed by 2025 because of higher life expectancy

16 August 2017 – featuring Carol Jagger

ABC Radio Canberra

Driving and dementia

October 2017 – featuring Kaarin Anstey

ABC Television News Afternoons, ABC Radio Mornings

with Jenny Marchant, ABC Radio Mornings with Jon Faine, ABC Radio National News

Age-friendly workplaces could help people to be healthier in later life

31 October 2017 – featuring Hal Kendig and Cathy Gong

ONLINE

Austaxpolicy

Means testing public pensions:

A policy option for an ageing population

1 February 2017 – featuring George Kudrna

The Conversation

FactCheck: Is Australia on track to have the oldest pension age in the developed world?

15 February 2017 – featuring Rafal Chomik

Seniorpolitik.no

Norway's pension reform receives praise from Australia

3 April 2017 – featuring George Kudrna

The Conversation

Budget needs a sharper policy scalpel to help first home buyers

11 May 2017 – featuring Rachel Ong

BusinessThink

Federal Budget Roundtable: 2017 Budget

11 May 2017 – featuring John Piggott

The Conversation

Women rely on the family home to support them in old age

29 May 2017 – featuring Rachel Ong

BusinessThink

Is income-indemnity insurance an aged care solution?

21 June 2017 – featuring Hazel Bateman

The Conversation

Australians are working longer so they can pay off their mortgage debt

29 June 2017 – featuring Rachel Ong

The Conversation

Australians want insurance against the burden of old age

26 July 2017 – featuring research by Shang Wu, Hazel Bateman and Susan Thorp

Express

Care home crisis: Almost 190,000 new places will be needed in less than 20 years

15 August 2017 – featuring Carol Jagger

Health Insurance and Protection Daily

Extra 71,000 care home places needed by 2025

16 August 2017 – featuring Carol Jagger

Carehome.co.uk

Extra 71,200 care home beds needed by 2025

16 August 2017 – featuring Carol Jagger

Science Daily

An extra 71000 care home places will be needed by 2025 in England as care needs increase, study predicts

16 August 2017 – featuring Carol Jagger

BT News

Experts warn 190,000 new care home places necessary by 2035

16 August 2017 – featuring Carol Jagger

Pharmafile

Massive increase in UK care home places needed by 2025, report finds

16 August 2017 – featuring Carol Jagger

Chronicle Live

Newcastle University experts reveal increasing strain as 71,000 new care home places needed by 2025

16 August 2017 – featuring Carol Jagger

The Conversation

How governments have widened the gap between generations in home ownership

29 August 2017 – featuring Rachel Ong

BruDirect, Nam news network, Philippine Canadian Inquirer, Xinhuanet

Age-friendly workplaces contributing to better health in older employees

31 October 2017 – featuring Cathy Gong and Hal Kendig

IUSSP Conference Newsletter 31 October

Does the weather influence death?

31 October 2017 – featuring Zhongwei Zhao

Aged Care Guide

Age-friendly workplaces could lead to a healthier later life

14 November 2017 – featuring Cathy Gong and Hal Kendig

Asia & the Pacific Policy Society – APPS Policy Forum

Deflating the myth of a demographic time bomb

28 November 2017 – featuring Cathy Gong and Hal Kendig

PRESENTATIONS TO GOVERNMENT, INDUSTRY AND THE BUSINESS COMMUNITY

- 1 Anstey, K.J. (May 2017). Prevention of Dementia and Promotion of Cognitive Health. Department of Health. Canberra, Australia.
- 2 Bateman, H. (March 2017). Australia's Public Age Pension and Population Ageing. Effectiveness of Government Social Security Programs in Developing Asia Workshop. Jakarta, Indonesia.
- 3 Bateman, H. (May 2017). Pension Investment in the Post Financial Crisis Era – The Australian Experience. China Ageing Finance Forum (CAFF50) Global Summit. Shenzhen, China.
- 4 Bateman, H. (October 2017). Optimal DC design: A Cross Country (Australia and the Netherlands) Study of Spending and Saving in Retirement. International Centre for Pension Management (ICPM) Discussion Forum. Amsterdam, the Netherlands.
- 5 Booth, H. (April 2017). Ageing and Longevity: What the Future Holds for Australia. Australia and New Zealand School of Government (ANZSOG) Executive Fellows Program. Sydney, Australia.
- 6 Byles, J.E. (August 2017). Use, Access to, and Impact of Medicare Services for Australian Women: Findings from the Australian Longitudinal Study on Women's Health. Australian Healthcare and Hospitals Association Data and Innovation Collaboration Network Meeting. Brisbane, Australia.
- 7 Byles, J.E. (September 2017). Medicare in Later Life. Department of Health, Women's Health Week. Canberra, Australia.
- 8 Gong, C. (August 2017). Impacts of Voluntary and Involuntary Workforce Transitions at Mature Ages: Longitudinal Evidence from HILDA. Commonwealth Treasury. Canberra, Australia.
- 9 Hosseini-Chavoshi, M. (November 2017). Fertility Transition and Population Policy Changes. Presentation to the Government of Iran. Tehran, Iran.
- 10 Iskhakov, F. (November 2017). Optimal Annuity Purchases for Australian Retirees. Macroeconomic Group, Commonwealth Treasury. Canberra, Australia.
- 11 Keane, M. (February 2017). Effects of Taxation on Labour Supply and Human Capital. Commonwealth Treasury. Canberra, Australia.
- 12 Kudrna, G. (June 2017). Demographic Change and Fiscal Policy Responses. Research Seminar at the Czech National Bank. Prague, Czech Republic.
- 13 Kudrna, G. (August 2017). Effects of Fiscal Consolidation in Australia. Treasury-CEPAR Joint Workshop on Fiscal Policy Modelling. Canberra, Australia.
- 14 McDonald, P. (February 2017). Health Status of the Older People in Rural Indonesia. Ministry of National Development and Planning. Jakarta, Indonesia.
- 15 McDonald, P. (February 2017). The Health Status of Older People in 10 Rural Villages in Indonesia. Presentations to the Indonesian National Planning Board on Ageing in Rural Indonesia. Jakarta, Indonesia.
- 16 McDonald, P. (July 2017). Immigration, Ageing and the Australian Labour Force. Department of Social Services Futures Event. Canberra, Australia.
- 17 McDonald, P. (September 2017). Immigration, Ageing and the Australian Labour Force. Department of Social Services. Canberra, Australia.
- 18 Ong, R. (May 2017). Women in Economics – 2017 Federal Budget Reflections. National Press Club Address. Canberra, Australia.
- 19 Sherris, M. (September 2017). Variable Annuities and Retirement Product Innovation. Workshop at AMP. Sydney, Australia.
- 20 Utomo, I. and McDonald, P. (February 2017). Who Cares? Older People and Their Carers in Rural Indonesia. Ministry of National Development and Planning. Jakarta, Indonesia.
- 7 de, Cure M. and Mitchell, O.S. (July 2017). Panel: Comprehensive Income Products for Retirement. 25th Annual Colloquium of Superannuation Researchers. Sydney, Australia.
- 8 Hosking, D.E. (May 2017). Member: Alzheimer's Australia ACT Working Group to Implement a Lifestyle Risk Reduction Program in the ACT. Canberra, Australia.
- 9 Hosseini-Chavoshi, M. (December 2017). Panel: Fertility and Childbearing: Trends, Levels and Patterns. Center for Strategic Studies. Tehran, Iran.
- 10 Kendig, H. (2017). Member: Research Advisory Committee for Project on Ageism, Benevolent Society.
- 11 Kudrna, G. (August 2017). Appointed to the Steering Committee for Development of Overlapping Generations for Australia (OLGA) Model. Commonwealth Treasury. Canberra, Australia.
- 12 McDonald, P. (2017). Briefed Renmin University and the Chinese Government on Policy Approaches to Support the Birth Rate in China. Beijing, China.
- 13 McDonald, P. (July 2017). Briefed Commonwealth Treasury on Economic Demography. Canberra, Australia.
- 14 McDonald, P. (March 2017). Briefed Dr Kay Patterson, Age Discrimination Commissioner, Australian Human Rights Commission on CEPAR Research. Melbourne, Australia.
- 15 McDonald, P. (May 2017). Briefed Department of Foreign Affairs on Indonesian Demography. Canberra, Australia.
- 16 McDonald, P. (October 2017). Briefed Embassy of Japan on Potential Population Policies for Japan. Canberra, Australia.
- 17 McDonald, P. (September 2017). Briefed Commonwealth Treasury on MARIA model and National Transfer Accounts. Canberra, Australia.
- 18 McDonald, P. (September 2017). Visa Simplification Roundtable, Department of Immigration and Border Protection. Melbourne, Australia.
- 19 Ong, R. (September 2017). Panel: The State of Our State Budget Briefing. Bank of Western Australia (Bankwest). Perth, Australia.
- 20 Piggott, J. (2017). Member: WHO Expert Group on the Economics of Health and Ageing.
- 21 Piggott, J. (December 2017). Invited Participant: Sir Roland Wilson Foundation and Crawford School of Public Policy, Secretaries Lunch. Canberra, Australia.
- 22 Piggott, J. (July 2017). Briefed Philipp Ivanov, Asia Society Australia, on CEPAR's Asia Research Portfolio. Sydney, Australia.

BRIEFINGS, COMMITTEE MEMBERSHIPS AND PARTICIPATION IN ROUNDTABLE AND PANEL DISCUSSIONS

- 23 Piggott, J. (July 2017). Discussant: Time Shifting of Income Undermines Income Tax Equity, Efficiency, Simplicity and Integrity – Is Fixing it So Outrageous? Festival of Outrageous Tax Ideas. Sydney, Australia.
- 24 Piggott, J. (June 2017). Panel: Mapping Out Future Pension Scenarios. INPARR Seminar: Pension Foresight: Envisaging Retirement Income Plans of the Future. Paris, France.
- 25 Piggott, J. (May 2017). Briefed Commonwealth Treasury on OLG Model Development. Canberra, Australia.
- 26 Piggott, J. (May 2017). BusinessThink Federal Budget Roundtable. Sydney, Australia.
- 27 Piggott, J., Bateman, H., Sherris, M., Ziveyi, J., Villegas, A., Xu, X. and Yan, G. (February 2017). Briefed Commonwealth Treasury on Development of the Framework for Comprehensive Income Products for Retirement (CIPRS). Sydney, Australia.
- 28 Sherris, M. (2017). Development of Sections Task Force at International Actuarial Association Meetings. Budapest, Hungary.
- 29 Sherris, M. (July 2017). Executive Panel: Developed Market Dynamics – Global Resilience and the Role of Insurance. IIS 53rd Annual Global Insurance Forum. London, UK.
- 30 Sherris, M. (April 2017). Briefed International Actuarial Association Mortality Working Group on Longevity Risk Research Workshop and Forum in Sydney and Related Research. Budapest, Hungary.
- 6 Booth, H. (November 2017). Longevity and Old-Age Mortality in Australia: Future Prospects and Implications. Mortality in Australia: Marking the 150th Anniversary of the First Australian Life Table. Sydney, Australia.
- 7 Booth, H. (October 2017). On Living Longer. Inaugural Professorial Lecture, ANU. Canberra, Australia.
- 8 McDonald, P. (February 2017). Ageing and the Labour Force. Future of Work Forum, University of Melbourne. Melbourne, Australia.
- 9 McDonald, P. (November 2017). Long-term Changes in Australian Mortality by Age and Sex. Mortality in Australia: Marking the 150th Anniversary of the First Australian Life Table. Sydney, Australia.
- 10 O'Connor, C.M. (October 2017). The Tailored Activity Program (TAP) and other Non-Pharmacological Interventions in FTD. FRONTIER Frontotemporal Dementia (FTD) Information and Support Day for Families and Carers. Brain and Mind Centre, University of Sydney. Sydney, Australia.
- 11 Piggott, J. (May 2017). Population Ageing. Learn @ Lunch Series. Sydney, Australia.
- 12 Piggott, J. (November 2017). Panel: Making an Impact. UNSW Business School Showcase. Sydney, Australia.
- 13 Piggott, J. (October 2017). In Conversation: The Longevity Reform Challenge. *The Economist's* Business of Longevity Summit 2017. Hong Kong, China.
- 14 Piggott, J. (September 2017). Population Ageing. Scientia Circle. UNSW. Sydney, Australia.
- 15 Sherris, M. (November 2017). Life Tables and Insurance Applications. Mortality in Australia: Marking the 150th Anniversary of the First Australian Life Table. Sydney, Australia.
- 16 Temple, J. and Jukic, M. (November 2017). Mortality and Life expectancy in the Australian Aged Care System. Mortality in Australia: Marking the 150th Anniversary of the First Australian Life Table. Sydney, Australia.

PUBLIC TALKS

- 1 Anstey, K.J. (February 2017). Dementia, MCI and Driving: Balancing Risks and Rights. Alzheimer's Australia ACT Research Forum – Great Expectations: Inspiring Hope through Research. Canberra, Australia.
- 2 Anstey, K.J. (July 2017). Introduction to the International Research Network on Dementia Prevention. International Research Network on Dementia Prevention Launch Event. London, United Kingdom.
- 3 Anstey, K.J. (May 2017). Driving for Our Lives: When is it Safe and When is it Not? U3A. Sydney, Australia.
- 4 Anstey, K.J. (May 2017). Living Well to Prevent Dementia. Australasian Hellenic Progressive Association. Sydney, Australia.
- 5 Anstey, K.J. (October 2017). Cognitive Decline, Dementia and Driving. Driving and Health Symposium. Canberra, Australia.

CENTRE FINANCE

CONSOLIDATED FINANCIAL STATEMENT 2011–2017

INCOME	2011(\$)	2012(\$)	2013(\$)	2014(\$)	2015(\$)	2016(\$)	2017(\$)	
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	1,082,547	
Australian National University	313,000	330,162	582,759	600,372	611,108	310,748	557,695	
University of Sydney	312,000	329,107	101,872	104,952	106,829	108,645	110,278	
University of Melbourne							383,889	
ARC Post Award Funding distributed as follows:								
University of New South Wales		205,026	205,026	40,026	40,026	35,026	40,026	
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	678,000	
Australian National University	130,250	13,730	350,420	221,380	221,380	189,835	151,693	
University of Sydney	130,000	130,000	38,900	38,750	38,750	38,750	38,750	
University of Melbourne							129,376	
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	50,000	NOTE 2
Medibank	50,000		36,364		- 1,563			
AMP	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
PwC			50,000	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	722,065	
Superannuation Colloquium Registration Fees				23,164	22,742	22,300	21,250	
Association of Asia Pacific Rim Universities (APRU)						9,361	8,849	
Asia-Pacific Economic Cooperation (APEC)							20,000	
Total Income	3,028,692	3,738,044	4,091,299	3,451,820	3,568,881	3,905,831	4,094,418	

EXPENDITURE	2011(\$)	2012(\$)	2013(\$)	2014(\$)	2015(\$)	2016(\$)	2017(\$)
Salaries	813,109	2,254,769	3,358,535	2,695,560	2,775,390	2,883,156	3,630,724
Scholarships		105,324	124,475	126,163	101,737	105,157	83,633
Travel	63,487	291,975	568,550	324,959	363,765	405,354	488,553
Emerging Researchers in Ageing initiative: annual contribution	60,000	69,803	54,771	50,783	85,850	70,098	71,148
Events	25,250	60,387	100,684	56,371	36,869	55,340	84,314
Other research related expenses	16,852	37,766	83,099	46,131	34,445	36,813	111,170
Recruitment and relocation expenses	16,935	47,648	5,344	8,636	26,409	33,936	12,486
Centre administration, consumables and I.T. maintenance	30,418	38,507	36,156	30,364	28,606	42,774	38,826
Equipment	16,738	49,336	24,743	9,391	40,287	22,969	22,613
Website, branding and marketing	48,403	94,800	86,273	67,805	50,150	50,853	45,371
Total Expenditure	1,091,192	3,050,315	4,442,631	3,416,163	3,543,508	3,706,449	4,588,838
Opening balance at the beginning of the year	-	1,937,500	2,625,229	2,273,897	2,309,554	2,334,928	2,534,310
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	2,039,890

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 for 2016 from the University of New South Wales to the Australian National University and the University of Melbourne were delayed. These distributions were made in 2017 and are 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 2017.

