ARC CENTRE OF
EXCELLENCE IN
POPULATION
AGEING
RESEARCH

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ANNUAL REPORT 2011

UNSW
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SYDNEY · CANBERRA · AUSTRALIA·

THE UNIVERSITY OF
SYDNEY

Australian
National
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Australian Government

Australian Research Council

CONTENTS

INTRODUCING THE CENTRE

ABOUT CEPAR

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

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

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

MISSION

CEPAR'S MISSION IS TO PRODUCE RESEARCH THAT WILL TRANSFORM THINKING ABOUT POPULATION AGEING, INFORM BUSINESS PRACTICE AND PUBLIC POLICY, AND IMPROVE PEOPLE'S WELLBEING THROUGHOUT THEIR LIVES.

OBJECTIVES

THE OBJECTIVES OF THE CENTRE ARE TO:

- Produce original research, to be published in leading international academic journals, in each of the nominated fields, integrating them to advance knowledge globally
- Establish outstanding research capability to generate the evidence base and policy analysis required to anticipate and respond constructively to 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.

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DIRECTOR'S REPORT & HIGHLIGHTS

PROFESSOR JOHN PIGGOTT

The ARC Centre of Excellence in Population Ageing Research is approaching its first birthday. It is a collaboration between the University of New South Wales (UNSW), the University of Sydney and the Australian National University (ANU) and a number of international university, government and industry partners. The news of the success of the bid was received some 18 months ago, but it is only nine months since the Centre was formally established.

Much time was spent after the announcement of the award in concluding existing commitments, which in my case comprised my position as Associate Dean Research in the Australian School of Business at UNSW, a role I relinquished at the end of 2010. Once those responsibilities had been discharged, and Anne Gordon, the Centre's Director of Operations, had taken up her appointment, we focused for several months on executing legal agreements with collaborating and partner universities, and other partner organisations. CEPAR was formally established on March 18

2011, the date on which the last required agreement was signed.

In the time since, much has been achieved. With the agreements signed and funding confirmed, we were able to transfer funds to other nodes, recruit research personnel, move forward with hiring a full management team, organise our governance structure, and develop research-based initiatives designed to further the core purposes of the Centre. Apart from direct research activity, these include workshops and conferences, further funding applications, developing international linkages, and initiatives to help our Early Career Researchers (ECRs) gain a broader appreciation of the issue the Centre is researching than is possible from the perspective of a single discipline. We have expanded our research community to include several new associate investigators, both ECRs and experienced researchers, mostly drawn from Australian universities.

This report is designed to provide a substantive account of the Centre's achievements thus far, including initiatives which

have only just begun. This will allow us to use the document not only to provide an account of our activities to the ARC, but to introduce CEPAR to newly engaged and potential partners and researchers.

We begin with the most important activity – primary research.

DURING ITS FIRST EIGHT MONTHS, CEPAR SUPPORTED, OFTEN IN COMBINATION WITH OTHER FUNDING SOURCES, 47 SEPARATE RESEARCH PROJECTS BEING UNDERTAKEN BY ITS INVESTIGATORS AND RESEARCH FELLOWS.

These range across our broad research programs, and are described in Section 2. Already, research supported by CEPAR has resulted in more than 30 publications. We have also started a seminar series, which will get underway fully in 2012.

Related to our primary research function, comes funding. Mike Keane was awarded a Laureate Fellowship in August, covering the period 2011 – 2016, focused on the

economics of population ageing. Alan Woodland and I are ARC Professorial Fellows, and Kaarin Anstey holds an NHMRC Senior Research Fellowship to allow her to continue her work on psychological aspects of ageing. As well, Kaarin was appointed Director of ANU's newly established Centre for Research on Ageing, Health and Wellbeing.

IN OTHER GRANT SUCCESSES, CEPAR WAS AWARDED AN ADDITIONAL $1.25 MILLION FROM THE ARC TO FURTHER OUR WORK WITH ECRS AND RESEARCH CAPACITY BUILDING, FROM 2012.

The NSW Government awarded us $500,000 to work on health and longevity issues. And, smaller in value but nevertheless very significant, we won funding from the Harvard-Australia Society to allow us to run a conference on the Economics of Population Ageing at Harvard University in late 2012 or early 2013. Two successful bids to support international collaborative research were also submitted in 2011: Associate Investigator Noriyuki Takayama was awarded funds to visit CEPAR in July 2012 under the Prime Minister's Education Assistance Program for Japan and Dr Bei Lu, a Postdoctoral Fellow at the UNSW node, successfully applied for funding under the ASSA Australia-China Joint Action Exchange Program for a project commencing in 2012.

The development of research capacity in population ageing is one of CEPAR's most important goals. The new ARC funding has allowed us to appoint six CEPAR-DECRAs, and finance ECR workshops on topics connected with population ageing which will be available not just to CEPAR affiliates, but to all postdoctoral researchers focused on population ageing. This reflects the inclusive philosophy we have adopted in all our programs to nurture young researchers. Overseen by our Deputy Director, Peter McDonald, CEPAR's comprehensive mentoring program caters for young researchers at all levels. All honours students in Australasia with a research topic in ageing are invited to apply to present at the National Honours Colloquium; and the Emerging Researchers in Ageing (ERA) conference is open to all pursuing a PhD on ageing. Both these events took place this year at the UNSW campus, and are documented in Section 2.

We are very aware that to build a sustained research capacity in the field, not only do we need to support researchers experienced in the field of population ageing, but also to attract new young researchers. We have established a $5000 supplementary scholarship for PhD students who have been awarded an APA or similar national or university award, to encourage interest in this vital field. These scholarships were advertised in September and resulted in 12 new and continuing CEPAR affiliated students being offered a 2012 supplementary scholarship.

An important element of the CEPAR research environment is a multidisciplinary perspective. The UNSW CEPAR space accommodates both actuaries and economists, and has been designed to facilitate interaction; comparable space has been established at The University of Sydney and ANU nodes. There is dedicated space for visitors and we were fortunate to host a number of international experts in 2011. As well, we plan to run an annual workshop designed to mix at least two of the cognate disciplines represented in CEPAR. In 2011, the Demography and Longevity Workshop drew on both demographers and actuaries. Speakers included several internationally based young researchers, as well as our own research fellows and investigators.

WE SEE ENGAGEMENT WITH EXTERNAL STAKEHOLDERS AS VITAL TO THE SUCCESS OF THE CENTRE'S MANDATE.

Michael Sherris led the development of a joint workshop on longevity hosted by PwC in October, and this was so successful that we plan further events along these lines. In addition, CEPAR members have been active in their involvement with policy and practice. Hal Kendig chaired the NSW Whole of Government Ageing Roundtable in September and he and Kaarin Anstey were invited to a consultation with the Advisory Panel on the Economic Potential of Senior Australians held at Treasury House. I was invited as one of the lead speakers at the Ian Castles Roundtable on Taxation and Social Security in Canberra in October. Alan Woodland and Peter McDonald presented papers to the Productivity Commission conference in March. A comprehensive list of our contributions is provided in Section 4.

As well, representatives of our government and industry stakeholders have attended CEPAR workshops and conferences run throughout the year, and we have had bilateral meetings with most of our financial supporters.

On the international stage, Peter McDonald entered the second year of his appointment as President of the International Union for the Scientific Study of Population and was this year appointed to the Council of Advisors, Population Europe, a consortium of the leading population research centres in Europe. Bob Cumming strengthened his links with colleagues at the Babol University of Medical Sciences in Iran, through

his collaboration on the Amirkola Health and Ageing Project.

The Centre was well represented at international conferences. Mike Keane was invited to present the highly prestigious Cowles lecture at the Summer meetings of the Econometric Society at Washington University in St. Louis, MO. I represented CEPAR at the Global Economic Symposium at Kiel in October, and the World Pension Summit in Amsterdam in November.

Hal Kendig was invited to address the Experts' Consultation on Healthy Ageing in the Western Pacific Region held in Manila in May and presented keynote addresses at the Korean Gerontology Conference and a comparative policy workshop hosted by Tsinghua University and the Chinese Ministry of Health in Beijing. Peter McDonald was the keynote speaker at the Conference of the Population Association of Taiwan and was invited to give a Süßmilch Lecture at the Max Planck Institute for Demographic Research and to present at the Annual Meeting of the Population

Association of America in Washington DC. Michael Sherris was invited to present a number of papers at the Australasian Actuarial Education and Research Symposium.
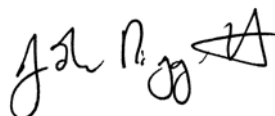
The Leaders' Forum is a group of Chief Executives from business, government and other relevant organisations concerned with addressing issues arising from our ageing demographic.

Marc de Cure, who, as Chair of the Forum, was vital in generating industry support for the Centre, took up a position as CFO and Executive Vice President at AIA in Hong Kong in late 2010, and resigned from his position as Chair. He has returned to Australia now, and I am delighted to report that he has re-engaged with CEPAR, chairing its Advisory Board as well as the Leaders' Forum. His involvement will be critical in promoting creative engagement between industry, government, and the Centre.

External engagement is an important reason why we have invested heavily in branding and our website. We see a strong brand as providing a symbol to which external supporters can relate; and the website

as our window to the world outside research, as well as an essential vehicle for communication of research. Our website is scheduled to go live in February 2012.

Overall, we have met or exceeded most of our Key Performance Indicators for 2011. The time has now come to step back and reflect on where our research agenda and evolving perspectives on the issue will take CEPAR over the next period. It is only in the last month or so that the logistical structure of CEPAR has been bedded down to the point where such reflection can take place. Some initial thoughts appear in Strategic Directions on pages 7–8, and these will be honed into a well-defined strategy through 2012 and beyond. For now, though, it is enough to say that in the nine months since formal establishment, CEPAR has gained impetus as a research organisation with substantial potential. Future years will determine the extent to which that potential is fulfilled.

John Piggott

HIGHLIGHTS

$1.25 MILLION ADDITIONAL ARC FUNDS AWARDED TO CEPAR TO SUPPORT EARLY CAREER RESEARCHERS IN THE CENTRE

$500,000 NSW STATE GOVERNMENT SCIENCE LEVERAGING FUNDS AWARDED

$8.3 MILLION IN OTHER FUNDING GRANTS AWARDED TO RESEARCH TEAMS WHICH INCLUDE CEPAR CHIEF INVESTIGATORS

47 RESEARCH PROJECTS INITIATED

33 JOURNAL PUBLICATIONS

EMERGING RESEARCHERS IN AGEING CONFERENCE HOSTED

10,714 PAGE VIEWS ON OUR WEBSITE

KAARIN ANSTEY ELECTED A FELLOW OF THE ACADEMY OF THE SOCIAL SCIENCES IN AUSTRALIA

ROBERT CUMMING AWARDED A DISTINGUISHED PROFESSORIAL ACHIEVEMENT AWARD FROM THE SYDNEY MEDICAL SCHOOL FOR RESEARCH, TEACHING AND LEARNING AS WELL AS SERVICE TO SYDNEY MEDICAL SCHOOL, UNIVERSITY OF SYDNEY AND THE PROFESSION

MIKE KEANE AWARDED AN AUSTRALIAN LAUREATE FELLOWSHIP WORTH MORE THAN $2 MILLION

HAL KENDIG CHAIRED THE NSW PREMIER'S AGEING ROUNDTABLE AT PARLIAMENT HOUSE

PETER MCDONALD APPOINTED TO THE COUNCIL OF ADVISORS, POPULATION EUROPE

JOHN PIGGOTT AWARDED AN ARC AUSTRALIAN PROFESSORIAL FELLOWSHIP AND A UNSW SCIENTIA PROFESSORSHIP, ONE OF THE HIGHEST ACCOLADES AWARDED BY UNSW

MICHAEL SHERRIS LED THE DEVELOPMENT OF A JOINT WORKSHOP ON LONGEVITY HOSTED BY PWC

ALAN WOODLAND AND PETER MCDONALD PRESENTED TO THE PRODUCTIVITY COMMISSION ROUNDTABLE ON A 'SUSTAINABLE' POPULATION.

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CHAIRMAN'S MESSAGE

MARC DE CURE

I am delighted to present the inaugural report as Chair of the Advisory Board. CEPAR was formed in 2011 to undertake research and develop research capacity in areas related to population ageing and demographic change. The Advisory Board's role is to facilitate real engagement between the Centre, government, industry and the broader community to shape the research agenda and ensure the effective dissemination and application of the Centre's findings.

Considerable energy has been exerted throughout 2011 by John Piggott, his collaborating investigators and support staff in commencing the research programs and establishing CEPAR's infrastructure. In addition, the critical process of engagement has commenced with two successful workshops held during the year involving senior academic, business and government representatives. These workshops have proved beneficial in identifying and exploring the issues, exchanging ideas and bringing people together.

To understand the importance of CEPAR it's critical to understand the issue. For the past 50 years the world has experienced significant population growth. This population growth has been enabled by advances in technology, medicine and commerce. The growth has put strains on the Earth's fragile environment but has supported sustained and significant growth in individual wealth and economic activity. This growth in population has slowed, with many countries experiencing zero or negative population growth. This has created a population bubble which is progressively moving into retirement. This will cause a dramatic change in the ratio of working to retired population, slowing economic growth, pressure on public spending and health services, a diminishing income tax base, changing consumption and infrastructure requirements, and potentially changes to the very structure of society. There is no doubt that population ageing will be one of the most significant global issues in the 21st century.

The need to prepare for the impact of demographic transition was recognised by John and me many years ago culminating in the formation of the Australian Institute of Population Ageing Research (AIPAR) based at the University of New South Wales. AIPAR was officially launched by the Federal Treasurer, The Honourable Wayne Swan, in 2009. The purpose of AIPAR is to support and encourage the development of research into the issue of population ageing. AIPAR is supported by a Leaders' Forum, which I chair, comprising CEOs of some of Australia's largest corporations and Department Secretaries of major Commonwealth government departments. I would like to acknowledge and thank the Leaders' Forum members and Bain & Co for the crucial role they played in securing industry and government support for the bid for CEPAR.

This support evidences the growing awareness of the importance of changing demographic structure in business, government and increasingly the broader community. Impacts on the finance and insurance industry (potential repricing of risk and increased demand for post-retirement products), on the health care sector, and on infrastructure (residential settings increasingly designed to cope with older people ageing in place) will all require anticipation and planning, in an economic environment fundamentally changed by demographic transition. The support of government, business and the professions is vital to CEPAR's success, providing funding, input to the research agenda and facilitating the transfer of research outcomes into policy and product responses. This two-way exchange is a new and exciting approach that we anticipate will enhance the effectiveness and efficiency of the research. We plan to continue to draw on the support of the Leaders' Forum and active engagement with all CEPAR sponsors to optimise the opportunity presented by this new research model.

We are all very excited by the opportunity to make a significant contribution to the population ageing knowledge base and research capacity, and fundamentally to informing the development of responses to this very significant issue.

Marc de Cure

STRATEGIC DIRECTIONS

CEPAR HAS MADE CONSIDERABLE PROGRESS IN 2011 AND IN THE COMING YEARS WE WILL CONTINUE TO DEVELOP AND IMPLEMENT OUR STRATEGY IN ORDER TO MEET THE CENTRE'S OBJECTIVES.

Developing CEPAR's strategic plan is a fascinating and challenging process. Partly this is because CEPAR is unique in a number of ways. It emerged as a fully fledged Centre of Excellence without previous national research centre funding. It combines expertise across a range of disciplines in an innovative research model that to our knowledge has not been brought together previously. And it is addressing an issue of global and especially regional importance, in which perceptions about the impact of the changing demographic will drive policy.

CEPAR's rationale is predicated upon fulfilling objectives that move beyond research *per se*, even though its core purpose is to conduct research. The first step in developing strategic direction is to ensure ongoing dynamism and refine priorities in the research program. We then have four further strategic priorities: building research capacity; strengthening research infrastructure; engaging external stakeholders; and developing international linkages.

CRYSTALLISING THE RESEARCH AGENDA

CEPAR's broad research objective is to enhance understanding of the ageing demographic which Australia, the Asian region and the world is confronting, with a view to improving policy-making and business practice. Two forces interact to yield a clear research strategy. First, there are the interests of our research personnel. These comprise not only our principal investigators, but an expanding group of Associate Investigators interested in adding to the critical mass of research strength that CEPAR embodies, and our new recruits, who are at the forefront of research in the field. Second, there are external stakeholders, with whom we have begun to interact, who will help to guide the relative emphasis of our research effort. A successful strategy will see these forces interacting to understand where the most important research contributions might lie, and where the important gaps in knowledge remain.

Over the next 12 months, we will reflect on activity to date, identify gaps, and re-assess where our research concentrations are, and where they should be. Bain & Co has offered to assist with this, and we look forward to working with a professional consulting firm to assist us with the evolution of our research agenda. This interaction is planned for the first half of 2012, and will point the way for the evolution of our research agenda.

BUILDING RESEARCH CAPACITY

For too long researchers in ageing have trained and then operated within discipline-based cultures which ignore relevant research, and knowledge, developed in other disciplines. Exposure to the methods, analyses, and especially the conceptual frameworks of other disciplines in their approach to ageing research will enrich and inform the goals and values of young researchers which will serve them throughout their careers.

We have already invested heavily in multidisciplinary conferences aimed at Honours and PhD students, and these have been effective and enthusiastically received. A number of research fellows have been recruited to work within CEPAR and the Centre already has a number of PhD student affiliates.

In 2012 we will extend our national mentoring program to include early career researchers (ECRs) by offering multidisciplinary workshops and postdoctoral training programs. At the Centre level, we will continue to recruit new research fellows to work on the core research program and offer supplementary PhD scholarships to attract the best students. We also plan to implement an ECR and Higher Degree Research (HDR) student exchange program in collaboration with our international partner universities to provide opportunities for our young researchers to build their networks. Consideration will be given to strategies for attracting honours students to the Centre. Through these initiatives we will enhance research capacity while augmenting our research contribution.

STRENGTHENING RESEARCH INFRASTRUCTURE

While we are now progressing well with regard to the human side of research capacity building, the empirical analysis of demographic change

STRATEGIC DIRECTIONS

in Australia is hampered by the lack of strong data. Many countries around the world have developed internationally comparable panel surveys to capture the behaviour and circumstances of older cohorts. These include not only the developed economies of North America and Europe, but emerging nations such as China, India, and Korea, among many others. Although our policy structures and business environment are very different to those elsewhere, there are few databases which allow convincing comparison of the resulting behaviours with those of our neighbours and comparator developed nations. It is time we developed an empirical base to match these, and some effort will be devoted over the next year or two to try to seed this initiative. We are still working out how this might best be done. Such a database would enable researchers globally to include Australia in their international studies, and the range and quality of analysis available to policymakers in Australia would dramatically improve.

ENGAGING EXTERNAL STAKEHOLDERS

Engagement with external stakeholders is vital if CEPAR is to have impact. We have had high level discussions with several financial stakeholders about possible research projects, and their representatives have attended conferences, workshops and meetings.

In 2012, we plan to build on this, both nationally and internationally. Our thinking falls into two streams. The first relates to our relationship with existing partner organisations, their perceptions and needs, and the combined impact they may have on policy and practice. CEPAR offers not only new research, but also a wealth of existing knowledge, concentrated into a single entity. Only through working with our partners will we be able to translate this knowledge into impact. The Leaders' Forum, a group of CEOs from business and government, among whom are numbered the CEOs of our industry and government partners, has the potential to deliver the impact we need. A model for engaging the Forum in specific pieces of policy analysis and action is being developed, and we

hope to trial this in 2012. Other initiatives to reach policymakers, practitioners, consumer groups and the wider community, such as research briefs, will also be piloted over the next year.

But although these initiatives potentially provide effective conduits into Australian policy and practice, the population ageing issue is a global one. To develop our policy reach internationally we are considering a two pronged approach. First, we are supporting the development of a UNSW certificated course in population ageing, to be offered abroad, and which will be marketed to officials of foreign governments and international organisations. In this, we will probably partner with international agencies in course development and delivery. This will open lines of communication and engagement beyond those of our financial stakeholders to a much broader canvas of influence, thus better exploiting the potential of the knowledge crucible that the Centre represents.

Second, we plan to explore the possibility of building generic projection models of demographic change, incorporating the most

important elements of that change – pensions, health, labour force participation – to allow major nations in the region a comparative base for analysing their own demographic and its challenges. Again, this may well be pursued in partnership with international organisations.

Neither of these ideas is definite yet. But they both represent ways in which we can use the knowledge base that CEPAR embodies to enhance our footprint internationally, and to help promote constructive, well-informed, forward thinking on the population ageing issue.

DEVELOPING INTERNATIONAL LINKAGES

In 2012 we will concentrate on developing our international links. We have recently approved funding protocols for international visitors and for partner investigator involvement, and will refine these in 2012. Outside our listed international partner organisations, connections are currently being built with the OECD and the World Bank; with Harvard University, with whom we are jointly organising a conference; and with the Netherlands group Netspar,

perhaps the Centre with a mandate closest to our own. We aim to run a population ageing conference focused on Australia and our regional neighbours in 2012, and a conference with global reach in 2013. We also will begin to sponsor events at a range of international meetings within disciplines and fields related to ageing. This agenda will be pursued and consolidated throughout 2012, as our focus turns from internal matters to international relationships.

CEPAR's strategic evolution is in the early stages of development. In part this is because the opportunity presented by Centre funding is so unusual in the social sciences – it is a road less travelled. In part it is because the Centre had no funding history – it is a start-up. But we see these as strengths in our position, not weaknesses.

They provide the opportunity to be truly innovative in our research, our capacity building, our knowledge dissemination, and our role in building community awareness of the issue at hand.

SECTION 1

GOVERNANCE & STRUCTURE

GOVERNANCE

The governance structure of the Centre supports strategic development as well as engagement between researchers, industry and government. Central to CEPAR's

governance are the Centre Director and the Management Committee who have overall responsibility for Centre performance, holding ultimate

accountability for all aspects of Centre activity. The Scientific Advisory Committee, Centre Advisory Board and the Leaders' Forum provide the Management Committee

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

Three subcommittees - focused on research management, mentoring, and outreach - support the Management Committee.

CEPAR ORGANISATIONAL CHART

SCIENTIFIC ADVISORY COMMITTEE	MANAGEMENT COMMITTEE	ADVISORY BOARD	LEADERS' FORUM

MENTORING SUBCOMMITTEE	RESEARCH SUBCOMMITTEE	OUTREACH SUBCOMMITTEE

PROGRAM LEADER — System-wide economic, social and policy issues	PROGRAM LEADER — Decision making by individuals, households and firms	PROGRAM LEADER — Integrating public and private provision of products and services	PROGRAM LEADER — Ageing well and productively	PROGRAM LEADER — International benchmarking and policy responses

SCIENTIFIC ADVISORY COMMITTEE

The Scientific Advisory Committee provides advice on the strategic direction of the Centre from a global perspective, with emphasis on research programs. Members of the Committee will actively build the

international profile of the Centre and identify potential international partners and linkage opportunities.

The Scientific Advisory Committee will meet for the first time in 2012. This meeting will be scheduled to coincide with the Centre's annual

conference thus providing an opportunity for Committee members to engage in depth with the Centre's research and personnel.

The Scientific Advisory Committee comprises five international leaders in the area of population ageing,

drawn from a range of fields reflecting the Centre's multidisciplinary nature.

SCIENTIFIC ADVISORY COMMITTEE MEMBERS

Professor David Bloom, Harvard School of Public Health

David E. Bloom is Clarence James Gamble Professor of Economics and Demography in the Department of Global Health and Population, Harvard School of Public Health and is Director of Harvard's Program on the Global Demography of Aging. He is also a Faculty Research Associate at the National Bureau of Economic Research, an elected Fellow of the American Academy of Arts and Sciences, a member of the Board of Directors of PSI and a member of the Board of Trustees of amfAR. Dr. Bloom is an economist whose work focuses on health, demography, education, and labour. In recent years, he has written extensively on primary, secondary, and tertiary education in developing countries and on the links between health status, population dynamics, and economic growth. Dr. Bloom has published more than 300 articles, book chapters, and books.

Professor Gordon Clark, Oxford University

Gordon L. Clark is the Halford Mackinder Professor of Geography at Oxford University. He has served on the Social Science Committee of the British Academy, is an elected member of the Oxford University's Socially Responsible Investment Committee, an employer-nominated trustee of the Oxford Staff Pension Scheme, a consultant to MetallRente (Germany's largest DC pension plan), and a Founding Governor of the UK Pension Policy Institute.

An economic geographer with an abiding interest in the tension between global financial integration and national and regional institutions, his research has a number of related strands. One is focused on global finance and the investment management industry including the governance structure and decision-making performance of pension funds, endowments, and sovereign wealth funds. His research on household financial decision-making has focused on long-term saving for retirement utilising theories and methods from the behavioural and social sciences in the context of risk and uncertainty.

Professor Yasuhiko Saito, Advanced Research Institute for the Sciences and Humanities, Nihon University

Yasuhiko Saito is a Professor at the Advanced Research Institute for the Sciences and Humanities at Nihon University, Tokyo. To understand ageing societies and older adults' health in particular, he does interdisciplinary work with researchers in the fields of sociology, economics, gerontology, psychology, anthropology, social work, epidemiology, psychiatry, dentistry, internal medicine and nursing.

His collaborative work extends over more than 20 countries. Over the past 10 years, he has conducted a five-wave national longitudinal survey on ageing and health in Japan. He is currently collecting data from Japan in collaboration with researchers in France, Denmark, Sweden, Switzerland, and Japan for a five country comparative study of centenarians.

Professor Merril Silverstein, Sociology and Gerontology Centre, Southern California

Merril Silverstein is Professor of Gerontology and Sociology at the University of Southern California. His research focuses on ageing within the context of family life, including such topics as intergenerational transfers and transmission, social support over the life-course, grandparent-grandchild relations, migration in later life, public policy toward care giving families, and international perspectives on ageing families. He is currently principal investigator of the Longitudinal Study of Generations and has active projects in China, Sweden, and Israel on the topic of intergenerational relations. He has 87 publications, 60 of which have appeared in peer-reviewed journals. Dr. Silverstein is a Fellow of the Gerontological Society of America, the Brookdale National Fellowship Program, and the Fulbright International Senior Scholars Program.

Professor Hans-Werner Sinn, University of Munich and Ifo Group

Hans Werner-Sinn is Professor of Economics and Public Finance at the University of Munich. He is also the President of Ifo Institute for Economic Research and the Director of the Centre for Economic Studies at University of Munich. He is a National Bureau of Economic Research fellow; a fellow of the European Economic Association; a lifetime member of the Council of Economic Advisors to the German Federal Ministry of Economics; and a member of the Bavarian Academy of Sciences, the Northrhine-Westfalian Academy of Sciences and the Executive Committee of the International Economic Association. His current research interests include public finance, economics of transition, allocation theory, risk and insurance, natural resources and trade theory.

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GOVERNANCE

ADVISORY BOARD

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

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

Board members seek to both facilitate and enable the achievement of the Centre's mission and objectives by bringing their expertise and experience to bear. Members will 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.

The Board will meet at least annually. Additionally, the Director or Chair will meet bilaterally with individual members to discuss particular issues. The inaugural board meeting is scheduled for early 2012.

LEADERS' FORUM

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

The Forum is a conduit for industry and government to help shape the research agenda on demographic change. Established in 2004 to support the Australian Institute for Population Ageing Research at UNSW, it provides high level strategic insight and facilitates engagement with end users. The Leaders' Forum was vital in securing industry and government support for the CEPAR bid as well as being instrumental in the formulation of the CEPAR research agenda. Together with the Advisory Board, it will play an ongoing role in the engagement process.

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

MARC DE CURE

ADVISORY BOARD MEMBERS

MARC DE CURE	CHAIR
HELEN BARTLETT	Pro Vice-Chancellor and President, Gippsland campus, Monash University and Convenor, Emerging Researchers in Ageing Initiative
STEPHEN BUNKER	Research Consultant, Medibank
JOHN CREEDY	Professor of Economics, University of Melbourne
JONATHAN DEANE	General Manager, Group Strategy, AMP
ALAN DUNCAN	Director, National Centre for Social and Economic Modelling, University of Canberra
ANNE GORDON	CEPAR Director of Operations
ROB HEFEREN	Executive Director, Revenue Group, The Treasury
CATHERINE NANCE	Partner, PricewaterhouseCoopers
JOHN PIGGOTT	CEPAR Director
EDWARD WHITEHOUSE	Principal Administrator, Directorate for Employment, Labour and Social Affairs, OECD
SERENA WILSON	Deputy Secretary, Department of Families, Housing, Community Services and Indigenous Affairs
REPRESENTATIVE	Department of Health and Ageing
REPRESENTATIVE	National Seniors Australia

LEADERS' FORUM MEMBERS

MARC DE CURE	CHAIR
JOHN PIGGOTT	CEPAR Director
JENNIFER ALEXANDER	Royal Australasian College of Physicians
CAMERON CLYNE	National Australia Bank
CRAIG DUNN	AMP
LES FIELD	UNSW
JANE HALTON	Department of Health and Ageing
JEFF HARMER	Formerly, Department of Families, Housing, Community Services and Indigenous Affairs
KEN HENRY AC	Special Advisor to the Prime Minister
MARK JOHNSON	PricewaterhouseCoopers Australia
JOHN LAKER	Australian Prudential Regulation Authority
MATTHEW QUINN	Stockland
HEATHER RIDOUT	Australian Industry Group
GEORGE SAVVIDES	Medibank Private
GLENN STEVENS	Reserve Bank of Australia

MARC DE CURE
CHAIR, ADVISORY BOARD AND LEADERS' FORUM

Marc de Cure has long recognised the social and economic significance of demographic change and the need to undertake and promulgate research to inform government policy and commercial responses.

He played a key role in the establishment of the Leaders' Forum in 2004 and, as its Chair, was pivotal in securing industry and government support for the Centre of Excellence bid in 2010.

Marc is a Company Director and advisor and previously held senior executive roles in leading financial and professional services groups.

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

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

Marc serves on the Business Advisory Council and the Executive Committee of the Australian School of Business at UNSW. He holds a Bachelor of Commerce (Honours) from UNSW, a Master of Wine Quality from UWS and is a Fellow of the Institute of Chartered Accountants in Australia.

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GOVERNANCE

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 and courses. In strategic planning, the Committee seeks high level advice from the Centre Advisory Board, Scientific Advisory Committee and Leaders' Forum.

The Committee comprises:

JOHN PIGGOTT	CENTRE DIRECTOR (CHAIR)
PETER MCDONALD	Deputy Director and Australian National University Node Leader
HAL KENDIG	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

The Committee meets formally at least four times a year. Consultation also takes place via email and teleconferencing. In 2011, the Committee met on 14 March, 3 June, 26 July and 14 November.

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.

The subcommittee met for the first time on 14 November, 2011 and is scheduled to meet three times a year from 2012.

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 consists of the Centre Director, the Director of Operations plus Associate Investigators Kate O'Loughlin, Heather Booth, Lisa Magnani and Daniel Alai (ECR representative).The subcommittee met for the first time on 2 September 2011 and will meet three times a year from 2012.

OUTREACH SUBCOMMITTEE

The outreach subcommittee oversees professional education programs, the distinguished visitors program, and monitors the production of research briefs and other initiatives designed to communicate research findings to the wider community.

The inaugural meeting of the subcommittee, chaired by Chief Investigator Michael Sherris, was held on 19 October 2011 and will meet thrice yearly. Its membership comprises the Centre Director, the Director of Operations plus Chief Investigator Kaarin Anstey, Associate Investigator Katja Hanewald and CEPAR's Communications and Marketing Manager, Kate Miranda.

STRUCTURE

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

NODES

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

The ANU node consists of teams based in the Centre for Research on Ageing, Health and Wellbeing and the Australian Demographic and Social Research Institute. Professor Peter McDonald, the Centre's Deputy Director, serves as ANU Node Leader.

Professor Hal Kendig leads the University of Sydney node which consists of researchers working in the Faculty of Health Sciences as well as the Sydney Medical School.

All eight Chief Investigators and many of the Centre's Associate Investigators are based at one of the three nodes.

Within Australia, Associate Investigators are also based at Flinders University, Monash University, the University of Newcastle and the University of Technology, Sydney.

PROGRAM LEADERS

The research program is organised into five different, but intimately connected, strands each headed by a Program Leader.

SYSTEM-WIDE ECONOMIC, SOCIAL AND POLICY ISSUES
Program leader: Scientia Professor Alan Woodland, School of Economics, Australian School of Business, University of New South Wales

DECISION MAKING BY INDIVIDUALS, HOUSEHOLDS AND FIRMS
Program leader: Professor Michael Keane, School of Economics, Australian School of Business, University of New South Wales

INTEGRATING PUBLIC AND PRIVATE PROVISION OF PRODUCTS AND SERVICES
Program leader: Professor Michael Sherris, Risk and Actuarial, Australian School of Business. University of New South Wales

AGEING WELL AND PRODUCTIVELY
Program leader: Professor Hal Kendig, Ageing, Work & Health Research Unit, Faculty Health Sciences, University of Sydney

INTERNATIONAL BENCHMARKING AND POLICY RESPONSES
Program leader: Professor Kaarin Anstey, Centre for Research on Ageing, Health and Wellbeing, Australian National University

INTERNATIONAL UNIVERSITY PARTNERS
Our partner investigators are drawn from five world class research schools:

The University of Manchester

The University of Newcastle, United Kingdom

The University of Nottingham

The Wharton School

The University of Pennsylvania

Through our internationally based Associate Investigators we are connected to the following key research institutions:

Hitotsubashi University

Pennsylvania State University

Ragnar Frisch Centre for Economic Research, Oslo

St Gallen 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:

AMP

Department of Families, Housing, Community Services and Indigenous Affairs

Department of Health and Ageing

Medibank

NAB

NSW Trade and Investment

PricewaterhouseCoopers

Stockland

The Treasury

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PERSONNEL

CHIEF INVESTIGATORS

Scientia Professor
John Piggott
Australian School of Business
UNIVERSITY OF NEW SOUTH WALES

Professor Kaarin 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
Australian School of Business
UNIVERSITY OF NEW SOUTH WALES

Professor Hal Kendig
Ageing, Work and Health Research
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UNIVERSITY OF SYDNEY

Professor Peter McDonald
Australian Demographic and Social
Research Institute
AUSTRALIAN NATIONAL UNIVERSITY

Professor Michael Sherris
Australian School of Business
UNIVERSITY OF NEW SOUTH WALES

Scientia Professor
Alan Woodland
Australian School of Business
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PARTNER INVESTIGATORS

Professor Richard Disney
School of Economics
UNIVERSITY OF NOTTINGHAM

Professor Hanming Fang
Department of Economics
UNIVERSITY OF PENNSYLVANIA

Professor Carol Jagger
Institute of Ageing and Health
UNIVERSITY OF NEWCASTLE, UK

Professor Olivia Mitchell
Wharton School
UNIVERSITY OF PENNSYLVANIA

Professor James Nazroo
School of Social Sciences
UNIVERSITY OF MANCHESTER

ASSOCIATE INVESTIGATORS[1]

Dr Daniel Alai
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Business School
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Professor Helen Bartlett
Emerging Researchers in Ageing
(ERA) Initiative
MONASH UNIVERSITY

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UNIVERSITY OF NEW SOUTH WALES

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Australian Demographic and Social
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PENNSYLVANIA STATE UNIVERSITY

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Institute of Economics Research
HITOTSUBASHI UNIVERSITY

Dr Chung Tran
College of Business and
Economics
AUSTRALIAN NATIONAL UNIVERSITY

Professor Peter Whiteford
Social Policy Research Centre
UNIVERSITY OF NEW SOUTH WALES

Dr Tim Windsor
School of Psychology
FLINDERS UNIVERSITY

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[1] Not all Associate Investigators
were actively involved in the
research program in 2011

RESEARCH FELLOWS

Dr Elena Capatina
CEPAR
UNIVERSITY OF NEW SOUTH WALES

Dr Joelle Fong
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Dr Meimanat Hosseini-Chavoshi
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Dr Yan Yu
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Dr Vanessa Loh
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UNIVERSITY OF SYDNEY
(commenced January 2012)

Dr Ramona Meyricke
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UNIVERSITY OF NEW SOUTH WALES
(commenced March 2012)

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UNIVERSITY OF SYDNEY NODE
(until December 2011)

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Margi Woods
Specialist IT Support
AUSTRALIAN NATIONAL UNIVERSITY NODE

STUDENTS

CEPAR affiliated students are listed on pages 83–87

PROFESSOR HELEN BARTLETT OPENS THE 2011 EMERGING RESEARCHERS IN AGEING CONFERENCE.

SECTION 2

2

RESEARCH & RESEARCH TRAINING

STRAND 1

SYSTEM-WIDE ECONOMIC, SOCIAL AND POLICY ISSUES

Population ageing has national and global economic, social and policy implications. It has implications for the economy through changes in wage rates, resource allocation, productivity and growth; for the social fabric in terms of changes in the spatial distribution of the population, the demand for social services and aged care, and social interactions; for financial product markets and retirement provision through changing longevity and morbidity; and for the government through increased expenditures required for age pensions, public health provision and the development of economic and social policy settings. Our research program covers these and other system-wide aspects of population ageing.