NEW GRANTS, AWARDS, PRIZES & RECOGNITION

NEW GRANTS AWARDED TO RESEARCH TEAMS WHICH INCLUDED CEPAR CHIEF INVESTIGATORS

ANSTEY, K.J.

National Seniors Australia:

Online Resource for Healthy Aging

Total amount awarded: \$25,000

KIM, S., ANSTEY, K.J., WERNER, P. AND RICHARDSON, A.

Alzheimer’s Australia Dementia Research Foundation:

Hazel Hawke Research Grant in Dementia Care

Total amount awarded: \$50,000

O’DONNELL, M.L., LAUTENSCHLAGER, N., FORBES, D., ELLIS, K. AND ANSTEY, K.J.

Hallmark Aging Research Initiative:

Promoting Healthy Aging in Vietnam Veterans

Total amount awarded: \$22,500

SHERRIS, M., OLIVIERI, A. AND ZIVEYI, J.

ARC Discovery Grant:

Retirement Income Product Innovation

Total amount awarded: \$350,000

SHERRIS, M., ZIVEYI, J. AND VILLEGAS, A.

Society of Actuaries:

Longevity Risk: Actuarial and Predictive Models, Retirement Product Innovation, and Risk Management Strategies

Total amount awarded: \$336,903

NEW GRANTS AWARDED TO TEAMS INCLUDING CEPAR RESEARCHERS AND ASSOCIATE INVESTIGATORS ON TOPICS RELATED TO POPULATION AGEING

BATEMAN, H. AND TEPPA, F.

NetSPAR:

Regulation of Information Provision for Pension Choices: Australia and the Netherlands Compared

Total amount awarded: €20,000

BYLES, J.E., LOXTON, D. AND MISHRA, G.

Department of Health:

Australian Longitudinal Study on Women’s Health

Total amount awarded: \$3,450,000

FANG, H., HANEWALD, K. AND WU, S.

2017 Quartet Pilot Project Completion Award:

Long-term Care Financing
Using Home Equity Release

Total amount awarded: \$US 37,500

TAVENER, M., BYLES, J.E. AND CHOJENTA, C.

NSW Department of Family and Community Services:

Liveable Housing Checklist: Future Proofing Homes for Older Adults

Total amount awarded: \$22,786

AWARDS, PRIZES AND RECOGNITION

CASSY CURRYER

University of Newcastle’s Faculty of Education and Arts (FEDUA) HDR Achievement Award for 2017

RACHEL CURTIS

2017 Gary Andrews Student Award for best student presentation at the South Australian Gerontology Conference

NICOLE EE

2017 Emerging Researchers in Ageing Conference Best Poster Award

MITCHELL McMASTER

2017 Phyllis Montgomery Award from the Royal Commonwealth Society

CATHY MUNRO

2017 Australian Association of Gerontology Arthur Everitt Award

RACHEL ONG

Curtin University Media Award for Highest Contribution to The Conversation

JOHN PIGGOTT

Rockefeller Foundation Bellagio Center Residency, to be taken up August-September 2018

MICHAEL SHERRIS, ADAM WENQIANG SHAO AND JOELLE FONG

2017 ARIA Patrick Brockett & Arnold Shapiro Actuarial Journal Award

The background is a solid red color. On the left side, there are several thin, vertical red lines of varying heights. From the bottom left, a series of thin, diagonal red lines extend towards the top right, creating a sense of depth and movement. A large, white, stylized number '2' is positioned on the right side of the image, partially overlapping the diagonal lines.

PART

2

2017 REPORT/**CE 17**

(CEPAR 2017 – 2023)

PART 2: CE17

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ABOUT THE CENTRE

CEPAR CE17 IS BASED AT THE UNIVERSITY OF NEW SOUTH WALES (UNSW) WITH NODES AT THE AUSTRALIAN NATIONAL UNIVERSITY (ANU), THE UNIVERSITY OF MELBOURNE, THE UNIVERSITY OF SYDNEY AND THE UNIVERSITY OF WESTERN AUSTRALIA (UWA). IT HAS HIGH QUALITY PARTNERSHIPS WITH INFLUENTIAL ORGANISATIONS DRAWN FROM ACADEME, GOVERNMENT AND BUSINESS.

COMMENCING OPERATIONS ON 28 SEPTEMBER 2017, THE NEW CENTRE WILL BUILD ON AND EXTEND THE ACHIEVEMENTS, RESEARCH EXPERTISE, NETWORKS, INFRASTRUCTURE AND REPUTATION OF CEPAR CE11.

OBJECTIVES

The objectives of the Centre are to:

EXECUTE A TRANSFORMATIONAL AND MULTIDISCIPLINARY RESEARCH PROGRAM THAT

- produces original research that advances knowledge globally, published in leading international journals
- harnesses expanded research capability to generate evidence and policy analysis to address the most critical issues identified by individuals, industry, government and community groups
- anticipates and responds constructively to rapid demographic transition in Australia and internationally

EFFECTIVELY ENGAGE WITH EXTERNAL STAKEHOLDERS AS AN INTEGRAL PART OF THE CENTRE'S RESEARCH ACTIVITY TO

- develop research goals and to share in project execution
- translate research to influence economic and social policy, business practice, and community understanding

BUILD NATIONAL RESEARCH CAPABILITY AND COLLABORATION BY

- creating new researcher cohorts devoted to ageing research and trained in cross-disciplinary skills
- developing the research leadership and end-user engagement skills of early and mid-career researchers
- taking a leadership role by connecting researchers in ageing throughout Australia, ensuring that benefits from CEPAR's inclusive culture are fully realised

ELEVATE CEPAR'S, AND BY EXTENSION AUSTRALIA'S, REPUTATION AS A GLOBAL LEADER IN POPULATION AGEING RESEARCH BY

- strategically partnering with world-class institutions leading innovative research in the field
- connecting with researchers and centres focused on population ageing throughout the world.

HIGHLIGHTS

UNSW CEPAR NODE AWARDED ALMOST \$1 MILLION IN UNSW BUSINESS SCHOOL STRATEGIC FUNDING FOR A PROJECT TITLED ‘ASIA’S AGEING DEMOGRAPHIC: SHAPING POLICY AND BUSINESS RESPONSE’

CEPAR WORKSHOP ON MATURE LABOUR FORCE PARTICIPATION HELD IN CANBERRA IN OCTOBER

DEPUTY DIRECTOR KAARIN ANSTEY RECRUITED TO UNSW AND NEUROSCIENCE RESEARCH AUSTRALIA TO LEAD A MULTIDISCIPLINARY TEAM ADDRESSING AGEING RESEARCH, WITH A FOCUS ON VITAL COMMUNITY LIFESTYLE SOLUTIONS AROUND DEMENTIA IN THE AUSTRALIAN COMMUNITY

DEPUTY DIRECTOR HAZEL BATEMAN ONE OF A TEAM OF RESEARCHERS AWARDED €250,000 BY THE NETWORK FOR STUDIES ON PENSIONS, AGING AND RETIREMENT FOR A PROJECT ON CHOICE ARCHITECTURE IN PENSIONS AND RETIREMENT COMMENCING 2018

CEPAR RESEARCHERS PART OF A MULTIDISCIPLINARY TEAM AWARDED MAJOR FUNDING FROM THE UK’S ECONOMIC AND SOCIAL RESEARCH COUNCIL FOR A PROJECT ON SUSTAINABLE CARE

CHIEF INVESTIGATOR PETER MCDONALD INVITED BY THE UNITED NATIONS POPULATION FUND TO EDIT THE 2018 EDITION OF THE UNFPA PUBLICATION, *STATE OF WORLD POPULATION*

CHIEF INVESTIGATOR MICHAEL KEANE AND ASSOCIATE INVESTIGATOR OLENA STAVRUNOVA AWARDED THE 2017 DENNIS AIGNER AWARD FOR THE BEST PAPER IN THE *JOURNAL OF ECONOMETRICS* OVER THE 2015-2016 PERIOD

ACTIVITY PLAN FOR 2018

In 2018 CEPAR will undertake a range of activities which aim to provide Australia, the greater Pacific region, and the world, with crucial new knowledge to inform social and economic responses to one of the most important challenges of the 21st century: population ageing. We will 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; engage with the community; and build research capacity and capability to ensure CEPAR's sustainability.

ENGAGEMENT AND OUTREACH

A number of events are planned in 2018 to stimulate discussion about the issue and raise community awareness; engage with industry, government and the global research community; and raise the profile of the Centre. These include:

- A workshop on population ageing and the Chinese economy to be held in June in Shanghai in collaboration with Fudan University and ShanghaiTech University;
- CEPAR participation in a population ageing panel as part of a UNSW summit to be held in Hong Kong in March;
- The third annual conference of the International Network for Pensions, Aging and Retirement Research to be co-organised by CEPAR in collaboration with Wharton, NetSPAR and Willis Towers Watson and hosted by the OECD in Paris in June;
- A CEPAR organised plenary panel as part of the 22nd International Congress on Insurance: Mathematics and Economics to be held at UNSW in July;
- A workshop on longevity and long-term care risks and products to be held in Sydney on 19 July;

- The annual Colloquium on Pensions and Retirement Research on 2-3 July which will have inequality, pensions and retirement as its theme;
- The fourth international conference of long-term care directors and administrators to be hosted by CEPAR in Sydney on 2-3 August, which will have as its theme 'Aged care and ageing: Global challenges and responses';
- A roundtable with the Commonwealth Department of Health on the topic of aged care in August;
- A policy dialogue focused on retirement incomes, to be hosted in collaboration with the Australian National University's Crawford School of Public Policy;
- A health policy workshop focused on model planning and data acquisition to be hosted by the University of Melbourne CEPAR node in the latter part of the year;
- The Summer Workshop on the Economics of Health and Ageing in November at UNSW;
- A research and policy roundtable on cognitive ageing and productivity in later life;
- CEPAR's fortnightly seminar series; and
- Public talks featuring CEPAR personnel and distinguished visitors, including presentations at UNSW by Partner Investigator James Nazroo on health and inequality and Associate Investigator and Fulbright Fellow Ross Anadel on cognition and employment.

CEPAR will also work closely with our stakeholders to identify particular areas of interest in 2018 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 research brief focused on mature workers in organisations will be developed in 2018 as well as two fact sheets, covering Aged Care and Cognition respectively.

Towards the end of the year we will contact appropriate teacher associations and training institutions with a view to training high school teachers in the use of the Regional Australia Database for Ageing Research (RADAR) in 2019.

NATIONAL AND INTERNATIONAL NETWORKS

CEPAR will continue to expand its international footprint in 2018, especially in the Asia-Pacific region. The Australia-China Population Ageing Research Hub will be instrumental in the development of further linkages between CEPAR and key institutions in China as well as connecting with national researchers focused on this area of research.

The award of a large grant from the UNSW Business School to support research on developing policy and business responses to Asia's ageing demographic and to build linkages in Asia will also bolster our profile and networks in the region.

CEPAR will also remain a very active member of the Association of Pacific Rim Universities (APRU) Population Ageing Hub, having played a leading role in its establishment.

Distinguished visitors expected in 2018 include Professors Mohammad Jalal Abbasi-Shavazi (Tehran), Ross Anadel (South Florida), Robert Holzmann (Malaya), Olivia S. Mitchell (Wharton), James Nazroo (Manchester), Annamaria Olivieri (Parma), Ermanno Pitacco (Trieste) and Gianpiero Dalla Zuana (Padua); Drs Kay Deckers and Sebastian Kohler (Maastricht), Lesley Ross (Pennsylvania State), and Susan Torres (Deakin).

ACTIVITY PLAN FOR 2018

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MENTORING

The suite of mentoring programs developed by CEPAR over the life of the first centre to engage early career researchers (ECRs), Higher Degree Research and undergraduate students will continue to be offered in 2018. A five-day workshop will be organised in the latter part of the year offering CEPAR and non-CEPAR affiliated personnel the opportunity to learn state-of-the-art techniques from an international leader in quantitative methods. The Stakeholder Engagement Program will equip researchers with the skills necessary to effectively engage with stakeholders and communicate social science research. The CEPAR Industry and Government Fellowship Scheme will provide career development opportunities for members of CEPAR and its Partner Organisations as well as strengthen collaborative links. An academic exchange program will offer ECRs the opportunity to spend extended periods of time at other nodes or CEPAR partner institutions to advance the research program, expand their collaborations with PIs or AIs and to build their research networks. Summer scholarships will be offered to undergraduate students to offer a taste of life in a research centre. And CEPAR will again support the Emerging Researchers in Ageing national conference.

RESEARCH

Research in 2018 will be advanced on a number of topics consistent with the four research streams identified in the CEPAR Strategic Plan. Specific activities include:

1 Macro-demographic dynamics and population ageing policy

Prepare a paper on major demographic trends and likely futures

Extend the Regional Australia Database for Ageing Research (RADAR) using 2016 census data

Construct optimal tax and pension policies for Australia that vary over time as the demographic structure of the population changes, taking into account the welfare of all generations, discounted into the future

Continue to build a global Demographic database with disaggregation for the countries included in the G-Cubed (Demographics) Model

Produce a research paper surveying the current state of large scale modelling of demographics in macroeconomic models

Develop the prototype model for the Global economy with the 'approximation' approach to OLG modelling in each of the major regions

Begin extending and consolidating the Australian NTA model for 2015-16 and begin analysing the data.

2 Decision making, expectations and cognitive ageing

Develop the survey instrument, undertake pilot testing, and conduct an online survey and face to face interviews of approximately 1600 participants. Clean data and commence preparation for the 60s cohort survey

Review literature to develop an interdisciplinary conceptual model of decision making and cognitive ageing

Explore data on housing, assets, cognition and financial literacy for use in the development of a new life-cycle model incorporating (i) investments in health and housing and (ii) cognitive limitations in decision making.