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

RESEARCH PROJECTS

STRAND 1 SYSTEM-WIDE ECONOMIC, SOCIAL AND POLICY ISSUES

In this research strand, we have thus far focused on

- ANALYSING MORTALITY RISK: Changes in longevity and morbidity risk have implications for finance and insurance markets, and hence for the abilities of older cohorts to effectively obtain retirement support and cover themselves against these risks. As an integral part of this work, we assess the impact of these findings for product pricing and solvency requirements.

  In 2012 work will continue in a number of areas including longitudinal analysis of mortality data and projecting mortality trends.

- DEVELOPING MODELS WHICH EXAMINE THE DEMOGRAPHIC TRENDS INHERENT IN COHORT CHANGES: The massive 1946 to 1965 baby boom cohort, now reaching age 65, have had life experiences very different from those of the inter-war cohorts now in their 70s and 80s; the needs and expectations of this group are likely very different from older cohorts.

  Work to date has started to use the 2011 census to develop a baseline database and will be developed in 2012.

- DEVELOPING ECONOMY-WIDE OVERLAPPING GENERATIONS MODELS WITH THE CAPABILITY OF ANALYSING RETIREMENT POLICY: These models allow behaviour to change as a result of policy change – for example, saving decisions and the timing of retirement. The models are being used to analyse the economy wide impacts of alternative public pension structures, especially resource tested programs such as the Australian Age Pension. A specific study examines the 2010 changes to Australian superannuation policy.

  In 2012 the analysis of the economic and welfare impacts of population ageing in Australia will continue using these models.

- MEASURING ATTITUDES TO AGEING AND INTERGENERATIONAL SOLIDARITY: Two studies, one analysing European attitudinal and economic data related to intergenerational solidarity and the other using the 2009 Australian Survey of Social Attitudes, commenced and will continue in 2012.

  Some of this research was initiated under other grants which are still current. However, all the projects reported here have enjoyed CEPAR support. While much of this work has an Australian focus, methodological developments will generalise to other contexts, and some applications draw on data from other countries.

CONSISTENT DYNAMIC AFFINE MORTALITY MODEL FOR LONGEVITY RISK APPLICATIONS

RESEARCHERS

CRAIG BLACKBURN
MICHAEL SHERRIS

Traditionally insurance premiums and reserves treat the mortality intensity as a deterministic process.

These methods do not allow for systematic changes in mortality rates. There is now a large class of models that fit and forecast mortality intensity as a stochastic process, many based on econometric or demographic models which do not fit well into a financial framework.

With Solvency II regulations and an increased focus on identification and quantification of an insurer's risk, more suitable mortality models are required. Affine term structure models are used to price various interest rate and credit risky instruments. By modelling mortality in this affine framework this project quantifies systematic mortality risk and provides a framework for risk management and pricing applications.

The affine class of models have been proposed for mortality modelling in the literature, but little research has been done on the appropriateness of these models in identifying the factors driving systematic mortality risk.

This project proposes and develops a multi-factor affine term structure model for mortality risk applications. The framework includes an arbitrage-free model specification for the whole term structure of mortality. The dynamics of the model are affine, allowing for closed-form expressions for survival curves to be derived. The model has multiple risk factors allowing for applications to hedging, pricing mortality and longevity bonds, derivatives and more general risk management problems.

The consistent requirement ensures that risk-neutral survival curves at future dates take the same parametric form as the estimated survival curves from the observed data. A state-space representation is used to estimate parameters for the model with the Kalman filter.

The state-space form provides a separate measurement and transition system of equations. A measurement error variance is included for each age to capture the effect of sample population size. The transition system dynamics capture the stochastic properties of the underlying mortality rate. Swedish mortality data is used to assess 2- and 3-factor implementations of the model. A 3-factor model specification is shown to provide an excellent fit to the observed survival curves, especially for older ages.

Bootstrapping is used to estimate the distribution of each fitted parameter. Residual analysis is used to confirm model fit. Consistent models are shown to improve model performance and stability. The findings are written up in CEPAR Working Paper 2011/07 and have been submitted for publication in a leading international journal.

By modelling mortality in this affine framework this project quantifies systematic mortality risk and provides a framework for risk management and pricing applications

OPTIMAL CONSUMPTION AND PORTFOLIO SELECTION WITH SYSTEMATIC MORTALITY

RESEARCHERS

KATJA HANEWALD
MICHAEL SHERRIS

This project develops a theoretical framework for individual portfolio multi-period decision making taking into account systematic mortality risk and the range of products individuals have available to manage longevity risk. A discrete state and discrete time framework is developed that allows both optimal portfolio selection and theoretical risk pricing to be carried out. At the same time the model is set in a framework that allows for effective computation of strategies and for it to be made more realistic by allowing for incomplete markets and other features of longevity product markets found in practice.

This project develops a complete markets discrete state and discrete time model allowing for stochastic and systematic mortality and risky assets. The role of life annuities, Group Self-annuitisation Schemes (GSA's) and longevity bonds in an individual portfolio is assessed. The risk neutral computation approach is used to determine optimal portfolios in a single period and a multi-period setting with finite horizon and finite states modelled with a Markov-chain. The impact of an incomplete market for longevity risk will be assessed. Results will be illustrated under different utility assumptions and the impact of systematic mortality risk on risk premiums, demand for annuities and on optimal retirement product decisions is formally assessed.

The model framework allows recent advances in computational techniques for discrete decision problems to be applied to longevity risk management. Theoretical pricing models for longevity products as well as optimal risk management strategies allowing for systematic risk and the theoretical impact of market imperfections will be implemented in the framework, providing a basis for addressing a range of current research issues around optimal consumption and product selection with systematic risk not previously considered. This project will continue into 2012 and extends the research in the project, 'Individual Post-Retirement Longevity Risk Management under Systematic Mortality Risk' detailed on page 56. The research will produce a paper expected to be published in a top ranking journal.

The model framework allows recent advances in computational techniques for discrete decision problems to be applied to longevity risk management

PROJECTING MORTALITY TRENDS AND VOLATILITY USING LONG-RUN RELATIONSHIPS BETWEEN CAUSES OF DEATH

RESEARCHER

MICHAEL SHERRIS

External collaborators

SEVERINE GAILLE
(UNIVERSITY OF LAUSANNE)

STEPHANE LOISEL
(UNIVERSITY OF LYON)

Trends and volatility in mortality rates are closely linked to changes in the major causes of death over time. Different causes of death have shown different trends and volatilities over time. Causes of death also have close links with cohort effects observed in population mortality rates. Changes in causes of death are dependent since removing or reducing deaths from a particular cause will ultimately result in increased deaths from other causes at older ages.

Using information on trends in causes of death rather than forecasting these separately has the potential to provide better forecasts of mortality trends in aggregate and by age and sex for a population.

This project uses forecasting techniques that allow for relationships between changes in number and timing of deaths from differing causes of death in order to improve forecasting of population mortality trends. Differing causes of death have shown different trends over time and these trends have been similar in many developing countries. At the same time there is dependence between the causes of death that can be incorporated into forecasting of overall mortality rates.

The objective is to provide improved forecasts of population trends and uncertainty in future mortality using models that incorporate dependence between causes of death. The forecasting techniques are compared with other commonly used population mortality forecasting approaches including those that are based on projection of individual causes of death. This project will continue in 2012 and is expected to result in a paper suitable for publication in an international journal.

> Using information on trends in causes of death rather than forecasting these separately has the potential to provide better forecasts of mortality trends in aggregate and by age and sex for a population

PROFESSOR MICHAEL SHERRIS
BA Macq., MBA Syd., FIA, FIAA, FSA
CHIEF INVESTIGATOR

Michael Sherris is the inaugural Professor of Actuarial Studies in the Australian School of Business at the University of New South Wales.

His research sits at the intersection of actuarial science and financial economics, and has attracted a number of international and Australian awards. He was named Australian Actuary of the Year 2007 in recognition of his contributions to actuarial research and education both internationally and within Australia.

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

Member of the Enterprise Risk Management Institute International (ERMII).

Professor Sherris has provided consulting advice for banks, life insurance companies and fund managers in the areas of interest rate risk management, derivatives, funds management, project finance, investment modelling and superannuation.

RETHINKING AGE-PERIOD-COHORT MORTALITY TREND MODELS

RESEARCHERS

DANIEL ALAI
MICHAEL SHERRIS

Mortality improvement trend models have attracted increased research attention over recent years as longevity has improved at rates not previously anticipated. Most modelling of trends considers time period trends for differing ages. At the same time there is recognition that cohort trends are important and that for projection purposes these cohort trends are informative and potentially lead to better forecasts of future mortality.

This project takes an alternative approach to modelling mortality trends using ideas from non-life insurance loss modelling in order to gain insight into trends that are either missing or poorly handled in more conventional age-period modelling.

Longevity risk from uncertain mortality improvement has been recognised as the major risk facing annuity providers and pension funds. In this project we apply trend models from non-life claims reserving to model mortality trends, providing a new perspective on estimating mortality improvements and quantifying its respective uncertainty.

The approach is developed in a generalised linear models (GLM) setting. This allows the application of GLM software to fit the models as compared with many of the standard models currently used. This also allows quantification of parameter and process uncertainty in a standard statistical modelling approach.

Age and cohort trends are found to be sufficient to capture the mortality trends, effectively removing the need for a period trend. Age and period trends are the most common components in standard models currently adopted. One of the widely used standard approaches is shown to confound cohort and period effects.

The modelling approach in the paper is proposed as a consistent methodology for estimating trends in mortality rates. It provides for specific identification of age, period and cohort trends, the application of standard statistical tools and software to modelling mortality trends and a clear identification of the importance of cohort effects in mortality improvement. The framework can be enhanced using parameter reduction and also including Bayesian models for parameter uncertainty. The work has been written up for journal submission.

> This project takes an alternative approach to modelling mortality trends using ideas from non-life insurance loss modelling in order to gain insight into trends that are either missing or poorly handled in more conventional age-period modelling

---

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

Daniel Alai is a Senior Research Associate in the Australian Institute for Population Ageing Research at the Australian School of Business, University of New South Wales.

Daniel joined UNSW in June 2010 following his graduation from the Department of Mathematics at ETH Zurich. Prior to this he obtained a Bachelor of Mathematics, with double honours in Actuarial Science and Statistics, from the University of Waterloo.

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.

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RESEARCHERS

DANIEL ALAI
MICHAEL SHERRIS

Most studies of mortality and the risk factors that impact on mortality are either based on small surveys, use confidential industry or insurer data or are based on population aggregate data where only factors such as age and sex are identified. Individual mortality data is available from various surveys including the US Health and Retirement Study (HRS). The availability of such survey data allows for a broader assessment of the factors that determine mortality risks using longitudinal data analysis. This provides insight into factors that should be considered for insurers when rating life insurance and annuity business. The motivation is to not only quantify the significance of a range of risk factors in relative terms but to also quantify the heterogeneity in population longevity risk and implications for insurance products.

This project uses HRS data to investigate the main factors determining older age mortality. The data is analysed using two approaches. Both preserve the cross-sectional as well as the temporal nature of the data. The first is a survival data approach and the second is a panel data approach. Proportional hazards and marginal models are estimated. The resulting estimated hazard and odds ratios are shown to be comparable. This equivalence of model approaches is not well known in the actuarial and insurance literature and allows the extension of survival data models to take into account the benefits of the panel data marginal model by including external, systematic, explanatory variables in the analysis.

Dependency in the panel data is found not to be a critical factor for the HRS data. Gender, race, education, marital status, self reported health, BMI, personal habits (smoking and drinking), health history and wealth and income are factors that are analysed in the study. Broader economic factors such as GDP, health expenditure, unemployment, inflation and overall smoking prevalence are also included. This project will continue in 2012 and is expected to produce a paper suitable for submission to a leading international journal.

> The motivation is to not only quantify the significance of a range of risk factors in relative terms but to also quantify the heterogeneity in population longevity risk and implications for insurance products

THE IMPACT OF CHANGES IN SMOKING BEHAVIOUR ON EXTRAPOLATIVE LONGEVITY PROJECTION: EVIDENCE FROM THE UK

RESEARCHERS

HENRY JIN
JOHN EVANS
JOHN PIGGOTT

The Lee-Carter model (Lee and Carter 1992) has now become a standard method for statistically forecasting mortality. Based on extrapolation, it efficiently captures the information contained in past mortality experience to project future trends in mortality change, thus allowing trends in population longevity to be predicted. But the extrapolative approach embodied in Lee-Carter implies that the method is necessarily sensitive to structural breaks in mortality.

According to the World Health Organisation, smoking is the single greatest cause of preventable death worldwide (World Health Organisation, 2008). As the number of regular smokers decreases, the smoking-related death events are expected to fall. Over the past half century, a major structural change in behaviour impacting on lifespan has been the dramatic reduction in the prevalence of smoking. Tobacco was first introduced to Great Britain in the 16th Century.

In 1948, when surveys of smoking began, smoking was extremely popular among men. Around the same time, the causal link between lung cancer and tobacco smoking was established, and from this point on, the popularity of male smoking began to decline. By 1970, the percentage of cigarette smokers had fallen to 55%. From the 1970s onwards, the prevalence of smoking fell rapidly until the mid-1990s. After 1995 the rate has continued to fall but more slowly. By 2008 around 22% of men aged 16 and over were reported as cigarette smokers.

This project analyses the impact of changed smoking behaviour on longevity projection. We study the impact of smoking on the efficacy of the Lee-Carter method, using UK mortality and smoking data from 1950 to 2007, and propose a Smoking Linked Lee-Carter Method. The model specification is quite different to most conventional Lee-Carter model extensions.

First, instead of adding the smoking factor directly into the original Lee-Carter model as Wang and Preston (2009) did, our new model adds a UK smoking prevalence index as a leading indicator into the underlying random walk process of forecasting the mortality index. Second, rather than modelling the relation between the level of smoking and level of mortality (e.g., Wang and Preston, 2009; McCathy, 2011), our new model focuses on identifying the link between the changing rates of the two variables. Thirdly, we focus not only on the goodness-of-fit (as most previous studies do) but also accuracy of prediction. Our estimated model substantially reduces the projection errors, from 22% to 3%, in a series of comparable 27-year out-of-sample forecasts of the period life expectancies of UK males aged 65.

Interestingly, the Lee-Carter approach forecasts female mortality much more accurately, and introducing changed smoking behaviour generates little improvement in forecast.

Further work in the project will focus on deriving evidence-based lags in generating the relationship between changed smoking behaviour and reduced mortality. Currently, we have assumed a 10 year lag, for convenience. This will need to be modified in light of epidemiological evidence, or at least, sensitivity testing will be carried out.

> Our estimated model substantially reduces the projection errors, from 22% to 3%, in a series of comparable 27-year out-of-sample forecasts of the period life expectancies of UK males aged 65

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[2] See http://info.cancerresearchuk. org/cancerstats/types/lung/ smoking/

AUSTRALIA'S OLDER POPULATION:
COHORT ANALYSIS OF DEMOGRAPHIC CHANGE

RESEARCHERS
PETER MCDONALD
MEIMANAT
HOSSEINI-CHAVOSHI

This study aims to generate projections of the evolving structure of Australia's population through the next several decades. The objectives are to compile the demographic patterns of a range of socio-economic characteristics of Australia's older population from different available databases in a single source; and project a selection of the same characteristics of the Australian aged population over the thirty-year period, 2011-2041. The projections will determine:

- ethnic background and citizenship
- location, housing and living arrangements
- extended family situation
- health and disability status
- income level and sources
- wealth
- education and work histories
- labour force participation
- expenditure patterns
- engagement in volunteering and community activity
- leisure and recreational activities
- values and attitudes of older Australians.

The first phase of this project is to construct such an information database using the 2011 census as the baseline data. Having constructed this base data, the second phase is to project a selection of the same characteristics of the Australian aged population over the thirty-year period, 2011-2041 using time trends and information already available for birth cohorts.

The future characteristics of the aged population carry with them major implications for policy decisions, and such projections are essential for sensible long-term policy formulation. The constructed data from this project will provide a database that will benefit all future-oriented CEPAR research. It will be also essential to the cost modelling exercises of other CEPAR researchers throughout the seven years of the Centre's activities. This project extends and will complement research on the demography of future ageing.

During the first year of the project all available national representative datasets containing information about the Australian ageing population have been thoroughly investigated. Hosseini-Chavoshi was granted access to the Australian Bureau of Statistics (ABS) TableBuilder for the purpose of constructing the baseline data that includes the demographic and social variables available in the 2006 and 2011 censuses. In 2012, the baseline data will be extended to incorporate more information related to the health and economic status, and family arrangements of the aged population by borrowing variables from the Household, Income and Labour Dynamics in Australia (HILDA) survey, DYNOPTA (Dynamic Analyses to Optimise Ageing is a pooled dataset comprising information from nine Australian Longitudinal Studies of Ageing), and several national surveys conducted by the ABS. The researchers will also determine the best and most practical mortality, fertility and migration models to be used for projection purposes. They will review historical and contemporary literature in the field of ageing to illustrate the possible changes in the future demographic, family, and social and health characteristics of the ageing Australian population in the next thirty years.

DR MEIMANAT HOSSEINI-CHAVOSHI
BS (Public Health) Isfahan University of Medical Sciences, MA (Population Studies) PhD ANU
RESEARCH FELLOW

Meimanat Hosseini-Chavoshi is a Research Fellow in the Australian Demographic and Social Research Institute (ADSRI) at the Australian National University.

Prior to her graduate education at ANU, she had a longstanding career with the Iran Ministry of Health and Medical Education as Head of the Population Health Data Unit, and as a Senior Officer of Family Health. She was the focal point person for designing, implementing and data analysis of several national health surveys in the areas of demographic and health issues, fertility transition, adolescents, and ageing.

Over the past five years, she has collaborated with various scholars on different projects funded by such agencies as the Wellcome Trust, World Health Organization, Global Development Network, and Gender, Economic, Research, and Policy Analysis.

She has a strong publication record and has already received a major book award, the World Prize for Book of the Year of the Islamic Republic of Iran in 2010.

Meimanat will benefit from her involvement with CEPAR through expansion of her knowledge and understanding of ageing issues in Australia.

STOCHASTIC DEMOGRAPHIC MODELLING AND FORECASTING

RESEARCHER

HEATHER BOOTH

External collaborators

ROB HYNDMAN
(MONASH UNIVERSITY)

LEONIE TICKLE
(MACQUARIE UNIVERSITY) et al

Accelerated decreases in mortality in recent decades have led to a renewal of interest in mortality modelling and the future of human longevity. In Australia and other developed countries, increased longevity contributes significantly to population ageing. Demographers typically use population projections to model future population size and structure, traditionally using scenario-based high, medium and low variants of population size to represent variability. However, the deterministic assumption-based approach of scenarios limits their validity as a measure of uncertainty. Stochastic methods of population projection use the variability in demographic processes to model future population uncertainty. Each component of population change –

mortality, fertility and migration – is stochastically modelled and forecast, and combined in a single population projection with a probabilistic prediction interval. Stochastic modelling and forecasting of demographic processes, and their use in probabilistic population forecasting, are being adopted internationally as the method of choice.

This ongoing research project addresses methodological development and related applications. Over the last decade, we have developed and evaluated multiple methods of forecasting demographic rates or events using the principal components approach. The main focus has been mortality. Early work developed a variant (Booth, Maindonald, Smith 2002) of the Lee-Carter method (Lee and Carter 1992) and demonstrated its favourable performance

through detailed evaluation of competing variants. This variant is widely used internationally and forms the basis of current forecasts of Australian cohort mortality (Tickle and Booth, in progress). Other research (with Hyndman) focuses on forecasting functional models of mortality schedules, incorporating smoothing of observed rates via regression splines, additional terms of the principal components decomposition, and improved variance estimation. The most recent development achieves coherence between forecasts of the sexes or other population subgroups such as state populations (Hyndman, Booth and Yasmeen, 2011).

These methods are currently being used to produce the first probabilistic forecast of the population of France, based on forecasts of mortality, fertility and net migration (Booth, Hyndman, Pennec, in progress). A new probabilistic forecast of the Australian population will be produced as soon as up-to-date Australian data become available; this forecast will inform ageing research and policy. Future research will use these methods in applications examining cohort mortality and relational forecasting of mortality (Booth).

> Stochastic methods of population projection use the variability in demographic processes to model future population uncertainty

ON THE ECONOMICS OF A MEANS-TESTED PENSION PROGRAM

RESEARCHERS

CHUNG TRAN
ALAN WOODLAND

The majority of OECD countries have pay-as-you-go (PAYG) social security systems in which governments collect tax revenue from current workers to pay benefits to all current retirees (universal). Demographic transition is placing these systems under fiscal stress. The reform of PAYG social security systems has been on the political agenda for many OECD countries, with much discussion focussed on the introduction of means-testing to limit the benefit levels as well as coverage. Australia stands out as one of the few countries which already has a means-tested pension system, where means-testing is applied to direct pension benefits towards low income retirees. This research program investigates the implications of a means-tested pension program.

Inclusion of means-testing into pension programs allows governments to better direct benefits to those most in need and to control funding costs by providing flexibility around the conditions for receiving benefits (extensive margin) and the benefit level (intensive margin). These distinctive features of a means-tested pension program result in a number of new aspects. First, limiting benefits towards old and poor agents strengthens the redistributive or insurance function of a pension system, with emphasis more on intra-generational redistribution, while keeping the distortionary effects of tax financing relatively small. On the other hand, however, uncertainty about eligibility for pension benefits combined with high effective tax rates for retirees, distort individuals' inter-temporal allocation of resources over the lifetime. This in turn distorts individuals' incentive to work and save, and utility. The optimal design of a means-tested pension system should efficiently trade off the desirability of protecting the elderly on low incomes with the economic costs of distorting young people's incentives to work and save.

To that end we first examine the trade-off in design of a means-tested pension program in a simple overlapping generations economy in which individuals are heterogeneous and face two types of risk: skill and longevity. We find that the means test effect via the extensive margin indeed improves the insurance aspect but introduces opposing impacts on incentives, and that the final welfare outcome depends upon the relative strength of these effects. Next, we study these trade-offs in a dynamic general equilibrium overlapping generations model of Australia with household heterogeneity and relevant policies represented. We show the combination of the policy parameter values of means-testing variables, maximum pension benefit and taper rate (the rate at which the benefit declines), that balance out the negative incentive effect and the positive insurance effect. Our findings carry important implications for re-designing the means-tested pension systems and for moving from universal PAYG systems to means-tested systems.

This research has been written up in CEPAR Working Paper 2011/10 and is expected to result in a journal publication.

> Australia stands out as one of the few countries which already has a means-tested pension system

DR CHUNG TRAN
BA Hanoi National University, MA Hague Inst of Social Studies & Hanoi National University, PhD Indiana University
ASSOCIATE INVESTIGATOR

Chung Tran is a Lecturer in the Research School of Economics at the Australian National University.

Prior to his appointment at ANU, he worked as a postdoctoral fellow at the University of Sydney and the University of New South Wales.

Chung's primary research interests lie in the areas of macroeconomics and public economics.

Much of his current work explores the effects of public policy. Specific research topics include: evaluating dynamic effects of social security systems; analysing implications of health insurance systems; and understanding the dynamics of debt financing.

Commencing in 2012, Chung will work on a two year CEPAR project titled, 'Innovative Healthcare Financing Systems under Demographic Shift', funded by an ARC award to support Early Career Researchers in the Centre.

'The ECR grant will provide me with a great opportunity to really focus on my research over the next two years.'

OPTIMAL CAPITAL INCOME TAXATION
WITH MEANS-TESTED BENEFITS

RESEARCHERS
CAGRI KUMRU
JOHN PIGGOTT

The received wisdom since the 1980s has been that it is inefficient to tax capital. But over the past decade or so, this result has been challenged by a number of writers. The zero capital income taxation result might not hold if there is market incompleteness and/or the life-cycle framework is used. Individuals' optimal consumption-work plan is not constant over the life-cycle, so the government wants to use age-varying consumption and labour income tax rates. If it is not possible to condition tax rates on age, a positive capital income tax rate can be a substitute for age-conditioned consumption and labour income tax rates.

It is interesting that the idea of age based taxes has not been further developed in a policy setting. This is possibly because in the US, such a tax would be regarded as discriminatory. In fact, however, age based programs do exist – the US Medicare program is one example. In Australia, older people are entitled to a personal income tax offset which effectively changes the rates of personal income taxation.

The idea that positive capital income taxation can be rationalised as a second best tax has immediate implications for the analysis of means-tested retirement transfers. If retirement leisure cannot be taxed, then its complement, life-cycle capital accumulation, might be taxed as a second best policy. But that is exactly

what a means test, either on assets or on capital income, is.

The underlying purpose of this project is to investigate whether and under what circumstances this proposition - that means-testing might be efficiency improving – holds in practice. We have constructed a stylised overlapping generations (OLG) model calibrated to the UK economy, and aim to apply it to alternative specifications of UK policy and behaviour.

If it is found that means-testing enhances economic efficiency and welfare, this will have profound implications for resource-testing retirement transfers everywhere.

Our results show a negative relationship between the benefit reduction (taper) rate and the optimal capital tax rate: the higher the taper rate, the lower the capital income tax rate. This result illuminates the relationship between the optimal capital income tax rate and features of the pension program. In addition we show that the optimal tax system creates a larger welfare improvement when the taper rate is shallow, and that reforms in the tax-transfer system should be considered together instead of in isolation.

We expect this project to generate a paper to be published in a good international economics journal.

> If it is found that means-testing enhances economic efficiency and welfare, this will have profound implications for resource-testing retirement transfers everywhere

DR CAGRI KUMRU
BA Dokuz Eylul, PhD Pittsburgh
ASSOCIATE INVESTIGATOR

Cagri Kumru is a Lecturer in the Research School of Economics at the Australian National University.

Prior to his appointment at ANU, he was a postdoctoral fellow in the School of Economics at the University of New South Wales working with Professors Piggott, Woodland and McDonald on the project 'Working Longer: Policy Reforms and Practice Innovations'. From 2006-2007, he was a lecturer in the School of Economics, Celal Bayar University.

He brings to the project a unique mix of behavioural analysis, institutional pension expertise, and high level technical skills in overlapping generations modelling.

His research interests include macroeconomic theory; public economics; computational economics; and behavioural economics.

Kumru is one of six Early Career Researchers in the Centre who will be funded by the ARC to work on two year research projects. He will commence his project, 'Life Choices and Policy: Policy Analysis with Non-standard Preferences', in 2012.

'The infrastructure and networks that CEPAR provides are very beneficial to my research. During 2011 I received enormous support from the Centre that allowed me to complete a number of papers, attend various conferences and workshops and most importantly receive instant feedback from top-notch researchers in the field. '

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

RESEARCHERS

GEORGE KUDRNA
CHUNG TRAN
ALAN WOODLAND

Australia, like other developed countries, has an ageing population, with mortality and especially fertility rates falling over the last three decades. Such fundamental changes in the age structure of the Australian population have important economic-wide effects both now and in the future. In particular it places increasing demands on government spending in the form of pension benefits in Australia. On the other hand, however, changes in economic factors including public policy influence the evolution of demographic structure. Fiscal reform will inevitably form part of the overall policy response to demographic change, but formulating such policy response requires a solid understanding of the evolution of demographic structure and its interaction with economic activities. This project will develop a framework to study the dynamic evolution of age structure and implications for the Australian economy.

Already, an overlapping generations (OLG) model is being constructed to analyse these issues, and the project will extend this to incorporate unstable demographic transition paths. More specifically, it develops computable OLG models of the Australian economy with three key determinants of the Australian demographic evolution: time-variant declines in population growth rate, increases in life expectancies over time, and changes in immigration. We will model demographic change in the sense of a time-varying age distribution of the population with a birth function that is time varying, with a mortality function that is time varying, and with a net immigration function that is also time varying. These various demographic functions are influenced by the state of the economy so that the age distribution of the population evolves through time and finally converge to a stable age distribution.

Accounting for more realistic demographic transition paths allows us to capture more accurately interactions between demographic shift and economic factors. This provides a convenient tool for analysing macroeconomic implications of unstable demographic transition. We will apply our model to analyse the impacts of demographic transition on national savings, economic growth and fiscal sustainability. Note that previous studies usually assume a stable demographic transition path, which is very special and, in particular, does not fully capture the essence of population ageing in Australia. We instead fully account for the feedback effects of changing economic conditions on evolution of demographic structure over time. Moreover, our model allows us to separate the effects of demographic change from the effects of policy change in our simulations. Our model could be easily extended to analyse the effects of a wide-range of policy issues including tax reforms and pension reforms in Australia.

It is expected that this research will generate working papers and publications.

> We will apply our model to analyse the impacts of demographic transition on national savings, economic growth and fiscal sustainability

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DR GEORGE KUDRNA
MA Econ. TUL Czech Republic, PhD Econ Syd.
RESEARCH FELLOW

George Kudrna is a research fellow at the ARC Centre of Excellence in Population Ageing Research (CEPAR) at the University of New South Wales.

He joined CEPAR in July 2011 after working as a postdoctoral researcher at the School of Economics at UNSW. He completed his undergraduate studies in economics and insurance management in the Czech Republic, and graduated with a PhD in Economics from the University of Sydney in 2009.

George Kudrna's main research interests are in the fields of pension economics, economic modelling and computational macroeconomics. He has written articles published in the *Journal of Macroeconomics* and the *Economic Record*. His current research projects at CEPAR include (i) Macroeconomic and welfare effects of the 2010 changes to mandatory superannuation, (ii) Progressive tax changes to private pensions, (iii) Economic effects of population ageing in Australia and (iv) A lifecycle analysis of superannuation payout options.

MACROECONOMIC AND WELFARE EFFECTS OF THE 2010 CHANGES TO MANDATORY SUPERANNUATION

RESEARCHERS

GEORGE KUDRNA
ALAN WOODLAND

In the 2010-11 federal budget, the Australian Government announced major reforms to mandatory superannuation, including gradual increases in the mandatory contributions to 12% of earnings and a policy that effectively removes the concessional 15% tax on mandatory contributions for low income workers. This project examines the economic implications of these changes. We developed a computable overlapping generations (OLG) model calibrated to the Australian economy that incorporates a close interaction of superannuation, Age Pension and taxation policy settings and used it to explore the effects of the two changes to mandatory superannuation.

More broadly, the model provides an economic tool for studying the effects of a change to Australia's retirement income policy, additional to micro-simulation models developed by the Federal Treasury.

In this project, we numerically evaluate the macroeconomic and welfare implications of the reforms, using an OLG model calibrated to the Australian economy. Our model is specified to include life uncertainty, inter- and intra-generational heterogeneity amongst households and, most importantly, the major aspects of Australia's retirement income and taxation policies. We start with computing the benchmark steady state equilibrium that targets the key Australian aggregates averaged over five years ending in June 2010. Then we separately simulate the effects of (i) gradual increases in the mandatory contributions from 9% to 12% and (ii) the removal of the 15% tax on mandatory contributions for low income earners. Finally, we examine the effects of the reform as a whole.

The simulation results of the reform package show significantly larger superannuation asset accumulations due mainly to the higher mandatory Superannuation Guarantee (SG) rate. Although larger superannuation savings partly offset ordinary non-superannuation assets, the domestic total assets increase. The reform improves self-funding in retirement, with government expenditure on the age pension falling by about 4.6% in the long run due to greater assets and asset income assessed under the means test of the Age Pension. However, the larger total asset accumulation produces a dominating income effect on per capita labour supply, which declines by over 1.2% in the long run. In terms of welfare implications, the reform increases long run welfare for all household types, with higher income households benefiting solely from the increased SG rate, while lower income households only benefit from the contribution tax removal. To provide overall assessment of the reform we calculate the aggregate efficiency implications. These calculations indicate that the reform generates an efficiency gain of almost 0.8% or $11,753 in initial resources for each future born generation and, therefore, is potentially Pareto improving.

This research has been written up as CEPAR Working Paper 2011/14. We aim to submit the paper to the top Australian economic journal, the *Economic Record* as well as present the findings at the 18th International Conference on Computing in Economics and Finance in Prague.

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

Alan Woodland is Scientia Professor of Economics and ARC Australian Professorial Fellow in the School of Economics within the Australian School of Business at the University of New South Wales.

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

He is the recipient of the Distinguished Economist Award of the Economics Society of Australia. He is an Associate Editor of the *Review of International Economics*, a past editor of the *Economic Record*, and is currently on the editorial boards of *Empirical Economics*, the *International Journal of Economic Theory* and the *Economic Record*. Woodland has been a Reserve Bank of Australia Fellow in Economic Policy and a Senior Fulbright Fellow. He is also on the scientific boards of the European Trade Study Group (ETSG), Asia Pacific Trade Seminars (APTS), Australasian Trade Workshop (ATW) and the Dynamics, Economic Growth, and International Trade (DEGIT) Research Centre.

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ECONOMIC EFFECTS OF POPULATION GROWTH AND AGEING IN AUSTRALIA

RESEARCHERS

GEORGE KUDRNA
ALAN WOODLAND

This project documents past and future demographic trends in Australia, discusses some of the literature on the economic implications of ageing and presents some preliminary long-run macroeconomic and fiscal results for the effects of ageing in Australia using a computable dynamic model.

The population projections provided by the Productivity Commission's MoDEM 2.0 demographic model indicate that population ageing in Australia will continue/accelerate in the next few decades. Under the medium population scenario, the share of the population aged 65 years and over increases from about 13% in 2007 to over 24% in 2053. Moreover, the population share for those aged 85 years and over increases from 1.64% to 5.8% in 2053. In contrast, the 15-64 year cohort share declines by about seven percentage points. Consequently, the aged dependency ratio (i.e., the ratio of those aged 65+ to those aged 15-64) increases from 19.5% in 2007 to over 40% in 2053.

These demographic changes are expected to have vast macroeconomic and fiscal implications and to some extent also affect the behaviour of people and businesses. This research discusses some of the literature on the economic implications of ageing, concentrating on the economic effects of changes in fertility, mortality and migration rates as well as retirement policy reactions to ageing. We show that the literature yields controversial results, suggesting that ageing effects are likely to vary across countries of different size and across different fiscal and social security systems.

The main part of this project applies a general equilibrium overlapping generations (OLG) model to provide a preliminary, long run macroeconomic analysis of the implications of population ageing for the Australian economy. To compute the long run effects of population ageing, we undertake the following steps.

First, we use the cohort shares and age-specific survival rates in 2007 taken from MoDEM 2.0 to compute a benchmark solution that closely matches the actual values of the key macroeconomic aggregates in Australia in 2007-08. Then, we re-solve the model using the cohort shares and age-specific survival rates for 2053, derived from the low, medium, high projection scenarios of MoDEM 2.0. The results are derived under two alternative model assumptions - perfect and imperfect capital mobility.

The simulation results indicate that population ageing will reduce per capita labour supplies and increase asset accumulation by households, while per capita age pension and health expenditures to the government and the consumption tax rate will rise substantially.

Allowing for adjustments in the domestic interest rates in the model (i.e., imperfect capital mobility assumption), we show that population ageing leads to capital deepening and higher wages.

This research was published in *A "Sustainable" Population? - Key Policy Issues'*, Productivity Commission, Canberra, July 2011, pp. 41-66.

In 2012 we will draw on some of the demographic and economic modelling undertaken in this project to analyse the economic and welfare impacts of population ageing in Australia using a demographic OLG model.

> The simulation results indicate that population ageing will reduce per capita labour supplies and increase asset accumulation by households, while per capita age pension and health expenditures to the government and the consumption tax rate will rise substantially

INTERGENERATIONAL SOLIDARITY AND POPULATION AGEING: ATTITUDES IN EUROPE

RESEARCHERS

JOHN PIGGOTT
ED WHITEHOUSE

'Intergenerational solidarity' (IGS) means different things to different people. In this project, we view IGS as a means to an end: a mechanism for supporting mutually beneficial exchanges between generations. Because needs and resources vary across the life-cycle, each generation gains from such exchanges. They can go in both directions. Forwards, towards younger generations, are investments in infrastructure, innovation and environmental protection. Backwards, to older generations, are pensions, and public and family care for older people.

This perspective on IGS highlights social- and economic-policy issues. The family and the government are the only institutions that can ensure this intergenerational exchange works. The market is not able to do so because minors and the unborn cannot sign contracts, and because intergenerational investment is irreversible – for example, education cannot be returned. IGS embodies the trust necessary to ensure that these non-market mechanisms of exchange continue to work smoothly as conduits for inter-generational exchange.

Population ageing is placing IGS under stress. The two-way exchange of time and money between generations works best in times of demographic balance. Social and economic changes might also imperil IGS. Greater labour-force participation of women and more complex as well as smaller families weaken bonds between family members and reduce opportunities for informal caring. This project unites two new databases to determine whether, and how, demographic, social and economic changes are indeed affecting perceptions of IGS.