3 Organisations and the mature workforce

Develop and pilot the Mature Workers in Organisations (M-WOS) survey and its administrative platform

Identify participating organisations through multiple mechanisms (e.g., participation in relevant industry-oriented CEPAR events, running specific briefing sessions, etc.)

Develop and pilot the policy audit materials

Begin analysis of the World Values Survey and identify other relevant data sets that have the opportunity to investigate mature workers.

4 Sustainable wellbeing in later life

Analyse different approaches for incorporating systematic trends in mortality into multiple state models and linking models of heterogeneity with models of functional disability using Australian and/or US data

Design long-term care (LTC) insurance, project costs and assess impact of private LTC insurance on public expenditures in the Australian environment

Cost government expenditures and assess the impact of the design of private LTC insurance using Australian data to model functional disability incorporating systematic trends and uncertainty

Produce a country report (official life tables) for Australia for the IAA Mortality working group

Compare retirement income products with simulated cash flows based on financial (ESG) and actuarial models (cohort) for Australia

Develop models to predict individual life expectancy to quantify levels of health inequalities (including through the development of measures of health poverty)

Use statistical methods to decompose national health expenditure by disease using national data from New Zealand

Begin the development of a disease based health policy simulation model to make projections of long-term costs and outcomes that take account of secular trends in some disease (e.g. declines in cardiovascular disease and the rise of dementia)

Commence analysis of data from CHAMP, PATH and the Australian Longitudinal Study of Women's Health

Commence recruitment of participants from CHAMP and PATH for study of spousal interrelations

Document international pension policy profiles and relate these to the state of demographic transition in the relevant jurisdictions

Commence investigation of 'insurance in super' in the context of default stickiness and complementarity with mandatory superannuation participation

Commence work on the role of 'confusion audits' to enhance understanding of complex retirement products

Commence analysis of member level data to investigate interactions between mortgages, superannuation and life insurance.

PART 2
SECTION



GOVERNANCE
& STRUCTURE

GOVERNANCE

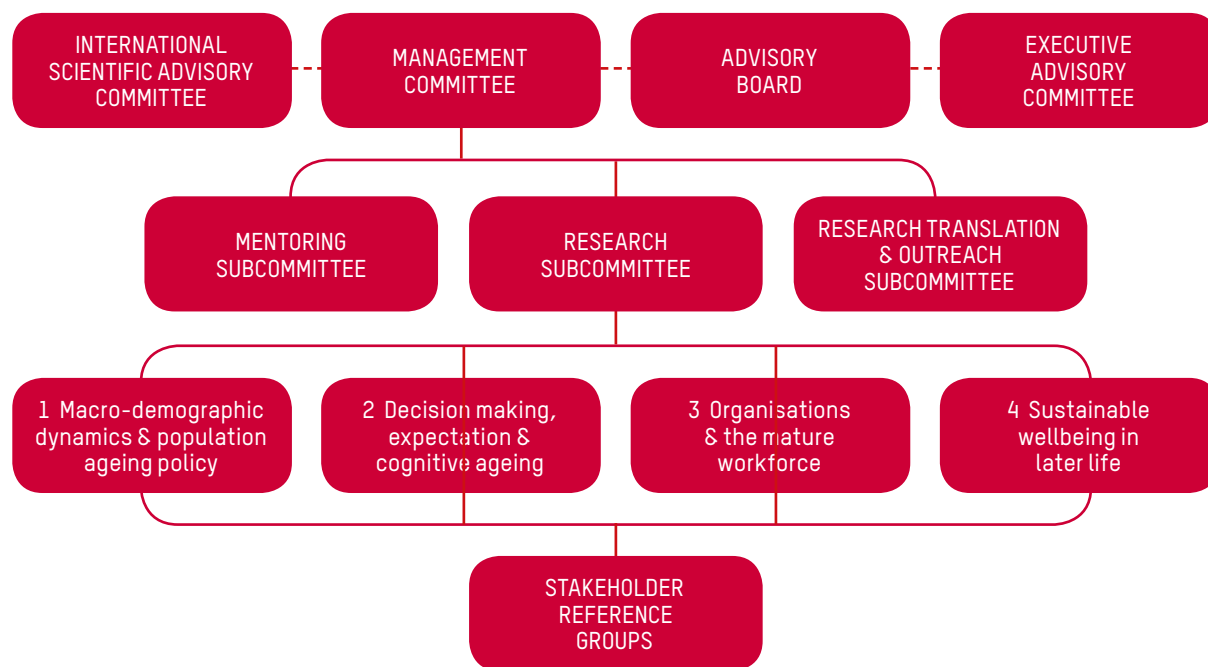
Our governance structure is designed to ensure the efficient operation of the Centre, maximise performance and support strategic planning.

At its core are the Management Committee and the Centre Management Team, which are responsible for the execution of Centre Activities.

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

with external perspectives on the formulation of research programs, their implementation, and the dissemination of research outcomes. In addition, Stakeholder Reference Groups (SRGs) facilitate stakeholder interaction and provide opportunities for end users to shape the direction of the Centre's research program and activities.

CEPAR ORGANISATIONAL CHART



INTERNATIONAL SCIENTIFIC ADVISORY COMMITTEE

The International Scientific Advisory Committee, comprising international leaders in the area of population ageing, will provide advice on the strategic direction of the Centre from a global perspective, with emphasis on research programs. This expands CEPAR's existing ISAC and provides a valuable opportunity for the CEPAR research program to be guided by researchers at the forefront of international developments. Drawn from a range of fields, reflecting the Centre's multidisciplinary nature, and with influential positions in academe and policy, members of the Committee will also identify and facilitate linkage opportunities as well as act as ambassadors for the Centre, actively building its global profile.

The International Scientific Advisory Committee comprises:

RICHARD BLUNDELL

Professor of Political Economy, University College London, and Director, ESRC Centre for the Microeconomic Analysis of Public Policy, Institute for Fiscal Studies

EILEEN CRIMMINS

Professor of Gerontology, University of Southern California, and Director, USC-UCLA Centre for Biodemography and Population Health

CAI FANG

Professor of Economics, and Deputy Director, Chinese Academy of Social Sciences

SARAH HARPER

Professor of Gerontology, Oxford, and Co-Director, Oxford Institute of Ageing

AYSE IMROHOROGLU

Professor of Finance and Business Economics, UCLA

DAVID LAIBSON

Professor of Economics, Harvard

RON LEE

Professor Emeritus of Economics and Demography, Berkeley

JAY OLSHANSKY

Professor of Gerontology, University of Illinois at Chicago

CAROL RYFF

Professor of Psychology, and Director of Institute on Aging, University of Wisconsin-Madison

YASUHIKO SAITO

Professor, Nihon University

MERRIL SILVERSTEIN

Marjorie Cantor Chair in Aging Studies, Syracuse University

JAMES P. SMITH

Distinguished Chair in Labor Markets and Demographic Studies, RAND Corporation

URSULA STAUDINGER

Director, Robert N Butler Columbia Aging Centre

MO WANG

Professor and Director of the Human Resource Research Centre, University of Florida

EXECUTIVE ADVISORY COMMITTEE

The Executive Advisory Committee will comprise CEOs of some of Australia's largest corporations, professional and community organisations and senior federal departmental secretaries. The committee will be established in 2018 to provide high level strategic insight to the Centre.

ADVISORY BOARD

The Advisory Board plays a critical role in supporting the realisation of the Centre's goals by providing an external perspective on the formulation of research programs, their implementation, and strategies for the translation of research findings to effectively influence economic and social policy, business practice, and community understanding. It facilitates two-way engagement between stakeholders and researchers and provides independent advice to the Management Committee with regard to strategy and external relations as well as new opportunities for engagement.

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.

During 2017 the Director and Chair met bilaterally with most Board members to brief them on the new research and engagement programs and the important role the Advisory Board plays in guiding the Centre's strategic direction. The first meeting of the Advisory Board will be held in 2018.

2017 ADVISORY BOARD MEMBERS

MARC DE CURE	Chair
MICHELLE BAXTER	Chief Executive Officer, Safe Work Australia
SEAN GREGORY	Chief Operating Officer, PricewaterhouseCoopers
DAVID GRUEN	Deputy Secretary, Economic, Department of the Prime Minister and Cabinet
NATALIE HORVAT	Executive Director, Economic Forecasting and Revenue Analysis, NSW Treasury
ROBERT JEREMENKO	Head, Retirement Income Policy Division, Commonwealth Treasury
MATTHEW LAWRENCE	Chief Executive Officer of MLC Super and Executive General Manager, NAB Wealth
JOANNE LOUNDES	Chief Economist, Department of Foreign Affairs and Trade
MARGOT MCCARTHY	Deputy Secretary, Ageing and Aged Care Group, Department of Health
PIP O'KEEFE	Lead Economist, Human Development, Asia Pacific, The World Bank
MIKE ORSZAG	Head of Global Research, Willis Towers Watson
THE HON DR KAY PATTERSON AO	Age Discrimination Commissioner, Australian Human Rights Commission
JOHN SIMON	Head, Economic Research, Reserve Bank of Australia
ANDREW WILSON	Group Executive – Healthcare and Strategy, Medibank
SERENA WILSON PSM	Deputy Secretary, Department of Social Services
IAN YATES AM	Chief Executive, Council on the Ageing

CEPAR REPRESENTATIVES ON THE ADVISORY BOARD

ANNE GORDON	Director of Operations
WARWICK MCKIBBIN	Director of Policy Engagement
JOHN PIGGOTT	Director
MICHAEL SHERRIS	Director of Industry Engagement

MANAGEMENT COMMITTEE

The Management Committee, together with the Centre Director, has overall responsibility for Centre performance and for ensuring that the Centre's activities are conducted in accordance with the Funding Agreement between UNSW and the ARC. In strategic planning, the Committee seeks high level advice from the Centre Advisory Board, International Scientific Advisory Committee and Executive Advisory Committee. Full descriptions of the role of the Management Committee and its subcommittees are set out on page 11.

In 2017, the Committee was chaired by Chief Investigator Alan Woodland and comprised:

JOHN PIGGOTT	Centre Director
KAARIN ANSTEY	Deputy Director, Chief Investigator and Australian National University Node Leader
HAZEL BATEMAN	Deputy Director, Chief Investigator and University of New South Wales Node Leader
PHILIP CLARKE	Chief Investigator and University of Melbourne Node Leader
ROBERT CUMMING	Chief Investigator and University of Sydney Node Leader
ANNE GORDON	Director of Operations
SHARON PARKER	Chief Investigator and University of Western Australia Node Leader

In 2017, the Committee met on 10 October. 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

Chaired by the Centre Director, the committee comprises all the Chief Investigators and the Director of Operations. In 2017, members of the research committee participated in a two-day Planning Workshop held on the 27th – 28th July which included discussions on the research program with particular emphasis on maximising interaction between the streams.

MENTORING SUBCOMMITTEE

The subcommittee comprises the two Directors of Mentoring, Sharon Parker and Marian Baird, the Centre Director, the Director of Operations, and ERA representative Matthew Carroll. In early 2018 Student, Early Career Researcher and Mid-career Researcher representatives will be selected to serve on the committee as well. The subcommittee met on 30 November 2017 and elected Marian Baird as the Committee Chair for 2018.

RESEARCH TRANSLATION AND OUTREACH SUBCOMMITTEE

The subcommittee, which met on 20 November 2017, comprises the Director of Policy Engagement, Warwick McKibbin, the Director of Industry Engagement, Michael Sherris, the Centre Director, the Director of Operations, the Senior Research Fellow – Research Translation, administrative personnel responsible for communications, events and stakeholder relationships, and a Chief Investigator. Michael Sherris was elected Committee Chair for 2018.

STAKEHOLDER REFERENCE GROUPS

The role of the Stakeholder Reference Groups (SRGs) is to facilitate stakeholder interaction with CEPAR researchers and promote research translation and knowledge transfer. SRGs also provide opportunities for end users to shape the direction of the Centre's research program and activities.

Each of the four Research Streams will have an SRG with membership comprising the Stream Leader (as Chair), the leaders of each of the Stream's projects (or their nominees), representatives of CEPAR's Partner Organisations plus additional members drawn from business, government and community circles as appropriate. Each stream's SRG may also form subgroups to focus on particular areas of research if needed.

Membership of each of the groups will be finalised in early 2018 and the inaugural meetings will take place in the first half of 2018.

CENTRE ADMINISTRATION AND OPERATION

Since its formal establishment on the 28th of September 2017, the new CEPAR has made significant inroads in the development of the organisational framework necessary to effectively administer and optimise the achievements of the Centre. Progress has been made in the six key domains prescribed by the Australian Research Council in the Funding Agreement:

STRATEGIC PLANNING

Central to the development of the Strategic Plan for the new Centre was a planning event which took place on 27-28 July 2017 involving the Chief Investigators, the Chair of our Advisory Board, senior CEPAR research fellows and key administrative personnel. We reviewed our objectives and vision for the Centre and discussed strategies for success to ensure we

position ourselves to make the most of our capabilities and the opportunities provided by our collaborating universities, partners and the Australian Research Council.

Ideas and strategies proposed at this event have been further discussed and refined at subsequent meetings of the Centre's Management Committee and the subcommittees for Research Translation and Outreach and Mentoring. A draft Strategic Plan for the new Centre is now being developed with the aim of presenting it to the Management Committee and Advisory Board in the first part of 2018 for feedback. Most importantly, the Strategic Plan will be a living document, augmented and revised as new opportunities emerge, thus providing a roadmap and a structure that will assist CEPAR to continue to strive for excellence in population ageing research and enable it to achieve its full potential.

EQUITY AND DIVERSITY PLANNING

CEPAR is committed to equity and diversity in the workplace and has developed an Equity Plan outlining how CEPAR supports these concepts in practice.

The document *Equity and Diversity at CEPAR: Principles, Policy and Practice* positions CEPAR as an equal opportunity employer committed to the principles of cultural diversity, disability inclusion, gender equality, and LGBTIQ inclusion. It is supported by workplace and diversity policies, as well as codes of conduct, in place at each of its collaborating universities.

In addition, it sets out CEPAR-specific policies and practices designed to engender a culture of equity and diversity, and which further support equity and diversity within the centre. These position the Centre as a flexible and family-friendly work environment. The document was approved by the Management Committee in November. It has been circulated to all CEPAR personnel and will be included in induction packs.

DISCRETIONARY FUNDING

CEPAR has set aside discretionary funds to support a number of schemes, including a Distinguished Visitors Program, an International Conference Travel Scheme for HDR students, and an HDR and ECR Travel Grant Scheme to support extended visits to other nodes and affiliated institutions for the purpose of research collaboration.

CENTRE COHESION

Strategies to support the cohesion of the Centre, across nodes and disciplines, are embedded in everything we do. Our governance framework and Centre structure are designed to ensure that personnel from all five nodes participate in the decision making of the Centre; that our partners have an opportunity to shape the direction of our research program and activities through membership of the Advisory Board and Stakeholder Reference Groups; and that our researchers regularly come together to discuss and plan research across nodes and disciplines, both informally through regular visits and formally at our Research Stream meetings and annual workshops.

Importantly, each of the nodes has a designated Node Leader who serves on the Centre Management Committee, and our Leadership team includes key positions based at the Australian National University (Director of Policy Engagement), the University of Western Australia (Director of Mentoring – Mid-Career Researchers), the University of Sydney (Director of Mentoring – Emerging Researchers) and UNSW (Director and Deputy Directors, Director of Industry Engagement). Our Stream Leaders are based at the University of Melbourne, the University of Western Australia and UNSW.

MENTORING AND PROFESSIONAL DEVELOPMENT

The Centre has developed a suite of programs designed to achieve our objective of creating new researcher cohorts devoted to ageing research, trained in cross-disciplinary skills, with the ability to engage with and respond to the needs of end users. The programs, which are tailored to students, postdoctoral researchers and mid-career researchers, are outlined in the Research Training and Mentoring Section on pages 155-156.

RESEARCH TRANSLATION, COMMUNICATIONS, EDUCATION AND OUTREACH

A draft Research Translation, Communications, Education and Outreach Plan, outlining a range of initiatives designed to translate our research, enhance the Centre's profile and address stakeholder needs, has been developed and endorsed by the Research Translation and Outreach Subcommittee. Key to its development were discussions at the CEPAR Planning Workshop held on 27-28 July 2017, and feedback from end users during individual meetings between CEPAR and industry and government partner organisations.

The Plan will be included in the CEPAR Strategic Plan. In addition, a list of initiatives in this portfolio will be developed each year and included as an appendix to the Strategic Plan.

NODES

The UNSW node, led by Professor Hazel Bateman, is hosted by the UNSW Business School.

The ANU node was based in the Centre for Research on Ageing, Health and Wellbeing in 2017 with Professor Kaarin Anstey serving as ANU Node Leader. From 2018, the node moves to the Crawford School of Public Policy under the leadership of Professor Warwick McKibbin.

Professor Philip Clarke leads the node at The University of Melbourne, based in the School of Population and Global Health.

The University of Sydney node consists of teams in the School of Public Health and the Business School. Professor Robert Cumming leads the University of Sydney node.

Professor Sharon Parker leads the University of Western Australia node based in the Centre for Transformative Work Design.

All 12 Chief Investigators (CIs) and many of the Centre’s Associate Investigators (AIs) are based at one of the five nodes. Within Australia, Associate Investigators are also based at the University of Newcastle, the University of South Australia and the University of Technology Sydney.

PROGRAMS

The research program is organised into four interconnected streams:

Macro-demographic Dynamics and Population Ageing Policy

Decision Making, Expectations and Cognitive Ageing

Organisations and the Mature Workforce

Sustainable Wellbeing in Later Life

INTERNATIONAL UNIVERSITY PARTNERS

Our Partner Investigators are drawn from three world-class research organisations:

The University of Manchester

The Wharton School

The University of Pennsylvania

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

London School of Economics

National Institute of Public Finance and Policy, New Delhi

NetSPAR

Portland State University

Ragnar Frisch Centre for Economic Research

University of Exeter

University of Kent

University of Leipzig

University of Oxford

University of Parma

University of Southern Florida

Universität St. Gallen

University of Trieste

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:

Australian Human Rights Commission

Department of Foreign Affairs and Trade

Department of Health

Department of Social Services

Medibank

NAB

NSW Treasury

PricewaterhouseCoopers

Reserve Bank of Australia

Safe Work Australia

The Treasury

The World Bank

Willis Towers Watson

In addition, the Centre is supported by Research Attraction and Acceleration Program (RAAP) funding from the NSW Department of Industry.

CENTRE PERSONNEL

CHIEF INVESTIGATORS



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.

His national policy experience includes membership of both the Henry Tax Review Panel (2008-2009) and the Australian Ministerial Superannuation Advisory Committee (2007-2011). 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 ongoing appointment, and from 2008-2010 was Visiting Scholar with the Department of Insurance and Risk Management, Wharton School of Business, University of Pennsylvania.



PROFESSOR KAARIN J. ANSTEY

BA (Hons) Syd., PhD Qld., FASSA
DEPUTY DIRECTOR

Kaarin Anstey was 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 until the end of 2017. In January 2018 she took up a joint Professorial appointment across UNSW and Neuroscience Research Australia (NeuRA).

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 which has followed over 7000 participants for more than 16 years. Kaarin has also developed a model of driving safety and conducts research to improve older driver skills. Kaarin is a member of the Expert Advisory Panel of the NHMRC National Institute for Dementia Research, a Director of the Board of the Dementia Australia Research Foundation, 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.



PROFESSOR HAZEL BATEMAN

BEC (Hons) Qld., PhD UNSW, GAICD
DEPUTY DIRECTOR AND UNSW NODE LEADER

Hazel Bateman is a Professor of Economics in the UNSW School of Risk and Actuarial Studies.

Hazel researches consumer financial decision making especially as it relates to retirement accumulation and decumulation. In particular, her work focuses on interventions to facilitate better financial decisions including: choice architecture, information architecture, financial literacy and financial advice; and the taxation and regulation of superannuation funds.

She is the author of over 70 peer-reviewed publications and book chapters and chief investigator on over a dozen ARC funded projects.

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 is a member of the NetSPAR Scientific Council, the Steering Committee of the Melbourne Mercer Global Pension Index and the UniSuper Consultative Committee. She is an editor of the *Journal of Pension Economics and Finance*.

**PROFESSOR MARIAN BAIRD AO**

BEc (Hons) DipEd PhD Sydney, FASSA

DIRECTOR OF MENTORING (EMERGING RESEARCHERS)

Marian Baird is Professor of Gender and Employment Relations, Head of the Discipline of Work and Organisational Studies and Co-Director of the Women, Work and Leadership Research Group in the University of Sydney Business School.

Marian was awarded an A0 in 2016 for outstanding services to improving the quality of women's working lives and for contributions to tertiary education. She is one of Australia's leading researchers in the fields of women, work and family. She has had numerous Australian government grants to study gender equitable organisational change and work and family. Marian has contributed to a number of government advisory boards and reference groups relating to parental leave, discrimination and gender equity in the workplace. In 2014 Marian led the review of women and leadership in the NSW Public Sector. In 2016 Marian led a study to improve access for women to non-traditional careers in Sydney Water and in 2017 she worked with a team of University of Sydney researchers on the Australian Women's Work Futures Study. In 2017 Marian and colleagues from Sydney University edited a ground-breaking book: *Women, Work and Care in the Asia Pacific*.

**PROFESSOR PHILIP CLARKE**

BEc N'cle (Aust), MEc Syd., PhD ANU

UNIVERSITY OF MELBOURNE NODE LEADER

Philip Clarke is the Director of the Centre for Health Policy and Chair in Health Economics at the Melbourne School of Population and Global Health at the University of Melbourne.

Previously, he was an Associate Professor at the Sydney School of Public Health and spent six years at the University of Oxford focused on the economic analysis of the United Kingdom Prospective Diabetes Study.

He has contributed to health economic policy debates in Australia, particularly around the pricing of generic pharmaceuticals and more recently the need for better statistics on outcomes and cost in the Australian system.

His health economic research interests include developing methods to value the benefits of improving access to health care, health inequalities and the use of simulation models in health economic evaluation. He has also undertaken policy relevant research for the World Bank, OECD, AusAID and the Department of Health.

He has over 80 peer-reviewed publications and has recently contributed to books on cost-effectiveness analysis and cost-benefit analysis published by Oxford University Press.

**PROFESSOR ROBERT CUMMING**

MBBS UNSW, MPH PhD Syd.

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 a member of the Australian Institute of Health and Welfare's National Arthritis and Musculoskeletal Conditions Monitoring Advisory Group and serves on the editorial boards of the *International Journal of Epidemiology* and *Osteoporosis International*. He is a Life Member of the Australasian Epidemiological Association. He was named a 2016 Highly Cited Researcher by Clarivate Analytics, one of just 115 Australian researchers across all academic disciplines to receive this award.



PROFESSOR MICHAEL KEANE

BS MIT, MA PhD Brown, FES, FASSA

Michael Keane is an Australian Laureate Fellow and Professor of Economics in the UNSW Business School. He is also a Plus Alliance Professor at King's College London.

Several independent sources have placed Michael Keane among the top 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 a Fellow of the Econometric Society in 2005 and won the Kenneth Arrow Award in 2008, as well as being named an Australian Federation Fellow in 2005 and Australian Laureate Fellow in 2011. He is an Associate Editor of the *Journal of Econometrics* and *Quantitative Marketing and Economics*.



PROFESSOR PETER McDONALD AM

BCom UNSW, PhD ANU, FASSA

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.



PROFESSOR WARWICK MCKIBBIN AO

BCom (Hons) UNSW, AM
PhD Harvard University, FASSA
DIRECTOR OF POLICY ENGAGEMENT

Warwick McKibbin is a Vice Chancellor's Chair in Public Policy and is Director of the Centre for Applied Macroeconomic Analysis in the Crawford School of Public Policy at the Australian National University. He is also a non-resident Senior Fellow at the Brookings Institution in Washington D.C.

He is internationally renowned for his contributions to global economic modelling and the theory of monetary policy and has published more than 200 peer-reviewed academic papers and five books as well as being a regular commentator in the popular press. He has a wide range of policy experience. He has been a member of the Board of the Reserve Bank of Australia (2001-2011); the Prime Minister's Science, Engineering and Innovation Council (2005-2008); and the Advisory Board of the Prime Minister's Taskforce into Housing Affordability (2002-2003).

He regularly advises international institutions, central banks, governments and corporations across a range of developed and emerging economies.

Warwick serves on the Editorial/Advisory Boards of *China & World Economy*, *Japan and the World Economy*, and *Asian Economic Papers*.



PROFESSOR SHARON K. PARKER

BSc (Hons) UWA, PhD Sheffield, FASSA
UWA NODE LEADER AND DIRECTOR OF MENTORING
(MID-CAREER RESEARCHERS)

Sharon K. Parker is an ARC Laureate Fellow and a Professor of Organisational Behaviour at the UWA Business School, University of Western Australia.

Sharon's research focuses particularly on job and work design, and she is also interested in employee performance and development. She is the Director of the Centre for Transformative Work Design. She has attracted competitive research funding worth over \$40,000,000, has published more than 90 internationally refereed articles, and is the author of a SAGE book on work design and a recent Routledge book on proactive behaviour.

Sharon is a recipient of the ARC's Kathleen Fitzpatrick Award and the Academy of Management OB Division Mentoring Award and is a Fellow of the Society for Industrial and Organisational Psychology. She also helped to develop the Good Work Design principles now used by Safe Work Australia and Comcare to foster the improved quality of work within Australian organisations.

Sharon is an Associate Editor for *Academy of Management Annals*, a past Associate Editor of the *Journal of Applied Psychology*, and has served on numerous editorial boards.



PROFESSOR MICHAEL SHERRIS

BA Macq., MBA Syd., FIA, FIAA, FSA
DIRECTOR OF INDUSTRY ENGAGEMENT

Michael Sherris is Professor of Actuarial Studies in the UNSW Business School. His research sits at the intersection of actuarial science and financial economics. 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*, *North American Actuarial Journal* and *Geneva Papers on Risk and Insurance*. He is on the editorial board of the *Annals of Actuarial Science* and is a co-editor of the *North American Actuarial Journal*.

Prior to becoming an academic he worked in the banking and finance industry. 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 is Chair of the AFIR-ERM Section of the International Actuarial Association. He was named Australian Actuary of the Year 2007 in recognition of his contributions to actuarial research and education both internationally and within Australia.



SCIENTIA PROFESSOR ALAN WOODLAND

BA PhD UNE, FASSA, FES

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*, *Journal of International Economics* and the *Journal of Economic Dynamics and Control*.

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.

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Dr Wenqiang (Adam) Shao

MILLIMAN

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RESEARCH STAFF

CEPAR is in the process of finalising recruitment for a number of research fellowship and assistant positions to commence in 2018.

In 2017, the following researchers were employed by CEPAR CE17:

Dr Larry Liu
RESEARCH FELLOW
Crawford School of Public Policy
AUSTRALIAN NATIONAL UNIVERSITY

Jay Stiles
RESEARCH ASSISTANT
Centre for Health Policy
UNIVERSITY OF MELBOURNE

PROFESSIONAL STAFF

Anne Gordon
Director of Operations
UNSW SYDNEY NODE

Amy Brushwood
Administrative Officer
UNSW SYDNEY NODE
(ON PARENTAL LEAVE)

Caitlin Currie
Administrative Support
AUSTRALIAN NATIONAL UNIVERSITY NODE

Helen Flint
Administrative Assistant
UNSW SYDNEY NODE

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

Colleen Faes-Scott
Management Accountant
UNSW SYDNEY NODE

Tracey Mayhew
Centre Manager
UNIVERSITY OF MELBOURNE NODE

Annabella McHugh
Administrative Officer
UNSW SYDNEY NODE

Nesha Nanu
Business Manager
UNIVERSITY OF MELBOURNE NODE

PART 2

SECTION

2

RESEARCH &
RESEARCH TRAINING

RESEARCH STREAM 1 MACRO-DEMOGRAPHIC DYNAMICS AND POPULATION AGEING POLICY

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STREAM LEADER: PETER MCDONALD

This stream brings together a multidisciplinary team comprising expertise in demography, economics and actuarial studies to develop a suite of models that will combine to place Australia at the forefront of macro-demographic modelling globally. Together they will generate greatly improved understanding of (i) the evolution of Australia's demography (ii) the optimal policy settings required to support an ageing demographic (iii) demographic changes in the region and its impact on Australia, and (iv) how transfers between generations will change as populations age.

The stream comprises four projects, three of which will commence in 2018 following the completion of current CEPAR work. Recruitment has been finalised for research positions connected to these three projects, enabling work to commence in January. Work has commenced on Project 1.3 and details about progress are included in the project overview below.

1.1 / DEMOGRAPHIC PROJECTION MODELS

CORE TEAM

PETER MCDONALD
JEROMEY TEMPLE
MEIMANAT HOSSEINI-CHAVOSHI
SAFI NAVAB SAFAVI

Associate Investigators

BOB GREGORY
IWU UTOMO
ZHONGWEI ZHAO

Led by McDonald, this project, to commence in 2018, will measure and estimate future demographic changes arising from the ageing of the population in Australia, taking migration into account. This work will underpin research in Streams 3 and 4, on mature labour force

participation, mortality and morbidity risk, macro health outcome simulations, successful ageing, and retirement policy issues, and inform Australian-based Partner Organisations in their short-term budget and policy planning. It will:

- Project future population trends in Australia in aggregate and also according to demographic differentials such as gender, ethnicity, and Indigenous status
- Analyse and interpret demographic trends in other countries especially in Asia
- Extend the Regional Australia Database for Ageing Research (RADAR) using 2016 Census data.