The project had its origins in the April 2011 OECD Social Security Ministerial meetings in Paris. Both authors were involved in preparing background briefing papers on IGS, which was one of three major topics discussed at the meetings. In the time since, we have married attitudinal (Eurobarometer survey data) and economic data from more than 20 countries in Europe (OECD databases), to examine whether imbalances at the level of the nation, generated by economic policy and demographic shift are related to national attitudes towards solidarity between generations.

Over the last several months, statistical analysis of these data has been pursued. In October, John Piggott visited Paris briefly to consolidate this work. Multivariate OLS and Probit models are the main techniques used. The project is now at the stage where preliminary estimation has been undertaken. To take this to the next stage, we are aiming to recruit an economic and statistical analyst to CEPAR in early 2012, to help finalise the results and write up the resulting paper. It is anticipated that a working paper will be written in 2012, and submitted for publication.

> Population ageing is placing intergenerational solidarity under stress. The two-way exchange of time and money between generations works best in times of demographic balance

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

John Piggott is Scientia Professor of Economics and ARC Australian Professorial Fellow in the Australian School of Business at the University of New South Wales.

He has a long standing interest in retirement and pension economics and finance, and in public finance. His publications include more than 90 journal articles and chapters in books, which have appeared in the leading international academic journals as well as in highly cited conference volumes. In addition, he has co-authored two books, both published by Cambridge University Press.

His policy experience includes membership of both the Henry Tax Review Panel (2008-2009) and the Australian Ministerial Superannuation Advisory Committee (2007-present). For nearly a decade, from 1999, he worked with the Japanese Government (Cabinet Level) on pension and population ageing issues, and in 2004 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, Zhejiang University, China, and from 2008-2010 was Visiting Scholar with the Department of Insurance and Risk Management, Wharton School of Business, University of Pennsylvania.

John serves as book review editor of the Cambridge journal, *Journal of Pension Economics and Finance*.

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ATTITUDES, AGEING AND INTERGENERATIONAL RELATIONS

RESEARCHERS

HAL KENDIG
KATE O'LOUGHLIN
COLETTE BROWNING
MERRIL SILVERSTEIN
KARLA HEESE

The rights and self respect of older people depend largely on their 'social treatment' in everyday life, but there is growing evidence that they are facing negative attitudes and outright discrimination that limit their contributions and wellbeing. Ageism is arguably the last of the 'isms', after sexism and racism, to be recognised and confronted. Negative views on ageing are increasing along with rising public concerns about the costs to government of an ageing population (The Treasurer's Intergenerational Report (IGR)). Negative attitudes are considered to be a major issue for older people in the workplace and in the poor quality of care experienced in the health system.

The Australian Government aims to increase productivity by encouraging people to work longer (Productivity Commission, 2005) and to limit health and social expenditure in order to reduce fiscal costs associated with rapid population ageing over the coming decades (IGR, 2010). However, these actions will depend heavily on the practices of employers and governments. Our 2009 Ageing Baby Boomers in Australia national survey found that 17% of older workers reported experiencing 'unfair treatment on the basis of their age' in the workforce and 25% reported unfair treatment when applying for work (O'Loughlin et al, 2010). A recent National Seniors Australia (NSA) report (2009) identifies age discrimination as a major problem for older workers. The Age Discrimination Act (2004) aims to address these problems, however there is little evidence to date on its effectiveness or on the knowledge required to guide effective action against age discrimination and promote positive attitudes towards ageing. This project aims to:

1   Determine the influence of attitudes specific to the different life situations of older workers, recent retirees, and those in advanced old age.
2   Identify societal attitudes to ageing, intergenerational justice, and related policies.

In 2011 a comprehensive search has been conducted of literature on the treatment of older adults in different areas of life: the workplace, healthcare, and everyday life. A review of the literature identified is now in progress.

Analysis of the 2009 Australian Survey of Social Attitudes (AuSSA) data is underway on the attitudes of different age groups, possible social and economic influences on them, and how they relate to political and social views relevant to older people (e.g. support (or not) for raising the pension age eligibility to 67 years).

In the next stage of the research we plan to:

1   Continue analysis of the 2009 AuSSA data and commence comparative analyses with the US and other countries drawing on the International Social Survey Program data file.
2   Develop plans and possible data collection for the 2013 AuSSA. We will examine in greater depth ageing people's experiences and perceptions of ageist treatment as well as younger people's experiences and perceptions that may give rise to them.

> Negative attitudes are considered to be a major issue for older people in the workplace and in the poor quality of care experienced in the health system

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DR KATE O'LOUGHLIN
BA Macq., PhD Syd.
ASSOCIATE INVESTIGATOR

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

Her primary research interest is in ageing currently focused in three key areas: behaviours and exposures across the life course and the effect of these on health outcomes in later life; the psycho-social and financial aspects of the transition to, and planning for retirement; and individual and community attitudes to ageing, with a specific focus on age discrimination in the workplace.

She is currently involved in projects analysing data related to life transitions and social pathways and the effect of these on health, as well as ageing and disability (hearing loss). These projects are based on data from the Melbourne Longitudinal Surveys of Healthy Ageing (MELSHA) and the ABS Disability and Carers Survey respectively. She is also a Chief Investigator on the ARC-funded Ageing Baby Boomers in Australia research project being conducted in collaboration with National Seniors Australia, the US AARP, and La Trobe University.

HANDBOOK IN THE ECONOMICS OF POPULATION AGEING

EDITORS

JOHN PIGGOTT
ALAN WOODLAND

Over the past decade, a great deal of research has been undertaken focusing on the economic implications of population ageing and the economic policy options to deal with the consequent issues that will arise over the next half century. Given this interest and research, it is important that the economics profession be provided with a reference that critically reviews the existing literature and economic ideas about population ageing, and points the way for new research. It is timely for at least two reasons. First, there is already a significant body of literature on the topic. Second, given the projected increasing ageing of the population, the interest in economic research on the topic and the urgency of sound policy responses will only increase.

We have been fortunate in securing a contract to produce a *Handbook in the Economics of Population Ageing*, to be published by Elsevier. The Elsevier handbook series is the most prestigious in the discipline, and in the past these handbooks have helped define a new field of research. We see this as an opportunity to not only provide an up-to-date and critical account of research findings to the present, but also to provide a platform to inform future research.

The *Handbook* aims to cover the mainstream topics in the economics of ageing, with a focus on emerging areas of research and policy. We intend to make it relevant to economists, professionals and policy analysts throughout the world. It will contain a blend of theoretical analysis, empirical work and policy evaluation in the chapters and the handbook as a whole.

We propose to begin by having a chapter that sets the scene for the remaining chapters by discussing what we refer to as the anatomy of population ageing. A number of review papers will then be commissioned to cover the household perspective, examining important decisions such as retirement timing, germane aspects of the economics of the family, issues in decision making and cognitive decline, and specific issues such as life-cycle portfolio allocation and residential choice.

We then turn to markets. Chapters in this part of the volume will review the literature on the impact of demographic change on the labour market, trade, insurance markets and migration. A number of papers will follow which deal with policy: taxation, poverty, social security, health, and aged care.

This is a long term project. We have secured about half the writers of the chapters, and hope to have this selection complete early in 2012. In late 2012 or early 2013, we are planning a conference, jointly with Harvard University, at which chapter writers will present their work to date, discuss gaps, and iron out overlaps. Final delivery is scheduled for 2014.

The material outcome will be a volume of contributions that will simultaneously provide an authoritative reference for scholars and other professionals interested in demographic change and its implications, and help shape the future research agenda in the field.

… it is important that the economics profession be provided with a reference that critically reviews the existing literature and economic ideas about population ageing, and points the way for new research

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DECISION MAKING BY INDIVIDUALS, HOUSEHOLDS AND FIRMS

INDIVIDUAL DECISIONS, ESPECIALLY THOSE WHERE BENEFITS ARE FAR INTO THE FUTURE, OR THOSE MADE BY OLDER HOUSEHOLDS, ARE COMPLEX TO MODEL. AGEING INEVITABLY BRINGS WITH IT CHANGES IN COMPETENCIES, AND THESE CARRY IMPLICATIONS FOR SOCIAL AND ECONOMIC OUTCOMES AND ADJUSTMENTS IN A SOCIETY WHERE OLDER COHORTS ARE MORE POPULOUS.

Two such dimensions are driving and financial competence and both are impacted by cognitive capacities. There is now well documented evidence that older cohorts can have difficulty making life choice decisions, such as when to retire, what retirement plan to choose, what health insurance to purchase, and what aged care decisions to make. But even when rationality is assumed, modelling such choices is complex.

Understanding choices and decisions in a life-cycle context is challenging, but is required to generate and interpret evidence for meaningful policy formulation. During 2011 a number of studies commenced which will continue into 2012.

Progress included:

- Further development of a study to assess whether cognitive and sensory measures predict driving outcomes and driving cessation among the elderly.
- The development of a new method to solve numerically decision problems with multiple choices, both continuous and discrete, in a stochastic environment.
- Work on the life-cycle impacts of health risk on decisions and choices, and the formulation of a project to study investment in health over the life cycle.
- Life-cycle modelling of human capital investment, saving, labour supply and retirement.

- An analysis of residential transition at older ages.
- Development of a model of optimal risk management in retirement.
- An analysis of the impacts on choice of major reforms in the Norwegian pension system.

STRAND 2

DECISION MAKING BY INDIVIDUALS, HOUSEHOLDS AND FIRMS

The ageing of individuals potentially involves changes in competency that may affect decision making and social interactions. Examples include changing driving competency and ability to make rational choices concerning retirement plans, age care and health insurance. Younger cohorts may also experience difficulties choosing future retirement plans. Our research assembles economic, social and psychology expertise to address the challenges posed by age transitions in cognitive and functional competencies and health and financial literacies.

RESEARCH PROJECTS

DO COGNITIVE AND SENSORY MEASURES PREDICT DRIVING OUTCOMES AND DRIVING CESSATION IN OLDER DRIVERS? A FIVE YEAR VALIDATION STUDY

RESEARCHERS

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Research Assistant

CARL MOLLER (ANU)

Adults over 65 years represent the most rapidly growing sector of the driving population. This is partly due to the general demographic shift of an increasingly larger proportion of older individuals in the population, as well as a growing trend for older adults to maintain their licenses for longer than previous generations. The out of home mobility afforded by driving has important implications for older adults including decreased risk of isolation, depression, poor health, and functional impairment through enabling access to resources known to protect quality of life, such as employment, community activities, friends, family and health care services. Therefore transportation, and maintaining mobility, is essential for older adults to access critical services and maintain community and social participation.

Research has shown a wide range of factors impact on older drivers' capacity to drive safely, indicating that vision testing alone does not adequately assess capacity to drive, and that other relevant cognitive and sensorimotor factors need to be taken into account. The development of screening tools is imperative, and of high priority for two important reasons. Firstly, to ensure safer roads by accurately identifying, counselling, educating and ultimately changing the driving behaviour of those older adults at greater risk of road accidents. Furthermore it will lead to the second priority, which is to ensure that self-regulating behaviour in older drivers is appropriate for the individual, and thus maintain mobility and driving status for as long as practical in older drivers to preserve mobility, independence, health and wellbeing.

This project is a five year validation study of three screening measures developed to assess older drivers who may be at risk of crashes or unsafe driving.

Participants who took part in a study of Driving and Healthy Ageing in 2006 are being followed up. This study will investigate the predictive validity of the ACT Hazard Perception Test by following-up individuals with regard to their driving history over the past five years. Validation of screening measures for older drivers will provide the evidence base on which to decide how to assess the safety of older drivers in the ACT. The study will also evaluate a new tool for assessing readiness to give up driving (REDI) and to determine the predictors of readiness to cease driving. The initial sample was recruited through the electoral roll.

The questionnaire was developed in September 2011 and administration began in October. Of the 308 participants in the 2006 study, 226 were able to be contacted and letters were sent to invite them to participate in the follow up study. Consent forms were returned by 152 of the 226 and these participants were then sent the questionnaire. To date, 134 questionnaires have been completed and data entered. Of these 134 participants, 72 have also completed a telephone interview comprising a brief cognitive assessment and a check of any missing answers in their written questionnaire. The telephone interview also provides participants with the opportunity to ask any questions they might have regarding the research. It is expected that all participants who completed the questionnaire will be administered the cognitive assessment before the end of the year.

In 2012 we will analyse the results of the survey and on this basis a report to the NRMA ACT Road Safety Trust will be prepared. The evaluation of the REDI tool will be conducted.

It is also expected that peer-reviewed journal publications and conference papers will result from this study.

> Validation of screening measures for older drivers will provide the evidence base on which to decide how to assess the safety of older drivers in the ACT

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LIFE-CYCLE MODELLING OF HUMAN CAPITAL INVESTMENT, SAVING, LABOUR SUPPLY AND RETIREMENT

RESEARCHERS

MICHAEL KEANE
ALAN WOODLAND
FEDOR ISKHAKOV

The existing literature takes a dynamic approach to studying retirement-related decisions and therefore must trade-off the computational tractability of the model against the level of detail used to describe the decision processes under consideration. Most papers concentrate on labour supply choices and timing of retirement, and develop sequential discrete choice models that treat consumption and savings as exogenously given. A few models take into consideration endogenous consumption-savings choices and describe how retirement benefits affect the earnings profile and consumption path over the life-cycle. Yet, none of the existing papers endogenises the process of human capital accumulation, which has been shown to play an important role in life-cycle models of labour supply and savings.

This project investigates how inclusion of human capital accumulation in the model of consumption-savings, labour supply and retirement affects optimal behaviour under different institutional settings. So far, our work has yielded an analytical framework. Considering all four decisions simultaneously will allow us to draw conclusions about how different choices interconnect, in particular how investments in human capital throughout the life-cycle are affected by various aspects of the pension system. We are also investigating how the level of accumulated human capital affects labour supply towards the end of one's working life and the timing of retirement.

The model will be applied to both US and Australian data and will study the effects of the Age Pension in Australia and Social Security in the US. Once estimated, the model will be used to simulate the effects of various changes in the retirement regulations on the decisions made by the individuals over the life-cycle. Related CEPAR projects will investigate the relationship between investments in health and human capital accumulation.

This project will generate new insights into the interactions between human capital investment decisions and labour supply over the life-cycle, and in particular how existing policy settings impact these. It will therefore have direct implications for policy formulation. We anticipate we will write this up in several separate papers, suitable for submission to strong international journals in Economics.

> This project will generate new insights into the interactions between human capital decisions and labour supply and life-cycle choices, and in particular how existing policy settings impact these

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Michael Keane is an Australian Laureate Fellow and Professor of Economics in the Australian School of Business at the University of New South Wales.

Several independent sources have placed Michael Keane among the top 50 economists internationally in terms of citations and the impact of his work. 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 Institute for Research on Poverty's Working Group on Problems of the Low Income Population since 1992 and as a member of the Peer Review Panel of the National Institutes of Health (NIH) in 1995-6, 1999 and 2001-5. In November 2009 he prepared a report on tax transfers and labour supply for the Australian Treasury's Commission on Australia's Future Tax System.

He has been a visiting scholar at the International Monetary Fund at various times throughout his career.

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

LIFE-CYCLE EFFECTS OF HEALTH RISK

RESEARCHER
ELENA CAPATINA

Health care system reform is a contentious topic of debate highlighting the need for a better understanding of how health affects individuals and their economic decisions. Current statistics suggest that health risk is a major component of overall risk and a big determinant of welfare with potential large macroeconomic implications. For example, 'using a conservative definition, 62.1% of all bankruptcies in 2007 were medical' (Himmelstein et al. (2009)).[3] In order to predict the effects of upcoming changes to the US health care system on the type and degree of health risk faced by individuals, it is important to understand the different channels through which health affects individuals and their economic consequences.

The project studies four channels through which health affects individuals: productivity, medical expenditures, available time and survival probabilities, and assesses their roles in determining labour supply, asset accumulation and welfare using a life-cycle model calibrated to the US economy. First, health has large implications for the macroeconomic variables studied through all four channels, and due to significant interactions, they need to be studied within a unified framework over the entire life-cycle. Health risk accounts for a large fraction of disposable income inequality, for example, approximately 9% for the high school educated group, with the productivity channel generating most health induced disposable income risk. Second, health affects education groups differently, with larger effects for non-college educated individuals, explaining 35% of the difference in labour supply and 31% of the difference in the degree of reliance on government transfers between education groups. Non-college educated individuals face higher probabilities of bad health at any age, experience larger productivity drops due to adverse health shocks, and have lower abilities to self-insure against future health shocks due to lower incomes. Despite the presence of a consumption floor guaranteeing a minimum level of consumption, health risk leads to much larger fractions of precautionary savings for the non-college than college educated. Since one of the most important channels is the effect of health on the productivity of the non-college group, improving non-college health outcomes has very large welfare benefits because overall productivity is raised in addition to individuals having on average more time to allocate to work and leisure. Improving non-college health closer to college levels results in large welfare gains, higher labour supply, and significantly lower reliance on government welfare programs. Improving health care system efficiency (i.e. lowering medical and time costs associated with bad health) also results in welfare gains, but expanding insurance coverage, either employer or government sponsored, has relatively small benefits if health outcomes remain unchanged.

This research has been written up as CEPAR Working paper 2011/15 and is currently under review by a peer reviewed Economics journal.

This project has studied health risk in a framework where health transitions probabilities over the life-cycle are exogenously determined. In reality, individuals can invest in their health and seek preventive medical care to improve their probabilities of good health as they age. This important consideration will be studied in the project 'Investment in Health over the Life-Cycle' by Michael Keane, Shiko Maruyama and Elena Capatina.

> ...health affects education groups differently, with larger effects for non-college educated individuals, explaining 35% of the difference in labour supply and 31% of the difference in the degree of reliance on government transfers between education groups

3   Himmelstein, D. U., D. Thorne, E. Warren, and S. Woolhandler (2009). 'Medical Bankruptcy in the United States, 2007: Results of a National Study', *The American Journal of Medicine*, 122, 741-6

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INVESTMENT IN HEALTH OVER THE LIFE-CYCLE

RESEARCHERS
MICHAEL KEANE
SHIKO MARUYAMA
ELENA CAPATINA

The project studies the relationship between socio-economic status (SES) and health through different causal channels. While many previous papers have established a strong correlation between socio-economic variables and health, very little is understood about the causal pathways behind it. The challenge lies in the ability to empirically identify the effect of SES on health, the effect of health on SES and the effect of common factors systematically correlated with both SES and health. Due to the present limited understanding of the SES-health relationship,

most existing life-cycle models make drastic simplifying assumptions, for example assuming that health evolves exogenously over the life-cycle and modelling human capital accumulation independent of health. However, 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. Therefore, we aim to fill this gap in the literature by building and estimating a model of health formation over the life-cycle in the spirit of Grossman (1972), focusing on the causal relationships between income and health and the role of policy in affecting these relationships.[4]

The first aim of the project is to clearly identify and estimate the causal channels through which SES and health are related. We will tackle the identification problem by careful construction of instrument variables that can be used to eliminate the simultaneity problem between SES and health. Second, we build and structurally estimate a life-cycle model of consumption, labour supply, asset accumulation and health investment. Since we are particularly interested in understanding the importance of different ways in which income affects health, we incorporate a rich process for the evolution of health over the life-cycle that takes into account investment in health

through effort and medical expenditures as well as other income related effects. A key feature is to distinguish between different types of health shocks with different causes and effects, for example temporary changes in health caused by minor accidents (e.g., broken bones), predictable long term health shocks (e.g., onset of lung cancer for smokers), and unpredictable long term health shocks (e.g., the onset of leukaemia). This detailed health process modelling is important since we need to accurately capture how people form expectations regarding the evolution of health and the degree of health risk they face throughout their lives in order to estimate how health impacts individuals'

economic decisions such as the allocation of resources between consumption, leisure, work and health investment. We also study how different types of health shocks affect income. The effect of health on labour supply is particularly important since it affects individuals' human capital accumulation and their ability to work and earn income as they age. Our paper will be the first to study these effects in a unified framework. Finally, we will apply the estimated model to study the role of policy in affecting individuals' incentives to invest in health and explore other topics of interest in the literature such as the relationship between income and health inequality.

DR ELENA CAPATINA
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Elena Capatina is a CEPAR research fellow located in the Australian School of Business at the University of New South Wales. 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.

'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. I have met with many other researchers affiliated with

CEPAR with interests and experience in this area, and have benefitted greatly from their suggestions and ideas. Also, since CEPAR is a multidisciplinary environment, I received valuable feedback from researchers in other fields, including Actuarial Sciences and Demographics, who provided me with new and exciting perspectives.

It has been very interesting to participate in several conferences, workshops and seminar series organised by CEPAR. At these events, I gained insights into potential research topics that are highly relevant today by talking with researchers from other fields, policymakers and professionals working in industry.'

This is a long-term project. We will develop our research over the next two years, and are expecting to produce several papers on the topics mentioned, aimed at publication in peer-reviewed, top-rated journals in Economics.

In the next year, we will first work on preparing the data set required for the model estimation. We are using data from the Medical Expenditure Panel Survey in the US. This data set is very large, containing detailed information on health status, health insurance, employment and other key individual characteristics. Our efforts will focus on understanding this data and constructing our key variables from the information provided.

We have also applied to gain access to a section of this survey containing information on assets that is not publicly available and will work on combining the data files. This information is critical for estimating our model.

After cleaning and understanding this data set, we will concentrate our efforts on constructing the variables of interest in our model. Since it is important to construct credible instruments for our identification strategy, this is a critical step that will require careful consideration.

We will then structurally estimate our model. At this stage, we will spend a few months on developing our programming codes and running the simulations. After obtaining our first results, we will write a preliminary draft outlining our findings and present this research at conferences toward the end of year 2012.

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

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

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Shiko Maruyama is a Lecturer in the School of Economics within the Australian School of Business at the University of New South Wales.

His research interests include empirical applied microeconomics and a wide range of health economics topics, such as health insurance, informal care, elderly care and intergenerational transfers and preventive health behaviour.

He is currently a Visiting Fellow at UTS. 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.

SAVINGS AND THEIR DETERMINANTS IN OLD AGE

RESEARCHER

LORETTI ISABELLA DOBRESCU

External collaborators

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Under this project, a portfolio of four sub-projects was developed to address the issues related to the declining savings patterns and their determinants, at the national and individual level.

First, in *To Love or to Pay: On Consumption, Health and Health care,* Dobrescu used a dynamic structural life-cycle model to investigate how heterogeneous health

and medical spending shocks affect the savings behaviour of the elderly. Consumers could respond to health shocks in two ways: they could directly pay for their health care expenses (self-insure) or they could rely on health insurance contracts. Two possible insurance options were considered, one formal (insurance contracts provided by the market) and one informal via care provided by family. Counterfactual experiments showed that health, medical spending and health insurance are indeed the main drivers of the slow wealth decumulation after retirement. Results on social cohesion confirmed three social literature findings: social cohesion generally rises with age, it declines with wealth and it is higher

in Mediterranean countries than in Central European or Scandinavian countries. Finally, high social cohesion is typically associated with increased life expectancy.

Second, in *Why Aren't Developed Countries Saving?* Dobrescu, Kotlikoff and Motta analysed the dramatic decline in the national saving rates over time. The US saved around 11 percent in 1970, but only one percent in 2008, while France saved over 23 percent of national income in 1970, but only nine percent in 2008. What explains these international and intertemporal differences? Is it demographics, government spending, productivity growth or preferences? For the US and France, whose saving behaviour

we studied, our answer is preferences. American and French societies are placing increasing weight on the welfare of those currently alive, particularly contemporaneous older generations. This conclusion emerges from estimating two models in which society makes consumption and labor supply decisions in light of uncertainty over future government spending, productivity, and social preferences. The two models differ in terms of the nature of preference uncertainty and the extent to which current society can control future societies' spending and labour supply decisions.

Third, in *Early Life Conditions and Financial Risk–taking in Older Age,* Christelis, Dobrescu and Motta used

life-history survey data from 11 European countries to analyse whether childhood conditions, such as socioeconomic status, cognitive abilities and health problems influence portfolio choice and risk attitudes later in life. After controlling for the corresponding conditions in adulthood, it was found that superior cognitive skills in childhood are positively associated with stock and mutual fund ownership. Childhood socioeconomic status is also positively associated with the ownership of stocks, mutual funds, individual retirement accounts, and willingness to take financial risks. On the other hand, bonds are not affected by early childhood conditions and we only found weak effects of childhood health

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Loretti Dobrescu is a Lecturer in the School of Economics at the University of New South Wales.

She is an established researcher with expertise in mathematical modelling and in estimating economic models using simulations. She has published significantly in international journals of mathematical modeling and is active in the research fields of Microeconometrics, with particular emphasis on the Economics of Ageing,

Health Economics and Mathematics. She was part of the backbone team that developed the first comprehensive dataset of ageing in Europe – Survey of Health, Ageing and Retirement in Europe, being operatively involved in the 'Earnings and Pensions' section and in the development of the dataset's imputation phase.

problems on portfolio choice in adulthood. Finally, favourable childhood conditions affect the transition in and out of risky asset ownership, by making divesting less likely and facilitating investing (i.e., transitioning from non-ownership to ownership).

Finally, in *Staying Home or Dining Out? Social Interactions and Old-Age Consumption Profiles*, Dobrescu, Motta and Gui developed a dynamic structural life-cycle model, wherein single retired individuals can choose to consume food at home, food outside the home and phone services to study the impact of social activities and health on individuals' consumption patterns. Results showed that social interactions affect consumption to a degree comparable with the impact of health status and this holds true especially for phone bills and food outside the home. Moreover, it appeared that these two factors weaken each other in enhancing utility of food at home and finally, have

the opposite joint effect on food outside the home and phone bills.

NEXT STAGE

It is broadly known that behaviour and age-related changes in behavioural processes are strongly connected to how well we age. Many behavioural elements, such as cognitive and functional abilities, social activity and happiness are intrinsic to maintaining health and quality of life. Moreover, all these elements play a critical role in shaping the economic choices of the elderly. Understanding the causes of variation in the economic decisions, their change with age and their effect on the socioeconomic status of the elderly is essential to maintaining

and enhancing quality of life throughout old age. The work developed in 2011 revealed some important factors that need to be considered when trying to explain or influence in any way the dissaving patterns of the elderly. In continuation of this line of research and directly connected to the last study, Dobrescu and Christelis will study this issue from yet another angle, namely analysing the impact of social interactions on health especially at advanced ages.

The work developed in 2011 revealed some important factors that need to be considered when trying to explain or influence in any way the dissaving patterns of the elderly

ELDERLY MOBILITY AND TRADE-DOWNS IN AUSTRALIA

RESEARCHERS

RENUKA SANE
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In most industrialised countries, and in Australia in particular, the owner-occupied home is a central asset among mature age cohorts. It might be expected that the elderly draw down their housing wealth, generally by moving to a smaller home, to help smooth consumption over the life-cycle.

In Australia, however, the mobility decision is complicated by the unique position of the owner occupied home: it attracts no income tax, no capital gains tax, and most important for the elderly, its value does not count in the Age Pension assets test. However, proceeds from the sale of a house count as assets and the returns from the investment of these assets count as income towards the income test. It follows that any decision to liquidate wealth held in the owner-occupied home may reduce Age Pension entitlements. In addition,

if a person transitions to aged care, the family home is not counted as an asset in determining the fees if another family member still resides in the home.

This project focuses on the role of the owner-occupation exemption in the Age Pension means test on residential choice and transition among the elderly. The study is expected to have international relevance, since owner-occupier exemption is a feature of many resource-tested programs around the world – in the US, for example, the SSI does not include the family home in determining eligibility, and it is also excluded from Medicaid's asset limits. While there has been considerable research on the role of means-tested pensions on savings and labour supply, residence exemption appears to have escaped much analytic attention.

We use the Household, Income and Labour Dynamics in Australia (HILDA) panel data-set for our analysis. We first estimate panel-data models for mobility. We then

estimate a selection model for trade-downs, conditional on moving. We find that residential mobility is rare in Australia. If a move is made, it is typically for reasons related to family, health or life-style changes. Very few moves are made simply with the intention of moving to a smaller home. Furthermore, moves made for the other reasons mentioned above tend not to lead to downsizing. We find that pensioners have a lower probability of trading-down than non-pensioners.

With current data, it is not possible to draw firm conclusions about whether these findings can be attributed to the Age Pension design, although the results are suggestive. In 2007, the taper rates on the assets test were reduced allowing retirees to hold a larger fraction of financial wealth before the age pension would be withdrawn.

If our hypothesis holds, we should see a greater fraction of retirees trading-down their family homes, especially those for whom the part-pension threshold was binding before the policy change. This would establish causality between pension status and trade-downs. Early next year, the new release of HILDA will provide data on mobility, trade-downs and wealth of households after 2007.

We thus propose to use the 2007 policy change as a natural experiment. We plan to exploit the exogenous change in assets test taper rates with a difference-in-difference model to estimate

the probability of trading down the family home. We expect to conclude the study in the course of 2012.

This research has been written up as CEPAR Working Paper 2011/12: 'The Impact on Residential Choice of the Family Home Exemption in Resource-tested Transfer Programs.'

> The study is expected to have international relevance, since owner-occupier exemption is a feature of many resource-tested programs around the world

OPTIMAL RISK MANAGEMENT IN RETIREMENT: THE ROLE OF HOUSING WEALTH, LONG-TERM CARE INSURANCE, AND ANNUITIES

RESEARCHERS

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THOMAS POST
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Many current retirees hold the major share of their wealth in the form of home equity. Home equity is unlike other retirement savings. A home provides a place to live as well as being a savings vehicle, which may serve as implicit insurance against a major health risk in old age: long-term care costs. At the same time, a home is not an ideal asset to meet the financial needs of elderly households, especially when having no other substantial sources of income. It concentrates a large amount of household savings in a single asset, exposing the household to substantial risk. It is illiquid and cannot be sold in parts in case of urgent cash needs. Home equity release products convert home equity into liquid wealth while at the same time allowing homeowners to continue residing in their home.

This project models the decisions of a retiring couple that holds the major part of their wealth in a residential home and faces longevity risk, long-term care risk, and house price uncertainty. The household is modelled as a couple since reverse mortgage decisions are often triggered by the death of the main income earner. The couple can buy annuities and long-term care insurance and borrow against their home using equity release products. The model components include house price risk, reverse mortgage prices, long term care and longevity risks, and insurance prices calibrated to Australian data.

The project outcomes will include an assessment of the welfare benefits of a number of different reverse mortgage designs including shared equity and more traditional reverse mortgages and the optimal product design from the homeowner's perspective. This is considered in different institutional settings including with and without long term care insurance, as well as life annuity products. Consideration is given to alternative institutional settings where costs are born by a government-sponsored system with co-insurance, where most care costs have to be met by the individual and private insurance is available, and where there is no private insurance market for care costs. Flexibility with respect to the timing of the reverse mortgage decision and flexibility with respect to the amount borrowed will be considered. The couple's decisions of when to optimally borrow against the home will be assessed. This project will continue in 2012 and is expected to result in a journal paper.

> The project outcomes will include an assessment of the welfare benefits of a number of different reverse mortgage designs including shared equity and more traditional reverse mortgages and the optimal product design from the homeowner's perspective

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Katja Hanewald joined UNSW in January of 2011 as a senior research associate. Prior to this, she worked as a research assistant at the Dr. Wolfgang Schieren Chair for Insurance and Risk Management and in the Collaborative Research Center 649: Economic Risk at Humboldt-Universität zu Berlin.

Her research interests include risk management, pricing, solvency, and regulatory requirements for life insurers and pension funds; models to quantify risks related to longevity and morbidity; and individuals' perception of mortality and longevity risks.

'I am always interested in a number of research topics beyond the projects I am currently working on. CEPAR provides the perfect setting for me to develop my projects and deepen my interest in other economic, demographic and actuarial areas.'

PREDICTING THE EFFECTS OF THE NORWEGIAN PENSION REFORM WITHIN A STRUCTURAL DYNAMIC APPROACH

RESEARCHER

FEDOR ISKHAKOV

External collaborators

JOHN RUST
(UNIVERSITY OF MARYLAND)
BERTEL SCHJERNING
(UNIVERSITY OF COPENHAGEN)

Norway has recently reformed its public pension system, introducing new rules for both the accumulation of pension wealth and calculation of pension benefits, which now depend not only on the working history of the retiree, but also on life expectancy and time of retirement. Together these innovations expand the range of choices available to workers, during and especially at the end of their working careers.

This project develops and estimates a comprehensive dynamic model capable of describing the behaviour of near retirees under previous institutional settings, and forecasting behavioural responses to the policy change. The model will also be used for providing policy suggestions based on counterfactual simulations.

The degree of innovation and overall scale of the Norwegian pension reform provide excellent grounds for testing the structural approach to modelling human behaviour itself. When the data on actual post reform behaviour becomes available, we plan to assess the adequacy of our model and the accuracy of the forecasts it produced.

The structural dynamic model being developed will describe individual labour supply, consumption-savings and retirement choices of prospective retirees in Norway under the new pension regulations of 2011. Pension reform in Norway drastically expands the choice set of the individuals by allowing retirement at an earlier age, partial pension take-up, and free combinations of earnings and pension benefits. The new system also introduces actuarial fairness by varying the pension benefit based on life expectancy and the age of first pension take-up.

Because the level of pension benefit is the result of redistributing accumulated pension rights over the take-up years, retirees have to coordinate their own savings with the pension right accumulation. Therefore, the model uses a standard consumption-savings framework with a single continuous choice, and introduces two discrete choices, namely the amount of labour supply and the amount of pension take-up. We solve the model using a modification of Carroll's method with discrete choices and additional state variables, and estimate it using Norwegian register data on wealth, savings and received pension benefits during the period 1997-2006.

Over the next two years this project will result in several papers including those with clear policy orientation and more theoretical ones, all aimed at publication in leading international journals in Economics.

This project is supported by the Ragnar Frisch Centre for Economic Research at the University of Oslo, project 1307 strategic centre programme on pension research, and CEPAR.

> The degree of innovation and overall scale of the Norwegian pension reform provide excellent grounds for testing the structural approach to modelling human behaviour itself

DR FEDOR ISKHAKOV

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RESEARCH FELLOW

Fedor Iskhakov is a CEPAR Research Fellow as well as a fellow at the Centre for the Study of Choice, University of Technology Sydney. He was a lecturer in the Graduate School of Management at St Petersburg University from 2009- 2010 and a Visiting Research Scholar at the University of Maryland in 2006 and 2010. Since 2002 he has had an ongoing association with the Frisch Centre for Economic Research where he has held the positions of student assistant, research fellow and postdoctoral research fellow.

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

His research interests lie in the area of structural microeconometrics, and more specifically in dynamic modelling of individual choice.

'Working at CEPAR gives me a unique chance to participate in research projects of the highest theoretical and methodological quality which have substantial relevance for economic policy in Australia and the world.'

EXTENDING THE ENDOGENOUS GRID METHOD FOR SOLVING DISCRETE-CONTINUOUS SEQUENTIAL DECISION PROBLEMS

RESEARCHER

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This project develops a new method of solving computationally demanding life-cycle models involving simultaneous discrete and continuous choices. Computational tractability has always been a limiting factor in studying realistic models of this class, resulting in oversimplification and limited policy relevance.

A typical focus of life-cycle models is the retirement choice, where the dynamic nature of the decisions made by people approaching retirement is very evident. Retirement choices are usually modelled within a discrete choice framework, and most studies disregard the underlying choices of consumption and savings. By moving the boundary of computational tractability, this project will facilitate the development of more realistic and accurate dynamic models of retirement choices.

In this project we extend Carroll's [2006 'The method of endogenous grid-points for solving dynamic stochastic optimisation problems', *Economic Letters* 91(3):312-320], an endogenous grid method for models with simultaneous discrete and continuous choices. We propose a solution algorithm which both avoids costly root-finding operations with respect to continuous decision variables and replaces optimisation across discrete decisions with more efficient calculations of the upper envelope of a finite set of piece-wise linear functions. Unlike previous literature we formulate the algorithm relying as little as possible on a particular model specification, and precisely define the class of dynamic stochastic optimal control problems to which it can be applied. We illustrate our algorithm using a discrete labour supply model with savings and borrowing constraints, and show that in comparison to the traditional brute force approach the proposed method runs at least an order of magnitude faster to deliver the same precision. The code is provided.

This project will be written up and submitted for publication in a top rated international journal in economics. It will also result in a software package for solving sequential discrete-continuous choice models which will assist future CEPAR projects by facilitating faster and easier model development. The algorithm will be applied to CEPAR projects in which the retirement decision is the focus of analysis.

> We propose a solution algorithm which both avoids costly root-finding operations with respect to continuous decision variables and replaces optimisation across discrete decisions with more efficient calculations of the upper envelope of a finite set of piece-wise linear functions

PROFESSOR HANMING FANG
BA Fudan, MA Virginia,
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PARTNER INVESTIGATOR

Hanming Fang is Professor of Economics at the University of Pennsylvania and a Research Associate at the National Bureau of Economic Research (NBER). He brings to the Centre expertise in insurance markets, and in analysing the choices people make in their major life decisions – for example, when to retire, or what pension plan to choose. Fang and Keane have published together in the past on this topic, and Fang plans to visit to strengthen his ties with the Centre.