1.2 / DEMOGRAPHIC CHANGE AND OPTIMAL POLICY

CORE TEAM

ALAN WOODLAND
GEORGE KUDRNA
MICHAEL KEANE
MICHAEL SHERRIS

Associate Investigator

CHUNG TRAN

Scheduled to commence in 2018 under the leadership of Woodland, this project will construct optimal policy profiles for the first time for Australia by using an overlapping generations (OLG) model, which best captures the demographic change and policy impacts on both current and future generations' wellbeing. It will break new ground globally by (i) integrating optimal policy solutions with population dynamics, productivity and technology, and (ii) analysing interactions between stochastic demographic projections and the representation of ageing in economic models.

OLG models comprise a large number of mathematical equations describing the behaviour of households, firms and government in labour, capital and product markets over time.

Parameters of these models are obtained by calibrating a baseline solution to data from the economy (for example, the Australian National Accounts and the Household Income and Labour Dynamics (HILDA) survey), and from Project 4.1 and Project 4.4. Solutions require dynamic programming and systems of nonlinear equation algorithms. A large scale OLG model of the Australian economy will be built to compute the optimal tax and pension policy trajectories, capturing demographic dynamics and wellbeing of both current and future generations. It will provide new ways to evaluate policy recommendations. We will approach it both theoretically and by using dynamic OLG models embedded in a dynamic optimisation problem.

The modelling framework will be used to determine the nature of the link between productivity, technology, and demography theoretically and empirically. This linkage has not been comprehensively investigated; it has important implications for long term macro model specification. We will construct theoretical and calibrated OLG models that incorporate education choice and endogenous technical change to explore how population ageing affects the skill mix and how this affects technical change, which then impacts the welfare of current and future generations.

1.3 / REGIONAL MACRO MODELLING

CORE TEAM

WARWICK MCKIBBIN
LARRY LIU
PETER MCDONALD
JOHN PIGGOTT
HANMING FANG

Associate Investigators

SHIKO MARUYAMA
IWU UTOMO
SHANG WU
ZHONGWEI ZHAO

To capture the complex trade and financial interdependencies within the region and adjustments over time, McKibbin and his team have commenced work on the development of the G-Cubed multi-country model to incorporate demographic factors. This research will inform Australia's responses to long term structural change as well as business cycle fluctuations driven by the demographics of Australia's trading partners. One PhD student has commenced working on the project, both on his dissertation, and as a research assistant. A second student began providing research assistance on the collection of demographic data. A third PhD student will commence in 2018.

The research will explore the impacts of changing demographics on labour supply, consumption and savings and the implications for the fiscal accounts of government. It will also incorporate changing consumption patterns across six critical sectors of production over time as a result of demographic change. The introduction of country specific demographic factors into the existing model will then directly affect the economy wide responses of investment, trade, capital flows and asset markets in general equilibrium.

In 2017, much of the research time was spent reading papers on the current state of the art in macroeconomic modelling on demographic change. This will develop into a survey paper to be produced during 2018. There was also an investment in constructing a global database based on major demographic variables for incorporating into the development of the model equations during 2018.

Data has been collected for a wide range of countries but will eventually be aggregated for: the United States; Europe; Australia; Rest of Advanced Economies; Japan; Korea; China; India; Indonesia; Other Asia; and Rest of World. The focus will be on Australia and the six Asian Economies. Within each region, production and consumption has been disaggregated into six sectors: energy, mining, agriculture, durable goods, non-durable goods, and services.

Complementing this research will be detailed analysis of ageing policy in the Asia-Pacific region, and specific Asian economies, to be undertaken by McDonald, Piggott, and Fang commencing in 2018.

1.4 / THE NATIONAL TRANSFER ACCOUNTS (NTA)

CORE TEAM

PETER MCDONALD
JEROMEY TEMPLE

This research, to commence in 2018, will be at the forefront of developments to extend NTA coverage to estimate time transfers between generations, enhancing current methodology to standardise estimates analogous to the NTA standardisation with National Accounts aggregates. It will extend and consolidate the Australian NTA model for 2015-16 and later years, and, in cooperation with the international NTA project, develop the NTA methodology in ways that enhance its contribution to the policy

process. For example, the NTA will be extended to examine how transfer mechanisms to meet deficits at young and old ages change with demographic shift, informing policy determination and generating new insights into both intra and inter-generational inequality, and their interaction.

The team will conduct time-transfer analysis enabling gender-specific analyses, drawing on the Australian Bureau of Statistics Time Use Surveys. This provides the databases essential for examining how time transfers, appropriately normalised to national aggregates, reinforce or offset monetised intergenerational transfers, and how both transfer types have evolved over a significant timespan, when mature labour force participation in Australia has been steadily increasing. Time transfer analysis permits gender-specific NTA analysis to be meaningfully performed. The work will deliver major insights for policymakers in long term strategic planning and policy development.

RESEARCH STREAM 2 DECISION MAKING, EXPECTATIONS AND COGNITIVE AGEING

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STREAM CO-LEADERS: KAARIN ANSTEY AND MICHAEL KEANE

This stream brings together for the first time the disparate areas of behavioural economics, neuroscience, and developmental and health psychology, to unify our understanding of life course choices and to transform policy perspectives.

Over the seven years it will examine the correlates and characteristics of individuals' decision making over the life course, emphasising the impact of age and cognition on decision making and consumer choice; and reveal how decision making is shaped by age-related changes in cognition, affect, values and goals as well as expectations about ageing. It will deliver a unifying model of life-cycle, or life course, decision making, which explicitly recognises limits to rational choice.

This stream seeks to enhance the wellbeing of people in old age by undertaking research which aims to fully capture the psychological and social factors that influence choice over the life course. These include decisions about: (i) savings, retirement, home ownership, insurance, (ii) planning for the future in terms of active ageing and aged care, and (iii) choices about health behaviour and management of chronic conditions.

The stream comprises four projects as outlined below. In 2018, Project 2.1 will commence following the completion of a planning phase in 2017 and preliminary work will commence on Project 2.2. Project 2.3 is expected to commence in 2019. 2.4 will commence in 2018, following the recruitment of a research fellow.

2.1 / INDIVIDUAL DIFFERENCES IN FINANCIAL AND HEALTH DECISION MAKING: IMPACTS ON PRODUCTIVE AGEING

CORE TEAM

KAARIN ANSTEY
HAZEL BATEMAN
MICHAEL KEANE
PLUS RESEARCH FELLOW TO BE APPOINTED

Associate Investigators

RICHARD BURNS
NICOLAS CHERBUIN
LINDA CLARE
ERIK HERNÆS
FEDOR ISKHAKOV
KIM KIELY
BEN NEWELL
RUTH PETERS
FEDERICA TEPPA
SUSAN THORP

This large multidisciplinary observational study, scheduled to commence in 2018 and continue through 2019, will use existing cohorts. Utilising longitudinal data is optimal for studying intra-individual and inter-individual differences in ageing, enabling examination of trajectories of key psychological, health, social, and demographic characteristics as well as concurrent decision-making behaviour. Led by Kaarin Anstey, the survey will be developed in consultation with a range of CIs and collaborators to underpin research in Streams 2, 3 and 4.

Two population-based cohorts (aged 57-61 (n=1600) and 78-82 (n=1400)) from the Personality and Total Health (PATH) Through Life Study, for which Anstey is a Principal Investigator, will form the survey sample. New items will measure the key domains of the project. Data collection will involve a combination of face-to-face assessments, online and telephone surveys.

The assessment will include six domains: Demographic (age, sex, education, socioeconomic status, ethnicity, religion, dependents); Psychological and social health (personality, mood and anxiety, loneliness, expectations of ageing, social networks and support); Health (medical conditions, chronic disease risk factors); Decision making (frequency of complex decisions and decisional conflict, housing, health and financial literacy); Cognition (processing speed, memory, attention and language, as well as impulsivity, risk taking, executive function and emotion recognition); and Work (job design, quality, stress, retirement decisions).

Structural equation modelling analysis will inform the development of a comprehensive model of ageing and decision making. Key theories and constructs will be evaluated. Latent class models will identify typologies of 'decision makers'.

2.2 / IDENTIFYING INDIVIDUAL AND SOCIAL INFLUENCES ON DECISION MAKING AT OLDER AGES

CORE TEAM

KAARIN ANSTEY
MICHAEL KEANE
HAZEL BATEMAN
PLUS RESEARCH FELLOW TO BE APPOINTED

Associate Investigators

HEATHER BOOTH
NICOLAS CHERBUIN
LINDA CLARE
LORETTI I. DOBRESCU
ERIK HERNÆS
KIM KIELY
JORDAN LOUVIERE
BEN NEWELL
RUTH PETERS
FEDERICA TEPPA
SUSAN THORP

This project will develop new, more comprehensive paradigms and predictive models of decision making in ageing. It will identify areas where training, guidelines and interventions can improve outcomes, and directly inform Project 4.6.

Decision making has traditionally been viewed as a cognitive ability, dependent on executive functions, but Han et al⁴ found a large discrepancy between cognition and decision making in older adults. Factors in addition to cognition are needed to explain decision making in older adults, including perceptions of trust, risk aversion, personal goals and values, expectations about ageing, affect, motivation and wisdom. Led by Anstey in collaboration with CIs Keane and Bateman and Associate Investigator Linda Clare, this project will explore these factors and their influence on decision making in a systematic manner.

2.3 / EXPECTATIONS AND THE AGEING EXPERIENCE

CORE TEAM

KAARIN ANSTEY
PLUS RESEARCH FELLOW TO BE APPOINTED

This project, led by Anstey, and scheduled to commence in 2019, will explore how age-stereotypes and expectations about ageing influence longevity and physical/mental health, using data from project 2.1.

2.4 / RATIONAL CHOICE THEORY AND CONSUMERS

CORE TEAM

MICHAEL KEANE
HANMING FANG
PLUS RESEARCH FELLOW TO BE APPOINTED

Associate Investigators

DENISE DOIRON
FEDOR ISKHAKOV
SHIKO MARIYAMA
OLENA STAVRUNOVA

This project, to commence in 2018, will develop new life-cycle models that will incorporate: (i) investments in health and housing and (ii) cognitive limitations in decision making for the first time. It builds directly on previous CEPAR work by Keane in which he developed the first life-cycle model to incorporate human capital, labour supply, saving, retirement decisions and progressive taxation simultaneously.

As health and housing are major life-cycle decisions that impact later life wellbeing and financial security, it is important to build them into the life-cycle model as well. There is considerable evidence that complex life-cycle decisions depart from optimal behaviour due to several cognitive factors: the difficulty of assessing contingencies under uncertainty, limitations of knowledge, decision biases, misperceptions, information costs, and presentation. This project will advance the standard framework to account for these complexities, explicitly incorporating insights from Projects 2.2 and 2.3.

This project will develop new types of choice models that extend rational choice theory to allow for the possibility that consumers do not fully understand the attributes of the products they are choosing from. The models

will incorporate non-traditional variables like cognitive ability and education into the choice process.

It will develop choice models where there are two sources of error, unobserved taste heterogeneity and genuine randomness arising from confusion. Individual differences in the complexity with which consumers make choices will be incorporated. The model incorporates key factors like misperceptions and confusion, ignored by conventional models. It will capture the processes by which people make complex choices in a more realistic way, enabling better prediction of how government policy impacts individuals' wellbeing.

⁴ Han, S., Boyle, P., James, B., Yu, L., Barnes, L. and Bennett, D. (2015). Discrepancies Between Cognition and Decision Making in Older Adults. *Ageing Clinical and Experimental Research*, Available online 21 May 2015.

RESEARCH STREAM 3 ORGANISATIONS AND THE MATURE WORKFORCE

STREAM LEADER: SHARON PARKER

This stream will undertake research to identify work designs and other organisational practices to attract and retain mature workers in organisations, thus enhancing their performance and improving growth and productivity. It will be at the vanguard of new research focused on the impact of various work designs on worker wellbeing at older ages, especially cognitive capital. It will investigate barriers to mature workforce participation, especially age discrimination and the accommodation of caring responsibilities, to inform workplace policy and practice.

The stream comprises four projects. Recruitment for research positions connected to these projects is close to complete and we are in the process of identifying organisations suitable for the surveys and case studies described below.

3.1 / MATURE WORKERS IN ORGANISATIONS SURVEY (M-WOS)

CORE TEAM

SHARON PARKER
MARIAN BAIRD
DANIELA ANDREI (COMMENCING MARCH 2018)
ANDREEA CONSTANTIN (COMMENCING APRIL 2018)
GIGI PETERY (COMMENCING MAY 2018)

Associate Investigators

ALEXANDRA HERON
DONALD TRUXILLO
HANNES ZACHER
PLUS OTHERS TO BE ADVISED

This longitudinal multi-level study including at least 15 organisations, of varying profile, encompassing at least 2000 older workers, will underpin Stream 3. Most existing longitudinal research on ageing is cohort-based, focusing on individuals within households, whereas this

organisation-based approach to studying mature workers is unique in allowing an examination of organisational processes and workplace interventions, at the same time as assessing individual processes. M-WOS has two elements:

- 1 A longitudinal survey of individuals across the organisations, led by Parker, which will survey all individuals over the age of 50 years biennially commencing in 2018/2019 (the survey will be staggered by organisation with some starting in 2018 and the others in 2019). Matched younger peers will be surveyed on similar measures to provide a point of comparison. Supervisors will assess the performance of mature workers and their peers; and partners/spouses of the mature workers will (where applicable) provide additional reports to triangulate the data. The longitudinal design of the study enables the assessment of causality (crucial for Project 3.2) as well as capturing the effects of any naturally-occurring changes occurring within the workplace (such as the introduction of new technology and/or new policies) or interventions (Project 3.3).
- 2 A detailed case study and policy audit within each organisation/business unit, led by Baird, which will be carried out to determine the evolution of organisation practice, a key input to Projects 3.3 and 3.4. This will involve a policy audit, using documentary analysis, audits of HR practices, and focused interviews with key informants at two points in time of each of the fifteen organisations to determine first, baseline policy data and second, change in policies.

3.2 / PROMOTING SUCCESSFUL AGEING IN THE WORKPLACE

CORE TEAM

SHARON PARKER
KAARIN ANSTEY
DANIELA ANDREI (COMMENCING MARCH 2018)
GIGI PETERY (COMMENCING MAY 2018)
PLUS RESEARCH FELLOW TO BE APPOINTED

Associate Investigators

RICHARD BURNS
PATRICK DUNLOP
DONALD TRUXILLO
CHIA-HUEI WU
HANNES ZACHER

This project will investigate how work factors, in combination with individual differences, promote or inhibit successful ageing. Some individuals age more successfully than others. That is, compared to average intra-individual trajectories of change, those who age successfully maintain or improve their wellbeing over time relative to the average downward trend, experience a lower probability of disease, and maintain physical and cognitive functioning until older ages. Parker and colleagues will identify what types of work designs (including flexible hours arrangements) and organisational supports promote healthy work for older people. Parker and Anstey will further investigate how cognitive, social, and psychological functioning is preserved or maintained through good work. The idea that work can be designed to facilitate such outcomes is part of an emerging, innovative perspective that mental and psychological capital can be enhanced across the lifespan, which links this research to that in Stream 2.

The research will include rigorous evaluations of work-based interventions designed to enhance successful ageing at work, taking into account individual attributes and gender.

In addition to drawing on the individual-level analysis from Project 3.1, this project will also capitalise on existing longitudinal cohort-studies that model individual-level change, particularly the PATH Through Life project (See Stream 2). Crucially, PATH Through Life has longitudinally assessed, over an extended number of years, key aspects of individuals' work, as well as indicators of their successful ageing, such as cognitive functioning and general psychological functioning. It thus provides an exceptional opportunity to investigate whether and how work causally affects successful ageing over the lifespan. Other Australian cohort-based longitudinal studies will also be drawn on where feasible.

3.3 / PROMOTING SUCCESSFUL TEAMS AND ORGANISATIONS

CORE TEAM

SHARON PARKER
 MARIAN BAIRD
 DANIELA ANDREI (COMMENCING MARCH 2018)
 ANDREEA CONSTANTIN (COMMENCING APRIL 2018)
 GIGI PETERY (COMMENCING MAY 2018)

Associate Investigators

DONALD TRUXILLO
 CHIA-HUEI WU
 HANNES ZACHER

This project will provide a rigorous evidence base to enable organisations to facilitate mature workforce participation through work design innovation and the removal of organisational barriers. Whereas Project 3.2 focuses on how work design shapes individual outcomes of mature workers, such as their health and functioning, this project concentrates on how optimal work designs and organisational practices attract mature workers into employment, and then motivate and support their full engagement in work, leading to enhanced organisational productivity.

We will focus on how - through the design of high quality work - the performance of older mature workers can be maintained and enhanced, thereby increasing the productivity and innovation of teams and organisations. Our research will take into account novel intersections between organisational psychology and lifespan developmental theory. Productive work design will accommodate these changes. Supervisory behaviours that support mature workers, such as effective task allocation and the fostering of a positive age diversity climate, are further crucial workplace innovations for increasing performance and reducing turnover in contemporary organisations.

Work will also be undertaken by Baird and Parker to understand the channels of age discrimination within the workplace and to inform anti-discrimination policy.

Data from Project 3.1, especially on team-level and organisational-level outcomes (e.g., team performance, organisational turnover), will be used in this project. In addition, the project will implement work redesign interventions to promote enhanced effectiveness for organisations. It will also include an extension of a large-scale survey of not-for-profit organisations (including charities, etc.) that Parker is involved in.

3.4 / PROMOTING EFFECTIVE CARE OUTSIDE OF WORK

CORE TEAM

MARIAN BAIRD
 SHARON PARKER
 DANIELA ANDREI (COMMENCING MARCH 2018)
 ANDREEA CONSTANTIN (COMMENCING APRIL 2018)
 GIGI PETERY (COMMENCING MAY 2018)

Associate Investigators

MONIKA BÜTLER
 ALEXANDRA HERON

KATE O'LOUGHLIN
 HANNES ZACHER

The aim of this project is to identify and advance models of workplace policy and practice that allow mature age workers, especially women, to balance work with their increasing care responsibilities outside of work. The need to increase mature age workers' labour force participation with the call for more non-institutional elder care has produced a policy conundrum: there is a double demand on mature age citizens to participate in the labour market while providing care for older family members, and increasingly, grandchildren.

Leading Australian organisations are currently trialling or introducing more novel and expansive approaches to flexible work, but knowledge of these policies and practices, of their incidence, nature and impact on mature age workers, remains partial and fragmented. International and Australian evidence points to the importance of the line manager in enabling mature age workers to access flexible work practices in order to combine work and care. Institutional theory will be applied to explain and evaluate organisational policy application and adaptation in the context of the national regulatory framework. The outcomes of this research will inform best practice organisational policies and implementation to enable older workers to participate longer in paid work while balancing this with their external care demands.

The project will include case studies and policy audits for each organisation (see Project 3.1 above), as well as interviews with a targeted selection of mature age workers to assess their experience of combining work and outside care. Additional insights will come from the analysis of existing data sets (e.g. the World Values survey and AHRC 2015).

RESEARCH STREAM 4 SUSTAINABLE WELLBEING IN LATER LIFE

STREAM LEADER: MICHAEL SHERRIS

This stream will undertake research to provide businesses, households, and governments with new knowledge and expanded options on a range of policy and practice issues confronting ageing societies. It will take the macro-demographic projections of Stream 1, the insights about cognitive ageing and decision making from Stream 2, and the evidence concerning organisation behaviour from Stream 3, to build a comprehensive evidence base for strategies and actions to enhance wellbeing in later life.

The stream comprises six projects which will substantively commence following the completion of current CEPAR work and the finalisation of recruitment for the research positions supporting these projects.

4.1 / MORTALITY AND MORBIDITY RISK

CORE TEAM

MICHAEL SHERRIS
HÉLOÏSE LABIT HARDY
OLIVIA S. MITCHELL

Associate Investigators

ADAM WENQIANG SHAO
ANDRÉS VILLEGAS
JONATHAN ZIYEVI

This project undertakes modelling essential for work in Projects 4.4 and 4.5, and relates to Projects 1.2, 4.2 and 4.3. Led by Sherris, it will extend current functional disability and health status models to include systematic risk factors, informing product and policy development and health modelling. Current actuarial modelling of functional disability and health status estimated from individual data assume time-homogeneous transition rates and allow these to vary by gender and age. They thus conflate idiosyncratic and systematic risk, since systematic risk is

time-sensitive. Markov ageing models developed for mortality heterogeneity have yet to effectively incorporate time in-homogeneous transitions.

These systematic risk factors will initially include a factor representing stochastic mortality improvement. The impact of this systematic improvement factor on disability and mortality rates as well as recovery rates will be estimated using advanced statistical techniques initially using the HRS data. Different definitions of functional disability will be explored including those based on activities of daily living as well as measures of cognition. Relevant Australian data will be also accessed as part of the project and model estimation will be carried out for Australian data.

4.2 / MACRO-HEALTH OUTCOME SIMULATIONS

CORE TEAM

PHILIP CLARKE
KAARIN ANSTEY
ROBERT CUMMING
JAMES NAZROO
MICHAEL SHERRIS
AN TRAN (COMMENCING JANUARY 2018)
JAY STILES

Associate Investigators

DENZIL FIEBIG
ALASTAIR GRAY

This project develops a new and innovative stochastic policy simulation model to forecast the health of older Australians and their long-term health care costs, aggregated to a national population level drawing on expertise in Economics, Actuarial Science, Epidemiology, Psychology and Sociology.

The overall aim of this project is to develop a resource comparable to models overseas such as the Future Elderly Model, and extend it, embedding it in a framework incorporating

uncertainty. This will enable a wide range of long-term projections, taking into account current and potential future behavioural and health system trends.

There is currently no comparable health policy simulation model in Australia. It will be based on micro-simulation built from tailored regression equations estimated on longitudinal data sets, particularly drawing on increasing availability of large administrative data sets in Australia in recent years.

Once developed, the simulation model will lay the foundations for the subsequent health policy research program which will include projections of long-term: (i) health care costs; (ii) disability adjusted life years (DALYS); and (iii) measures of productivity changes (such as working days lost) for older Australians.

A Research Fellow, Dr An Tran, has been recruited to commence work on the project in January 2018. Work has been underway on several projects to look at socioeconomic inequalities in life expectancy since mid-October.

4.3 / SOCIAL DETERMINANTS OF SUCCESSFUL AGEING

CORE TEAM

ROBERT CUMMING
KAARIN ANSTEY
JAMES NAZROO
RESEARCH FELLOW TO BE APPOINTED

Other Investigators

JULIE BYLES
HAL KENDIG

This project will combine, for the first time, data from several large existing Australian panel studies of ageing to identify sociodemographic factors associated with leading a long, healthy and independent life.

These studies include the Concord Health and Ageing in Men Project (CHAMP; led by Cumming), the PATH Through Life Project (led by Anstey), and the Australian Longitudinal Study on Women's Health (led by Byles). These three studies include detailed information on sociodemographic factors, including country of birth, education, income, and living arrangements. The work will be informed by findings from the English Longitudinal Study of Ageing (led by Nazroo). Successful ageing among Indigenous people will also be studied, using data from the Koori Growing Old Well Study. Determinants of successful ageing will be investigated separately among the so-called young-old (65-74), mid-old (75-84) and the old-old (85 years and older).

As spousal interrelations are likely to play an important role in successful ageing, we will recruit female partners of CHAMP participants and male partners of female PATH participants to study the impact of spousal interrelations on cognitive and physical ageing, maintenance of independence, caregiving and mortality.

4.4 / RETIREMENT POLICY ISSUES

CORE TEAM

JOHN PIGGOTT
 MARIAN BAIRD
 HANMING FANG
 OLIVIA S. MITCHELL
 JAMES NAZROO
 MICHAEL SHERRIS
 ALAN WOODLAND
 RAFAL CHOMIK
 BEI LU
 MIGUEL OLIVO-VILLABRILLE

Associate Investigators

MONIKA BÜTLER
 BOB GREGORY
 ERIK HERNÆS
 CAGRI KUMRU
 SIMEN MARKUSSEN
 SHIKO MARUYAMA
 RENUKA SANE
 SUSAN THORP
 ANDRÉS VILLEGAS
 PETER WHITEFORD
 SHANG WU

This project will determine best practice for retirement income policy with an ageing demographic. It will provide a comparative evidence base for industry and policy reform, in Australia and internationally. It will draw on Projects 1.2, 3.4 and 4.1, and Stream 2, to provide analysis complementary to Projects 4.5 and 4.6. Led by Piggott, it will integrate insights from analysis of actuarial product design, retirement policy and tax modelling, and the participation of women in the workforce, to inform policy. It will document policy change and projected reforms, and analyse their impacts using stochastic modelling techniques. It will especially focus on women's resources in later life.

4.5 / FINANCIAL AND INSURANCE PRODUCT DESIGN

CORE TEAM

MICHAEL SHERRIS
 MICHAEL KEANE
 JOHN PIGGOTT
 OLIVIA S. MITCHELL
 HÉLOÏSE LABIT HARDY

Associate Investigators

DANIEL ALAI
 MONIKA BÜTLER
 DENZIL FIEBIG
 ANNAMARIA OLIVIERI
 ERMANNIO PITACCO

ADAM WENQIANG SHAO
 SUSAN THORP
 ANDRÉS VILLEGAS
 SHANG WU
 JONATHAN ZIYEVI

Led by Sherris, this project will deliver much-needed modelling to support insurance and financial markets, and develop models for sustainable cost-effective products allowing individuals to manage longevity, health, and aged care risk. It will investigate:

- 1 Optimal design of health and aged care insurance products. Using the evidence base for separating idiosyncratic and systematic risk generated by Project 4.1, it will explore the potential for splitting risks between insurer and consumer to reduce premiums. In this context, a range of alternative designs will be assessed and the impact of capital and regulatory costs of guarantees provided by insurers will be quantified.
- 2 The development of products which will help consumers maximise income in retirement. The project will consider accumulation investment strategies to target retirement income taking into account inflation and longevity risks. The incorporation of health and disability status for older ages will allow us to model the benefits of innovations, such as enhanced annuities, that provide higher annuity payments to lives of lesser health status, and life care annuities that combine long-term care with life annuity payments.
- 3 Improved design of equity release products. Better models of residential house prices based on individual dwelling characteristics will be developed to radically advance the design and costing of these products that involve many risks, including house price, health and longevity. Related taxation issues will also be analysed.

4.6 / GUIDING FINANCIAL DECISION MAKING

CORE TEAM

HAZEL BATEMAN
OLIVIA S. MITCHELL
RESEARCH FELLOW TO BE APPOINTED

Associate Investigators

LORETTI ISABELLA DOBRESCU
FEDOR ISKHAKOV
JORDAN LOUVIERE
BEN NEWELL
FEDERICA TEPPA
SUSAN THORP

Outcomes will guide member interaction and communication by the financial services industry, and associated policy and regulation.

This project, led by Bateman, will improve understanding of how individuals make decisions about retirement, health and aged care financing and how they can be supported to make better choices. Outcomes will guide member interaction and communication by the financial services industry, retirement income product and health and aged care insurance design, and associated policy and regulation.

Using surveys, discrete choice and field experiments and member-level, administrative data to investigate better options for guiding retirement finance decisions, the project will identify evidence-based prescriptions for policy and industry and investigate alternative means of ‘helping’ individuals make better decisions. Informed by evidence from Stream 2, the project will identify a subset of interventions to assist people with retirement finance decisions using theory, empirical and experimental methods. It will investigate how information architecture, choice architecture, financial education and advice can be used to improve retirement saving decisions (contribution rates, asset allocation), decumulation decisions (product choice, drawdown patterns), aged care financing, housing and life insurance choices.

RESEARCH TRAINING & MENTORING

IN 2017 THE CENTRE FOCUSED ON FINALISING THE DETAILS OF A SUITE OF PROGRAMS DESIGNED TO SUPPORT THE DEVELOPMENT OF NEW RESEARCHER COHORTS, WITH AN EMPHASIS ON BUILDING CROSS-DISCIPLINARY SKILLS AND THE ABILITY TO ENGAGE WITH AND RESPOND TO THE NEEDS OF END USERS.

The CEPAR research environment is unique globally in encouraging researchers at all career stages to draw on deep knowledge of their own disciplines while engaging with colleagues from different cognate backgrounds.

Our initiatives are aimed at developing researchers not only affiliated with CEPAR but also those affiliated with other national, and in some cases international, groups focused on the issue. In this way, we plan to continue playing a major role in national capacity building and networking, and to ensure impact in the longer term. Some of our initiatives were developed during the first term of our funding; others are new, reflecting our aim to continue to enhance the experience of researchers in our four targeted groups: mid-career, early career, PhD students, and undergraduates.

MID-CAREER RESEARCHERS

We will play a major role in mentoring the next generation of research leaders in ageing in Australia, through a number of mechanisms.

The Future Leaders in Ageing Research program will accelerate high potential mid-career researchers' capability to lead research. Organised by CI Parker, the program will be delivered to approximately 25 mid-career researchers nationally (including non-CEPAR

personnel). Offered over a 12-month time frame, it features personal development projects, peer learning projects mentored by senior research 'mentors', individual coaching and mentoring, engagement in a change simulation, 360 degree leadership assessments as well as other self-assessments.

Within CEPAR, mid-career researchers will be mentored by senior researchers, who will support them in the development of the leadership and relationship skills required to establish and manage a large, complex multidisciplinary program firmly engaged with national and international partners in academe, government and industry. Subcommittee membership spanning all career stages will further facilitate this.

Forums and workshops will provide opportunities for mid-career researchers to engage with national and international leaders in the field.