He has been working on two projects through 2011 related to these issues, and to CEPAR's mission. The first is a project with Edward Kung on understanding the interactions between the life insurance industry and the emerging life settlement industry. The life settlement industry involves an intermediary who will take over premium payments from a life insurance policyholder intending to lapse their coverage. They make a payment to the initial policyholder in return for being named a beneficiary.

This project investigates the theoretical and empirical effects of the emerging life settlement market on consumer welfare. While you would expect that consumers would be better off, in equilibrium, this may not always be the case. For example, the presence of the settlement firms may lead to the primary insurance companies raising the premiums. It is the general equilibrium effect, which will reflect the long run welfare effect of the life settlement industry on consumers, that has been the focus of this project's theoretical analysis.

Fang and Kung show that the general equilibrium welfare effect of the settlement industry crucially depends on the reason for lapsation. If it is due to loss of the bequest motive, then the settlement industry lowers consumer welfare in equilibrium unambiguously. However, if lapsing is due to liquidity shock, then the settlement industry may increase consumer welfare in equilibrium. These theoretical results have led to an empirical project which aims to disentangle the roles of different factors - loss of the bequest motive, liquidity shocks, health shocks, or even idiosyncratic preference

shocks - in the lapsation decision observed in the data. The project has already produced an NBER Working Paper, 'How Does Life Settlement Affect the Primary Life Insurance Market?' (NBER WP 15761), and two other papers are currently in progress.

Fang is also working on a second project titled 'Equilibrium Labour Market Search and Health Insurance Reform' (with Naoki Aizawa at the University of Pennsylvania). In this study the authors present and empirically implement an equilibrium labour market search model where both the wages and health insurance provisions are endogenously determined. The model is able to replicate all the well-known relationships between firm size, wages, health insurance provision and worker health. The model is estimated using various sources of data including the Survey of Income and Program Participation (SIPP), the Medical Panel Expenditure Survey (MPES) and Robert Wood Johnson Foundation Employer Health Insurance Survey (RWJ-EHI) data. The model estimates are used to evaluate the equilibrium effects of several features of the health insurance reforms currently being implemented in the United States.

This latter project, in particular, is related to the health and retirement projects being undertaken by CEPAR researchers. Hanming Fang plans to visit CEPAR in 2012, and this will provide an opportunity to strengthen these associations.

STRAND 3

INTEGRATING PUBLIC AND PRIVATE PROVISION OF PRODUCTS AND SERVICES

Effective integration of public and private sources for retirement income, health insurance and aged care will become increasingly important as populations age. This research covers retirement products and the decisions households take regarding their purchase; health behaviour choices, including choices regarding preventive health; and purchases of aged related products and services. The analysis is designed to discover what innovations, by government and business, might improve outcomes.

RESEARCH PROJECTS

STRAND 3 INTEGRATING PUBLIC AND PRIVATE PROVISION OF PRODUCTS AND SERVICES

OLDER COHORTS EXPERIENCE DIFFERENT EXPOSURE TO ECONOMIC CIRCUMSTANCE THAN THEIR YOUNGER COUNTERPARTS. FOR EXAMPLE, THEY RELY ON DIFFERENT SOURCES OF INCOME IN RETIREMENT THAN DO YOUNGER WORKERS; AND THOSE STILL IN THE LABOUR FORCE FACE DIFFERENT CONSTRAINTS.

Health insurance and aged care provision are much more important for this group. A series of projects falling into this stream explore product provision to older cohorts, especially as they relate to risk, the nature of late life working conditions, and the impact of alternative products on wellbeing. Issues of equity are also investigated, along with the relationship between private and public activity in these domains. Progress in 2011 has included:

- Analysing the training opportunities provided to older workers when innovation takes place, relative to their younger counterparts, in both Australia and Canada, and the association between training and hours constraints in the workplace.
- Assessing Australia's civil service and military pensions, both in terms of pension reform and in terms of life expectancy and liability calculation. In this latter work, we have cooperated with PwC, an industry partner, and Mercer, who have provided detailed civil service pension data.
- Quantifying the impact of public policy, including both progressive tax changes to Australian superannuation, and public pension provision to rural workers in China.
- The use of more sophisticated indicators to more accurately price annuities, assessing the risk-based capital requirements for longevity risk products, and examining the management of post retirement longevity risk through a portfolio of products.
- Investigating equity release products, especially reverse mortgages and home reversion instruments.
- Modelling health status and its impact on future survival.

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OLDER WORKERS' TRAINING OPPORTUNITIES IN TIMES OF WORKPLACE INNOVATION

RESEARCHER

ELISABETTA MAGNANI

Boosting older workers' labour force participation and productivity will largely depend on our ability to better understand the connection between training opportunities and hours constraints, and how institutional factors may shape the trade-offs between the two.

This project first established a theoretical link between employer-provided training and hour constraints, and then tested the model implications for older workers. To test the relationship between technological change, working hours, and training, two matched employer-employee data sets were used, namely the Australian

Workplace and Industrial Relations Survey (AWIRS) and the Canadian Workplace and Employee Survey (WES). These databases offer detailed information on employer-provided training, technology and organisational changes around the times of the interview (1995 for AWIRS and 1999 for WES), as well as information on individual workers. Although clear differences in the survey design and in the wording of the questions prevent any possibility of actual international comparisons, the richness of these databases was sufficient to explore the robustness of the findings on what determines hour constraints and training.

The main results can be summarised as follows:

It was established that there is a relationship between age and the chances of experiencing hour constraints, but that it differs between Australia and Canada. In Australia, older workers aged 55+ are less likely to be hour constrained than younger workers (those aged 25-29), but in Canada there is no substantial difference between these two age groups. A second important result is that there is no evidence that hour constraints endogenously emerge as a result of technology change. However, there is evidence that education, labour market assimilation and features of organisational change such as the increased practice of outsourcing at the workplace level, increase

the chances of workers' hour constraints. Finally, estimates of a bivariate probit model of joint determination of the two outcomes indicate that the presence of hours constraints negatively impact on the likelihood of a worker receiving employer-provided training. Interestingly, the negative effect of hours constraints on training opportunities appears to be larger (in absolute value) for prime age workers than for workers in the full samples, in both the AWIRS and WES estimations.

The results reflect the important differences between the type of retirement income available to older workers who leave the labour force in Canada and Australia. The strength of the Australian superannuation system

at the time of the survey, combined with the strong business cycle phase that Australians were experiencing compared to what Canadians were experiencing at the survey time provide important insights to understand how retirement financial opportunities shape labour market opportunities available to older workers in these two OECD countries.

> ...there is evidence that education, labour market assimilation and features of organisational change such as the increased practice of outsourcing at the workplace level, increase the chances of workers' hour constraints

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ASSOCIATE PROFESSOR ELISABETTA MAGNANI

Laurea Economics and Statistics PhD Bologna; MEcon PhD Yale

ASSOCIATE INVESTIGATOR

Elisabetta Magnani is Associate Professor of Economics in the Australian School of Business at the University of New South Wales.

She is interested in the demand side of labour economics, particularly the effect of technological and organisational change, and the effect of demographic transition on labour markets and its broad societal effects. She is also working on the intra-household effects of population ageing with a focus on low and middle

income countries. She has published widely in major economics journals such as *Labour Economics, Economic Inquiry* and the *Industrial and Labor Relations Review*.

CIVIL SERVICES AND MILITARY RETIREMENT INCOME PROVISION IN AUSTRALIA

RESEARCHERS

HAZEL BATEMAN
JOHN PIGGOTT

Civil service employees represent about 25% of Australian workers. In common with much of the rest of the world, both developed countries and emerging economies, these workers have traditionally enjoyed far more generous pension benefits than most private sector employees, and these promises have not been pre-funded. The legacy costs of such arrangements thus constitute part of the nation's public debt, an issue now gaining prominence in the policy debate in the US and other countries. Australia is unusual in having already closed almost all these unfunded Defined Benefit (DB) plans to new entrants, and in having already

adopted various strategies to reduce legacy cost. This project undertook the documentation and analysis of these developments for the first time. This allows comparison with corresponding policies in other countries, and provides the basis for policy experience to be shared. It lays the foundation for further research on the estimation of the value of the legacy cost of civil service pensions in Australia.

Unfunded liabilities associated with the now closed DB schemes are currently reported at $A205.4 billion (about 15% of GDP). Liabilities are transparently calculated and are included in all State, Territory and Commonwealth government budget documents, although their methodology can be questioned.

All State and Territory governments and the Commonwealth Government have introduced strategies to eliminate these liabilities. Legislation has been enacted requiring various public authorities to reduce liabilities through regular payments from public sector budgets, and using the proceeds of asset sales, as well as the establishment of investment funds dedicated to reducing unfunded superannuation liabilities. Projections suggest that the unfunded liabilities associated with the closed public sector superannuation schemes will be eliminated in the next 30 years.

This scenario is in stark contrast to many countries, where the legacy costs of public sector pensions are often high and increasing. State and local pensions in

the US have been estimated as 25% of GDP. In many less developed economies, such as India and Pakistan, public sector pension liabilities are seen as a source of significant fiscal stress.

We argue that one driver of this progressive public sector pension reform has been the introduction of the Superannuation Guarantee[5], a mandatory funded DC pension plan initially introduced in the late 80s. Along with an enduring national concern for public sector prudence (Australia has the lowest national debt in the developed world; it was zero at the onset of the global financial crisis) this radical private sector policy reform led to public sector alignment. Until around 20 years ago, most public sector superannuation schemes were unfunded or partially

funded DB schemes with benefits financed on PAYG a basis. But public and private sector workers have almost always been subject to the same policies; as the Superannuation Guarantee policy framework developed, its requirements were brought to bear on public sector authorities, and these led to public sector pension reform.

This research was published in an edited book, *Reforming Pensions for Civil and Military Servants*, in 2011.

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[5] 'Superannuation' is the Australian term for occupational or personal pensions. The Superannuation Guarantee was so named because it aimed to guarantee that employers would contribute a minimum fraction (currently 9%) of wages into a fund for the employee's retirement.

ASSOCIATE PROFESSOR HAZEL BATEMAN

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Hazel Bateman is Associate Head of the School of Risk and Actuarial in the Australian School of Business and Director of the Centre for Pensions and Superannuation at the University of New South Wales.

She has more than 60 research publications in the area of the economics and finance of retirement incomes. The overall themes of her research are the adequacy and security of retirement saving and retirement benefits and the increasing risk and responsibility faced by retirement savers under defined contributions retirement income

arrangements. Her work on administrative costs and charges of superannuation funds has informed global pension policy developments, including the financial product disclosure legislation in Australia. Over the past eight years, Hazel has jointly held six ARC Discovery Grants, including a recently awarded grant of $960,000 to undertake research to better understand complex

retirement and superannuation decision making.

Hazel has been a consultant on retirement income issues to a range of Australian and international organisations including the OECD, the World Bank and APEC. She serves on the editorial board of the *Journal of Pension Economics and Finance*.

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PUBLIC SECTOR PENSION FUNDS IN AUSTRALIA: LONGEVITY SELECTION AND LIABILITIES

RESEARCHERS

JOHN PIGGOTT
MICHAEL SHERRIS
JOELLE HY. FONG
CAROLYN NJENGA

In common with many other countries, Australian public sector employees have traditionally enjoyed Defined Benefit pension entitlements, often unfunded, thereby creating liabilities for future generations of taxpayers. This project leverages on micro-level data on almost all Australian public sector funds to analyse two important issues. First, if, as preliminary analysis suggests, public sector employees have a higher life expectancy at retirement than their private sector counterparts, what is the quantitative significance of this, and what explanations can be identified? Second, taken as a whole, what is the exposure to longevity risk of the unfunded liability of the Australian public sector pension plans?

This project will investigate how the level and trend of pensioner mortality in Australia has varied by age and over time. Since these pensioners share many similar characteristics as the general Australian population, graduation by reference to population life tables is used to fit a mortality curve to the raw mortality pensioner data. Uncertainty associated with the estimated mortality rates at cross-sectional ages are assessed and used to develop upper and lower bounds on underlying pensioner mortality rates. This allows a better projection basis for future pensioner mortality allowing for uncertainty.

The project uses information on pensioner mortality levels, age patterns and trends relative to the Australian population to assess the fiscal implications arising from pensioner longevity risk. The significance of pensioner longevity is assessed by quantifying its impact on estimated unfunded liabilities.

The project will adopt a model fund approach along with assumptions for future mortality improvements of the age pensioners to assess expected liabilities and variability in those liabilities with dynamic simulations.

The pensioner data for the project was collated from record-level data on existing public sector pensioners from two fund actuaries, Mercer and PricewaterhouseCoopers. A variety of pensioner types including retiree pensioners, early retirees, invalids, and spouse pensioners are included. The dataset covers a large number of Australian superannuation funds, including those of the State and Territory governments and the Commonwealth government. Reports on the individual funds/schemes were collated to provide broader financial information on the pensioner liabilities. This project will continue in 2012 and is expected to produce a number of journal papers.

> The project uses information on pensioner mortality levels, age patterns and trends relative to the Australian population to assess the fiscal implications arising from pensioner longevity risk

PROGRESSIVE TAX CHANGES TO PRIVATE PENSIONS IN A LIFE-CYCLE FRAMEWORK

RESEARCHERS

GEORGE KUDRNA
ALAN WOODLAND

To increase retirement incomes and private savings, taxation of private pensions around the world is concessional compared to regular income taxation. In Australia, superannuation contributions and fund investment earnings are taxed at concessional, flat tax rates and benefits are generally tax free. The motivation for this research is vertical equity issues of Australia's superannuation taxation where the tax concessions attached to superannuation flow mainly to high income earners. In this research, we provide a quantitative analysis of hypothetical replacements of the existing superannuation tax regime with the tax regimes commonly found in other countries, where either benefits or contributions are taxed progressively at marginal income tax rates and where fund earnings are tax free. The main goal is to assess how these hypothetical reforms to superannuation taxation affect welfare and incomes of different income classes of households (vertical equity) as well as of different

generations (intergenerational equity).

The tax treatment applied to private pensions in most countries follows either the Exempt/Exempt/Taxable (EET) regime or the Taxable/Exempt/Exempt (TEE) regime. Under the EET regime, contributions and fund investment earnings are tax free but benefits are taxed progressively at marginal income tax rates at the time of withdrawal. Under the TEE regime, fund investment earnings and benefits are tax free but contributions are treated as ordinary private income and taxed progressively at marginal income tax rates. By contrast, the existing tax treatment applied to Australia's superannuation features a flat tax rate on contributions and fund investment earnings, with benefits being generally tax free. As the statutory rate of this flat tax on contributions and fund earnings is 15%, the system is concessional for most income earners compared to regular income taxation. However, the tax concessions to superannuation are not equally distributed between low and high income earners, as demonstrated by The Australian Future Tax

Structure (AFTS) (2008, 2010). For instance, AFTS (2008, p.22) estimates that over 37% of concessional contributions go to only about 5% of Australians on very high incomes.

Concerned with the vertical equity of the current superannuation taxation arrangements, this research examines the effects of the hypothetical replacements of the existing tax treatment with the EET and TEE tax regimes commonly applied to private pensions in other countries, where either benefits or contributions are treated as regular income and taxed progressively. As an alternative to the TEE regime, we also examine the effects of the proposal by AFTS (2010, pp. 84-85), which, in addition to the progressive income taxation of superannuation contributions, includes (i) a flat-rate refundable tax offset to contributions set such that the majority of taxpayers do not pay more than 15% tax on their contributions and (ii) a reduction of the statutory tax on fund investment earnings to 7.5%.

Using a dynamic general equilibrium life-cycle model calibrated to the Australian economy, the preliminary simulation results indicate that all three examined reforms to superannuation taxation improve the vertical equity in the short, medium and long run, as depicted by larger (lower) relative gains (losses) in welfare and incomes experienced by lower income households. While the welfare and macroeconomic effects of the TEE regime and the AFTS proposal are not largely different, these effects differ greatly from those generated from the shift to the EET tax regime. Under the EET tax regime, older generations suffer from large welfare losses as their private pensions are treated as regular income and taxed at marginal income tax rates. However, long run improvements in welfare for all income types are greater compared to the

other two tax reforms as large increases in the income tax revenue allow for a significant reduction in the budget balancing consumption tax rate. The examined reforms to superannuation taxation have also positive long run effects on aggregate total assets and household saving, which are significantly larger especially under the shift towards the EET tax regime.

This research will be written up as a CEPAR Working Paper. We aim to submit the paper for publication in one of the top international journals on economic modelling or pension and public economics in the middle of 2012 and present the findings at the 2nd International Conference on Micro and Macro Economics in Singapore.

> ...we provide a quantitative analysis of hypothetical replacements of the existing superannuation tax regime with the tax regimes commonly found in other countries, where either benefits or contributions are taxed progressively at marginal income tax rates and where fund earnings are tax free

MANAGING MIGRANT WORKERS' PENSIONS IN CHINA

RESEARCHERS

BEI LU
JOHN PIGGOTT

Currently, China is undergoing the largest regional migration in the world's history. Young rural workers are moving to urban areas, often in a different province, for substantial periods of their working lives. Currently there are about 220 million so-called 'mobile' workers, with no permanent right to stay in their immigrant location. About 60% of mobile workers go to six jurisdictions, either city states, such as Shanghai, or rich east coast provinces such as Zhejiang. Only 17% of mobile workers have pension plans, and of these, 75% cannot transfer their pension records from one workplace to another.

National guidelines and policies do recognise this latter problem, but in practice, procedures are too complicated for the guidelines to be effective. This is compounded by inflexible vesting rules. In many cases, rural workers receive only a small fraction of the pension benefits of their urban counterparts.

This project is applied and policy-oriented in nature. It proposes a notional defined contribution (NDC) system for mobile workers in China, breaking the concept of social pooling and substituting individual accounts. This facilitates record-keeping across jurisdictions. When a migrant worker reaches the national defined retirement age, all his contributions and accumulated interest

shall be annuitised and paid as retirement benefit, in an actuarially fair manner.

For such a proposal to be politically feasible, relevant stakeholders must perceive an advantage. We propose that the major immigrant jurisdictions retain control of the accumulation while the worker resides in that jurisdiction. Only workers migrating to 'minority' provinces would have their pension plan dealt with centrally.

In order to get more information and data about the migrant workers' behaviour and trends, we will treat Zhejiang and Henan as typical immigrant and emigrant provinces, respectively. The CHARLS survey, a pilot HRS survey for China, provides data

for these two provinces. A survey is proposed in Henan to study the migrant behaviour for rural mobile workers. We will also employ a simulation model of pension policy in Zhejiang province to show how these proposals impact upon fiscal variables.

Research aimed at consolidating the empirical case for the proposal will proceed in the first six months of 2012. The anticipated outcome is a research paper aimed at a specialist journal.

This is part of a larger project focused on social security policy and pension reform in Zhejiang Province, and is partly funded by an ARC Linkage grant in which the Zhejiang Institute for Public Policy is an industry partner.

Investigators include John Piggott, Michael Sherris, Hazel Bateman (all from UNSW and with CEPAR affiliation) and Xian-guo Yao (Zhejiang University).

> Only 17% of mobile workers [in China] have pension plans, and of these, 75% cannot transfer their pension records from one workplace to another

DR BEI LU
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POSTDOCTORAL FELLOW

Bei Lu is a postdoctoral fellow at the ARC Centre of Excellence in Population Ageing Research (CEPAR) at the University of New South Wales, and a Research Fellow with Zhejiang University, China.

After graduating from Tsinghua University in Beijing, Bei worked as an international trader in the metal industry for 12 years. She returned to academia in 2002 to undertake a PhD in Economics at the University of New South Wales. Her thesis and subsequent research focuses on pensions and related social welfare and economic issues.

Bei has been very successful in developing international linkages over the past ten years. In 2003, she initiated a research project with the provincial government of Zhejiang province, China, which examined the impacts of various pension reform proposals in that province, and this has formed the basis of an on-going engagement with pension economists and

policy-makers in China. In 2004, she assisted the World Bank's Operations Evaluation Department in evaluating the Bank's support of pension reform in the Asian region. Most recently, she spearheaded a research project with Zhejiang University which formed the basis of a successful Linkage grant application in 2010.

RISK-BASED CAPITAL REQUIREMENTS OF LIVING BENEFITS USING A BAYESIAN VECTOR AUTOREGRESSION MORTALITY MODEL

RESEARCHERS

CAROL NJENGA
MICHAEL SHERRIS

In 2013, the insurance capital regulator (Australian Prudential Regulatory Authority, APRA) will introduce changes to the calculation of insurer capital requirements which will have implications for future product providers of lifetime annuities. APRA has proposed an insurance risk charge covering the possibility that experience is worse than the best estimate of risks including longevity risk. Longevity relates to the mortality of lifetime annuitants. Stress margins are calculated as a one in 200 year event. Risk charge margins including mortality, morbidity and event stress are determined by an actuary except for the longevity stress margin which is specified by APRA.

This project investigates the adequacy of the proposed changes by analysing the potential for over/under-capitalisation resulting from the one in 200 events and the prescribed shock. A new mortality model for the full age range of survival probabilities is calibrated to Australian data and applied to the insurer capital assessment for longevity based on standard life and deferred annuities. The proposed simplification that 'A (permanent) 25% decrease in mortality rates for each age' is equivalent to the one in 200 year event is assessed. The structure and magnitude of this simplification are shown to have several shortcomings. An analysis of the mortality of Australian males from 1946-2007 confirms that mortality improvements are not constant by age.

If it assumed that mortality improvements are constant across all ages then the corresponding constant permanent decline based on the mortality model is closer to 15%. An age dependent stress given by a simple linear function of age is shown to fit historical mortality improvement trends for Australian data.

The research has been presented at the 19th Annual Colloquium of Superannuation Researchers held at UNSW on 14-15th July 2011, the 2011 Australasian Actuarial Education and Research Symposium held at ANU on 1-2nd December 2011 and the Western Risk and Insurance Association 2012 Annual Meeting held in Hawaii on 4-7th January, 2012. It is also expected to produce a journal publication.

A new mortality model for the full age range of survival probabilities is calibrated to Australian data and applied to the insurer capital assessment for longevity based on standard life and deferred annuities

INDIVIDUAL POST-RETIREMENT LONGEVITY RISK MANAGEMENT UNDER SYSTEMATIC MORTALITY RISK

RESEARCHERS

KATJA HANEWALD
JOHN PIGGOTT
MICHAEL SHERRIS

Most developed countries use subsidies and tax incentives to increase mandatory and voluntary retirement savings so individuals are less reliant on public pay-as-you-go pension systems. Payout phases of pension systems are organised very differently across countries with individuals increasingly responsible for post-retirement financial decisions. Individuals face a complex problem of post-retirement financial planning. They have to take into account investment risk, inflation risk, product loadings and guarantees and both systematic and unsystematic (idiosyncratic) longevity risk.

This project assesses an individual's post retirement longevity risk management strategy allowing for systematic longevity risk, recent product innovations, and product loadings. A discrete state model framework is used to derive the optimal longevity insurance strategy for an individual facing both idiosyncratic and systematic longevity risk subject to a budget constraint. The individual has access to a complete market of financial and insurance products that allows the individual to attain optimal consumption in current and future states. The products required to complete the market are a risk-free bond, a life annuity, a longevity bond, and a group self-annuitisation (GSA) plan. Products are priced using a contingent claims approach. Frictional costs and insolvency risk are introduced. An example is used to highlight the main insights of the model.

The analysis is then extended to a multi-period expected utility simulation of a range of longevity insurance strategies developed from the insights of the two-period model and concepts from optimal insurance. The longevity insurance strategies include portfolios of life annuities, deferred annuities, inflation-indexed annuities, GSA's, and phased withdrawals. Expected utilities and certainty equivalent consumption are used for welfare comparisons. The stochastic evolution of mortality rates is based on a multivariate mortality model published in Wills and Sherris (2010). The market model developed by Ngai and Sherris (2011) is used to generate future stochastic inflation and economic scenarios.

The results of the study show that for individuals with no bequest motive and with no product loadings, annuitisation strategies are optimal under systematic longevity risk. With loadings on guaranteed life annuity products, GSA plans, which are mutual and non-guaranteed, become significantly more attractive for individuals in managing their post-retirement longevity risk, replacing even annuitisation products with inflation guarantees. For individuals with a bequest motive, coinsurance strategies in the form of self annuitisation (phased withdrawals) dominate. Holdings of GSA plans increase significantly where there are loadings on guarantee products typical of these products. The research has been written up and submitted for journal publication. The paper is currently available online as part of the CEPAR Working Paper Series (number 2011/13).

This project assesses an individual's post retirement longevity risk management strategy allowing for systematic longevity risk, recent product innovations, and product loadings

BEYOND AGE AND SEX:
ENHANCING ANNUITY PRICING

RESEARCHER

JOELLE HY. FONG

Rising longevity and an increased policy interest in expanding the use of payout annuities in defined contribution pension systems has focused attention on the question of how annuities are priced. In the US and Canada, prices of standard annuities in the retail marketplace currently do not reflect buyers' personal characteristics other than age and sex. The lack of information in prices generates a number of concerns, including adverse selection, inflexible pricing, consumer distrust in pricing, and consequently under-developed annuity markets. This paper explores risk categorisation as a means of encouraging annuity market growth when mortality heterogeneity exists in the population, as well as the selection of suitable risk-classes.

Specifically, the study uses longitudinal micro data from the US Health and Retirement Study (HRS) to examine the financial and utility implications of annuitising under alternative pricing structures. It shows that several readily-measurable risk factors can significantly increase explained variability in mortality outcomes in a proportional hazards framework. To assess consumers' incentive to annuitise (or stay annuitised) when pricing becomes progressively detailed, the annuitisation values for a variety of risk groups were simulated. The impact of risk categorisation across risk groups was found to be uneven. A shorter-lived group will gain almost 30% in annuitisation values whereas a longer-lived group will only experience about 8% losses in financial and utility terms. The intuitive reason is that it is generally harder for individuals to lengthen longevity than to shorten it. Thus premium increases are disproportionally smaller than premium reductions when more risk-classes are used. Consequently, two effects may occur when more detailed annuity pricing is implemented: Firstly, shorter-lived groups will be induced to buy annuities, and secondly, longer-lived groups will still be incentivised to stay in the annuity market.

Overall, this will allow the market for standard annuities to grow and help alleviate adverse selection problems.

The results will be of interest to policymakers and plan sponsors who oversee retirement systems, as well as older adults who anticipate relying on annuities to finance their retirement. This study is also relevant to the debate about whether and how annuity providers should be permitted to put people into different risk categories. Notably, there has been a steady movement towards risk-class pricing for standard annuities in the UK in recent years; nonetheless, insurers are still struggling to define additional rating tools.

The project was completed during 2011 and the working paper was revised in preparation for submission to an economics journal.

> The results will be of interest to policymakers and plan sponsors who oversee retirement systems, as well as older adults who anticipate relying on annuities to finance their retirement

DR JOELLE HY FONG
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RESEARCH FELLOW

Joelle is a research fellow at the ARC Centre of Excellence in Population Ageing Research (CEPAR) at the University of New South Wales.

She joined CEPAR in August 2011 after graduating with a PhD in Insurance and Risk Management from the Wharton School of the University of Pennsylvania. She holds masters degrees from Wharton and Singapore Management University (SMU), and is currently an affiliate researcher with SMU's Sim Kee Boon Institute for Financial Economics. Prior to commencing her PhD, she also held several positions in the Singaporean Civil Service.

Joelle's research interests include the economics of pensions and retirement; private and public insurance; annuities; and risk management of morbidity and longevity. Her research has been published in the *Journal of Risk and Insurance* and the *Journal of Pension Economics and Finance*.

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DEVELOPING EQUITY RELEASE MARKETS: RISK ANALYSIS FOR REVERSE MORTGAGE AND HOME REVERSION PRODUCTS

RESEARCHERS

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External collaborator

HUA CHEN
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Equity release products provide a means for an ageing population with high levels of home ownership to finance retirement income and health care needs. There are many variants of equity release products ranging from shared equity products to reverse mortgage loans that provide either lump sums or income from drawdowns or as annuities. Individuals rely on efficient pricing and effective risk management by the product provider when they unlock equity in their house. The impact of uncertain future house prices, variable interest rates, charges by the lender and other risk factors interact in complex ways in determining future income, returns and risks for these equity release products. Product providers must take these factors into account in designing products, pricing any risks and in determining capital to meet regulatory requirements.

This project investigates the cash flow risk profiles for a provider for the popular equity release products, including the traditional reverse mortgage contract and the home reversion contract. These cash flow profiles are used to quantify the risk faced by the product provider, the pricing of the contracts to take the risk into account and the capital requirements to support the product.

Economic scenarios are generated using a vector-autoregressive model for house prices, rental yields and interest rates in real terms. A multi-state Markov model is used to model contract termination probabilities arising from death, entry into long-term care, and refinancing. Efficient solutions and product designs are assessed taking into account the capital requirements and profitability of the products. This project will continue in 2012 and the results will be written up for journal submission.

> The impact of uncertain future house prices, variable interest rates, charges by the lender and other risk factors interact in complex ways in determining future income, returns and risks for these equity release products

LIFETIME DEPENDENCE MODELLING USING THE TRUNCATED MULTIVARIATE GAMMA DISTRIBUTION

RESEARCHERS

DANIEL ALAI
MICHAEL SHERRIS

External collaborator

ZINOVIY LANDSMAN
(UNIVERSITY OF HAIFA)

Dependence between lives in a population arises mostly from common factors impacting an individuals' survival probability. Improvements in medicine and treatments for various diseases improve the survival prospects of all individuals in a population to a greater or lesser extent. Most models for mortality risk include a common factor or several factors that capture this dependence. However most of these models do not provide an analytical form for the survival curve and make it computationally difficult to assess product portfolios without the extensive use of numerical simulations.

This project investigates the application of a new model for dependence between lifetimes to the valuation of a portfolio, or cohort, of annuitants with similar risk characteristics. Lifetimes are jointly modelled using a truncated multivariate gamma distribution that captures dependence through a shared gamma distributed risk factor. Model parameter estimation is based on the method of moments. The project considers model calibration and estimation, joint survival probabilities and quantifying the level of dependence within the group of lives. Portfolios of lifetime annuities are modelled and the impact of dependence between lives assessed for pricing and risk management of the portfolio. Results are compared against the assumption of independent lives that underlies much portfolio risk analysis for life insurance and annuity risk management.

This project will continue in 2012 and is expected to result in a paper suitable for submission to a highly ranked international journal.

This project investigates the application of a new model for dependence between lifetimes to the valuation of a portfolio, or cohort, of annuitants with similar risk characteristics

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MODELLING HEALTH STATUS AND MORTALITY WITH PHASE-TYPE MARKOV-AGEING MODELS

RESEARCHER

MICHAEL SHERRIS

External collaborators

MARIA GOVORUN
(UNIVERSITÉ LIBRE DE
BRUXELLES)

STEPHANE LOISEL
(UNIVERSITY OF LYON)

Heterogeneity in population mortality is important for many aspects of longevity risk. Insurers must take this into account in pricing life annuities and costing pensions. This is also important for long term health insurance contracts where heterogeneity in mortality arises from differing health status. Phase-type Markov-Ageing Models are increasingly being used to model heterogeneity in population mortality and are being applied to a range of financial applications including pricing and risk management of insurer products.

This project aims to develop a model for health status and survival using Phase-type distributions. The model will be implemented in a stochastic Markov-ageing framework. These models have the advantage that they provide analytical solutions for survival distributions and for the values of health and mortality state dependent cash flows. By defining health states appropriately and calibrating the model to health and mortality data, the model is applied to value life annuities and long term care contracts. Capital requirements for providers of these products are also assessed for a portfolio of life annuity and long term care contracts using the model. This project will continue in 2012 and is expected to result in a journal paper.

These models have the advantage that they provide analytical solutions for survival distributions and for the values of health and mortality state dependent cash flows

PROFESSOR RICHARD DISNEY

BA Cambridge, MA Sussex

PARTNER INVESTIGATOR

Richard Disney is Professor of Economics at the University of Nottingham and a Research Fellow at the Institute for Fiscal Studies. He has held visiting positions at both the International Monetary Fund and the World Bank, and has been a consultant for the World Bank, the ILO, the OECD and a number of UK government departments.

His research interests lie largely in the field of applied microeconomics, including tax policy, social welfare reform and pensions policy, all in both developed and the developing countries; and the economics of labour markets, including retirement behaviour and wage structure. He has published widely in top academic journals.

He has been working on several projects linked to the CEPAR research agenda.

The first is a project with Dr John Gathergood (University of Nottingham) on the relationship between recent trends in house prices in the United Kingdom and the United States and trends in saving, consumption spending and household indebtedness. The work examines two main hypotheses concerning the relationship between household wealth and household spending:

first, that much of the observed correlation between household spending and saving on the one hand and housing wealth on the other, can be explained by changes in income expectations and by the co-movements of housing wealth and financial wealth. Using British Household Panel Survey data matched to Family Resources Survey data, Disney, Gathergood and Henley (JEEA, 2010) show that the imputed average marginal propensity to consume out of housing wealth is low (of the order of 1-2 per cent) when adjustments have been made for these other factors.

In related work, they hypothesise that the response of households to house price shocks is particularly strong among households which are collateral constrained (have low liquid wealth are/or high loan-to-value ratios). Papers on the UK with Bridges (*Economica*, 2010) and on the US in the *B.E. Journal of Macroeconomics* (2011) demonstrate that the average marginal propensity to consume of 1-2% aggregates an almost-zero response among unconstrained households and a much higher response among collateral constrained households. However, even though house prices are, if anything, more volatile in the UK than the US, the

responsiveness of consumers to house price shocks is greater in the US than the UK, which the authors attribute to differences in the mortgage market. Interestingly, there is little evidence of a 'life-cycle' effect in the willingness of consumers to utilise housing wealth to increase consumption spending.

Ongoing work is looking at the relationship between pension wealth and housing wealth, both as determinants of household spending, but also in the degree of substitutability between the two forms of wealth; and at the impact of the UK government's longstanding policy of 'right-to-buy' for tenants of publicly owned housing. This research complements the projects of Sane and Piggott on residential trade-downs in Australia, and the work by Hanewald and Sherris on the role of housing wealth in retirement risk management.

A second longstanding strand of work, in collaboration with the Institute for Fiscal Studies, looks at the impact of tax policy on saving and asset accumulation, especially in the form of housing and pension assets.

Richard presented a survey paper on 'Issues in the tax treatment of pensions and housing: the case of Australia' at the 'Future Tax and Transfer Policy Conference' held in Melbourne in June 2009 as part of the Henry Review. Disney plans to visit CEPAR during 2012 to develop a research project on pension reform and retirement with John Piggott. On the UK, a series of papers have considered facets of the UK tax system, and in particular reforms to the social security and pension programmes, and how these have impacted on household saving. The current programme of work, with Carl Emmerson and Rowena Crawford at the Institute for Fiscal Studies in London, considers the effect of tax reliefs at higher rate thresholds and the treatment of pension contributions by the system of working tax credits. Preliminary results are available as Institute for Fiscal Studies Working Papers.

Accompanying this is work on the impact of reforms of the programme of pensions for public sector workers; papers with Emmerson and Gemma Tetlow on public sector workers in general in the Economic Journal (2009) and teachers in particular in Fiscal Studies (2010) consider the 'money's worth' of pensions before and after reforms. This ties in with research projects focused on Australian civil service pensions by Bateman and Piggott and Fong, Piggott and Sherris. Ongoing work with Crawford, to be presented at a NBER conference, Summer 2012, will focus on the reform of early retirement options for members of the UK police forces.

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PROFESSOR OLIVIA MITCHELL
BA Harvard,
MA PhD Wisconsin – Madison
PARTNER INVESTIGATOR

Olivia S. Mitchell is International Foundation of Employee Benefit Plans Professor; Professor of Business and Public Policy; Professor of Insurance and Risk Management; and Executive Director of the Pension Research Council at the Wharton School, University of Pennsylvania.

Olivia Mitchell has been working on several projects related to the mission of CEPAR. Most importantly, she has maintained an active interest in annuitisation as a means to help finance retirement security. Her recent refereed volume with John Piggott and Noriyuki Takayama entitled *Revisiting Retirement Payouts: Market Developments and Policy Issues* (Oxford: OUP, 2011) examines the challenges facing global annuity markets and outlines innovative efforts along these lines. This book outlines research themes identified by Mitchell and Piggott in a chapter entitled 'Turning Wealth into Lifetime Income: The Challenge Ahead,' in that new volume. Moreover, work with Joelle Fong and Benedict S. K. Koh entitled 'Longevity Risk Management

in Singapore's National Pension System,' in the Journal of Risk and Insurance, complements this research.

She is also examining issues pertinent to optimal household portfolio management over the life-cycle. In a recent paper appearing in the Review of Finance with Jingjing Chai, Wolfram Horneff, and Raimond Maurer entitled 'Optimal Portfolio Choice over the Life-Cycle with Flexible Work, Endogenous Retiremen s for a consumer who selects her hours of work and retirement age given uncertain labour income and investment returns. Shocks in labour income and capital markets interact to influence retirement and asset allocation patterns in complex ways. When workers can adjust work hours and retirement flexibly and also have access to lifetime payout markets, they will respond to negative labour market shocks and high stock returns by working less while young, buying more annuities, and retiring early. Further, the model is able to fit several important empirical stylised facts, such as the two peaks in retirement rates, the humped shape pattern of work hours, the sizeable discontinuity in consumption at retirement, and the low annuity take ups of older households.

In a major project on pension reform in Chile, Mitchell has examined various impacts of the Chilean pension reform on outcomes of interest including financial literacy, retirement preparedness, pension saving, and consumption spending. In a paper soon to appear in the *American Economic Review* entitled 'Financial Literacy, Schooling, and Wealth Accumulation' by Mitchell, Jere Behrman, and Cindy Soo, the authors anayse how financial literacy and schooling attainment influence wealth. In a related NBER working paper by Mitchell, Behrman, Maria Cecilia Calderon, Javiera Vasquez and David Bravo, entitled 'First-Round Impacts of the 2008 Chilean Pension System Reform,' the authors examine how a wide range of outcomes responded to the reform implemented since they posit that the reforms may have influenced behaviour in unanticipated or even undesirable ways from the policy perspective. The results indicate that targeted households with elderly individuals received about 2.4 percent more household annual income, with little evidence of crowding-out private transfers. Mitchell is also working on annuitization in Chile, in a paper with Jose Ruiz entitled 'Pension Payments in Chile: Past,

Present, and Future Prospects.'

A major project on financial literacy, particularly as it pertains to retirement saving and preparedness is also underway. In a new special issue of the *Journal of Pension Economics and Finance*, co-edited with Annamaria Lusardi, several key studies on financial literacy and financial planning around the world have been commissioned. Furthermore, related work with Justine Hastings and Eric Chyn explores 'Fees, Framing, and Financial Literacy in the Choice of Pension Manager,' in the new refereed Oxford University Press volume entitled *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*. Ongoing work in this arena examines the role of ambiguity aversion in shaping retirement saving, insurance purchase, and investment portfolios.

Mitchell visited CEPAR in July 2011 to discuss new joint research initiatives, and a further visit is planned in 2012 to move these forward.

In addition, the Pension Research Council hosted a visit by CEPAR Associate Investigator Katja Hanewald in August 2011.

STRAND 4

AGEING WELL
AND PRODUCTIVELY

This strand of the research involves life-cycle behaviour and decisions concerning such things as working hours, retirement and health management. These choices made by individuals as they age materially affect their economic, health and social wellbeing.

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

RESEARCH PROJECTS

STRAND 4 AGEING WELL AND PRODUCTIVELY

RESEARCH ON AGEING WELL AND PRODUCTIVELY WILL EXAMINE WAYS IN WHICH HEALTH AND PSYCHO-SOCIAL FACTORS INFLUENCE PRODUCTIVE CONTRIBUTIONS (INCLUDING WORKFORCE PARTICIPATION AND CARE GIVING) AS WELL AS INDEPENDENCE, WELLBEING, AND USE OF HEALTH AND COMMUNITY SERVICES.

There will be a focus on potentially changeable actions by individuals and governments that can maintain or improve capacities and beneficial consequences for productivity and wellbeing. Key influences to be examined include health behaviours and social exposures over the life course, attitudes towards ageing and older people, patterns of intergenerational relations, and diversity among socio-economic groups. This research has a focus on longitudinal research that can identify the range of inter-related factors that can influence health, productivity, service use, and wellbeing outcomes. A number of projects were conducted in 2011, many of which will continue in 2012.

Progress in 2011 included:

- Analysing the relationship between healthy lifestyles and older people's capacities to age well; and the correlation between education level and obesity.
- Examining the influence of ageing attitudes and expectations on health behaviours and medical help-seeking.
- Surveying ACT residents on the features of Age Friendly Cities to identify positive and negative examples of infrastructure and practices and to elicit suggestions for improvement.
- Developing methods and capacity to use routinely collected health services data to examine ways in which the use and impacts of health and aged care services change as people grow older.

- Analysing the results of the Concord Health and Ageing in Men Project to gain new insights into frailty and mobility in older men including the relationship between testosterone levels and longevity.
- Investigating the causes and consequences of changes in labour force participation rates at older ages in Australia, with a view to forecasting future movements in these rates and future impacts on individual retirement savings and the government's fiscal position.

In 2012, work will commence on a number of new projects which include examining the relationship between work and care giving among baby boomers in Australia, the UK and Canada; investigating Australian longitudinal data on the determinants and consequences of workforce participation and care for ageing individuals using HILDA datasets from 2000 to 2011; and conducting cross-national comparisons of health status and productivity.

LIFESTYLE INFLUENCES ON HEALTHY AGEING AND CHRONIC DISEASE: LONGITUDINAL PREDICTORS

RESEARCHERS
COLETTE BROWNING
HAL KENDIG
LINDY CLEMSON

Contrary to prevailing negative attitudes towards ageing, a new generation of research is demonstrating that the processes of ageing are amenable to a range of bio-psycho-social influences, with many of them being changeable and hence improvable. Ageing well approaches recognise the potential for older people to manage the negative correlates of ageing, such as chronic illnesses, disability and dependence, in order to optimise outcomes in later life. Healthy lifestyles, including physical and social activity, and healthy eating are central to positive outcomes for older people.

In this project we use data gathered since 1994 by the Melbourne Longitudinal Studies on Healthy Ageing program (MELSHA) to examine ageing well in order to inform the development of interventions and services to optimise ageing well.

This project examines the predictors and consequences of ageing well as key factors that can be addressed in healthy ageing interventions and services. It aims to identify: a) lifestyle influences on ageing well; b) trajectories of health and wellbeing in old age; and c) health and disability transition points for targeted interventions. This research will: a) inform the development of new healthy ageing interventions to enhance positive health actions and self care and

b) improve service models for older people.

In 2011 we conducted research on the longer-term outcomes of healthy life-styles and the impact that these have on older people's capacities to age well. This impact was measured by their survival rates, being able to remain living in the community, and their ability to maintain good self-rated health, independence in daily living, and good psychological wellbeing. We found that a number of lifestyle factors, rather than diseases, impacted significantly on people's ability to age well. These included physical activity, healthy eating, acceptable weight, and perceived adequacy of social support. This work has resulted in a publication in *Dialogue* as well as a paper

under review. The Medibank Community Fund, which co-funds the project, has published two news items on their website.

In 2011 we also updated the MELSHA database in order to further analyse change and outcome data from 1994 to 2010.

NEXT STAGE
Our work on predictors of ageing well highlighted a number of modifiable lifestyle influences on ageing well. However it is evident that older people have different trajectories of ageing well over the course of their later lives. Some continue to age well, others show sudden declines in wellbeing that continue until they die while others will recover from these declines. In order to understand what influences

these different trajectories in late life we need to be able to describe them and then examine the factors that influence good and poor outcomes. Understanding the predictors of these trajectories will enable us to develop and better target interventions for older people. In the next phase of analyses we will focus specifically on the roles of physical activity, chronic illness and social connectedness on trajectories of wellbeing as we age.

> We found that a number of lifestyle factors, rather than diseases, impacted significantly on people's ability to age well

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PROFESSOR COLETTE BROWNING
BSc (Hons) MSc Monash;
PhD La Trobe
ASSOCIATE INVESTIGATOR

Colette Browning is Professor of Healthy Ageing and Director of the Monash Research for an Ageing Society and Director of Primary Care Research in the School of Primary Health Care, Monash University.

She is recognised as a national and international leader in psychology and health. Together with Hal Kendig, she co-directs the Melbourne Longitudinal Studies on Healthy Ageing program.

Her research focuses on healthy ageing and improving quality of life for older people, chronic disease self-management and consumer involvement in health care

decision making. She leads a large program of research in China on chronic illness management supported by the China Ministry of Health and has ongoing collaborations at Peking University on population ageing. She is a member of the China Family Panel Study Advisory Committee.

She has published widely in major international journals and is the series editor with Professor Shane Thomas, for a forthcoming book series on Healthy Ageing for Springer Publishing.

Collette is an Associate Editor of *Australian Psychologist* and a Fellow of the Australian Psychological Society.

SOCIAL NETWORKS AND AGEING

RESEARCHERS
HEATHER BOOTH
TIM WINDSOR

External collaborator
ROBERT ACKLAND (ANU)

Social networks are fundamental to human wellbeing (Berkman & Glass 2000). The quality and availability of social relationships directly influences wellbeing, while the indirect effects of social networks operate through the flow and quality of information leading to improved choices and outcomes. Social connectedness is particularly significant for the wellbeing of older adults, and remaining socially integrated is recognised as a key component of 'ageing well'.

It is important, therefore, that older people actively maintain and reform social relations in order to avoid social isolation as family and friends are lost through death, marital dissolution and migration and as disability and ill-health reduce their own ability to engage in social activities.

The advent of Web 2.0 technologies means that social networking increasingly takes place via the Internet using social network services (SNSs) such as Facebook. Whether such online social exchanges are as beneficial as traditional communication (e.g., face-to-face, telephone) is unknown. The aims of this research are to understand the role of social networks in successful ageing, measured by family- and friend-based social connectedness and repartnering. These measures are known to contribute to physical and mental wellbeing in older people, but little is known about the mechanisms involved. This study focuses on patterns of social engagement in order to understand their influence on these successful ageing outcomes as well as on self-rated health and mental health outcomes.

Survey data have been collected from more than 2000 respondents giving details of social activity with family and friends by mode of communication, as well as health and mental health. A follow-up survey is planned, including questions focused on Facebook users and an opt-in application to collect online social networking data from the Facebook website, enabling a social network analysis to be linked to survey data. Other data comprise online forum data with linked survey data. These different groups will be compared. Analyses are in progress, and several conference presentations have been made.

> Social connectedness is particularly significant for the wellbeing of older adults, and remaining socially integrated is recognised as a key component of 'ageing well'

ASSOCIATE PROFESSOR
HEATHER BOOTH
BSc(Econ) (Hons) London;
MSc Southampton; PhD London
ASSOCIATE INVESTIGATOR

Heather Booth is Associate Professor at the Australian Demographic and Social Research Institute (ADSRI) at the Australian National University. She leads the ADSRI Group on Longevity, Ageing and Mortality.

Heather's research interests in ageing include social networks, self-rated health and wellbeing, and the provision of family-based informal aged care. Other related interests are stochastic mortality modelling and forecasting, stochastic population forecasting, mortality, and microsimulation modelling of the older Australian population.

Heather leads the Social Networks and Ageing Project (2010-2013) and is a lead investigator on the AWAP-funded collaborative DYNOPTA project which combines data from multiple Australian longitudinal studies of ageing. She also coordinates the ANU Interdisciplinary Microsimulation Project.

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EDUCATIONAL DIFFERENCES IN THE OVERWEIGHT AND OBESE IN AUSTRALIA AND THE UNITED STATES

RESEARCHERS

YAN YU
PETER MCDONALD

Excess body mass has reached epidemic proportions in both developed and developing countries with long-term social and health implications. In the United States, 68% of the adult population currently has a body mass index (BMI) of 25 and greater and is therefore considered as overweight; and the figure for having a BMI of 30 and greater (considered as obese) is 34%.

Another dramatic change in recent decades is the increase in educational attainment. The proportion of the American adult population with at least some college education has increased from 12% to 56%. Figures are similar in other industrialised populations. Empirical evidence regarding the education-obesity association is inconsistent. Some widely cited claims based on analyses of the National Health and Nutrition Examination Surveys (NHANES) from the United States are: 1) educational differences in obesity have declined, for women in particular, since the 1970s; 2) although obesity continues to be inversely related to education among women, it no longer differs by education among men; and 3) the greatest increase in obesity has occurred with the most educated men and women. Under the assumption of no population heterogeneity, one estimate suggested that by 2048, all Americans would be overweight or obese.

However, a recent published paper based on the NHANES data spanning the period between 1971 and 2006 found that among non-Hispanic whites aged 25-64 and younger black women aged 25-44, the negative association between education and obesity has persisted, and the increase in obesity has been similar for most education categories, but greater for women with some college education and smaller for younger white men who do not finish high school (Yu 2011). The prevalence of obesity among those with some college education is higher than that of college graduates, a difference that has been unchanged among men but increased among women since the 1970s. Failing to recognise this difference and lumping the two college groups together has led to biased estimates and spurious trends in previous results.

This project will be expanded to include Australian data and further investigate the period versus cohort patterns of change in the association between education and body mass. Prior research focused on change over time periods, referring to contemporaneous factors such as changes in technology and food preparation as possible explanations of the overweight and obesity epidemic.

A cohort analysis brings a fresh perspective to understanding the population heterogeneities, underlying mechanisms, and implications for population health of the overweight and obese.
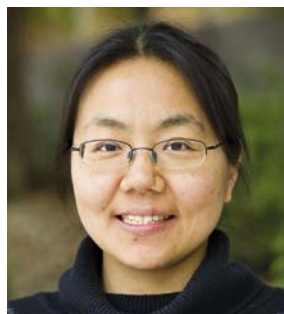
DR YAN YU

BS Shanghai JiaoTong, MA Sociology Columbia, MS Statistics PhD Sociology Wisconsin-Madison
RESEARCH FELLOW

Yan Yu has been a research fellow at the Australian Demographic and Social Research Institute at the Australian National University since 2009.

Her doctoral thesis brought a demographer's perspective to bear on the public health concern of obesity. She received the 2009 Dorothy S. Thomas Award from the Population Association of America for her thesis.

Her research interests include health and mortality, and the demography of ageing in both developed and developing countries. Her current research projects include age, period and cohort patterns of body mass and mortality, and socio-economic differences in risk behaviours.

'CEPAR has provided me with financial support to continue to carry on the research on health and mortality differentials. Participation in the CEPAR workshop on Demography and Longevity has facilitated communication with Australian and international researchers interested in population ageing.'

THE BODY MASS-MORTALITY ASSOCIATION IN THE UNITED STATES: THE TEMPORAL PATTERNS

RESEARCHER
YAN YU

Widespread weight gain has led to epidemic proportions of excess body mass in the US and elsewhere. Overweight or obesity is associated with a host of fatal and non-fatal diseases such as cardiovascular diseases, cancer, diabetes, gallbladder diseases, osteoarthritis and pulmonary diseases. Controversy remains whether excess fat mass, at the moderate level in particular, elevates mortality at all. The much-publicised studies using the National Health and Nutrition Examination Surveys (NHANES), find that, compared with normal weight (BMI between 18.5 and 25), mortality is lower for overweight (BMI between 25 and 30), not higher for moderate obesity (BMI between 30 and 35), but is highest for underweight (BMI less than 18.5). This largely agrees with the existing literature. On the other hand,

significant excess mortality for the moderately overweight or obese was reported in the Framingham Heart Study (aged 30-49). Since a large majority of the US population is in the middle BMI range between 25 and 35, the conflicting results have led to a great deal of confusion and contention in public health circles. Questions have arisen as to whether current definitions of overweight and obesity should continue to be used to characterise a large segment of the population.

One paper based on Yan Yu's doctoral thesis addressed the controversy about whether excess BMI is detrimental to survival in old age. It has been argued that age is associated with a decline in excess overweight or obese mortality, and an extra amount of fat is protective or at least brings no

additional harm to old-age survival. Most prior work compared cross-sectional age groups that belong to a multitude of birth cohorts at survey baseline, and are followed up for mortality over a long period of time. Thus, one cannot discern age patterns that are independent of differences over birth cohort and time period in the BMI-mortality association. The new paper conducted a parametric survival analysis of representative survey data for three cohorts of American men and women born between 1901 and 1957 and observed from 1988 to 2006 under an age-period-cohort framework, and found that mortality differentials strengthen across cohorts

but do not decline over age or change across the study period (Yu 2011). As excess overweight or obese mortality has been increasing from earlier to later cohorts, ignoring cohort differences leads to a declining age pattern.

This project will extend the dissertation research to engage more recently published work and address the controversies regarding the changing association between excess body mass and mortality.

> Questions have arisen as to whether current definitions of overweight and obesity should continue to be used to characterise a large segment of the population

ACTWELL – THE INFLUENCE OF AGEING ATTITUDES AND EXPECTATIONS ON HEALTH BEHAVIOURS AND MEDICAL HELP-SEEKING

RESEARCHERS

KERRY SARGENT-COX
KAARIN ANSTEY

Negative stereotypical views of older adults are linked to poor health outcomes, but the mechanisms behind this relationship are unclear. A promising hypothesis argues that stereotypes create expectations of ageing processes and interpretation of health problems, which in turn affect health behaviours and medical actions. Identifying and debunking stereotypes may improve health and self-management.

This study employed a cross-sectional survey to collect original, representative (population-based), quantitative data.

The aim was to identify the degree to which expectations of ageing affect health literacy, health behaviours and health outcomes in young, mid-aged and older adults. The attribution of musculoskeletal symptoms to the 'normal ageing processes' was also explored.

This project is the first phase of a larger project. The ultimate aim of the project is to develop an intervention program that addresses and challenges negative expectations of ageing with the goal of increasing preventive health behaviours in mid-life and older adults.

The questionnaire was developed in January – May of 2011. The questionnaire included five parts;

demographic, health and lifestyle (including ADLs, medical problems, pain, BMI, diet, smoking and alcohol, and health attitudes), health literacy, wellbeing, and attitudes towards age and ageing.

The questionnaire was piloted in May 2011 with 287 adults from the Canberra region who were either self-care residents of Kangara Waters retirement village, or undergraduate psychology students at the University of Canberra. Participants were aged from 17 years to 92 years old (M = 37.77, SD = 25.77).

Administration of the questionnaire to a random sample of 3000 individuals in the ACT and surrounding district began in August 2011. The return rate for

completed questionnaires as of 11/11/11 was 26% (630 paper surveys and 158 online), well above the target of n=500.

The data is currently being entered, cleaned and made ready for analyses. There are at least five manuscripts (journal publications) planned for the data, as well as at least one conference presentation submission in 2012. In addition, a report for ACT Health is being prepared.

This project is jointly funded by ACT Health and CEPAR.

> The ultimate aim of the project is to develop an intervention program that addresses and challenges negative expectations of ageing with the goal of increasing preventive health behaviours in mid-life and older adults

DR KERRY SARGENT-COX
BAppPsych (Hons) UC, PhD ANU
POSTDOCTORAL FELLOW

Kerry Sargent-Cox is a CEPAR postdoctoral fellow located at the Centre for Research in Ageing, Health and Wellbeing at the Australian National University. Kerry's primary research explores the psychosocial predictors of positive and healthy ageing. Her work is primarily focused on longitudinal and cross-

national studies examining expectations surrounding ageing and their predictive quality for major health outcomes and mortality in older adults.

'As a postdoctoral fellow my involvement with CEPAR has provided me with important opportunities to further my career and research skills. In the last 12 months I organised and chaired a symposium at the International Gerontology and Geriatrics Asia Pacific

Congress 'The value of cross-national comparison in health and wellbeing to enhance understanding of ageing well'. This symposium was a direct result of my collaboration with Professors Kaarin Anstey and Hal Kendig, both CEPAR Chief Investigators. This collaboration has also led to several publications (both accepted in press and currently under review). Working closely with such esteemed colleagues as

Professor Anstey has also provided me with invaluable mentoring, collaboration and networking opportunities.

Through CEPAR I have also had invitations to be a discussant at the Australian School of Business National Honours Colloquium held at the University of New South Wales, as well as assess abstracts and papers for the Emerging Researchers in Ageing 2011 conference.

CONCORD HEALTH AND AGEING IN MEN PROJECT

RESEARCHER

ROBERT CUMMING

External collaborators

FIONA BLYTH
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VASI NAGANATHAN
PHILIP SAMBROOK
MARKUS SEIBEL
LOUISE WAITE
(ALL UNIVERSITY OF SYDNEY)
THOMAS TRAVISON
(BOSTON UNIVERSITY)

Much research on ageing has had a focus on women, as they tend to live longer than men. Nevertheless, about 40% of people aged 75 and over in Australia are men. The Concord Health and Ageing in Men Project (CHAMP) was designed to fill the gap in knowledge about the health of older men.

CHAMP is one of the world's most comprehensive studies of ageing in men. The study is chiefly concerned with frailty, longevity and the major geriatric medical syndromes of dementia, falls, incontinence and mobility impairment.

Between 2005 and 2007, men aged 70 years and over living in the community around Concord Hospital in Sydney were invited to participate in CHAMP. A total of 1705 men were recruited. Eighty per cent of these men were seen again two years later and five year follow-up visits will be completed in 2012.

Twenty four CHAMP papers have been published or are in press. Three papers published in 2011 illustrate the breadth of new knowledge generated from CHAMP.

Data from CHAMP showed that men with lower levels of testosterone in their blood tended to be much more frail than men with higher levels of testosterone (Travison TG et al. 'Changes in reproductive hormone concentrations predict the prevalence and progression of the frailty syndrome in older men: The Concord Health and Ageing in Men Project', *Journal of Clinical Endocrinology and Metabolism* 2011:96:2464-74). Further analysis will look at the relationship between testosterone levels and longevity.

CHAMP includes more than 300 men who came to Australia as migrants from Italy in the 1950s and 1960s. The study found that men born in Italy were much less likely to fall over than men born in Australia (Stanaway FF et al. 'Ethnicity and falls in older men: Low rates of falls in Italian-born men in Australia', *Age and Ageing* 2011:40:595-601). Differences in health according to ethnic background have important implications for planning services for older Australians.

Impaired mobility is a problem for many older people. CHAMP found that slow walking speed was a strong predictor of mortality (Stanaway FF et al. 'How fast does the Grim Reaper walk? An ROC curve analysis in healthy men 70 and over', *British Medical Journal*, published online December 15, 2011). This is an important finding that suggests that encouraging older people to walk faster may improve their health.

CHAMP is supported by the NHMRC, CEPAR and the Ageing and Alzheimer's Research Foundation.

> The study is chiefly concerned with frailty, longevity and the major geriatric medical syndromes of dementia, falls, incontinence and mobility impairment

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PROFESSOR ROBERT CUMMING
MBBS UNSW, MPH PhD Syd., FAFPHM Royal Australian College of Physicians
CHIEF INVESTIGATOR

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 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. 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 in sub-Saharan Africa.

He is a member of the Commonwealth Department of Health's National Arthritis and Muscoskeletal Conditions Data Working Group; the council of the Ageing and Alzheimer's Research Foundation; the Woolcock Institute of Medical Research Advisory Committee; and the Steering Committee of Andrology Australia's Longitudinal Study on the Reproductive Health of Middle Aged and Ageing Men.

In 2011 Robert was awarded a Distinguished Professorial Achievement Award for research, teaching and learning as well as service to Sydney Medical School, University of Sydney and the profession.

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INVESTIGATING PATHWAYS OF HEALTH AND COMMUNITY CARE SERVICE USE

RESEARCHERS

JULIE BYLES
HAL KENDIG
KARLA HEESE

Australia urgently requires information to guide and monitor major health reforms anticipating massive population ageing and increasing demand on health services. Of particular relevance are the challenges of redesigning care for those with chronic and complex conditions, integrating services, and improving distribution and access to services on the basis of need. Such improvements in care require a better understanding of how services respond to changes in health state, movements and interfaces between acute, community and residential care settings, and variations in social and economic contexts. Linkages between longitudinal survey and health services use data are essential to identify how specific health service usage relates to individual changes in physical and mental health and provide the ideal evidence base for understanding these multiple, complex and pressing issues .[6]

This program, supported by the NSW State Leveraging grant, is developing methods and capacity to use routinely collected health services data to examine ways in which the use and impacts of health and aged care services change as people grow older and to provide information that can inform health care service delivery, planning and policy. The emphasis will be on linkage of health services data to population survey data; and on methods to convert these data into information for understanding patterns, pathways and costs of health and aged care services as people age. The program will also develop methods for using longitudinal and linked data to evaluate health care innovations and programs aimed at addressing the health care needs of an ageing population. By linking longitudinal survey data with health services data it is possible to determine individual factors associated with use of these services and the differential changes in health outcomes for those who do and do not use them.

The aims are to:

1   Build platforms, methods and capacities for using linked data to examine ways in which the use and impacts of health and aged care services change as people grow older including:
    • Linkage of longitudinal health survey and hospital separations data
    • Basic descriptive outputs
    • Development of methods and analytical modules

2   Undertake analyses of health care use associated with major chronic illnesses and health risk behaviours, and the modifying effects of age, gender, other sociodemographic factors, and area of residence

3   Undertake analyses to identify major drivers of health service use and factors associated with different levels and patterns of use among particular population subgroups according to age, gender, sociodemographic resources, and geographical location

4   Develop and apply techniques for post-roll out evaluation of recent health and policy innovations.

PROFESSOR JULIE BYLES

B Med PhD Newcastle
ASSOCIATE INVESTIGATOR

Julie Byles is Professor and Director of the Research Centre for Gender, Health and Ageing at the University of Newcastle.

Her 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. Her recent work has focussed on health assessment, medications used by older people, sleep disturbance, health effects of alcohol for older women, nutrition screening and interventions, health and retirement, and prevention of falls in residential care.

Julie is the National President of the Australian Association of Gerontology and in 2011 Chair of the AAG Collaborating Centres. She is co-Director of the Australian Longitudinal Study on Women's Health, and is also closely involved with the NSW 45 and Up Study, a longitudinal study involving over 250,000 men and women across New South Wales. She is also a lead investigator on two large collaborative NHMRC grants to combine data from several Australian longitudinal studies of ageing. She contributes to government and non-government programs relating to ageing research and health care for older persons.

The research has already produced one publication: Kendig, H., N. Mealing, R. Carr, S. Lujic, J. Byles and L. Jorm. (2011). 'Assessing patterns of home and community care service use and client profiles in Australia: a cluster analysis approach using linked data', *Health and Social Care in the Community*, Early view.

The work plan for 2012 includes:

1 Establishment of a project steering and advisory committee which includes health services researchers, clinicians, and health care governance and policy
2 Application for data linkage
3 Assembly of data and descriptive outputs
4 Analysis of health care use associated with stroke
5 Evaluation of recent NSW led initiatives in stroke care

We have chosen stroke as one of the first case studies for the analysis platform. Stroke poses a particular burden for Australia and its health and aged care systems. Stroke is the second leading cause of death in Australia and the leading cause of adult disability. Stroke is also a condition that emphasises the importance of a continuum of care in prevention, treatment, recovery and long-term support. Currently, much of the evidence-base for the management of stroke concerns the acute setting and immediate rehabilitation.

Very little is known about the longer-term outcomes and the ways in which health and aged care services interact to meet the needs of people who have experienced stroke. Prophylactic measures such as anti-hypertensive treatment and cholesterol lowering drugs (statins) are thought to have reduced the incidence and severity of stroke, and more effective responses to stroke may have reduced the consequences of this condition. For instance, ambulance services have been adapted to provide more efficient transport to appropriate health care, and multidisciplinary stroke units have been established across NSW. However, while these measures have been supported by evidence from randomised controlled trials and other studies, there is little evidence of their impact on disability and service demands at state or national level, and no information as to how they translate across different settings.

Linkages between longitudinal survey and health services use data are essential to identify how specific health service usage relates to individual changes in physical and mental health

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6 As highlighted in our previous research published: Jorm, L., S. R. Walter, et al. (2010). 'Home and community care services: A major opportunity for preventative care', *BMC Geriatrics* 10(26): 1-9

PROFESSOR HAL KENDIG
AB UC Davis, MPl PhD USC, FASSA
CHIEF INVESTIGATOR
AND UNIVERSITY OF SYDNEY
NODE LEADER

Hal Kendig is Research Professor of Ageing and Health at the University of Sydney where he heads the Ageing, Work and Health Research Unit in the Faculty of Health Sciences.

He served as National Convenor of the ARC/NHMRC Research Network in Ageing Well to 2010.

He is a gerontologist and sociologist with expertise in longitudinal survey research, health behaviours, socio-economic resources, housing and health and community care services and policies. With Colette Browning at Monash, he co-directs the ongoing Melbourne Longitudinal Surveys of Healthy Ageing (MELSHA). He is recognised internationally for more than 180 publications on health, social, and policy aspects of ageing.

He is active in research and advocacy for older people as attested to by his Life Membership of both the Council on the Ageing (Australia) and National Seniors Association.

In 2003, he was awarded the Centenary Medal for 'outstanding service to aged care and healthy ageing research' and in 2008 he contributed to the Australia 2020 Summit's Long term National Health Strategy.

He serves on the editorial boards of the *Journal of Gerontology (Social Sciences), Ageing and Society,* and the *Australasian Journal on Ageing.*

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EMPLOYMENT AT OLDER AGES IN AUSTRALIA: DETERMINANTS AND TRENDS

RESEARCHERS

PETER MCDONALD
ARIANE UTOMO

As a population ages and workers leave the labour force, labour force participation falls. When workers leave the labour force at older ages, they stop earning wages and, instead, many obtain their income from state income support schemes. This has a double effect upon the state budget: a reduction in taxation revenue and an increase in government expenditure. Because ageing also leads to higher health costs, the fiscal effect of workers leaving the labour force can put state budgets under strain. This situation is already evident in several European countries and is an important reason for the growth of government debt in these countries.

On the personal level as well, as expectation of life increases, the number of years that people may need to support themselves after they retire, increases. For many, this may mean that their savings are inadequate to cover their needs across their lifetime, thus putting further pressure upon state resources.

This situation is ameliorated if older workers remain in the labour force longer than has been the case in the past. In Australia, labour force participation rates at older ages (55 and over) were relatively low by international standards prior to 2000 but, in the past decade, these rates have increased sharply.

This has contributed to the fiscally-beneficial situation that the proportion of the Australian population that is in the labour force is now (2011) at its highest point in over 50 years. At the end of the decade, there are signs that this trend is slowing.

This project investigates the causes and consequences of changes in labour force participation rates at older ages in Australia with a view to forecasting future movements in these rates and future impacts on individual retirement savings and the government's fiscal position. Use is made of census and survey data and data from workplaces.

A paper based on analysis of 2006 Census data has been published that examines who retires early and who continues to work. It shows that continued work is strongly associated with education and with professional and management occupations, the latter including farmers. Blue collar workers and public employees, on the other hand, tend to retire at younger ages. As the project moves forward, analysis will be conducted of the results of the 2011 Census and a database of employees of some 30 companies. Assessment will also be made of the consequences for government revenue and expenditure of future changes in labour force participation.

> ...continued work is strongly associated with education and with professional and management occupations, the latter including farmers. Blue collar workers and public employees, on the other hand, tend to retire at younger ages

DR ARIANE UTOMO

PhD BAS, BEc (Hons), Australian National University
RESEARCH FELLOW

Ariane Utomo is a Research Fellow at the Australian Demographic and Social Research Institute at the Australian National University. She was appointed in 2009 to work on the ARC Linkage project *Working Late and the Spectre of Uselessness: Sustaining Labour Supply in a Globalising Economy*.

'My involvement with CEPAR has enabled me to develop my core research interests in the area of gender, education, and the labour force, and extend these into the framework of population and workforce ageing. I am currently working on two research projects related to workforce and population ageing with Professor Peter McDonald and Dr Jeromey Temple. In addition to the project described above I am also involved in a project which applies population projection methods to forecast the impact of population ageing in the future labour productivity across OECD countries.

As a member of the teaching staff in the university, I have also been able to relay the knowledge and skills I have gained in this research area to my undergraduate and postgraduate students. Since I have maintained an interest in population issues in Indonesia and Asia, I am keen to collaborate in future comparative research looking into population and workforce ageing in the region.'

STRAND 5

INTERNATIONAL BENCHMARKING & POLICY RESPONSES

This strand involves the development of a systematic framework for cross-national comparisons of policies related to demographic change, which links Australia more firmly into international networks based on collaboration across large-scale studies of ageing. It will yield comparative policy insights and render our primary research more globally useful.

RESEARCH PROJECTS

STRAND 5   INTERNATIONAL BENCHMARKING & POLICY RESPONSES

THERE ARE SEVERAL REASONS WHY AN INTEGRATED PROGRAM OF RESEARCH ON POPULATION AGEING REQUIRES A STREAM ON INTERNATIONAL BENCHMARKING.

First, comparing Australia with other countries on key outcomes such as retirement income, health, longevity, and wellbeing enables us to evaluate whether we are ageing well as a society and identify areas where we can improve relative to other similar countries. Second, the historical, social, political and health factors that influence ageing populations are complex, contemporary, and not amenable to experimental manipulation. Within a specific culture, it is often not possible to measure cultural influences as there may not be enough cultural variation or policy variation. This means that cross-national comparison is the best method by which to compare many of the macro influences on societies and

individuals as they age. For example, within a country where there is publically funded healthcare or retirement income, it is not possible to evaluate the influence of these factors on health or age of retirement. Comparing countries with and without universal publically funded healthcare provides the opportunity to make inferences about the impact of this on individuals and societies, as long as other factors are very carefully controlled. Third, there may be key lessons we can learn from other countries that differ in terms of their social policies, their culture, diet and lifestyle, and the way aged care is managed, valued and funded. Establishing similar metrics on key indicators between countries enables comparisons to be made in these key areas.

In 2011, the International Benchmarking Stream focused on comparisons between Australia and the United States, using national surveys that contained comparable information in each country. These projects were significant for the development of research methods for this research stream, including the harmonization of variables, and statistical modelling. Findings from these projects had key policy implications, and raised many issues to be investigated in future projects. In 2012, the work program for this stream will expand to include comparisons with Asian countries, initially Japan and Korea, both of which have excellent national

longitudinal ageing studies. As Australia lacks a national longitudinal ageing study we will continue to use other datasets such as the Household Income and Labour Dynamics in Australia Study, and the DYNOPTA dataset. Specific research topics to be investigated include examination of risk factors for chronic disease by country and gender, comparison of health expectancies, comparison of self-rated health and associated predictors between countries, and evaluation of policies relating to aged care.

SOCIOECONOMIC INFLUENCES ON HEALTH AND MOBILITY: CROSS-NATIONAL COMPARISONS

RESEARCHERS

KAARIN ANSTEY
KERRY SARGENT-COX
HAL KENDIG
KARLA HEESE
RACHEL CARR
JACQUI BREWER

Drawing from harmonised data from the US Health and Retirement Survey (HRS) and the Household Income and Labour Dynamics in Australia (HILDA), this analysis aimed to identify socio-economic differences between the US and Australia in the prevalence and correlates of self-reported health and mobility patterns. By better understanding these cross-national differences there will be potential to guide health promotion, interventions, and policies that can enable healthy ageing and social participation.

In the first study, data from the HRS (N= 2589) and HILDA survey (N=1760) were used to compare the macro level policy frameworks on individual retirement timing expectations for pre-Baby Boomers (61+ years) and early Baby Boomers (45 to 60 years). Australian workers reported younger expected age of retirement compared to the US sample. Reporting poor health was more strongly associated with

younger expected retirement age in the US than Australia. Cohort and gender differences in the US were found for the effect of private health insurance on younger expected age of retirement. Our results show the impact of different policies on retirement expectations among older workers and demonstrate the value of cross-national comparisons.

In a second study, societal differences between the US and Australia in self-reported mobility difficulties of older people as well as socio-economic variation within the countries were examined, again using harmonised data from the HRS and HILDA. Across all socio-demographic groups, older Australians were found to be more likely than older Americans to report difficulty with walking one block and climbing a flight of stairs. The prevalence of mobility limitations was greater in both countries for more 'vulnerable' groups - those at older ages, lower educated groups and separated and widowed individuals - and the country differences were especially large for these vulnerable older groups. The findings suggest that social gradients of health are found in mobility measures of functional health in later life

in both Australia and the US. The cross-national differences in the prevalence of self-reported mobility limitations may reflect methodological differences between the surveys, social differences in response, and/or actual differences in individual's capacities and/or the barriers and facilitators they face in their social, policy, and physical environments.

In a further study, a systematic review was conducted to evaluate estimates of years of cognitive health expectancy and dementia free life expectancy internationally. Results showed that at age 65, the range in years of expected cognitive impairment for males ranged from 0.5 to 2.2 and for females ranged from 0.9 to 4.8. At age 80, the range in years of expected cognitive impairment for males ranged from 0.6 to 2.1 and for females ranged from 0.6 to 3.8. There are significant data gaps in our knowledge of how countries vary in terms of years of cognitive health expectancy. Findings are consistent for women living longer but also having more years of cognitive impairment. Policy implications will be discussed.

This project was jointly funded by the ARC/NHMRC Research Network in Ageing and CEPAR and has resulted in a number of outputs. In addition to three papers presented at the Asia-Pacific International Congress of Gerontology and Geriatrics in October 2011 (see pages 100-102 for details), the project has also produced:

Kendig, H., Sargent-Cox, K.A., Carr, R., Heese, K., & Anstey, K.J. (under review). 'Socioeconomic disparities in mobility in later life: An exploration of Australia and the United States.'