EARLY-CAREER RESEARCHERS

ECRs are mentored by senior CEPAR researchers and have opportunities to interact with experts within the five collaborating universities as well as international leaders in the field. Our distinguished visitors program, ECR exchange program, and international workshops provide opportunities for our ECRs to engage with global experts. Emphasis is placed on building an enriched appreciation of multidisciplinary perspectives and ECRs are encouraged to play leading roles in the organisation of seminars and workshops. As well, ECRs contribute to research and centre management, with roles in Stream coordination and on CEPAR committees. Our ECR mentoring program is underpinned by four major initiatives:

Annual five-day methodology workshops will provide opportunities for ECRs and PhD students to learn state-of-the-art techniques from international leaders in quantitative methods, vital for their research careers. The workshops –

open to CEPAR and non-CEPAR affiliates – will build research capacity in population ageing and develop career networks for workshop participants.

Our Stakeholder Engagement Program will equip researchers with the skills necessary to effectively engage with stakeholders and communicate social science research. It will provide opportunities to hone these skills under the mentorship of experienced CEPAR researchers. The program will consist of regular workshops on 'presenting to government and industry', offering support in preparing presentations for stakeholders. Regular opportunities to apply these skills will be provided by participation in roundtables with end users and Stakeholder Reference Groups.

The CEPAR Industry and Government Fellowship Scheme will provide career development opportunities for members of CEPAR and its Partner Organisations as well as strengthen collaborative links. This flexible scheme operates in both directions with CEPAR or industry/ government fellows negotiating a participative pattern that suits the nature of the collaboration and the individual's needs.

Our ECR exchange program offers the opportunity to spend extended periods of time at other nodes and CEPAR partner institutions to advance the research program, expand collaborations with PIs and AIs and to build research networks. It also provides the opportunity for ECRs working with our international PIs and AIs to visit CEPAR.

PHD STUDENTS

The cornerstone of CEPAR's national PhD student engagement strategy continues to be the Emerging Researchers in Ageing Program (ERA), an initiative which brings together HDR students interested in ageing research. Comprising a current registered membership of over 750, the ERA program consists of an annual conference, a

virtual seminar series and research training workshops.

Our supplementary scholarship scheme supports the recruitment of the very best domestic and international students. Our conference travel funding scheme enables students to disseminate their research findings, and a PhD exchange program promotes collaboration and networking. PhD student places will be available in the methodology workshops described above.

UNDERGRADUATE STUDENTS

Our annual summer scholarship program provides opportunities for undergraduate students to experience working in a research environment by participating in the execution of a research project under the supervision of an ECR. It also provides a pipeline of honours students as well as opportunities for our ECRs to develop supervision skills.

Scholarships are also available for honours students affiliated with the Centre, who are provided with dedicated workspace within CEPAR to ensure they are integrated into Centre life.

CEPAR RESEARCH STUDENTS

CEPAR affiliated students work under the supervision of CEPAR Investigators on topics related to population ageing.

In 2017 a total of 27 HDR students were affiliated with the Centre. Many of these students were affiliated with the CE11 Centre and we are delighted that they have elected to continue to be part of the community of young scholars that CEPAR has established.

JEOFREY ABALOS	
Thesis:	Determinants of health status and health expectancy among older persons in the Philippines
Supervisor:	Professor Heather Booth
Co-supervisor:	Professor Zhongwei Zhao
MUHAMMAD ABSOR	
Thesis:	Ageing in rural Indonesia: Filling the gaps to meet the bio-psychosocial-spiritual needs of older persons
Supervisor:	Professor Peter McDonald
Co-supervisors:	Dr Iwu Utomo and Dr Arianne Utomo
RICHARD ARTHUR	
Thesis:	Is anxiety a risk factor in cognitive ageing?
Supervisor:	Professor Kaarin J. Anstey
Advisors:	Dr Richard A. Burns, Dr Moyra E. Mortby and Professor Richard O’Kearney
BIANCA BONOLLO	
Thesis:	New perspectives on health choices and social interactions
Supervisor:	A/Professor Loretta I. Dobrescu
Co-supervisor:	Professor John Piggott
CASSIE CURRYER	
Thesis:	A view of home: Older people, housing and social policy in Australia
Supervisor:	Professor Julie Byles
Co-supervisor:	Professor Mel Gray
ARPITA DAS	
Thesis:	Nutrient intake and its effects on health outcomes and mortality among older men living in Australia: The Concord Health and Ageing in Men Project
Supervisor:	Dr Vasant Hirani
Co-supervisor:	Professor Robert Cumming
DOROTHY DUDLEY	
Thesis:	Understanding personal goals in retirement and their relationship with life satisfaction - An Australian perspective
Supervisor:	A/Professor Kate O’Loughlin
Co-supervisors:	Dr Vanessa Loh and Dr Sophie Lewis
PARIVASH EFTEKHARI	
Thesis:	Quality care in older Australian women with asthma
Supervisor:	Professor Julie Byles
Co-supervisors:	Ms Peta Forder and Dr Melissa Harris
TIN LONG HO	
Thesis:	Retirement financial planning in China: The role of housing and new retirement financial products
Supervisors:	Professor Hazel Bateman, Dr Katja Hanewald and Professor Hanming Fang
ALIZA HUNT	
Thesis:	Ageing well in Indonesia: Meeting the mental health needs of elderly Indonesians
Supervisors:	Professors Peter McDonald, Phil Batterham and Zachary Steel
Co-supervisor:	Dr Steve McEachern

NEIL JEYASINGAM

Thesis: Attitudes to ageing: Factors contributing to optimal mental health in older persons
 Supervisor: A/Professor Kate O'Loughlin
 Co-supervisor: A/Professor Lynda Matthews
 Advisor: A/Professor Adrian Hayes

SHUANGLAN (SHIANNA) LI

Thesis: Investment strategies in pooled annuities
 Supervisor: Professor Michael Sherris
 Co-supervisors: Dr Andrés Villegas and Dr Héloïse Labit Hardy

YULONG LI

Thesis: Health status, mortality heterogeneity and implications for post-retirement product innovation
 Supervisors: Professor Michael Sherris and Dr Jonathan Ziveyi
 Co-supervisor: Dr Andrés Villegas

JANET MACCORA

Thesis: Gender differences in modifiable risk factors for cognitive decline in ageing
 Supervisor: Professor Kaarin J. Anstey

MITCHELL MCMASTER

Thesis: A randomised controlled trial of multidomain dementia risk reduction for mild cognitive impairment (BBL-MCI)
 Supervisor: Professor Kaarin J. Anstey
 Co-supervisors: Professor Linda Clare, Dr Sarang Kim and A/Professor Nicolas Cherbuin

KATE MILLEDGE

Thesis: Study of the inter-relationships between dietary intake, oral health, and frailty among older Australian men
 Supervisor: Dr Vasant Hirani
 Co-supervisors: Professor Robert Cumming and Dr Fiona O'Leary

CATHY MONRO

Thesis: The changing nature of aged care in Australia: Living Longer Living Better reforms and the impact on service providers and consumers
 Supervisor: A/Professor Kate O'Loughlin
 Co-supervisor: A/Professor Lee-Fay Low

ARM NAKORNTAB

Thesis: Annuities and estate taxation in an entrepreneurship model
 Supervisor: Dr Cagri Kumru

PHITAWAT POONPOLKUL

Thesis: Evaluating implications of demographic changes on the macroeconomy and the conduct of monetary policy
 Supervisor: Professor Warwick McKibbin
 Co-supervisors: Dr Larry Liu and Professor Renee McKibbin

MIJANUR RAHMAN

Thesis: Modelling trajectories to aged care service use among older Australian women
 Supervisor: Professor Julie Byles
 Co-supervisor: Professor Jimmy Efir

DAVID RODGERS

Thesis: Demographic change and optimal policy responses
 Supervisor: Professor Alan Woodland
 Co-supervisor: Dr George Kudrna

GEORGE SMYRNIS

Thesis: Essays on improving retirement engagement
 Supervisor: Professor Susan Thorp

QUANG TRINH

Thesis: Ageing and intergenerational relationships in Vietnam
 Supervisor: Professor Hal Kendig
 Co-supervisors: Professor Peter McDonald, A/Professor Minh Huu Nguyen and Dr Vasoontara Yiengprugsawan

CHENG WAN

Thesis: The demand for hybrid longevity and health insurance products in China
 Supervisors: Professor Hazel Bateman, Dr Katja Hanewald and Professor Hanming Fang

DANIEL WHEADON

Thesis: Demographic change and optimal policy response
 Supervisor: Professor Alan Woodland
 Co-supervisor: Dr George Kudrna

XIAO XU

Thesis: Variable annuity guarantee benefits - An integrated study of financial and actuarial valuations
 Supervisor: Professor Michael Sherris
 Co-supervisors: Dr Jennifer Alonso García and Dr Jonathan Ziveyi

DANDAN YU

Thesis: Collective household decision making
 Supervisor: Professor Denzil Fiebig
 Co-supervisor: Professor Denise Doiron

PART 2
SECTION

3

EXTERNAL LINKAGES

INDUSTRY & GOVERNMENT LINKS

TWO-WAY ENGAGEMENT WITH INDUSTRY, GOVERNMENT AND COMMUNITY GROUPS IS CRITICAL TO OUR RESEARCH TRANSLATION, PROVIDING A CONDUIT TO INFLUENCE ECONOMIC AND SOCIAL POLICY, BUSINESS PRACTICE AND COMMUNITY UNDERSTANDING.

It enables us to involve end users every step of the way, from the development of research goals through to the execution of projects and the communication of our research findings.

In the months leading up to the establishment of the new Centre in late September 2017, CEPAR Director John Piggott, Advisory Board Chair Marc de Cure and relevant CEPAR researchers met with senior representatives of most of our government and industry partners. These discussions provided critical input for the formulation of our Research Translation, Communication, Education and Outreach Plan. During these meetings, particular areas of research interest were explored; topics for future workshops and briefings were identified; additional opportunities for engagement were proposed; and strategies for expanding our reach beyond key contacts within individual organisations were developed. In addition, we discussed opportunities for stakeholder representation on the CEPAR Advisory Board and for CEPAR representatives to serve on government and industry committees and working groups. Our stakeholders also expressed interest in the CEPAR Industry and Government Fellowship Scheme as both a mechanism for individual career development and as a tool to enhance partner organisation participation in research projects.

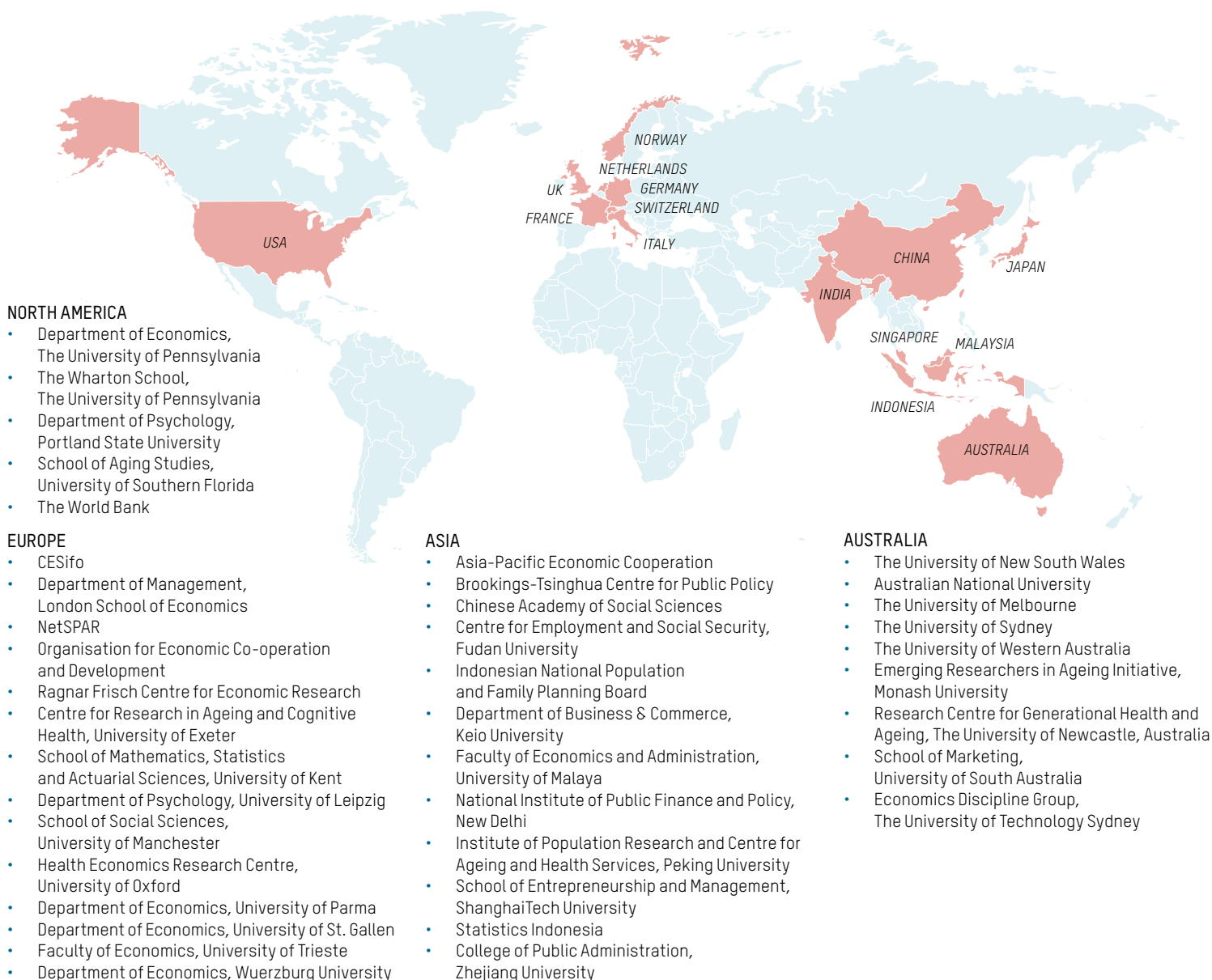
A key element of our strategy to expand our points of contact within each organisation is the introduction of Stakeholder Reference Groups (SRGs). SRGs provide a valuable opportunity for end users to engage in shaping the direction of the research program, provide feedback on the research, and facilitate access to data, personnel and other resources. In late 2017 we began the process of establishing a reference group for each stream, which will comprise selected members of the research team, representatives of our partner organisations plus additional members drawn from business, government and community circles as appropriate. Inaugural meetings of the SRGs are expected to take place in the first half of 2018.

The CEPAR Workshop on Mature Labour Force Participation, involving investigators from both CE11 and CE17, provided a major opportunity for CEPAR to explore this pressing issue with both state and government representatives as well as individuals drawn from industry, community groups and academe. Full details are included in the CE11 section of the report on page 92.

In 2018 CEPAR looks forward to implementing a range of translation and outreach activities as detailed in our Research Translation, Communications, Education and Outreach Plan. Major events planned are detailed in the 'Engagement and Outreach' section of the Activity Plan for 2018 (see page 129).

NATIONAL & INTERNATIONAL LINKS

CEPAR'S CONNECTIONS WITH SPECIALIST GROUPS AND NETWORKS, BOTH NATIONALLY AND INTERNATIONALLY, ARE EXTENSIVE.