Sargent-Cox, K.A., Anstey, K.J., Kendig, H., & Skladzien, E. (In press). 'Determinants of retirement timing expectations in the United States and Australia: A cross-national comparison of the effects of health and retirement benefit policies on retirement timing decisions', *Journal of Aging and Social Policy.*

Our results show the impact of different policies on retirement expectations among older workers and demonstrate the value of cross-national comparisons

COMPARISON OF INTERNATIONAL SOLVENCY REGULATION FOR LIFETIME ANNUITIES

RESEARCHERS

KATJA HANEWALD
MICHAEL SHERRIS

External collaborator
MAATHUMAI NIRMALENDRAN
(UNSW HONOURS STUDENT)

Many developed nations are faced with the task of providing retirement solutions for an ageing population. Effective longevity risk management solutions are needed that transform retirement savings into reliable retirement income sources. Annuities provide an ideal hedge against longevity risk and should be of substantial value to risk-averse individuals with uncertain lifetimes. However, consumer demand for annuities is limited in most markets including Australia. Effective regulatory controls can help to develop and enhance market participation in longevity insurance products. Higher capital requirements lower insolvency risks and reduce insolvency costs to policyholders and shareholders.

On the other hand, stringent solvency conditions and high capital requirements can result in greater capital costs and higher premiums giving rise to fewer individuals purchasing longevity insurance and eschewing the benefits associated with annuities. Effective regulation needs to efficiently balance this trade-off between prudential security and consumer affordability.

This project considers a number of related issues for solvency regulation of life annuity products. How do international solvency regimes for lifetime guaranteed annuities compare against each other? How to determine an optimal level of solvency which balances the regulatory trade-off between prudential security and consumer willingness to buy these annuities? What improvements should the Australian regulator consider to encourage a more efficient solvency regime for Australian lifetime guaranteed annuities?

Quantitative and qualitative methods are employed to answer these research questions. Current international solvency regimes are described and compared using an established qualitative framework. Five countries are chosen to represent a sample of the world with developed annuity markets and/or developed regulatory systems: the United States, the European Union (Solvency II), the United Kingdom, Switzerland, and Australia. Following that a multi-period value maximization model for an insurer offering lifetime guaranteed annuities is developed and used to show the features of the optimal solvency level that balances the trade-off between prudential security and consumer willingness to buy annuities. The model incorporates a stochastic

mortality model, stochastic investment returns, and an imperfectly elastic demand function capturing consumer preferences for financial quality. The model is used to compare annuity supply and demand under different regulatory regimes. The results are used to comment on the strengths and weakness of the capital requirements of the Australian prudential system for lifetime guaranteed annuities. The research will be written up as a paper suitable for submission to a leading international journal and will be presented at a conference for industry practitioners.

> Effective regulatory controls can help to develop and enhance market participation in longevity insurance products

RESEARCHERS

KAARIN ANSTEY
KERRY SARGENT-COX

In June, 2010, Canberra was accepted into the World Health Organisation's (WHO) Global Network of Age-Friendly Cities (AFC), a group of municipalities that seek to improve the living experience of its senior residents. The WHO *Checklist of Essential Features of Age- friendly Cities* includes outdoor spaces and buildings, transportation, housing, social participation, respect and social inclusion, civic participation and employment, communication and information, community and health services. This project surveyed ACT residents on the features of AFCs to identify positive and negative examples of infrastructure and practices and to elicit suggestions for improvement. A questionnaire was developed that measures key indicators and will measure long term change.

The questionnaire was developed in June and July 2011 in collaboration with the ACT Office for Ageing and was based on the eight domains of an Age-friendly City identified by WHO. For each domain one question was identified as a possible key indicator for comparison in future surveys. A number of open ended questions were included to encourage people to provide opinions and suggestions.

The questionnaire was administered in July 2011. The response rate was approximately 33% with 1652 questionnaires returned by mail and a further 320 questionnaires completed online.

To determine the representativeness of the survey data the demographic profile of the respondents to this survey has been compared to data from the Australian Bureau of Statistics (ABS) 2006 Census for Canberra residents aged 60 years and older where comparable data was available. The sample had a higher proportion of females and older respondents than the census data. The older age of our sample can be explained, at least in part, by the large number of questionnaires distributed to retirement villages.

A 70 page report of the findings of the study was delivered to ACT Office for Ageing in October 2011.

This project was jointly funded by ACT Government and CEPAR.

> This project surveyed ACT residents on the features of Age-friendly Cities to identify positive and negative examples of infrastructure and practices and to elicit suggestions for improvement

PROFESSOR KAARIN ANSTEY
BA(Hons) Syd., PhD Qld., FASSA
CHIEF INVESTIGATOR

Kaarin Anstey is Director of the Centre for Research on Ageing, Health and Wellbeing, and Director of the Dementia Collaborative Research Centre, Early Diagnosis and Prevention, both of which are based at the Australian National University. She is also an NHMRC Senior Research Fellow and an Adjunct Professor at the Pennsylvania State University Gerontology Centre.

Her substantive research interests include the epidemiology of cognition and dementia with a focus on identifying lifestyle, brain, and biological risk factors for cognitive decline, and the impact of cognitive ageing on everyday function and driving. Her work on risk factors for dementia and cognitive decline is highly cited and her work on estimates of probable dementia in Australia which arose from the DYNOPTA project has been used by ACCESS Economics to develop the most recent projections of the cost of dementia in Australia.

In 2008 she was an invited participant in the Australia 2020 Summit Health Stream and in 2010 she advised the Governor General on Priorities in Aged Care. She is currently a member of the Transport Research Board of the United States National Academies which provides advice to the US Congress.

She is a member of a number of editorial boards.

PROFESSOR CAROL JAGGER
BSc MSc Leeds, PhD Leicester
PARTNER INVESTIGATOR

Carol Jagger is the AXA Professor of Epidemiology of Ageing in the Institute for Ageing and Health at Newcastle University, UK. She brings 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. Her AXA chair research program has three themes all of which are relevant to CEPAR:

1 UNDERSTANDING VARIATIONS IN HEALTHY ACTIVE LIFE EXPECTANCY

In 2011, two three-year projects began under this theme. The first is the Joint Action European Health and Life Expectancy Information System (JA EHLEIS) funded by the EU Public Health program. Jagger leads the main analytic work package estimating and comparing trends in Healthy Life Years across the 27 European countries and finding the main factors responsible for the variation between countries. The second project, funded by the Economic and Social Research Council (ESRC) aims to explain inequalities in healthy life expectancy across geographic areas in England and Wales and will include a large methodological component which will benchmark current software packages for calculating health expectancy from longitudinal studies.

2 DISABILITY AND FUNCTIONING IN LATER LIFE

Disability, its measurement, drivers and consequences form the main part of this theme, with specific questions around patterns of disability trajectories in the oldest-old and whether new cohorts of older people have the same levels and combinations of functioning to earlier ones with consequent implications for future health and social care provision. Two major longitudinal studies of ageing: the Newcastle 85+ Study and the new cohort of the MRC Cognitive Function and Ageing Study (MRC CFAS) are the main data sources. A key publication this year has highlighted the wide variation in need for care of a population of 85 year olds[7].

3 AGEING POPULATION PROJECTIONS FOR POLICY

The basis of this research theme is Jagger's macro-simulation model SIMPOP which links trends in disease to future levels of disability and disability-free life expectancy. This model allows the exploration of the level of health improvement (through disease prevention or treatment) required to obtain compression of disability.

Currently Anstey and Jagger are in the process of producing the first estimates of life expectancy free of cognitive impairment for Australia as part of CEPAR.

7   Jagger, C., Collerton, J.C., Davies, K., Kingston, A., Robinson, L.A., Eccles, M.P., von Zglinicki, T., Martin-Ruiz, C., James, O.F.W., Kirkwood, T.B.L and Bond, J., (2011) 'Capability and dependency in the Newcastle 85+ cohort study. Projections of future care needs,' *BMC Geriatrics* 2011, 11:21

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

James Nazroo is Professor of Sociology at the University of Manchester. He also serves as Director of the Manchester Interdisciplinary Collaboration for Research on Ageing and Director of the Cathie Marsh Centre for Census and Survey Research. He is an international authority on social determinants of health and wellbeing in later life, social inequalities over the life course, and longitudinal surveys of health and retirement in different cultural contexts.

He is the lead investigator for the research grant 'Inequalities in later life frailty and wellbeing' (2011-2016); a chief investigator on the ongoing 'English Longitudinal Study of Ageing' (ELSA); and a partner investigator on the ARC Discovery grant 'Socio-economic determinants and health inequalities over the life course' (2010-2012) being conducted in collaboration with CEPAR Chief Investigator Kendig and Associate Investigators Byles and O'Loughlin.

During 2011 Professor Nazroo commenced collaboration with the International Benchmarking and Comparative Policy Analysis research program with additional contributions to the research program Ageing Productively and Well.

Nazroo is working principally with Kendig to build Australian collaboration in comparative studies of ageing across Europe, Asia, and North America. He will draw on his leading role in the UK ELSA study, long standing collaborations with the US HRS survey, and his advisory responsibilities for comparable surveys now underway in Asian countries. He will have a leading part in comparative analyses examining socio-economic and cultural influences on health and productivity outcomes as they may vary across societal and policy contexts. For this he is advising on comparable measurement across countries of social class and other socio-economic influences on health and wellbeing outcomes for ageing people.

Nazroo also is collaborating with Kendig and Byles to deepen their comparative Australian-UK analysis of life history influences on life outcomes in later life. He will collaborate in analyses of the socio-economic determinants of inequalities in later life to elucidate opportunities to ameliorate them through social policies influencing life chances earlier in the life span. Continuing the two-country comparisons will shed light on how evolving social change and policy variation influence successive cohorts and, importantly, how social positions influence life outcomes for groups facing different opportunities and disadvantages over their lives. In 2012 this research will focus on Australia-English comparisons, with O'Loughlin and Kendig, of work and care giving experiences in the baby boom cohort. We will also explore extending the life history approach to other countries that have collected comparable data in the Study of Health, Ageing and Retirement in Europe (SHARE).

The leading research concentration on ageing at Manchester will be an important destination for visits building the capacities and collaborations of Centre staff and associated early career researchers. In turn CEPAR will serve as a destination for collaborators associated with Professor Nazroo's UK program and those in his extensive international partnerships.

RESEARCH TRAINING & MENTORING

CEPAR IS COMMITTED TO TRAINING A NEW GENERATION OF YOUNG RESEARCHERS.

OUR OBJECTIVE IS TO DEVELOP A CRITICAL MASS OF STUDENTS AND EARLY CAREER RESEARCHERS WITH A SOUND APPRECIATION OF MULTI-DISCIPLINARY RESEARCH AND STRONG RESEARCH TRAINING, FIRMLY LINKED INTO CEPAR'S INDUSTRY, GOVERNMENT AND INTERNATIONAL NETWORKS.

This year we hosted two events to bring together young researchers from around the country to meet and exchange ideas. The 10th National Emerging Researchers in Ageing Conference, held in November, provided a forum for Higher Degree Research (HDR) students around the nation to come together to share their research. The Population Ageing Stream of the National Honours Colloquium (NHC), held in August, assembled fourth year honours students to present their research-in-progress. Both events were successful in attracting students from a wide range of disciplines and provided an opportunity for students to develop their networks and benefit from the insights of other disciplines.

Our research capacity building program received a major boost this year with the success of our bid for post-award funding to support ECRs. The additional funds from the Australian Research Council will be used to mount a comprehensive series of ECR workshops and master-classes beginning in 2012 as well as support six early career researchers to undertake two year projects which will enhance CEPAR's research program.

We have already established a considerable corpus of young researchers deeply involved in the CEPAR research program and this will grow as the Centre gains momentum. Benefits flow in both directions. While the Centre provides opportunities for training and development, these young researchers contribute to Centre life as well as make specific research contributions.

Peter McDonald
Deputy Director

HIGHER DEGREE RESEARCH TRAINING

Twenty HDR students are currently enrolled under the supervision of CEPAR Investigators and working on topics aligned with the Centre's research agenda. Details of their research theses are provided on pages 83–87. These students have the opportunity to participate in a range of Centre activities, including conferences and workshops and meetings with international visitors. A number of these students have been awarded 2012 CEPAR supplementary scholarships to support their research.

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. As part of our collaboration with ERA, we hosted the 2011 annual conference.

EMERGING RESEARCHERS IN AGEING CONFERENCE

The 10th National ERA conference attracted participants from a wide range of disciplines, drawn from twenty-two Australian universities. The conference showcased the work of more than 50 higher degree research students, covering a range of issues, including the cost implications of an ageing society, retaining older workers, determinants of wellbeing, the impact of ageing policies, sustainable retirement, and improving dementia services.

PROFESSOR PETER MCDONALD
BCom UNSW, PhD ANU, FASSA, AM
DEPUTY DIRECTOR AND
ANU NODE LEADER

Peter McDonald is Professor of Demography and Director of the Australian Demographic and Social Research Institute at the Australian National University, and President of the International Union for the Scientific Study of Population.

Throughout his career, he has been actively engaged in the teaching and promotion of demography as a discipline while applying interdisciplinary approaches in his research. His recent work has focused on theory relating to low fertility, the implications of low fertility for population futures and related policy options.

He is a member of the Council of Advisors, Population Europe, a consortium of the leading population research centres in Europe. He is also a member of the advisory boards of the Stockholm University Linnaeus Centre on Social Policy and Family Dynamics in Europe (SPaDE) and the Norwegian Research Council: Demographic consequences of Nordic Family Policy (NORDiC).

Peter serves on the editorial boards of a number of international journals.

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RESEARCH TRAINING & MENTORING

It provided an exceptional opportunity for emerging researchers to explore a diverse range of ageing-related topics from a variety of perspectives as well as network with other higher degree research students, academics, practitioners and policy makers. Many of the students participated in one of the two pre-conference workshops offered:

- Writing and reviewing for publication (presented by the Editorial Board of the *Australasian Journal on Ageing*).
- Funding your research: Applying for grants.

Students also had the opportunity to hear from two keynote speakers, both distinguished researchers in their fields. CEPAR's Peter McDonald spoke on 'Population Ageing and its Implications for the Australian Labour Force' and Henry Brodaty, the Director of the Dementia Collaborative Research Centre, presented 'Dementia: The Next Big Thing is Now!'

PROFESSOR HELEN BARTLETT
Pro Vice-Chancellor and President at Monash University, Gippsland Campus
CONVENER, ERA INITIATIVE
CEPAR ASSOCIATE INVESTIGATOR

'ERA was established in 2002 as a capacity building initiative to provide support and encouragement to students from all disciplines undertaking research higher degrees in the field of human ageing in Australia, by offering them opportunities to network and collaborate with their peers, senior academics and policy makers within Australia and internationally. ERA was previously supported by the ARC/NHMRC Research Network in Ageing Well and has played a major role in building ageing research capacity in Australia. With CEPAR's support we hope to expand ERA's reach and the range of opportunities available to emerging and more established researchers.'

NATASHA GINNIVAN
PhD student,
Ageing Research Unit, ANU
2011 ERA CONFERENCE PARTICIPANT

'Through the mentoring of Kaarin Anstey and Kerry Sargent-Cox, I have been supported and encouraged to seek new opportunities to share my work, such as presenting at the 2011 Emerging Researchers in Ageing Conference hosted by CEPAR. It was the first time I had presented at an academic conference and I found it a really positive and valuable experience. The audience was interested and supportive. As part of the ERA conference, CEPAR hosted several workshops for emerging researchers and they were a great opportunity to receive feedback from leading academics in a range of disciplines.'

HONOURS STUDENT ENGAGEMENT

NATIONAL HONOURS COLLOQUIUM

To engage honours students from around the country, CEPAR initiated the addition of a population ageing stream to the UNSW Australian School of Business' National Honours Colloquium (NHC). The stream is designed to provide participants with an enriched appreciation of multidisciplinary research and the impetus to consider higher degree research.

Eight students from a range of disciplinary backgrounds were awarded travel scholarships to attend the event, present their research-in-progress and receive feedback in a stimulating and supportive environment. The Colloquium culminated in a dinner geared to promoting networking between students, industry leaders and academics.

CLARE AITKEN
Honours in Psychology student, University of Canberra
2011 NATIONAL HONOURS COLLOQUIUM PARTICIPANT

'The opportunity to have CEPAR Chief Investigators available to review my research has been tremendously beneficial and has improved my research by diversifying my perspective. My research is in the psychology field and the opportunity for input from leading academics in other fields has helped to provide a multidisciplinary context to my work.'

EARLY CAREER RESEARCHER MENTORING AND TRAINING

ECRs are mentored by CEPAR senior researchers and have opportunities to interact with experts within the three collaborating universities, our industry and government partners and Centre visitors, many of whom are international leaders in their field. In 2012, the Centre plans to initiate an ECR and HDR student exchange scheme which will provide funding for young researchers to build their international networks and connect with some of the world's leading centres in the field.

ECRs participate in Centre activities such as workshops and seminars, contribute to the Centre's working paper series and have opportunities to develop a range of skills. For example, Centre ECRs participated in the ERA conference as session chairs and at the NHC as discussants.

Commencing in 2012, CEPAR will convene a series of workshops and master-classes which will provide opportunities for early career researchers, within

and external to the Centre, to learn cutting edge techniques from international leaders.

The Centre employed nine research fellows in 2011 and a further six ECRs were involved as Associate Investigators in the research program. Over the next period they will be joined by ECRs supported by ARC post award funding, two new research fellows recruited towards the end of 2011 (one of which is supported by the NSW State Government Leveraging funding) as well as others expected to be recruited in early 2012.

ARC POST AWARD FUNDING

Six research projects have been developed to expand the CEPAR research agenda and provide excellent opportunities for ECR development. Each involves innovation and cross-disciplinary engagement which provide synergistic development opportunities for a new research generation. In nearly all cases, the identified ECR has previously worked with a CEPAR CI, and this provides a collaborative foundation for the proposed project. The six projects and ECRs involved are detailed below:

1 AUSTRALIA'S OLDER POPULATION: COHORT ANALYSIS OF DEMOGRAPHIC CHANGE

RESEARCHER
MEIMANAT HOSSEINI-CHAVOSHI

Meimanat commenced her project in 2011. See page 26 for details.

2 LIFE CHOICES AND POLICY: POLICY ANALYSIS WITH NON-STANDARD PREFERENCES

RESEARCHER
CAGRI KUMRU

This research project takes as its point of departure the often-observed inconsistencies between the behaviour implied by standard economic consumer preference functions and individual and household behaviour that is actually observed. It will systematise the exploration of non-standard preferences that aim to capture aspects of human behaviour such as temptation, lack of self-control, and myopia. It will take documented behavioural traits and formalise them to allow tractability within life-cycle and overlapping generations (OLG) models. Functions will be estimated using a standard data-set, and the impacts of alternative

preference formulations will be measured.

The policy domain for the analysis will be various taxation and social insurance programs. In this context, the significance of the research can hardly be overstated. Demographic shift has brought with it a global awareness of the importance of pension reform for economic and especially fiscal stability. Yet almost all policy modelling analysis relies on preference specifications which ignore the behavioural traits listed above. This research program aims to fill this gap.

3 MENTAL CAPITAL AND SUCCESSFUL AGEING: PROMOTING HEALTHY AGEING AND WELLBEING IN ADULTHOOD

RESEARCHER
RICHARD BURNS

This research program seeks to identify components of Mental Capital (MC) which are related to successful and healthy ageing in the older Australian adult population. MC encompasses a person's cognitive and emotional resources and includes their cognitive abilities; their capacity to learn, be flexible and efficient; their sense of vitality and engagement with life; their self-referent

attitudes (e.g. sense of mastery and resilience); and their affective experience, and reflects an interaction between genetic endowment and adaptation to life experiences over the life course.

The project aims to 1) identify the trajectories of MC throughout adulthood and old age; 2) identify the protective effects of MC on the development of physical and mental illness; and 3) demonstrate whether positive psychology interventions which focus on MC components, are efficacious in later life. It is expected that this project will directly inform social policy relating to health promotion and planning community services.

4 INNOVATIVE HEALTH FINANCING SYSTEMS UNDER DEMOGRAPHIC SHIFT

RESEARCHER
CHUNG TRAN

This project aims to develop a dynamic general equilibrium life-cycle framework to assess the capacity of the Australian health insurance system to absorb the growth in healthcare costs. The project will also identify a set of optimal cost-sharing strategies in response to

RESEARCH TRAINING & MENTORING

growing medical needs while maintaining the quality, affordability and accessibility of health care, which helps Australian families and individuals live healthy, productive, and fulfilling lives. The model will allow analysis of health insurance system reforms to identify policies that foster the role of private health insurance markets, and provide public and private partnerships to facilitate effective cost sharing amongst Australians.

5   VOTING ON ALTERNATIVE HEALTH CARE REFORMS: HOW DO THE ELDERLY DECIDE?

RESEARCHER
LORETTI ISABELLA DOBRESCU

Population ageing will create pressure for increased spending, particularly in health care. With escalating health costs, reforms will become necessary to improve long-run financial sustainability. This project focuses on the political economy underlying the process of reform. Will future voters support such policy reform? Several models will be developed to identify and explain the determinants of the voting mechanism

for health care reform, and assess their effect on individual decisions. Political feasibility will be assessed by specifying various policies for model simulation.

First, a model of political support for the health care reform will be formulated. The extent of contributions and social transfers between the working-age population and the retired is endogenously determined by voting. The balance between different interests (preferences over policies regarding health care system components or characteristics) will determine the political economy equilibrium. Second, empirical analysis will be conducted to evaluate the efficiency of different systems based on complex and realistic dynamic models. The final result is a set of accurate models that would recreate economic situations, realistically simulate individual behaviour and allow international comparisons (with the US and Europe).

6   HEALTH INSURANCE CHOICES OF SENIOR CITIZENS

RESEARCHER
OLENA STAVRUNOVA

A number of recent studies have shown that senior citizens have difficulty making decisions about health insurance. The evidence includes studies showing that (1) senior citizens have a poor understanding of the attributes of different insurance plan options, and (2) they often do not consider factors that, for a rational agent, should be relevant when deciding on insurance plans (e.g., risk level, the impact of insurance on waiting times). It has also been found that factors like cognitive ability have a great influence on insurance choices.

One aim of this project is to extend traditional economic models of insurance demand to include non-traditional factors like cognitive ability,

uncertainty about plan attributes, and confusion in making choices. Another aim is to extend existing models by focusing more on waiting lists as a determinant of demand for private insurance. But this aspect of insurance demand has been little studied. Given an empirical model of the impact of waiting times on insurance demand, we can evaluate the effectiveness of alternative policies to reduce waiting times.

NSW STATE GOVERNMENT SUPPORT FOR EARLY CAREER RESEARCHERS

In 2011, the NSW State Government awarded the Centre $500,000 to fund two additional projects, one in finance and the other in health. The projects will involve a number of personnel over a two and a half year period and will each provide salary support for an early career researcher.

1   PUBLIC-PRIVATE STRATEGIES TO SUPPORT ASSET-LIABILITY MANAGEMENT FOR RETIREMENT INSURANCE PRODUCTS

EARLY CAREER RESEARCHER
RAMONA MEYRICKE (COMMENCED MARCH 2012)

Deploying stochastic optimisation techniques to capture the inherent uncertainty of the financial and economic environment, this project will focus on issues such as appropriate capital reserves for retirement insurance products, and new methodologies for estimating systematic longevity risk, aiming to build capacity to diversify this risk through better calibrated mortality based derivatives.

It will investigate how government policy might more precisely support fragile insurance markets through issuing securities which provide the potential for asset-liability management strategies to be successfully pursued by pension funds and related entities.

2   INVESTIGATING PATHWAYS OF HEALTH AND COMMUNITY CARE SERVICE USE

This project is described in detail on pages 70–71. A research fellow is expected to be recruited to work on this project in early 2012.

PHD STUDENT THESES

CEPAR affiliated students work under the supervision of CEPAR Investigators on topics aligned with the Centre's research agenda.

STUDENTS LOCATED AT THE AUSTRALIAN SCHOOL OF BUSINESS, UNSW

NATALIA ARANCO
MEc Universidad de Montevideo
SUPERVISOR
Professor John Piggott
CO-SUPERVISOR
Professor Michael Sherris

Assessing the evolution of the educational-mortality gap among countries

The connections between health and education at a global level work through multiple mechanisms, including quality of healthcare services and GDP growth rate. Given these synergies and complementarities the returns to education in terms of mortality may differ among countries. As a consequence, the gap between more and less educated countries in terms of mortality rates may increase or decrease with time. Based on this, the objective of this

research is to analyse the evolution of the returns to education in terms of mortality from an international comparison perspective and to assess how the education-mortality gap has evolved over time.

CRAIG BLACKBURN
BCom (Hons) UNSW, MAct (Hons) UNSW, MEng(R), JCU, BEng (Hons) QUT
SUPERVISOR
Professor Michael Sherris
CO-SUPERVISOR
A/Professor John Evans

Longevity risk management and securitisation

Longevity risk for an insurer affects their regulatory capital requirements. Ideally, an insurer would like to transfer some of this risk to capital markets. Econometric techniques for mortality modelling only provide *ad hoc* pricing methods. Arbitrage-free mortality models have been proposed, but these don't allow for multiple cohorts and are difficult to calibrate. This thesis proposes modelling the whole term structure of mortality rates in a consistent framework that allows the pricing and valuing of mortality risky contracts. We can price complex insurance products, such as Guaranteed Annuity Options, and propose hedging instruments

that will efficiently transfer mortality risk to financial markets.

NATALIA GARABATO
BA Economics (Hons), University of the Republic, Montevideo
SUPERVISOR
Professor John Piggott
CO-SUPERVISOR
Professor Denzil Fiebig

Pension literacy, present bias and retirement outcomes in Chile

The increasing costs of an ageing population and over-generous public pension arrangements has driven governments to introduce changes in the pension system that have led to an increase in the risk and responsibility of retirement provision borne by workers and individuals. Financial education has, therefore, become a crucial instrument for retirement planning.

This research starts by analysing the determinants of financial literacy and planning in Chile. In the second stage, a contingent valuation experiment included in the EPS will be used to study the determinants of the willingness to pay for additional pension benefits and look at its interaction with different levels of pension and financial

literacy. Finally, and making use of a one-time experiment included in the EPS, we will analyse the relationship between respondent's impatience and their disposition to plan for retirement.

HENRY HONGBO JIN
MCom UNSW
SUPERVISOR
Professor John Piggott
CO-SUPERVISOR
A/Professor John Evans

Financing retirement: Two issues in private risk

Investment and longevity risks are the two key risks that retirees face, particularly given the global trend towards contribution accumulation funds. This thesis examines two issues: Socially Responsible Investments (SRI) and the predictability of longevity. The first strand focuses on one of the issues beginning to face retirement funds: that as well as earning acceptable rates of return, the very large amounts of money should be used to encourage socially acceptable behaviour amongst the investments. The issue of the predictability of longevity is also discussed and by introducing a smoking related leading indicator, a new approach is developed

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that improves upon the standard Lee-Carter method (1992). The thesis demonstrates that this new approach would have substantially reduced the projection error in forecasting the UK male period life expectancy at age 65 from 22% to 3%.

ADAM WENQIANG SHAO
BEc (Hons) Beijing International Studies University
SUPERVISOR
Professor Michael Sherris
CO-SUPERVISOR
A/Professor John Evans

Pricing models and risk management of reverse mortgages

This thesis focuses on pricing and risk management issues in reverse mortgages allowing for individual house price risks and more detailed demographic models. It will develop new models for idiosyncratic risk in relation to individual house prices. Demographic models allowing for health status using multi-state models will be applied to incorporate realistic triggers for repayment. The thesis will explore risk-based capital issues, taking into account house price risk, longevity risk, and interest rate risk.

STUDENTS LOCATED AT THE CENTRE FOR RESEARCH ON AGEING, HEALTH AND WELLBEING, ANU

DIMITY CRISP
MSc Research UC
SUPERVISOR
Professor Kaarin Anstey

Transitions in later life: The impact of residential relocation on wellbeing

This thesis is investigating the experience of relocating to a retirement village. The study employs a prospective longitudinal design to examine the adaptation of 83 older Australians (aged 57 to 90 years) to independent living units within a retirement village over a 12 month period. The study has obtained self-reported data from participants prior to relocating, 1-, 6- and 12-months post-relocation. Changes in social networks, loneliness, subjective wellbeing and life engagement are compared to a sample of community-dwelling (n=549) residents.

NATASHA GINNIVAN
BSc (Psych) UNSW, PGDip (Psych) Macq.
SUPERVISOR
Professor Kaarin Anstey
CO-SUPERVISOR
Dr Kerry Sargent-Cox

Self-perceptions of ageing from a cross-cultural perspective: The differential impact of socio-cultural practices on identity and age-stereotypes

Due to differing social practices around elder respect in more collectivist cultures such as China, Japan and the Philippines, it is hypothesised in some research that older people in these cultures are less prone to the internalisation of negative age stereotypes. This project investigates attitudes towards ageing in two cultures differing along the individualist-collectivist dimension (Australia being a more individualist culture, and the Philippines, being a more collectivist culture) to see where differences lie and to further our understanding of the underlying psychological processes which facilitate the internalisation and embodiment of negative age stereotypes.

KIM KIELY
BLibStudies (Hons) Syd.
SUPERVISOR
Professor Kaarin Anstey
CO-SUPERVISORS
Professor Mary Luszcz
Dr Lesley Ross
Dr Denis Gerstorf

The interplay of cognition and sensory function in late life

This research uses harmonised and pooled population based longitudinal data to investigate links between cognitive and sensory ageing. Specifically, it will report prevalence, incidence rates, risk factors and impacts of age-related hearing loss co-morbid with vision loss and cognitive impairment. It will also model long term trajectories of hearing and cognitive decline, testing dynamic interdependent associations between cognitive functioning with sensory impairment in the years before death. The dissertation will integrate perspectives of functional decline in late life across the disciplines of psychology, public health and epidemiology.

SARANG KIM
BA Melb., PGDip MA Bond
SUPERVISOR
Professor Kaarin Anstey
CO-SUPERVISORS
Dr Kerry Sargent-Cox
Dr Nicolas Cherbuin

Motivations and barriers to lifestyle and behavioural changes for dementia risk reduction

Dementia and cognitive decline are often thought of as a part of normal ageing, unavoidable and incurable. However, recent research has identified some risk factors for dementia, some of which are modifiable. This project aims to identify factors that motivate and discourage people from changing their behaviour and lifestyle in order to reduce their risk of developing dementia. It also aims to examine the importance of the individual's perception of dementia prevention and their motivation towards lifestyle and behavioural changes on the efficacy of a community based online intervention.

LARA MORRIS
BSc (Psych) (Hons), MClinPsych

SUPERVISOR
Professor Kaarin Anstey

CO-SUPERVISORS
Dr Kerry Sargent-Cox
Dr Nicolas Cherbuin

Patterns and implications of health risk factors for chronic disease

This research examines the patterns in biomedical and behavioural health risk factors for chronic disease throughout the life course. It explores the development of risk factors, as well as the mental and physical health outcomes. This study also aims to examine changes in individual health risk factors profiles over time, and the implication of change to disease risk. This research will primarily utilise data from the Personality and Total Health Through Life study.

CHWEE CHWEE VON SANDEN
BSc (Hons) ANU

SUPERVISOR
A/Professor Peter Butterworth

CO-SUPERVISOR
Professor Kaarin Anstey

Health and labour force participation among older Australians: Investigating the roles of cognitive and sensory functions

Existing research on the relationship between health and retirement has focused on the roles of physical and mental health. There has been little research examining the relationship between functional capacities, such as cognitive and sensory functions, and workforce exit. Ageing research has demonstrated that cognitive and sensory functions decline with age and can negatively impact on everyday tasks. These functional declines may also impact on work performance, potentially leading to workforce exit. The thesis aims to examine whether declines in cognitive and sensory functions are related to workforce exit using the Dynamic Analyses to Optimise Ageing (DYNOPTA) dataset.

SARAH WALKER
BA (Hons) Psychology, ANU

SUPERVISOR
Professor Kaarin Anstey

CO-SUPERVISORS
Dr Tim Windsor
Dr Jay Brinker

The psychosocial impacts of giving up driving in later life

This research looks at the lived experiences of volunteers aged 65 and above. Research shows giving up driving can lead to poorer physical health, increased risk of mortality, depressive symptoms and emotional distress. Little is known about people's actual experiences, the cognitive coping strategies used to deal with the detrimental and often distressing consequences, or the positive impacts of quitting driving; these are the focus of this mixed-method research. A number of factors, having relatives or friends who drive, accessible shops and services, a planned or staged decline in driving, or having a say in the decision, are also examined.

STUDENTS LOCATED AT THE AUSTRALIAN DEMOGRAPHIC AND SOCIAL RESEARCH INSTITUTE, ANU

ALICE FALKINER
BA (Hons) MSocRes ANU

SUPERVISOR
Professor Peter McDonald

CO-SUPERVISOR
Dr Anne Evans

Changing caring responsibilities in Australia: The rise of the sandwich generation

As the Australian population ages, and as Australian women delay childbearing until later in life, more and more Australians are likely to join the 'sandwich generation'; those faced with caring for children and elderly relatives at the same time.

There is a significant gap in Australian knowledge about people who provide informal child and elder care at the same time. As such, this research aims to determine not only the size, composition and growth of the sandwich generation, but also to assess the impact that membership of the sandwich generation has on other areas of Australian's lives.

CUC THU HOANG
BA Sociology VNU, MA Population Studies ANU

SUPERVISOR
A/Professor Heather Booth

CO-SUPERVISORS
Dr Iwu Utomo
Professor Philip Taylor

The transition in modes of aged care in Vietnam

Reliance on informal support systems through family and kinship members is the normative standard of care for the elderly in Vietnam. The traditional 'ideal' mode of care is for the elderly to live with married children, especially the married son, surrounded by grandchildren, and receive care from daughters or daughters-in-law. Recently, Vietnam has experienced substantial demographic, socio-economic changes as a result of the move from a central planned economy to a socialist market economy. All these changes have reduced the capacity of the family to care for the elderly. While the support from the state is limited, families experience many structural constraints. By analysing secondary data, and conducting fieldwork in Vietnam, the study aims to understand different modes of aged care and how these modes have been shaped by the changing conditions.

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NERIDA HUNTER
BA BCom Melb., MGovt & Comm Law ANU

SUPERVISOR
Professor Peter McDonald

CO-SUPERVISOR
Dr Anthony Hogan

The ageing of regional Australia

This study uses the 2011 Census to examine population ageing and the settlement patterns of older people in regional Australia. It involves the use of small area projection methods to examine the pace and magnitude of population ageing in key regional communities and investigate patterns of residential mobility of older people in these communities. The research is designed to support service providers to understand the service needs of their communities and the potential implications of population ageing on settlement patterns in Australia.

M. PILAR RIOSECO
Licentiate in Psychology Pontificia Universidad Catolica de Chile, MSocRes ANU

SUPERVISOR
A/Professor Heather Booth

CO-SUPERVISORS
Dr Robert Ackland
Professor Hal Kendig

The role of social connectedness in the process of retirement in Australia

Retirement is a key area of social and policy research in the context of population ageing. Although several studies have been done in this area, little is known about the role that social connectedness plays in the process of retirement. In particular, do individual's social activities and social support from family and friends influence retirement planning and behaviour? Using theories of successful ageing this thesis investigates how different patterns of social connectedness influence older adults' retirement. This research uses primary cross-sectional data (2010-11 SNAP survey) and secondary longitudinal data (HILDA survey).

MAHIN RAISSI
BS MA Tehran

SUPERVISORS
Dr Robert Ackland
A/Professor Heather Booth

Influences in social media: Influences in online social networks and successful ageing in Australia

This research will investigate the role of Online Social Networking (OSN) in the lives of Australian seniors by examining mechanisms and processes of behaviour transmission in [online] social networks. It will study how seniors' ageing status changes over time as a result of online interaction. Successful ageing will be measured by five outcomes: partnering, informal economic activity, voluntary activity, social connectedness and family connectedness via panelled online survey. Social networking behaviour will be measured by data collected from two OSN sites: an online forum dedicated to Australian Elders and Facebook.com.

SAFRINA THRISTIAWATI
BA Econ Indonesia, MA Demography ANU, MA Social Policy Syd.

SUPERVISOR
Professor Terence Hull

CO-SUPERVISORS
A/Professor Heather Booth
Dr Iwu Utomo

Gender and wellbeing of older Indonesians

Indonesia's population is ageing. Life expectancy has increased from 49 years in 1975 to 71 years in 2007. This study explores the gender and ethnic differences in the physical wellbeing of older Indonesians and the ways in which socio-cultural factors influence this. Using an ethnographic approach, 651 people aged 60+, from two ethnicities with very different kinship system, were questioned in Lampung. The study found that overall, older men are likely to have better wellbeing than women. The foremost factors are education, lifestyle and men's cultural role as head of the household.