GLOBAL CONNECTIVITY

Nationally, our Chief Investigators and Australian-based Associate Investigators (AIs) connect us with premier research groups around the country and our national outreach and engagement programs are designed to provide opportunities for all researchers focused on the issue of population ageing to come together to share research findings. Our new CEPAR Affiliates Scheme aims to widen CEPAR's reach by providing a mechanism for researchers not eligible to become AIs to engage with CEPAR.

Internationally, our Partner and Associate Investigators provide exceptional opportunities to engage with leading international groups. Our strong links with specialist groups working on a range of issues pertinent to the challenges of population ageing provide the foundation for joint workshops and other initiatives. As an example, our scientific direction - joint with NetSPAR, Wharton, and Willis Towers Watson - of the International Network for Pensions, Aging, and Retirement Research, positions us as international leaders in the field of pensions research.

CEPAR's involvement in a project investigating sustainable care, funded by a major grant from the UK's Economic and Social Research Council valued at £2.5 million, further connects us with leading international groups focused on issues related to population ageing, as does Hazel Bateman's membership of an international team of researchers which secured a large grant for a project on choice architecture in pensions and retirement.

Regionally, we remain strongly committed to expanding our linkages. A large grant from the UNSW Business School to extend our research program focused on population ageing in Asia and to build connection between the UNSW node of CEPAR and leading research institutions in Asia will support this endeavour, as will the node's Australia-China Population Ageing Research Hub. Our membership of the Steering Group of the Association of Pacific Rim Universities (APRU) Population Ageing Research Hub strongly positions us to lead regional collaborative initiatives in ageing research.

PART 2
SECTION



PERFORMANCE INDICATORS
& FINANCIAL STATEMENT

2017 KEY PERFORMANCE INDICATORS

CEPAR CE17 targets for 2017 were set with an anticipated commencement date of September 2017.

MEASURE	2017 TARGET	2017 RESULT
Refereed journal articles	0	0
Book chapters	0	3
Working papers	0	0
Percentage of publications appearing in top tier journals	N/A	N/A
Training courses held/offered by the Centre	1	0
Workshops/conferences held/offered by the Centre	0	1
Additional researchers working on Centre research		
• Postdoctoral researchers ⁵	6	1
• Honours students	0	0
• PhD students ⁶	0	26
• Masters by research students ⁷	0	1
• Masters by coursework students	0	0
• Associate Investigators ⁸	0	17
Postgraduate completions	0	0
Mentoring programs	1	0
Presentations/briefings		
• Public	0	4
• Government (parliamentarians and departments/agencies at both state and federal level)	0	11
• Industry/business/end-users	0	4
New organisations collaborating with, or involved in, the Centre	0	3
Students mentored through the ERA program ⁹	0	0
Translational documents published	0	0

⁵ Due to the Centre not officially commencing until 28 September 2017, most newly recruited Research Fellows will commence in 2018 and as a result training and mentoring programs targeted at this group have been deferred until 2018.

⁶ Includes continuing CEPAR CE11 students who have been accepted for affiliation with the new Centre

⁷ Includes a continuing CEPAR CE11 student who has been accepted for affiliation with the new Centre

⁸ Includes continuing CEPAR CE11 Associate Investigators (AIs) and new AIs who were not listed in the CEPAR CE17 application

⁹ Students mentored through the ERA program in 2017 have been counted towards the CE11 KPI

RESEARCH OUTPUTS & END USER LINKS

RESEARCH OUTPUTS

A3 BOOK – EDITED

- 1 Baird, M., Ford, M. and Hill, E. (Eds.) (2017). *Women, Work and Care in the Asia-Pacific*. Routledge.

B BOOK CHAPTERS

- 1 Anxo, D., Baird, M. and Erhel, C. (2017). Work and Care Regimes and Women's Employment Outcomes: Australia, France and Sweden Compared. In Grimshaw, C., Fagan, C., Hebson, G. and Tavora, I. (Eds.), *Making Work More Equal: A New Labour Market Segmentation Approach*. (pp309 - 329). Manchester University Press.
- 2 Chen, M., Hao, J. and Baird, M. (2017). China: The Reconfiguring of Women, Work and Care. In Baird, M., Ford, M. and Hill, E. (Eds.), *Women, Work and Care in the Asia-Pacific*. (pp25 - 40). Routledge.
- 3 Hill, E., Ford, M. and Baird, M. (2017). Work/Care Regimes in the Asia-Pacific: A Feminist Framework. In Baird, M., Ford, M. and Hill, E. (Eds.), *Women, Work and Care in the Asia-Pacific*. (pp1- 21). Routledge.

E4 UNPUBLISHED CONFERENCE PRESENTATIONS

- 1 Baird, M. (October 2017). Barriers and Enablers: What Influences Mature Age Workforce Engagement? Workshop on Mature Labour Force Participation. Canberra, Australia.
- 2 Clarke, P. (November 2017). Panel: The Future of Health Systems in Australia. Mortality in Australia: Marking the 150th Anniversary of the First Australian Life Table. Melbourne, Australia.
- 3 Heron, A. and Baird, M. (November 2017). Gendered Impacts: Elder Care and Organisational Responses. 5th European Conference on Politics and Gender. Lausanne, Switzerland.
- 4 Parker, S.K. (October 2017). Organisational Change: How Can Industry and Government Encourage Mature Workforce Participation? Workshop on Mature Labour Force Participation. Canberra, Australia.
- 5 Parker, S.K. (October 2017). Work Design: Improving the Psychosocial Quality of Work. Momentum 2017: Australian Physiotherapy Association Conference. Sydney, Australia.

SEMINAR PRESENTATIONS

- 1 Piggott, J. (November 2017). Perspectives from CEPAR. Health @ UNSW Business School Workshop.
- 2 Sherris, M. (November 2017). Modelling Health Status and Long Term Care Insurance. Health @ UNSW Business School Workshop.

END USER LINKS

PRESENTATIONS/BRIEFINGS

PUBLIC

- 1 Clarke, P. (November 2017). Inequality in Australian Mortality. Mortality and Life Expectancy in the Australian Aged Care System. Mortality in Australia: Marking the 150th Anniversary of the First Australian Life Table. Melbourne, Australia.
- 2 McKibbin, W. (October 2017). The Impact of Demographic Change in Asia on the Global Economy. Crawford School of Public Policy. Canberra Australia.
- 3 Parker, S.K. (November 2017). Work Design Principles. Healthcare Professionals – Promoting the Health Benefits of Good Work. Australian Health Benefits of Good Work Signatory Steering Group Industry Forum. Perth, Australia.
- 4 Parker, S.K. (September 2017). Ageing in the Workplace from an Organisational Perspective: What Do We Know and What Do We Still Need to Learn? Ageing, Age Friendly Communities Professional Development Day. Perth, Australia.

GOVERNMENT

- 1 McKibbin, W. (August 2017). Building National Demographics into the G-Cubed Global Model. Treasury-CEPAR Joint Workshop on Fiscal Policy Modelling. Canberra, Australia.
- 2 Piggott, J. (April 2017). Briefed David Gruen, Deputy Secretary, Department of Prime Minister and Cabinet on CEPAR Research. Canberra, Australia.
- 3 Piggott, J. (September 2017). Briefed Department of Foreign Affairs and Trade on CEPAR Research Program. Canberra, Australia.
- 4 Piggott, J. (August 2017). Briefed Dr Kay Patterson, Age Discrimination Commissioner, Australian Human Rights Commission on CEPAR Partnership. Sydney, Australia.
- 5 Piggott, J. and de Cure, M. (July 2017). Briefed Joanne Loundes, Department of Foreign Affairs and Trade on CEPAR Partnership. Canberra, Australia.

- 6 Piggott, J., Chomik, R., Kudrna, G. and Gordon, A. (May 2017). Briefed NSW Treasury on CEPAR Partnership. Sydney, Australia.
- 7 Piggott, J. and de Cure, M. (August 2017). Briefed Dr Luci Ellis, Reserve Bank of Australia on CEPAR Partnership. Sydney, Australia.
- 8 Piggott, J. and de Cure, M. (July 2017). Briefed Mark Cormack, Department of Health on CEPAR Partnership. Canberra, Australia.
- 9 Piggott, J. and de Cure, M. (September 2017). Briefed Robert Jeremenko, Commonwealth Treasury on CEPAR Partnership. Canberra, Australia.
- 10 Piggott, J. and de Cure, M. (July 2017). Briefed Serena Wilson, Department of Social Services on CEPAR Partnership. Canberra, Australia.
- 11 Piggott, J., Chomik, R. and Baird, M. (November 2017). Briefed Reserve Bank of Australia staff on Mature Labour Force Research. Sydney, Australia.

INDUSTRY/BUSINESS/END USERS

- 1 Piggott, J. and de Cure, M. (July 2017). Briefed Linda Swan, Medibank on CEPAR Partnership. Sydney, Australia.
- 2 Piggott, J. and de Cure, M. (July 2017). Briefed Matt Lawrance, NAB MLC on CEPAR Partnership. Sydney, Australia.
- 3 Piggott, J. and de Cure, M. (August 2017). Briefed Pip O'Keefe and Robert Palacios, World Bank on CEPAR Partnership. Sydney, Australia.
- 4 Piggott, J. and de Cure, M. (October 2017). Briefed Sarah Butler, PwC on CEPAR Partnership. Sydney, Australia.
- 5 Piggott, J. and de Cure, M. (October 2017). Briefed Tony Negline, Chartered Accountants Australia and New Zealand, on CEPAR Research Program. Sydney, Australia.

COMMUNICATIONS, EDUCATION & COMMUNITY OUTREACH; NEW GRANTS, AWARDS & RECOGNITION

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COMMUNICATIONS, EDUCATION & COMMUNITY OUTREACH

In the first months of CEPAR's term, a draft Communications, Education and Community Outreach Plan was developed and endorsed by the Research Translation and Outreach Subcommittee. The Plan will be presented first to the Advisory Board in 2018 for feedback and then to the Management Committee for final consideration. The ultimate aims of the Plan are to maximise the Centre's impact and establish CEPAR as a global leader in population ageing research. Events and activities developed as part of this Plan for the coming year are listed in the Activity Plan for 2018 on page 129-131.

The other major focus for the new CEPAR was the development of the CEPAR website to showcase the Centre's work and activities as well as provide a number of resources to enhance community understanding of the issues associated with an ageing demographic.

In 2017 CEPAR featured in the following media items:

The Sydney Morning Herald
UNSW and NeuRA join forces to form 'Mega' Ageing and Dementia Research Centre (sic)
29 September 2017 – featuring Kaarin Anstey

Daily Liberal, The Advocate, The Newcastle Herald, North Queensland Register
'Mega' centre to dramatically change the way we treat elderly
29 September 2017 – featuring Kaarin Anstey

The Sydney Morning Herald
Australia's workforce still highly segregated by gender: WGEA report
17 November 2017 – featuring Marian Baird

NEW GRANT

YEANDLE, S., O'LOUGHLIN, K., BAIRD, M., KENDIG, H., CLEMSON, L., YIENGPRUGSAWAN, V. AND OTHERS
UK Economic and Social Research Council:

Sustainable Care: Connecting people and systems

Total amount awarded: £2,500,000

AWARDS & RECOGNITION

MICHAEL KEANE AND OLENA STAVRUNOVA
2017 Dennis Aigner Award for best paper in the *Journal of Econometrics* over the 2015-2016 period

PETER MCDONALD
Invited by the United Nations Population Fund to edit the 2018 edition of the UNFPA publication, State of World Population

CENTRE FINANCE

CONSOLIDATED FINANCIAL STATEMENT 2017

INCOME	Notes	2017(\$)	EXPENDITURE	2017(\$)
ARC Centre Grant distributed as follows:	1		Salaries	61,325
University of New South Wales		2,579,024	Scholarships	-
Australian National University		-	Travel	2,872
University of Sydney		255,732	Emerging Researchers in Ageing initiative: annual contribution	-
University of Melbourne		420,305	Events	335
University of Western Australia		246,688	Other research related expenses	581
University of New South Wales	1	548,551	Recruitment and relocation expenses	3,034
Australian National University	1	-	Centre administration, consumables and I.T. maintenance	145
University of Sydney		83,839	Equipment	-
University of Melbourne		73,980	Website, branding and marketing	4,978
University of Western Australia		54,260	Total Expenditure	73,270
Department of Industry (Research Attraction and Acceleration Program Funding)	2	66,000	Opening balance at the beginning of the year	-
Department of Foreign Affairs and Trade		30,000		
Department of Health		50,000	Closing balance as at year end	4,690,109
Department of Social Services		50,000		
Medibank	3	50,000		
National Wealth Management Services Limited		50,000		
NSW Treasury		50,000		
PwC		40,000		
Reserve Bank of Australia		50,000		
Willis Towers Watson		65,000		
Total Income		4,763,379		

Note 1: The announcement of Kaarin Anstey's move from the Australian National University to the University of New South Wales necessitated a variation to the Eligible Organisations Agreement. As a result, all payments from the University of New South Wales to the Australian National University (ANU) were delayed as well as ANU's internal contributions. These distributions will be made in 2018 and reflected in the 2018 financial statement.

Note 2: A total of \$1,000,000 was received in 2017, covering the period 2017-2023. \$66k is reported for 2017.

Note 3: A total of \$150,000 was received in 2017, covering the period 2017-2019. \$50k is reported for 2017.

ESTIMATES OF FUTURE INCOME & EXPENDITURE

INCOME

The Centre's main source of funds in 2018 will be the Australian Research Council (ARC). The administering and collaborating organisations, as well as the partner organisations will make contributions at their contracted rates. The UNSW Business School will provide in 2018 an additional \$300,000 to support the hiring of research personnel associated with new research on developing policy and business responses to Asia's ageing demographic. In total, we estimate 2018 Centre income to be around \$6.5 million.

EXPENDITURE

In 2018 the Centre plans to fund a range of initiatives as detailed in the 2018 activity plan provided on pages 129-131. Salaries for ECRs will continue to account for a large portion of the Centre budget. We anticipate that we will spend about \$5.8 million in total, of which approximately \$4.5 million will be allocated to salaries and scholarship stipends.

PERSONNEL

It is anticipated that the Centre will spend approximately \$3.5 million in 2018 on research personnel, most of whom will be ECRs.

It is expected that 25 students will be supported by CEPAR scholarships in 2018 at a total cost of \$225,000. 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 2018 as well as offer workshops for ECRs and PhD students.

Funds will 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 2018 is approximately \$245,000.

COLLABORATION, 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. Our research briefs and fact sheets translate research for a wider audience.

Leading international experts will visit the Centre under CEPAR's Distinguished Visitor Program and funds will be available for CEPAR personnel to visit international collaborators and present research findings at major conferences. Funds will be also made available to support the involvement of our partner and associate investigators in the research program and outreach activities. It is expected that these activities will be supported by a combination of industry and collaborating university funds. Total estimated expenditure for these activities in 2018 is \$680,000.

OTHER

Approximately \$850,000 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 \$350,000 will be spent on other research related activities including surveys.

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