"Heather Booth and Peter McDonald are very encouraging mentors who have helped me to grow professionally. They are both very accessible and I am always learning from them, especially practical and cultural knowledge that cannot necessarily be learnt from books. Their guidance has been of great benefit to my research and professional experience"

SAFRINA THRISTIAWATI,
PHD CANDIDATE

JIAYING ZHAO
BMed Fudan, MA ANU
SUPERVISORS
Professor Zhongwei Zhao
A/Professor Heather Booth

Transitions in mortality from cardiovascular disease in Chinese societies: Trends, patterns, and socioeconomic determinants

The cardiovascular revolution which began in the late 1960s resulted in the epidemiological transition from 'the age of degenerative and man-made diseases' to 'the age of delayed degenerative diseases' (Olshansky & Ault 1986). This thesis examines the trends and patterns of mortality from cardiovascular disease in three Chinese cities (Hong Kong, Shanghai, and Taipei), all of which have experienced rapid socioeconomic reform over the past three decades. The impact of institutional factors on the mortality transition is assessed. On the basis of the above analysis, several theoretical issues about recent mortality decline are discussed.

STUDENT LOCATED IN THE FACULTY OF HEALTH SCIENCES, UNIVERSITY OF SYDNEY

MARTIN SNOKE
BEc (Hons) QUT.
SUPERVISORS
Professor Hal Kendig
Dr Kate O'Loughlin

Baby boomers' retirement planning in turbulent times: The role of financial security

The aim of this thesis is to examine the retirement planning and preparations of Australian baby boomers. It aims to answer the following research question: What is the role of financial security in the plans and preparations for Australian boomers retirement? In addressing this question the predictors and likely outcomes of having different levels of financial security will be examined. Two key conceptual components of financial security within a financial wellness framework will be examined: objective and subjective. As emerged from the literature review, limited examination of the subjective components has been undertaken in the Australian context, and for baby boomers as a cohort group.

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SECTION

3

EXTERNAL LINKAGES

INDUSTRY & GOVERNMENT LINKS

FOR OUR RESEARCH TO HAVE IMPACT, END USERS MUST BE ENGAGED. BUILDING STRONG LINKS WITH STAKEHOLDERS AND OTHER ORGANISATIONS IS ONE OF CEPAR'S CORE OBJECTIVES AND THE EFFECTIVENESS OF OUR LINKS WITH GOVERNMENT AND INDUSTRY WILL BE CRUCIAL TO OUR SUCCESS.

A variety of activities are being deployed to achieve this. Individual researchers take part in policy and practice meetings such as roundtables, workshops, briefings. We organise workshops and conferences of our own. We consult and communicate with government and industry leaders on a one-on-one basis. We also invite our stakeholders to events whose primary purpose may be something other than stakeholder engagement, but which nevertheless provide the opportunity for value-adding engagement between our organisations.

Two events in 2011 demonstrated the benefit of developing two-way engagement between researchers and end users. The Demography and Longevity Workshop held in July provided an opportunity for government and industry professionals to join researchers working in this field to discuss both methodological approaches and data challenges in analysing longevity from a demographic standpoint. In October, CEPAR researchers shared new research findings at a workshop on longevity hosted by our partner, PwC.

In addition, the Emerging Researchers in Ageing (ERA) Conference and the National Honours Colloquium dinner provided opportunities for our partners to meet up-and-coming researchers from around the nation. These discussions were mutually beneficial: young researchers benefitted from an end user perspective and industry representatives learnt more about emerging research themes.

We have also met face-to-face with most of our stakeholders to find commonalities between CEPAR research programs and their research-based interests.

Plans for 2012 include the development of short courses specifically for industry professionals. Aimed at policy-makers and practitioners, these courses will be designed to share new knowledge in an accessible way.

We also plan to pilot the production of research briefs aimed at communicating research findings to the wider community.

Professor Michael Sherris
Chair, Outreach Subcommittee

CEPAR EVENTS
DEMOGRAPHY AND LONGEVITY WORKSHOP
This workshop was designed to bridge disciplinary boundaries to strengthen the foundations of analysis of longevity trends. Various disciplines study the causal factors behind improvements in longevity, but rarely meet together. This inaugural CEPAR workshop brought actuaries, demographers, geographers, sociologists, economists and health researchers together to compare approaches and share research findings.

They joined industry professionals to discuss both methodological approaches and data challenges in analysing longevity from a demographic standpoint. International speakers

AMP believes that CEPAR has a significant and important role to play in a multitude of different ways in the critical area of population ageing research.

As a leading participant in Australia's superannuation, life assurance and asset management markets and a strong advocate for the value of all Australians seeking advice to help them prepare adequately for their futures, AMP felt that a partnership with CEPAR to support its research and broader work in this field was a natural thing to do and that CEPAR's work would also help it broaden its own understanding of the many different dimensions and challenges in population ageing.

JONATHAN DEANE, GENERAL MANAGER, STRATEGY, AMP

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included David McCarthy from Imperial College London, Annamaria Olivieri from the University of Parma and Nikola Sander from the Vienna Institute of Demography.

Topics were diverse, and examined issues such as the effects of population ageing on GDP per capita; lifestyle, health, and socio-demographic predictors of survival and ageing well; retirement migration of Australian baby boomers; the heterogeneity of Australian population mortality and implications for a viable life annuity market; and ageing, cognition and dementia in Aboriginal and Torres Strait Islander Australians, as well as papers on methodology.

'We have a long way to go to arrive at a unified view of longevity futures, but this workshop demonstrated the future potential of this research endeavour. Government and industry participants added an operational perspective which kept discussion well grounded.'

John Piggott
Centre Director

PWC LONGEVITY WORKSHOP

This workshop, hosted by PwC, presented new research on longevity insurance and products. It featured presentations by CEPAR investigators Michael Sherris and Katja Hanewald, along with PwC Associate Chao Qiao. A panel discussion, chaired by John Piggott, included presentations by Wayne Brazel (AMP), Catherine Nance (PwC) and Phil Gallagher (Australian Treasury), all from CEPAR partner organisations, together with Martin Stevenson (Mercer and International Actuarial Association), David Cox (Challenger) and Barry Rafe (Institute of Actuaries Australia).

The workshop clearly pointed to the need for further product development in the longevity insurance space, built upon current and planned CEPAR research.

CONTRIBUTIONS TO THE POLICY DEBATE

Throughout 2011, CEPAR investigators contributed to a range of policy discussions, drawing on their own research and the vast accumulated knowledge embodied in the CEPAR community. Highlights included:

- Hal Kendig chaired the NSW Whole of Government Ageing Roundtable on 15 September 2011 at Parliament House which brought together leaders and experts on ageing from across government, academia and non-government sectors to set key directions for the new strategy.
- Peter McDonald was appointed to the Council of Advisors on Population Europe in December 2011.

- Peter McDonald and Alan Woodland presented at the 2011 Productivity Roundtable on A *'Sustainable' Population? – Key Policy Issues* held in Canberra, 21-23 March 2011. Woodland discussed the Economic Effects of Population Growth and Ageing in Australia and McDonald the Determinants of Australia's Future Demography.
- John Piggott participated in the Ian Castles Roundtable on Taxation and Social Security held at ANU in October 2011 involving academe, government and advocacy groups.

PwC is a strong supporter of the ARC Centre of Excellence in Population Ageing Research.

We are keenly aware of the ageing demographic both here and overseas and the need to encourage suitable financial product development to meet the needs of our changing society. The research undertaken by CEPAR will assist with the development of financial product for managing assets and longevity and this will benefit the wider community. We support the development of these specialist skills including the actuarial and economic skills and the academic and research staff and students who will be involved in these studies

CATHERINE NANCE, PARTNER, PwC

INTERNATIONAL LINKS

CEPAR has strong links with the international research community and is committed to developing these further. As outlined in *Strategic Directions*, plans are underway to build relationships between CEPAR as an organisation with academics and policy-makers in other countries and with international organisations. It is anticipated that as CEPAR's reputation grows, its impact, and those of its members, will be enhanced.

From the outset, CEPAR established connections with world class institutions through its partner and associate investigators. In 2011, a new collaboration was initiated with the Department of Global Health and Population (GHP) at Harvard University.
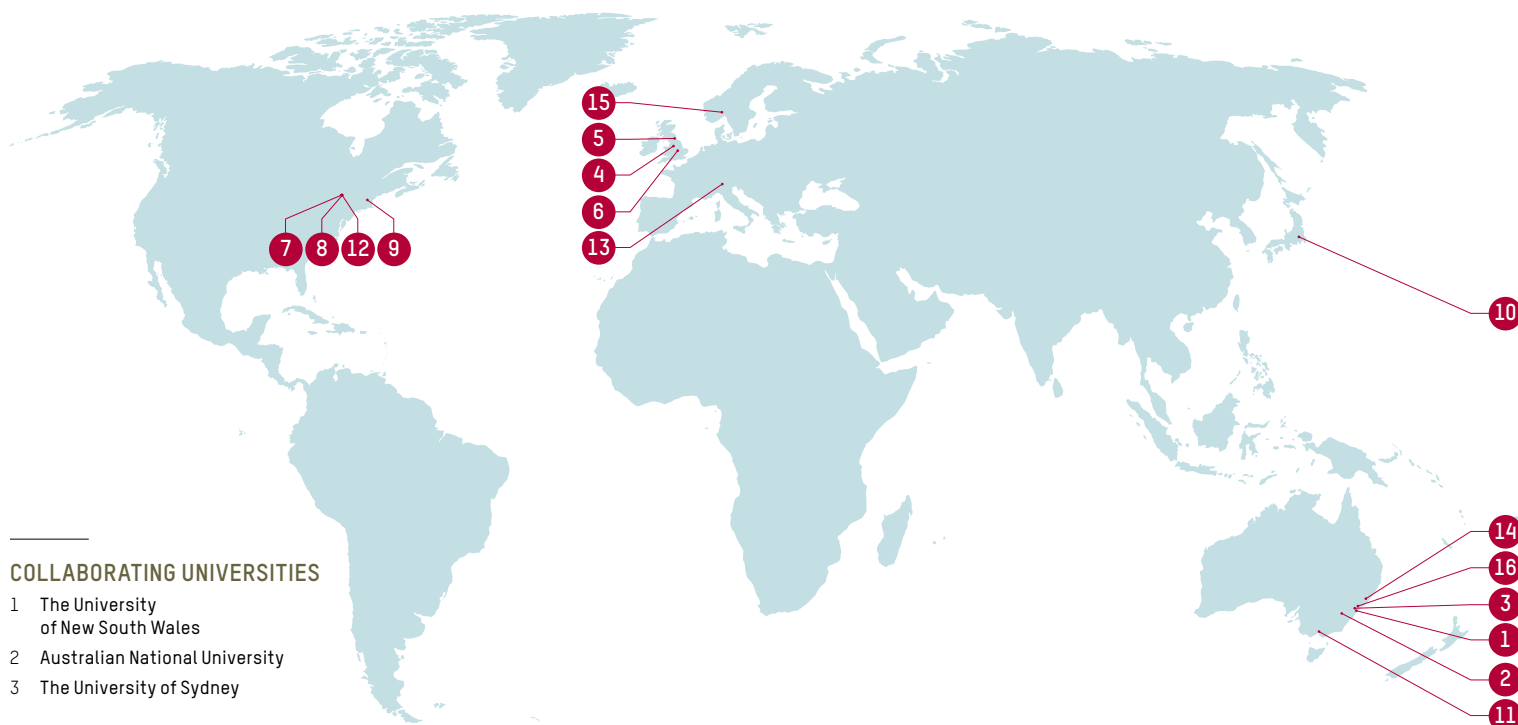
COLLABORATING UNIVERSITIES

1 The University of New South Wales
2 Australian National University
3 The University of Sydney

PARTNER UNIVERSITIES

4 School of Social Sciences
   University of Manchester
5 Institute for Ageing and Health
   University of Newcastle (UK)
6 School of Economics
   University of Nottingham

7 Department of Economics
   University of Pennsylvania
8 Wharton School
   University of Pennsylvania

ASSOCIATED UNIVERSITIES

9 Department of Global Health and Population (GHP)
   Harvard University
10 Institute for Economic Research
   Hitotsubashi University

11 School of Primary Health Care and Emerging Researchers in Ageing Initiative
   Monash University
12 Gerontology Centre
   Pennsylvania State Unversity
13 Department of Economics
   St Gallen University

14 Research Centre for Gender, Health and Ageing
   The University of Newcastle (Australia)
15 Ragnar Frisch Centre for Economic Research
   University of Oslo
16 Centre for the Study of Choice
   University of Technology, Sydney

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INTERNATIONAL LINKS

NEW COLLABORATIONS WITH INTERNATIONAL UNIVERSITIES

DEPARTMENT OF GLOBAL HEALTH AND POPULATION (GHP) AT HARVARD UNIVERSITY

In 2011, CEPAR entered into a new collaboration with the Department of Global Health and Population (GHP) at Harvard University. The Department is internationally recognised for its contribution to the understanding of health and population ageing issues. Its approach combines the analysis of population and health using quantitative and qualitative methods, the investigation of policies that affect general and reproductive health, and a concern with the politics and ethics of health and development. GHP houses the university wide Program on the Global Demography of Aging.

A jointly hosted conference on the Economics of Population Ageing will be held at Harvard University in late 2012 or early 2013. The objective is to bring together leading academic economists from disparate fields who have an interest in population ageing, to share perspectives and present their current research on this important topic. Conference Convenors are David Bloom, Professor of Economics and Demography and Chair of the Department of Global Health and Population at Harvard, along with John Piggott and Alan Woodland.

As well as building collaborative ties, the conference will also be essential in a project to develop a *Handbook of the Economics of Population Ageing Research,* which John Piggott and Alan Woodland have contracted to deliver to Elsevier by mid 2014 (see page 35). There will be strong overlap between conference participants and contributors to the Handbook. The Elsevier Handbook Series is widely recognised as a leader in the discipline.

NETSPAR

Netspar is perhaps the independently funded research group which comes closest to the CEPAR model. In its core values, it recognises the importance of diverse types of knowledge, a wide range of disciplines, and methodological approaches. Based in the Netherlands with a strong European focus, it does not support particular policy positions, but is instead dedicated to promoting a wider understanding of the economic and social implications of pensions and retirement. It strives to effectively disseminate unbiased research output among public policymakers, professionals and trustees in financial institutions, and the academic community.

CEPAR is building a relationship with Netspar, initially through research visits. John Piggott will be a keynote speaker at the Netspar annual conference early in 2012, and Netspar researchers are scheduled to visit CEPAR later in the year to participate in a workshop or conference (still to be decided) and explore the Australian Superannuation Guarantee. The Netherlands has recently decided to move towards this model, away from their current Defined Benefit pension.

NEW PARTNERSHIPS WITH INTERNATIONAL ORGANISATIONS

WORLD BANK AND OECD

CEPAR is working to develop links with international organisations as well as universities globally. In November, CEPAR co-hosted Professor Robert Holzmann, formerly the Director of Social Protection at the World Bank and currently a senior Bank consultant, to discuss the possibility of developing certificated courses in Population Ageing directed at government officials and interested private sector managers. The plan is to develop this program through the School of Risk and Actuarial at UNSW. Also discussed was the possibility of CEPAR working with the Bank in building projection models of demographic change.

Links with the OECD are being developed through joint work between Ed Whitehouse, Chief OECD Pension Economist, and John Piggott who worked together on the Ministerial meeting background paper on Intergenerational Solidarity in 2010 and 2011. A joint research project subsequently developed (see page 33). Ed is a member of CEPAR's Advisory Board.

INTERNATIONAL VISITORS

International visitors are a part of how we stay at the leading edge of research. In 2011, CEPAR hosted the following visitors:

PROFESSOR HENRY OHLSSON
Department of Economics, Uppsala University
3 October, 2011-31 January, 2012
Host – John Piggott

PROFESSOR ROBERT HOLZMANN
The World Bank
November 2011
Hosts – John Piggott and John Evans

A/PROFESSOR SUSUMU IMAI
Economics Department, Queens University, Kingston, Ontario
29 August -23 September, 2011
Host – Michael Keane

DR MICHAEL ORSZAG
Global Research Services, Towers Watson
29 August -2 September 2011; 2-8 May, 2011
Host – John Piggott

PROFESSOR ROBERT MILLER
Tepper School of Business, Carnegie Mellon University
15-19 August, 2011
Host – Michael Keane

PROFESSOR MONIKA BÜTLER
School of Economics and Political Science, University of St Gallen, Switzerland
3-7 July, 2011
Host – John Piggott

DR DAVID MCCARTHY
Business School, Imperial College London
25-29 July, 2011
Host – John Piggott

PROFESSOR OLIVIA MITCHELL
Wharton School, University of Pennsylvania
10-15 July, 2011
Host – John Piggott

DR HUA CHEN
Fox School of Business, Temple University
July 2011
Host – Michael Sherris

PROFESSOR ANNAMARIA OLIVIERI
School of Management, University of Parma
July 2011
Host – Michael Sherris

DR THOMAS POST
School of Business and Economics, Maastricht University
July 2011
Host – Michael Sherris

PROFESSOR RICHARD BLUNDELL
University College, London
July 2011
Host – Alan Woodland

DR ANDY TOWERS
School of Psychology, New Zealand Longitudinal Study of Ageing at Massey University
June 2011
Host – Hal Kendig

PROFESSOR DAVID BUNCE
Department of Psychology, Brunel University
April 2011
Host – Kaarin Anstey

DR WEIJIA ZHONG
Department of Radiology, the Second Affiliated Hospital of Chongqing Medical University, China
March 2011
Host – Kaarin Anstey

MONIKA BÜTLER

Monika Bütler is Professor of Economics at St Gallen University, Switzerland, where she also heads up the Swiss Institute for Empirical Economic Research. She is one of Europe's best-known pension economists, an editor of the *Journal of Pension Economics and Finance* and a research coordinator for Netspar. During her visit to CEPAR in July, she presented at the 19th Annual Colloquium of Superannuation Researchers. Her paper, 'How Much do Means-tested Benefits Reduce the Demand for Annuities?', was as relevant to Australian policy as to her native Switzerland. Monika's ongoing research program will intersect with those of CEPAR researchers around the nature of means-testing, and annuity markets.

INTERNATIONAL VISITS

CEPAR investigators were invited to visit a number of leading research institutions in 2011.

DANIEL ALAI
University of Connecticut
August 2011
Host – Professor Emil Valdez

KAARIN ANSTEY
Johns Hopkins University
5-10 June 2011
Hosts –
Professors Marilyn Alber
Karen Bandeen-Roche

Pennsylvania State University
13-15 June 2011
Hosts –
Professor Martin Sliwinski
Professor Steve Zarit
Dr Nilam Ram

Oregon Health University
15-17 June 2011
Hosts –
Associate Professor Hiroko Dodge
Professor Graham Kaye

ROBERT CUMMING
Babol University of Medical Sciences
5-10 June 2011
Host – Dr Reza Hosseini

KATJA HANEWALD
University of Parma
19-22 November 2011
Host – Professor Annamaria Olivieri

Wharton School and Pension Research Council, University of Pennsylvania
1-5 August 2011
Host – Professor Olivia Mitchell

INTERNATIONAL LINKS

FEDOR ISKHAKOV
School of Humanities and Social
Sciences, Nanyang Technological
University
15-17 November 2011
Host – Dr Jie Zhou

Faculty of Economics,
University of Copenhagen
18 November -4 December 2011
Host – Dr Bertel Schjerning

Frisch Centre for Economic
Research, University of Oslo
4-10 December 2011
Host – Professor Erik Hernaes

MICHAEL KEANE
Arizona State University
2-8 September 2011

Federal Reserve Bank of New York
13-16 June; 20-23 June 2011

Yale University
17 June 2011

HAL KENDIG
Department of Sociology,
Tsinghua University
28 November – 4 December 2011
Host – Professor Mei Xiaomei

GEORGE KUDRNA
Centre for Economic Research
and Graduate Education -
Economics Institute (CERGE-EI),
Prague
20 June 2011
Host – Michal Pakos

CAGRI KUMRU
Bilgi University
16-21 November 2011
Host – Dr Ozturk

ELISABETTA MAGNANI
Centre for Labour Market Studies,
University of Leicester
22-27 November 2011
Host – Dr Rutvica Andrijasevic

PETER MCDONALD
University of Montreal
25 March 2011
Host – Professor Thomas Le Grand

McGill University
28 March 2011
Host – Professor Michael Smith

National Institute of Demographic
and Economic Analysis, University
of Waikato
15 September 2011
Host – Professor Natalie Jackson

US National Centre for Atmospheric
Research, Boulder, Colorado
17 October 2011
Host – Dr Brian O'Neill

University of Colorado Population
Studies Center
18 October 2011
Host – Professor Fred Pampel

Department of Sociology,
University of Groningen
28 October 2011
Host – Professor Melinda Mills

Netherlands Interdisciplinary
Demographic Institute
31 October 2011
Host – Professor Leo Wissen

London School of Economics
and Politics
9 November 2011
Host – Professor Michael Murphy

JOHN PIGGOTT
Zhejiang University
11-15 April 2011
Host – Professor Mi

OECD
30 September – 5 October 2011
Host – Ed Whitehouse

MICHAEL SHERRIS
University of Lausanne
5-7 September 2011
Host – Dr Severine Gaille

University of Lyon
June 2011
Host – Professor Stephane Loisel

In June 2011, Professor Robert Cumming spent a week in Iran as the guest of Babol University of Medical Sciences. He gave a lecture at the University and worked with his Iranian colleagues to finalise the methodology for the Amirkola Health and Ageing Project. Robert's involvement with this project began when he hosted an Iranian epidemiologist, Dr Reza Hosseini, at the University of Sydney in 2009.

Babol is a city of about 200,000 people in Iran's Mazandaran province on the Caspian Sea, about four hours drive from Tehran. The medical school in Babol is relatively young and the Amirkola Health and Ageing Project has been developed as a platform for expanding the research capacity of the institution.

Robert also visited Babol's only nursing home as well as a number of health facilities including health houses staffed by 'behvarz', Iran's equivalent of China's barefoot doctors. While the health houses still focus on maternal and child health, staff also assess the health problem of older people, including falls and dementia.

PROFESSOR ROBERT CUMMING IN IRAN

SECTION 4

PERFORMANCE INDICATORS & FINANCIAL STATEMENT

KEY PERFORMANCE INDICATORS

MEASURE	2011 TARGET	2011 RESULT
RESEARCH FINDINGS		
Total research outputs	25	123
– Refereed journal articles	10	33
– Percentage appearing in A* and A journals	30%	50%
Invited talks/papers/keynotes given at major international meetings	10	23
Commentaries about the Centre's achievements		
– Media releases	6	10
– Articles	6	32
RESEARCH TRAINING AND PROFESSIONAL EDUCATION		
Attended professional training courses for staff and postgraduate students	0	4
Centre attendees at all professional training courses	8	11
New PhD students working on core Centre research and supervised by Centre staff	6	5[8]
New postdoctoral researchers recruited to the Centre working on core Centre research	10	11
New Honours students working on core Centre research and supervised by Centre staff	4	0
Postgraduate completions	0	0
Early Career Researchers working on core Centre research	7	15
Students mentored	150	300[9]
Mentoring programs	2	2
INTERNATIONAL, NATIONAL AND REGIONAL LINKS AND NETWORKS		
International visitors and visiting fellows	8	15
National and international workshops held/organised by the Centre	1	2
Visits to overseas universities or organisations	4	29
Interdisciplinary research: Research projects and papers co-authored by writers with different disciplinary backgrounds	1	5

[8] Excludes new CEPAR affiliated students who commenced PhD studies prior to the establishment of CEPAR.
[9] Includes students mentored under the Emerging Researchers in Ageing initiative.

MEASURE	2011 TARGET	2011 RESULT
END-USER LINKS		
Government, industry and business community briefings	3	29
Public awareness programs	1	0
Currency of information on the Centre's website (number of updates per year)	10	49
Website hits	3000	3554 unique visitors
Public talks given by Centre staff	15	8
ORGANISATIONAL SUPPORT		
Annual cash contributions from Collaborating Organisations	$938,250	$938,250
Annual in-kind contributions from Collaborating Organisations	$969,201	$1,291,899
Annual cash contributions from Partner Organisations	$250,000	$245,455
Annual in-kind contributions from Partner Organisations	$729,722	641,208 [10]
Other research income secured by Centre staff [11]		
– ARC grants	$250,000	$415,709
– Other Australian Competitive Grants	$250,000	$1,426,861
– Other Commonwealth, State and Local Government Grants [12]	$125,000	$149,169
– Industry/Private Sector Grants	$125,000	$72,383
Number of new organisations collaborating with, or involved in, the Centre	0	1
NATIONAL BENEFIT		
Contribution to the National Research Priorities and the National Innovation Priorities		
– Public conferences	1	1
– Government and industry briefings	3	29
– Communiques etc	12	42

[10] Target was based on a start date of 1 January 2011. The official start date of the Centre was 18 March 2011. As the Centre gains momentum, engagement with our partner organisations is increasing.

[11] Includes all new grants awarded in 2011 where a CEPAR Chief Investigator and/or Research Fellow is included in the research team. Only 2011 income is shown.

[12] The award of the NSW Science Leveraging Fund 2010/11 allocation is included although funds were not formally released until February 2012.

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RESEARCH OUTPUTS

B   BOOK CHAPTERS

1   Clemson, L. (2011). Fall Risk Behavior. In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of Behavioral Medicine*. In press; to be published August 29, 2012. Springer: New York.

2   Bateman, H., & Piggott, J. (2011). Civil Services and Military Retirement Income Provision in Australia. In Takayama, N.(Ed.) *Reforming Pensions for Civil and Military Servants*. (pp.29-54) Maruzen Publishing Co., Japan.

3   McDonald, P. (2011). Employment at Older Ages in Australia: Determinants and Trends. In Griffin, T. and Beddie, F. (Eds). *Older workers: Research readings*. (pp. 25-41). Adelaide: National Centre for Vocational Education Research, Department of Education, Employment and Workplace Relations.

C1   JOURNAL ARTICLES: ARTICLES IN SCHOLARLY REFEREED JOURNALS

1   Anstey, K.J., Kiely, K.M., Booth, H., Birrell, C.L., Butterworth, P., Byles, J., Luszcz, M.A., Gibson, R. (2011). Indigenous Australians are under-represented in longitudinal ageing studies. *Australian and New Zealand Journal of Public Health*, 35 (4), 331-336.

2   Anstey, K.J., Wood, J. (2011) Chronological age and age-related cognitive deficits are associated with an increase in multiple types of driving errors in late life. *Neuropsychology*, 25 (5), 613-21.

3   Anstey, K.J., Bielak, A.M.M., Birrell, C.L., Browning, C.J., Burns, R.A., Byles, J., et al. (2011). Understanding ageing in older Australians: The contribution of the DYNOPTA project to the evidence base and policy. *Australasian Journal on Ageing*, 30 (s2), 24-31.

4   Bielak, A.A., Anstey, K.J., Christensen, H., Windsor, T.D. (2011). Activity engagement is related to level, but not change in cognitive ability across adulthood. *Psychology and Aging*. In press (available online 1 August 2011).

5   Bielak, A.A., Gerstorf, D., Kiely, K.M., Anstey, K.J., Luszcz, M. (2011). Depressive symptoms predict decline in perceptual speed in older adulthood. *Psychology and Aging*, 26 (3), 576-583.

6   Bielak, A. A. M., Byles, J. E., Luszcz, M. A., & Anstey, K. J. (2011). Combining longitudinal studies showed prevalence of disease differed throughout older adulthood. *Journal of Clinical Epidemiology*. In press (available online 8 Nov 2011).

7   Black, D., Wilson, L., O'Loughlin, K., and Kendig, H. (2011). Cities, environmental stressors, ageing and chronic disease. *Australasian Journal on Ageing*, In Press (early view online 25 July 2011).

8   Cherbuin, N., & Anstey, K.J. (2011). The Mediterranean diet is not related to cognitive change in a large prospective investigation: the PATH Through Life study. *American Journal of Geriatric Psychiatry*, In press (available online Sep 20 2011).

9   Cowlishaw, S., Niele, S., Teshuva, K., Browning, C., and Kendig, H. (2011). Older adults' spirituality and life satisfaction: A longitudinal test of social support and sense of coherence as mediating. *Ageing and Society*, Forthcoming. Accepted for publication October 2011.

10   Everitt, A. V., Le Couteur D.G., and Kendig, H. (2011). The changing face of ageing research & practice in Australia over the last 50 years. *Australasian Journal on Ageing*, 30 (4), 173-174.

11   Gaille, S., and Sherris, M. (2011). Modelling mortality with common stochastic long-run trends. *The Geneva Papers*, 36 (4), 592-621.

12   Gong, C., McNamara, J., Vidyattama, Y., Miranti, R., Tanton, R., Harding, A., and Kendig, H. (2011). Developing spatial microsimulation estimates of small area advantage and disadvantage among older Australians. *Population, Space and Place*. In Press (early view online September 13 2011).

13   Gopinath, B., Anstey, K.J., Sue, C.M., Kifley, A., and Mitchell, P. (2011). Olfactory impairment in older adults is associated with depressive symptoms and poorer quality of life scores. *American Journal of Geriatric Psychiatry*, 19 (9), 830-834.

14   Hanewald, K., Post, T., and Gründl, H. (2011). Explaining mortality dynamics: The role of macroeconomic fluctuations and cause of death trend. *North American Actuarial Journal*, 15 (2), 290-314.

15   Hanewald, K., Post, T., and Gründl, H. (2011). Stochastic mortality, macroeconomic risks, and life insurer solvency. *The Geneva Papers on Risk and Insurance - Issues and Practice*, 36 (3), 458-478.

16   Hosseini-Chavoshi M., Abbasi-Shavazi M.J., Engelman M., Agree E. and Bishai, D. (2011). The health of older women after high parity in Taft, Iran. *Asian Population Studies*, 7 (3), 263 – 274.

17   Keane M. (2011). Human capital, taxes and labour supply. *Economic Record*, 87 (s1), 37-44.

18   Keane, M. (2011). Labor supply and taxes: A survey. *Journal of Economic Literature*, 49 (4), 961-1075.

19   Kendig, H. (2011). Research and evaluation priorities: The report of the Productivity Commission on care of older people. *Australasian Journal on Ageing*, 30 (2), 54-56.

20   Kendig, H., Mealing, N., Carr, R., Lujic, S., Byles J., and Jorm, L. (2011). Assessing patterns of home and community care service use and client profiles in Australia: A cluster analysis approach using linked data. *Health and Social Care in the Community*, In press (available online 22 Nov 2011)

21   Ko, A., Van Nguyen, H., Chan, L., Shen, Q., Ding, X. M., Chan, D. L, Brock, K., and Clemson, L. (2011). Developing a self-reported tool on fall risk based on toileting responses on in-hospital falls. *Geriatric Nursing*, 33 (1), 9-16.

22   Magnani, E. (2011). Vertical disintegration and training: Evidence from a matched employer–employee survey. *Journal of Productivity Analysis*, Forthcoming. Accepted for publication Nov 26, 2011.

23   Mills, M., Rindfuss, R., McDonald, P.and te Velde, E. (2011). Why do people postpone parenthood? Reasons and social policy incentives. *Human Reproduction Update*, 17 (6), 848-860.

24   Njenga, C. N., and Sherris, M. (2011). Longevity risk and the econometric analysis of mortality trends and volatility. *Asia-Pacific Journal of Risk and Insurance*, 5 (2), Article 2.

25   Peterson, E., Finlayson, M. L., Elliot, J. E., Painter, J., & Clemson, L. (2011). Opportunities in fall prevention for occupational therapy practitioners. *American Journal of Occupational Therapy*, In press. Accepted for publication October 2011.

26   Piggott, J.R., and Sane, R. (2011). Demographic shift and financial markets in APEC: New age solutions to age old challenges. *Asia-Pacific Journal of Risk and Insurance*, Forthcoming. Accepted for publication December, 2011.

27   Sargent-Cox, K., Butterworth, P., Anstey, K.J. (2011). The global financial crisis and psychological health in a sample of Australian older adults: A longitudinal study. *Social Science and Medicine*, 73 (7), 1105-1112.

28   Sargent-Cox, K.A., Anstey, K.J., & Luszcz, M.A. (2011). Change in health and self-perceptions of aging over 16 years: The role of psychological resources. *Health Psychology*, Forthcoming. Accepted for publication 17/11/11.

29 Stanaway, F.F., Cumming, R.G., Naganathan, V., Blyth, F.M., Handelsman, D.J., Le Couteur, D.G., Waite, L.M., Creasey, H.M., Seibel, M.J., and Sambrook, P.N. (2011). Ethnicity and falls in older men: Low rates of falls in Italian-born men in Australia. *Age and Ageing*, 40 (5), 595-601.

30 Travison, T.G., Nguyen, A.H., Naganathan, V., Stanaway, F.F., Blyth, F.M., Cumming, R.G., Le Couteur, D.G., Sambrook, P.N., and Handelsman, D.J. (2011). How fast does the Grim Reaper walk? An ROC curve analysis in healthy men 70 and over. *British Medical Journal*, 343, published online December, 2011.

31 Travison, T.G., Nguyen, A.H., Naganathan, V., Stanaway, F.F., Blyth, F.M., Cumming, R.G., Le Couteur, D.G., Sambrook, P.N., and Handelsman, D.J. (2011). Changes in reproductive hormone concentrations predict the prevalence and progression of the frailty syndrome in older men: The concord health and ageing in men project. *Journal of Clinical Endocrinology and Metabolism*, 96 (8), 2464-2474.

32 Yu, Y. (2011). Reexamining the declining effect of age on mortality differentials associated with excess body mass: Evidence of cohort distortions in the United States. *American Journal of Public Health*, In press (available online Sep 22 2011).

33 Yu, Y. (2011). Educational differences in obesity in the United States: A closer look at the trends. *Obesity: A research journal*. In press (available online Oct 13 2011).

C2 JOURNAL ARTICLE: REFEREED JOURNAL, OTHER CONTRIBUTION

1 Blake, D., Courbage, C., MacMinn, R. & Sherris, M. (2011). Longevity risk and capital markets: The 2010–2011 update. *The Geneva Papers on Risk and Insurance—Issues and Practice*, 36, 489-500.

C3 JOURNAL ARTICLE: NON-REFEREED ARTICLE

1 Kendig, H., and Browning, C. (2011). Ageing well in a healthy Australia. *Dialogue, Academy of the Social Sciences in Australia*, 31 (12), 23-30.

C5 UNPUBLISHED REPORTS

1 Bateman, H., Eblingz, C., Geweke, J., Louviere, J., Satchellkand, S., and Thorp, S. (2011). Economic rationality, risk presentation, and retirement portfolio choice. CEPAR Working Paper Series.

2 Kumru, C.S., and Thanopoulos, A.C. (2011). Self-control preferences and taxation: A quantitative analysis in a life-cycle model. CEPAR Working Paper Series.

3 Capatina, E. (2011). Life-cycle effects of health risk. CEPAR Working Paper Series.

4 Centre for Research on Ageing, Health and Wellbeing, Australian National University (2011). A baseline survey of Canberra as an age-friendly city. Report produced for ACT Community Services Directorate, Department of Disability, Housing and Community.

5 Hanewald, K., and Sherris, M. (2011). House price risk models for banking and insurance applications. CEPAR Working Paper Series.

6 Hanewald, K., Piggott, J., and Sherris, M. (2011). Individual post-retirement longevity risk management under systematic mortality risk. CEPAR Working Paper Series.

7 Hecht, C., and Hanewald, K. (2011). Who responds to tax reforms? Evidence from the life insurance market. CEPAR Working Paper Series.

8 Keane, M. (2011). Income taxation in a life cycle model with human capital. CEPAR Working Paper Series.

9 Keane, M. and Stavrunova, O. (2011). Adverse selection, moral hazard and the demand for medigap insurance. CEPAR Working Paper Series.

10 Kudrna, G. and Woodland, A. (2011). Macroeconomic and welfare effects of the 2010 changes to mandatory superannuation. CEPAR Working Paper Series.

11 Magnani E., Verma G., and Rammohan A. (2011). Competition for care: The impact on children of elderly coresidence. CEPAR Working Paper Series.

12 Magnani, E. (2011). Assessing the effect of firms' boundaries on training: The case of Australia and Canada. CEPAR Working Paper Series.

13 Magnani, E. (2011). Hour constraints and training for older workers: A comparison between Australia and Canada using matched employer-employee surveys. CEPAR Working Paper Series.

14 McDonald P., and Kippen, R. (2011). Forecasting births. Feature article, ABS Catalogue Number 2051.0, Australian Bureau of Statistics, Canberra.

15 Post, T., and Hanewald, K. (2011). Longevity risk, subjective survival expectations, and individual saving behavior. CEPAR Working Paper Series.

16 Sane, R., and Piggott, J. (2011). The impact on residential choice of the family home exemption in resource-tested transfer programs. CEPAR Working Paper Series.

17 Temple, J., Adair, T., and Hosseini-Chavoshi, M. (2011). Ageing and the barriers to labour force participation in Australia. Productive Ageing Centre, National Seniors Australia, Canberra.

18 Tran, C., and Woodland, A. (2011). Trade-offs in means-tested pension design. CEPAR Working Paper Series.

19 Utomo, A., McDonald, P., Temple T., and Rice J. (2011). Patterns of older workers in two Australian public service organisations: Research report.

OTHER OUTPUTS

1 Booth, H. and Rioseco, P. (2011). Journey time to visit family and friends among National Seniors Australia members. Fact Sheet 2. National Seniors Productive Ageing Centre: Canberra.

2 Crisp, D. (Nov 2011). Relocation to a retirement village. Residents' personal reflections on expectations and experiences. Poster presentation. Gerontological Society of America Conference. Boston, USA.

E1 CONFERENCE: FULL WRITTEN PAPERS IN REFEREED PROCEEDINGS

1 Aitken, C., Vanags, T., and Sargent-Cox, K. (2011). Age differences in the impact of ageing expectations on health behaviours and outcomes. 10th National Emerging Researchers in Ageing Conference: *Researching ageing transitions*. 195-201.

2 Ginnivan, N.A, Anstey, K.J, Sargent-Cox, K, Levy, B.R. (2011). Self-perceptions of ageing from a cross-cultural perspective: Do collectivist cultures provide a buffer for the impact of negative stereotypes about age? 10th National Emerging Researchers in Ageing Conference: *Researching ageing transitions*. 165-169.

3 Njenga, C., and Sherris, M. (2011). Modeling mortality with a Bayesian vector autoregression. 10th National Emerging Researchers in Ageing Conference: *Researching ageing transitions*. 87-93.

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RESEARCH OUTPUTS

4   Thristiawati, S. (2011). Physical wellbeing of older Indonesians and related socio-cultural factors. 10th National Emerging Researchers in Ageing Conference: *Researching ageing transitions*. 157-163.

ROUNDTABLE PROCEEDINGS

1   Kudrna, G. and Woodland, A. (2011). Economic effects of population growth and ageing in Australia. Productivity Commission, A 'Sustainable' Population – Key Policy Issues. Roundtable Proceedings, 41-66. Canberra.

2   McDonald, P. (2011). The determinants of Australia's future population. Productivity Commission, A 'Sustainable' Population – Key Policy Issues. Roundtable Proceedings, 9-23. Canberra.

E4 UNPUBLISHED CONFERENCE PRESENTATIONS

1   Alai, D., Sherris, M. (2011). Rethinking age-period-cohort mortality trend models. Presented at the CEPAR Demography and Longevity Workshop, Sydney, Australia 24-25 July 2011; the 46th Actuarial Research Conference, Storrs, Connecticut, USA, 13 August 2011 and the Seventh International Longevity Risk and Capital Markets Solutions Conference, Frankfurt, Germany, 9 September 2011.

2   Anstey, K.J., Kiely, K., Brewer, J., and Jagger, C. (2011). Cognitive health expectancy in Australian older adults and comparison with published estimates from the UK, Thailand and the USA. Presented at the 9th Asia/Oceania Regional Congress of Gerontology and Geriatrics, Melbourne, Australia, 26 October 2011.

3   Anstey, K. (2011). Cognitive decline and cardiometabolic disease. Presented at the Ausdiab Conference, Melbourne, Australia, 12 May 2011.

4   Anstey, K. (2011). Cognitive and sensory factors associated with safe driving. Presented at the Alzheimer's Australia conference, Sydney, Australia, 18 May 2011.

5   Anstey, K. (2011). Evidence for risk and protective factors for Alzheimer's disease. Presented at the Optimising Healthy Brain Ageing Symposium, Sydney, Australia, 2 November 2011.

6   Aranco, N. (2011). Assessing the evolution of the educational-mortality gap among countries. Presented at the 10th National Emerging Researchers in Ageing Conference, Sydney, Australia, 24-25 November 2011.

7   Blackburn C., and Sherris, M. (2011). Consistent, dynamic affine model for longevity risk applications. Presented at the 15th IME Congress, Trieste, Italy, 14-17 June 2011; the AFIR Colloquium, Madrid, Spain, 22 June 2011 and the 10th National Emerging Researchers in Ageing Conference, Sydney, Australia, 24-25 November 2011.

8   Booth, H., and Rioseco, P. (2011). Exploring the digital divide: Internet use for social networking among older Australians. Presented at the Ninth Asia/Oceania Regional Congress of Gerontology and Geriatrics, Melbourne, Australia, 24-27 October 2011.

9   Clemson, L., Wesson, J., Close, J. (2011). Embedding balance and strength training in daily life activity: A randomised trial. Presented at the Occupational Therapy Australia 24th National Conference, Gold Coast, Australia, 29 June – 1 July 2011.

10 Clemson, L. (2011). Avoiding the double whammy - dementia and falls: pilot testing a novel approach to falls prevention in the community. Presented at the Occupational Therapy Australia 24th National Conference, Gold Coast, Australia, 29 June – 1 July 2011.

11 Clemson, L. (2011). The evidence for fall prevention using environmental adaptations and a framework for practice. Presented at the Occupational Therapy Australia 24th National Conference, Gold Coast, Australia, 29 June – 1 July 2011.

12 Clemson, L., Jarvis, F., Mathews, M. (2011). Technology for dementia: Occupational therapists attitude and practices towards technology for wayfinding. Presented at the Occupational Therapy Australia 24th National Conference, Gold Coast, Australia, 29 June – 1 July 2011.

13 Crisp, D. (2011). Adapting to life in a retirement village: Examining resident experiences over the first 12 months. Presented at the Gerontological Society of America Conference, Boston, USA, 14-18 November 2011.

14 Crisp, D. (2011). Relocation to a retirement village: Investigating the impact on health, well-being and social connection. Presented at the Australian Psychological Society Conference, Canberra, Australia, October 2011.

15 Fong, J. (2011). Beyond age and sex- enhancing annuity underwriting. Presented at the 19th Australian Colloquium of Superannuation Researchers, Sydney, Australia, 14-15 July 2011; the CEPAR Demography and Longevity Workshop, Sydney, Australia, 24-25 July 2011; and the Sim Kee Boon Institute for Financial Economics Seminar Series, Singapore, 7 July 2011.

16 Hanewald, K., Piggott, J., Sherris, M. (2011). Individual post retirement longevity risk management under systematic mortality risk. Presented at the 19th Annual Colloquium of Superannuation Researchers, Sydney, Australia, 14-15 July 2011; the 15th Asia Pacific Risk and Insurance Association Annual Conference, Tokyo, Japan, 31 July - 3 August 2011; the Annual Meeting of the American Risk and Insurance Association, San Diego, USA, 9 August 2011; the Seventh International Longevity Risk and Capital Markets Solution Conference, Frankfurt, Germany, 9 September 2011; PwC Longevity Workshop, Sydney, Australia, 27 October 2011 and the Research Seminar of the Department of Economics, University of Parma, Parma, Italy, 21 September 2011.

17 Hanewald, K., Sherris, M. (2011). Statistical models for postcode-level house price risk for applications in banking and insurance. Presented at the 2011 Australasian Actuarial Education and Research Symposium, Canberra, Australia, 1-2 December 2011.

18 Hanewald, K. (2011). Explaining mortality dynamics: The role of macroeconomic fluctuations and cause of death trends. Presented at the CEPAR Demography and Longevity Workshop. Sydney, Australia, 24-25 July 2011.

19 Iskhakov, F. (2011). A structural model of consumption and savings, labor supply and retirement. Presented at the 19th Annual Colloquium of Superannuation Researchers, Sydney, Australia, 14-15 July 2011.

20 Iskhakov, F. (2011). Extending endogenous grid method for solving discrete-continuous sequential decision problems. Presented at the Econometric Society Australasian Meeting 2011, Adelaide, Australia, 4-7 July 2011.

21 Iskhakov, F. (2011). Structural dynamic model of retirement with latent health indicator. Presented at the 40th Australian Conference of Economists, Canberra, Australia, 11-14 July 2011.

22 Kendig, H. (2011). What are the differences in the mobility capacities of ageing people in Australia and the United States? Presented at the IAGG Ninth Asia/Oceania Regional Congress of Gerontology and Geriatrics, Melbourne, Australia, 23-27 October 2011.

23   Kendig, H. and Browning, C. (2011). Life style influences on ageing well: Findings from MELSHA. CEPAR Demography and Longevity Workshop, Sydney Australia 24-25 July 2011.

24   Kumru, C. (2011). Optimal capital income tax rate when retirement provision is means-tested. Presented at the 16th World Congress of IEA, Beijing, China, 4-8 July 2011

25   Kumru, C. (2011). Self-control preferences and fiscal policies: A quantitative analysis in a life-cycle model. Presented at the 40th Australian Conference of Economists, Canberra, Australia, 11-13 July 2011 and the Second LeeX International Conference on Theoretical and Experimental Macroeconomics, Barcelona, Spain, 10-11 June 2011.

26   Magnani, E. (2011). Hour constraints and training for older workers: A comparison between Australia and Canada using matched employer-employee surveys. Presented at the 52nd Italian Economic Society Annual conference, Rome, Italy, 14-15 October 2011.

27   McDonald, P. (2011). Demography and GDP per capita: A cross national study. Presented at the CEPAR Demography and Longevity Workshop, Sydney, Australia, 24-25 July 2011 and the University of Montreal, Canada, 25 March 2011.

28   McDonald, P. (2011). Australian demographic trends. Presented at the Australian Population Association Conference on Demography in the Southern Hemisphere. Canberra, Australia, 22 September 2011.

29   McDonald, P. (2011). Demographic dynamics of migration. Presented at the Department of Immigration and Citizenship Colloquium, Migration: Social Impacts and Social Change, Canberra, Australia, 21-22 November 2011.

30   McDonald, P. (2011). Keynote presentation. Population ageing and its implications for the Australian labour force. Presented at the Emerging Researchers in Ageing Conference, Sydney, Australia, 24-25 November 2011.

31   Njenga, C. and Sherris, M. (2011). Risk based capital requirements of living benefits using a Bayesian vector autoregression mortality model. Presented at the 19th Annual Colloquium of Superannuation Researchers, Sydney, Australia, 14-15 July 2011.

32   Njenga, C. And Sherris, M. (2011). Mortality stress margins for insurer risk-based capital requirements for pensions and life annuities. Presented at the Australasian Actuarial Education and Research Symposium, Canberra, Australia, 1-2 December 2011.

33   Sargent-Cox, K.A., Anstey, K.J., Kendig, H., and Slkadzien, E. (2011). Determinants of retirement expectations in the United States and Australia: A cross-national comparison of baby-boomer and pre-baby-boomers. Presented at the 9th Asia/Oceania Regional Congress of Gerontology and Geriatrics. Melbourne, Australia, 26 October 2011.

34   Sherris, M., Chen, H., Sun, T., and Zhu, W. (2011). Living with ambiguity: Pricing mortality-linked securities with smooth ambiguity preferences. Presented at the Seventh International Longevity Risk and Capital Markets Solutions Conference. Frankfurt, Germany, 8-9 September 2011.

35   Sherris, M., and Qiao, C. (2011). Managing systematic mortality risk with group self pooling and annuitisation schemes. Presented at the Institute of Actuaries of Australia Biennial Convention 2011, Sydney, Australia, 10-13 April 2011; the 19th Annual Colloquium of Superannuation Researchers, Sydney, Australia, 14-15 July 2011; the Seventh International Longevity Risk and Capital Markets Solutions Conference. Frankfurt, Germany, 8-9 September 2011; the Southern Finance Association Annual Meeting, Key West, USA, 16-19 November; the Southern Risk and Insurance Association Meeting, New Orleans, USA, 20-22 November 2011; and at HEC University of Lausanne, Switzerland, 6 September 2011.

36   Sherris, M. (2011). Increasing profitability by rethinking existing risk management strategies. Presented at the Corporate Risk Management Conference, Sydney, Australia, 29 March 2011.

37   Sherris, M. (2011). Modelling mortality with a Bayesian vector autoregression. Presented at the Institute of Actuaries of Australia Biennial Convention 2011, Sydney, Australia, 10-13 April 2011.

38   Su, S., Sherris, M., and Njenga, C. (2011). Heterogeneity of Australian population mortality and implications for a viable life annuity market. Presented at the Institute of Actuaries of Australia Biennial Convention 2011, Sydney, Australia, 10-13 April 2011; the CEPAR Demography and Longevity Workshop, 24-25 July 2011 and the Asia Pacific Risk and Insurance Association Annual Conference, Tokyo, Japan, 31 July – 3 August 2011.

39   Yu, Y. (2011). Do mortality differentials associated with body mass decline over age? An age-period-cohort analysis and evidence of cohort distortions in the US. Presented at the Annual Meeting of the Population Association of America, Washington DC, USA, 31 March – 2 April 2011.

40   Yu, Y. (2011) Re-examining the declining effect of age on mortality differentials associated with excess body mass: Evidence of cohort distortions in the US. Presented at the CEPAR Demography and Longevity Conference, Sydney, Australia 24-25 July 2011.

A further 18 unpublished presentations were made at major international meetings. These are included in the following list.

INVITED PRESENTATIONS TO MAJOR INTERNATIONAL MEETINGS[13]

1   Clemson, L. (2011). Stepping On: Development, evidence and translation into practice. Presented at the Centre for Disease Control, Injury Branch, Annual Symposium on Falls Prevention, Atlanta, USA, 12-14 September 2011.

2   Keane, M. (2011). Plenary Speaker. Human capital, labor supply and taxes. Presented at the 7th International Symposium on Economic Theory and Applications (SETA Conference), Melbourne, Australia, 14 April 2011.

3   Keane, M. (2011). Cowles Lecture. Human capital, labor supply and taxes. Presented at the Summer Meeting of the Econometric Society, St. Louis, USA, 11 June 2011.

4   Kendig, H. (2011). Intersectional action in healthy ageing. Presented at the Experts Consultation on Healthy Ageing in the Western Pacific, Manila, Philippines, 9-10 May 2011.

5   Kendig, H. (2011). Keynote Speaker. Long term care in Australia and Asia. Presented at the Comparative policy workshop hosted by the Tsinghua University and Chinese Ministry of Health in Beijing, Beijing, China, 28 November – 4 December 2011.

6   Kendig, H. (2011). Keynote Speaker. Directions in international gerontology and opportunities for Korea. Presented at the Korean Gerontology Conferences, Seoul, South Korea, 25 November 2011.

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[13] The invited speaker's name appears in bold where a co-authored paper was presented.

RESEARCH OUTPUTS

7   Magnani, E. (2011). Older workers' training opportunities in times of workplace innovation. Presented at the World Demographic and Ageing (WDA) Forum 'Ageing, Health and Productivity', St. Gallen, Switzerland, 29 August 2011.

8   Magnani, E. (2011). Older workers' training opportunities in times of workplace innovation. Presented at the 2nd International Workshop on the Socio-Economics of Ageing, ISEG, University of Lisbon, Lisbon, Portugal, 4-5 October 2011.

9   McDonald, P. (2011). Keynote Speaker. Very low fertility rates in East Asia: Causes, consequences and policy approaches. Presented at the Conference of the Population Association of Taiwan, Taipei, Taiwan, 28-29 April 2011.

10 McDonald, P. (2011). Why English speaking countries have relatively high fertility. Presented at the 40th Australian Conference of Economists, Canberra, Australia, 11-13 July 2011.

11 McDonald, P. (2011). Forecasting births. Presented at the First Human Fertility Database Symposium, Max Planck Institute for Demographic Research, Rostock, Germany, 3-4 November 2011.

12 McDonald, P., Utomo, A., and Temple, J. (2011). Demography and GDP per Capita: A Cross National Study. Presented at the Annual Meeting of the Population Association of America, Washington DC, USA, 31 March - 2 April 2011.

13 O'Loughlin, K. (2011). Australian Babyboomers face retirement during the Global Financial Crisis. Presented at the IAGG Ninth Asia/Oceania Regional Congress of Gerontology and Geriatrics, Melbourne, Australia, 23-27 November 2011.

14 Piggott, J. (2011). Australia's retirement provision: The decumulation challenge. Presented at the World Pension Summit 2011, Amsterdam City, The Netherlands, 4-5 November 2011.

15 Piggott, J., Celler, B., and Ray, P. (2011). How to reduce health costs using ICT. Presented at the Global Economic Symposium, Kiel, Germany, 4 October 2011.

16 Piggott, J. (2011). Managing health and retirement under demographic shift: 5 ideas whose time has come. Presented at the Global Economic Symposium, Kiel, Germany, 4 October 2011.

17 Piggott, J. (2011). The Potential for matching defined contributions (MDC) design features in pension systems to increase coverage in low and middle income countries. Presented to the World Bank, 6-7 June 2011.

18 Quang, T.P.H., and Sherris, M. (2011). Application of multiple criteria decision making methods in insurance-linked security portfolio selection . Presented to the Australasian Actuarial Education and Research Symposium 2011, Canberra, Australia, 1-2 December 2011.

19 Nirmalendran, M., Sherris, M., and Hanewald, K. (2011). Comparison of international solvency regimes for lifetime guaranteed annuities. Presented at the Australasian Actuarial Education and Research Symposium 2011, Canberra, Australia, 1-2 December 2011.

20 Sherris, M. (2011). Enterprise risk management, insurer value maximisation and market frictions. Presented at the AFIR Colloquium, Madrid, Spain, 19-22 June 2011.

21 Su, S., and Sherris, M. (2011). Heterogeneity of Australian population mortality and implications for a viable life annuity market. Presented at the Themed Semester of The Institut Louis Bachelier: Longevity Modeling an inter-disciplinary approach, *L'Institut Louis Bachelier - Centre d'Innovation Financière, Ecole Nationale de la Statistique et l'Administration Economique,* France, 30-31 May 2011.

22 Alai, D., and Sherris, M. (2011). Rethinking age-period-cohort mortality trend models. Australasian Actuarial Education and Research Symposium 2011, Canberra, Australia, 1-2 December 2011.

23 Hanewald, K. and Sherris, M. (2011). Statistical models for postcode-level house price risk for applications in banking and insurance. Presented at the Australasian Actuarial Education and Research Symposium, Canberra, Australia, 1-2 December 2011.

SEMINAR PRESENTATIONS

1   Anstey, K. (2011). The DYNOPTA project: development, methods and findings. Presented at the Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, 8 June 2011.

2   Booth, H. and Rioseco, P. (2011) Socio-demographic factors affecting older Australians' use of the Internet, email and online social networking: First results from the 2010/11 survey 'Social Activity and Wellbeing of Older Australians'. ANU Australian Demographic and Social Research Institute seminar, 11 October 2011.

3   Capatina, E. (2011). Life-cycle effects of health risk. Presented at the UNSW Economics Department's Macroeconomics Lunch Seminar, Sydney, Australia, 6 September 2011 and the Centre for Pensions and Superannuation (CPS) Seminar, Sydney, Australia, 16 September 2011.

4   Iskhakov, F. (2011). Extending endogenous grid method for solving discrete-continuous sequential decision problems. Presented at the School of Humanities and Social Sciences Nanyang Technological University, 16 November 2011 and the University of Copenhagen Economics Faculty, 21 November, 2011.

5   Kudrna, G. (2011). Implications of the 2009 age pension reform in Australia: A dynamic general equilibrium analysis. CPS Retirement Research Group Meeting, Sydney, Australia, 1 May 2011.

6   Magnani, E. (2011). Older workers' training opportunities in times of workplace innovation. Presented at the Centre for Labour Market Studies, University of Leicester Seminar, Leicester, United Kingdom, 22 November 2011.

7   McDonald, P. (2011). Why fertility is relatively high in English-speaking countries. Presented at McGill University, Montreal, Canada, 28 March 2011 and London School of Economics, London, United Kingdom, 9 November 2011.

8   McDonald, P. (2011). Low fertility in East Asia: Causes, consequences and policy responses. Presented at the National Taiwan University, Taipei, Taiwan, 24 April 2011.

9   McDonald, P. (2011). The determinants of Australia's future demography. Presented at the Australian Demographic and Social Research Institute, ANU, Canberra, Australia, 28 June 2011.

10 McDonald, P. (2011). Emerging demographic trends: Implications for international security. Presented at the National Security College, ANU, Canberra, Australia, 30 June 2011.

11 McDonald, P. (2011). Forecasting births. Presented at the Australian Bureau of Statistics, Canberra, Australia, 10 August 2011; the Population Studies Centre, University of Colorado, Boulder, 18 October 2011; University of Groningen, Netherlands, 28 October 2011; and the Netherlands Interdisciplinary Demographic Institute (NIDI), The Hague, The Netherlands, 15 September 2011.

12 McDonald, P. (2011). The determinants of Australia's future population: With implications for New Zealand. Presented at the National Institute of Demographic and Economic Analysis, University of Waikato, Hamilton, New Zealand, 15 September 2011.

13 McDonald, P. (2011). Population in the Asian century. Presented at the Australian National Institute for Public Policy, ANU, Canberra, Australia, 28 November 2011.

MEDIA AND COMMUNICATIONS

HIGHLIGHTS

10,714 PAGE VIEWS
ON OUR WEBSITE

32 MEDIA ARTICLES
IN PRINT, RADIO, TV
AND ONLINE MEDIA

10 MEDIA RELEASES

ONE OF CEPAR'S KEY OBJECTIVES IS TO ENGAGE GOVERNMENT, INDUSTRY AND THE PUBLIC BY COMMUNICATING OUR RESEARCH VIA A RANGE OF PLATFORMS, INCLUDING THROUGH TRADITIONAL MEDIA, SOCIAL MEDIA, ONLINE AS WELL AS CONFERENCES AND WORKSHOPS.

As a newly established centre, we have invested in a range of marketing and communications activities to generate publicity and create awareness of our research and expertise, including engaging with the media on population ageing issues and publicising our events through the media.

THE CEPAR BRAND

Our marketing, communications and media activities aim to enhance the essence of our brand and promote CEPAR as a leading authority building knowledge for an ageing world.

WEBSITE

CEPAR has an established web presence on the Australian School of Business, UNSW website and during our first year we received 3554 unique visitors to the site, with 68% of people returning to the site. Much of our investment in this area has been through the development of a new stand-alone CEPAR website to be launched in early 2012.
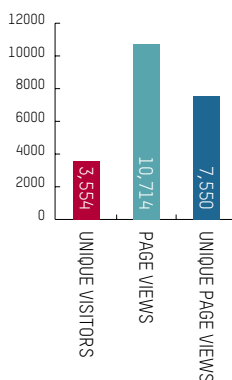
MEDIA

During 2011, we issued ten media releases and CEPAR staff featured in print and broadcast media nationally as well as in metropolitan media in Sydney and Canberra.

SOCIAL MEDIA

Social media is an important part of our communications and community outreach plan. CEPAR is active on Facebook and Twitter and LinkedIn. We see social media as a good platform to start conversations and share our research on the implications of population ageing. We will continue to build our audience in 2012.

For more information on our media and communications activities visit cepar.edu.au

PRINT MEDIA

The Australian Financial Review, *Real estate investments riskier than shares: Report*
7 December 2011,
featuring Michael Sherris.

The Canberra Times, *Unsafe, uneven footpaths are an age-old problem*
29 October 2011,
featuring Kaarin Anstey.

The Sunday Telegraph, *Why a big family has become a luxury item*
14 August 2011,
featuring Peter McDonald.

The same article was also syndicated in the Sunday Tasmanian and Sunday Mail in Adelaide.

Sunday Tasmanian, *Angst to put dent in birth rate*
14 August 2011,
featuring Peter McDonald.

Sunday Mail Adelaide, *Birth rate to drop as costs soar*
14 August 2011,
featuring Peter McDonald.

Science Magazine, *The upside of downsizing*
7 August 2011,
featuring Hal Kendig.

The Weekend Australian, *The ghost of Thomas Malthus hovers over unsustainable global population increases*
2 July 2011,
featuring Peter McDonald.

ENGAGED | CONNECTED | DYNAMIC
MULTIDISCIPLINARY | INNOVATIVE | GLOBAL

cepar
ARC CENTRE OF EXCELLENCE IN
POPULATION AGEING RESEARCH

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MEDIA AND COMMUNICATIONS

The Sydney Morning Herald,
For boomers, the R-word has changed to reality
18 June 2011,
featuring Hal Kendig.

The Canberra Times,
Older residents to rate our city
18 June 2011,
featuring Kaarin Anstey.

The Sunday Telegraph,
Birth of a new generation: The Alphas
12 June 2011,
featuring Peter McDonald.
Sydndicated in the Sunday Mail Brisbane and Sunday Times.

Sunday Mail Brisbane,
Birth of a new era of excitement
12 June 2011,
featuring Peter McDonald.

Sunday Times,
Age of Gen Alpha
12 June 2011,
featuring Peter McDonald.

The Australian,
Let Dick have his say but case for growth is overwhelming
2 June 2011,
featuring Peter McDonald.

The Australian,
ERA threat to policy debate
25 May 2011,
by Peter McDonald, Bruce Chapman and Percy Allan

The Weekend Australian,
Population expansion is the unstated focus of Swan's budget
14 May 2011,
featuring Peter McDonald.

Bergens Tedende (Norwegian newspaper),
Waiting explosion in dementia numbers
12 May 2011,
featuring Kaarin Anstey.

Bergens Tedende (Norwegian newspaper),
Youth obesity increasing dementia risk
18 April 2011,
featuring Kaarin Anstey.

The Australian,
Families fear their tax breaks will go
12 March 2011,
featuring Peter McDonald.

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TELEVISION

Channel 10,
6.30 with George Negus,
Living longer
17 October 2011,
featuring Michael Sherris.

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ONLINE

Finance News Network,
Real estate riskier than shares
8 December 2011,
by Michael Sherris.

Aged Care Insight,
Demographics will force a shift to positive ageing
December 2011,
by Hal Kendig.

Aged Care Insight,
Positive outcomes for seniors in retirement villages
17 October 2011,
by Dimity Crisp.

The Conversation,
Ask the elderly what they need, not the care industry
20 September 2011,
by Hal Kendig.

The Conversation,
What the Caring for Older Australians report means for the future of aged care
12 August 2011,
by Hal Kendig.

Australasian Science,
Middle-aged flabbiness leads to dementia
1 August 2011,
featuring Kaarin Anstey.

Crikey blog,
Aged care reform: The time is right
August 2011,
by Hal Kendig.

NJ Today (New Jersey online newspaper),
Driving errors increase as you age
26 July 2011,
featuring Kaarin Anstey.

Australian Ageing Agenda,
Canberra wants your opinion
19 July 2011,
featuring Kaarin Anstey.

Tahlequahdailypress.com (international),
Senior drivers may face obstacles
18 June 2011,
featuring Kaarin Anstey.

Australian Ageing Agenda
May/June issue,
The great dementia research challenge
June 2011,
featuring Kaarin Anstey.

HealthDay: News for Healthier Living,
Driving skills do ebb with age: Study
20 May 2011,
featuring Kaarin Anstey.

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RADIO

ABC, 702 Sydney Morning Show with John Morrison,
Implications of population ageing on the Australian workforce
24 November 2011,
interview with Peter McDonald.

ABC Radio National,
Breakfast with Fran Kelly,
Friday Panel: Aged care
12 August 2011,
interview with Hal Kendig.

ABC, 666 Canberra,
radio news and Drive program,
Age friendly city. How friendly is your city?
4 August 2011,
interview with Kaarin Anstey.

2CC Canberra, Drive program,
Age friendly city. How friendly is your city?
4 August 2011,
interview with Kaarin Anstey.

ABC radio, The World Today,
Population strategy avoids targets
13 May 2011,
interview with Peter McDonald

'The key thing to the Productivity Commission recommendations about separating out funding is that it will enable choice, it will enable variety. It will not simply prop up the existing system… It would be nice to be able to preserve the home for the inheritance of the children, most of whom are financially well off. It is entirely tax free. The price for doing that is that taxpayers of all income are putting into this.'

HAL KENDIG,
CEPAR CHIEF INVESTIGATOR,
ON ABC RADIO NATIONAL,
12 AUGUST 2011

'After the 2006 census, ABS demographers detected an uplift in immigration; they were also aware of baby boomers edging closer to retirement. The ABS sought a second opinion from Peter McDonald, head of demography at the Australian National University.

Professor McDonald is internationally recognised as an academic demographer. His advice was that because of the imminent retirement of baby boomers from the workforce the long-term migration assumption should be lifted to 180,000 a year. An extra 70,000 migrants a year were needed to offset the boomer retirement factor. The ABS responded by producing bold new population projections in September 2008 that showed Australia reaching 36 million by 2051.'

REPORT IN THE AUSTRALIAN,
2 JUNE 2011.

END USER LINKS

PRESENTATIONS TO GOVERNMENT, INDUSTRY AND THE BUSINESS COMMUNITY

1   Anstey, K. (2011). Is Alzheimer's disease preventable? Department of Health and Ageing Dementia Prevention Taskforce Meeting and Talk, Canberra, Australia, May 2011.

2   Anstey, K. (2011) The DYNOPTA project and an ageing research agenda. Progressing Australia's Ageing Research Agenda, NHMRC, ARC and the Australian Association of Gerontology Joint workshop, Melbourne Convention Centre, 28 October 2011.

3   Clemson, L. (2011). Falls prevention update: Environmental interventions. Mondial Allianz/DVA, Sydney, Australia, 4 November 2011.

4   Clemson, L. (2011). Preventing falls: The evidence from Australia. Centre for Interdisciplinary Research in Rehabilitation of Greater Montreal, the Jewish Rehabilitation Hospital and McGill University.

5   Keane, M. (2011). Human capital, labor supply and taxes. Federal Reserve Bank of New York, USA, 16 June 2011.

6   Kendig, H. (2011). Keynote address. Reflections on the Productivity Commission Report on Care of Older Australian. Aged & Community Services 2011 Summit: Transforming Respite now to 2015, Adelaide, Sydney, 6 May 2011.

7   McDonald, P. (2011). The Determinants of Australia's Future Demography. 2011 Productivity Roundtable on A 'Sustainable' Population? – Key Policy Issues, Canberra, 21-23 March 2011.

8   McDonald, P. (2011). Population dynamics and drivers. Institute of Public Affairs Australia and Academy of the Social Sciences in Australia, Roundtable on Sustainable Population Policy. Canberra, Australia, 15 April 2011.

9   McDonald, P. (2011). Employment at older ages in Australia: Determinants and trends. National Council for Vocational Education Research Roundtable on Older Workers, Canberra, Australia, 3 May 2011.

10 McDonald, P. (2011). Forecasting births. Australian Bureau of Statistics, Canberra, Australia, 10 August 2011.

11 McDonald, P. (2011). Australia's changing demographics and implications for the labour force. EE-OZ Training Standards Annual Conference, Cairns, Australia 11-13 October 2011.

12 McDonald, P. (2011). Population, labour force and Australia's economic growth. The Department of Immigration and Citizenship, Canberra, Australia, 23 November 2011.

13 Piggott, J. (2011). Personal tax and super. Ian Castles Roundtable on Tax and Social Security, Australian National University, Canberra, 12-13 October 2011.

14 Sargent-Cox, K. (2011). Progress and outcome report regarding the Age-friendly City Project, ACT Council on the Ageing Meeting, 9 August 2011.

15 Woodland, A. (2011). Economic effects of population growth and ageing. 2011 Productivity Roundtable on A 'Sustainable' Population? – Key Policy Issues, Canberra, 21-23 March 2011.

BRIEFINGS AND PARTICIPATION IN ROUNDTABLE AND PANEL DISCUSSIONS

1   Anstey, K. The Hon Mark Butler MP, Minister For Mental Health and Ageing, Roundtable Discussion on Ageing Associated Diseases, Parliament House, August 2011.

2   Anstey, K. The Hon Mark Butler MP & NHMRC Roundtable Discussion on the Future of Dementia Research in Australia, Parliament House, November 2011.

3   Anstey, K. Advisory Panel on the Economic Potential of Senior Australians, Treasury House, Canberra, November, 2011.

4   Kendig, H. Chair. NSW Whole of Government Ageing Roundtable, Parliament House, 15 September 2011.

5   Kendig, H. Advisory Panel on the Economic Potential of Senior Australians, Treasury House, Canberra, November 2011.

6   Kendig, H. NHMRC, ARC and the Australian Association of Gerontology Joint Workshop on Progressing Australia's Ageing Research Agenda, Melbourne, 28 October 2011.

7   Kendig, H. Informal Experts' Consultation on Healthy Ageing in the Western Pacific Region, Manila, 9-10 May 2011.

8   McDonald, P. Meeting with officials of the Taiwanese Government to discuss policy approaches to low fertility in Taiwan, 28 April 2011.

9   McDonald, P. Meeting with the Secretary, Department of Finance, Dr David Tune, to discuss Australian population, immigration, labour supply, 16 May 2011.

10 McDonald, P. Meeting with Skills Australia on immigration and skills on 6 June 2011.

11 McDonald, P. Meeting with the Victorian Minister for Planning, The Honourable Matthew Guy to discuss population and planning in Victoria, 18 March 2011.

12 McDonald, P. Advice provided to the Department of Planning and Community Development, Victoria on population futures, especially the future of migration as it affects Victoria, 18 March 2011.

13 McDonald, P. Meeting with the Minister for Immigration and Citizenship, the Hon. Chris Bowen to discuss immigration issues, 22 June 2011.

14 McDonald, P. Topic advisory panel member. 'Measures of Australia's Progress', Australian Bureau of Statistics; 22 August and 18 November 2011.

PUBLIC TALKS

1   Anstey, K. (2011). Findings from the ACT Age Friendly Cities Survey. Office for Ageing, ACT Older Persons Assembly Briefing Session, ACT Legislative Assembly, Canberra, Australia, 19 September 2011.

2   Anstey, K. (2011). What can we do to prevent Alzheimer's disease? SA& NT Dementia Training Study Centre, Glenside, Australia, August 2011.

3   Anstey, K. (2011) Is Alzheimer's disease preventable? University of Queensland Alumni Lecture Series, Brisbane, Australia, May 9 2011.

4   Clemson, L. (2011). Falls can be prevented: Enabling older people. The Stepping On program and CALD groups. Multicultural Falls Forum, Health Service Area, Punchbowl, Sydney, Australia, 3 May 2011.

5   Clemson, L. (2011). Falls prevention - evidence based interventions for at-risk community residing older people. Scholarship of Practice Lecture Series, University of Illinois. Illinois, USA, 8 August 2011.

6   McDonald, P. (2011). Policies for low fertility across varying welfare regimes. Süßmilch Lecture, Max Planck Institute for Demographic Research, Rostock, Germany, 2 November 2011.

7   McDonald, P. (2011). The role of immigration on the future of Australia as a 'global' country. Australian Chambers Business Congress, Gold Coast, Australia, 1-3 June 2011.

8   Piggott, J. (2011). Longevity risk and longevity insurance. IMCA Australia Annual Conference 2011, Sydney, Australia, 29 November 2011.

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NEW GRANTS AWARDED IN 2011

OUR RESEARCHERS WERE VERY SUCCESSFUL IN SECURING ADDITIONAL GRANT FUNDING IN 2011.

THE FOLLOWING GRANTS WERE AWARDED TO RESEARCH TEAMS WHICH INCLUDED CEPAR CHIEF INVESTIGATORS:

ARC GRANTS

KEANE. M.P.
Australian Laureate Fellowship: Understanding the implications of population ageing for the future costs of funding health care, aged care and aged pensions in Australia

Total amount awarded:
$2,461,000

PIGGOTT, J.R, SHERRIS, M., BATEMAN, H.J., YAO, X
ARC Linkage 2011: Developing sustainable retirement policy in a Chinese province: The case of Zhejiang

Total amount awarded:
$ 177,420

PIGGOTT, J. (APF), MITCHELL, O., DISNEY R.
ARC Discovery 2011 and Australian Professorial Fellowship: Integrating public and private retirement risk protection: Public policy and business practice

Total amount awarded:
$ 409,230

WINDSOR, T.D., ANSTEY, K.J., GERSTOF, D.
ARC Discovery 2011: Social context of adult development and healthy ageing

Total amount awarded:
$ 70,000

OTHER AUSTRALIAN COMPETITIVE GRANTS

DRAPER, B., WITHALL, A., **CUMMING, R.,** TROLLOR, J., LOY, C., QUINE, S.
NHMRC Dementia Research Grant: Improving service provision for early onset dementia: the INSPIRED Study

Total amount awarded:
$715,349

SHAW, J., ZIMMET, PAUL, **ANSTEY, K.J.,** KAVANAGH, A., ATKINS, R. CIF: CHADBAN, S. DUNSTAN, D. BALKAU, B
NHMRC Project Grant: AusDiab 3:
Emerging risk factors for and long-term incidence of cardio-metabolic diseases

Total amount awarded:
$2,537,113

ANSTEY, K.J., CHRISTENSEN, H. BUTTERWORTH, P., EASTEAL, S., **CHERBUIN, N.,** MACKINNON, A.
NHMRC Project Grant: Causes and consequences of mental disorders, cognitive decline and dementia over the adult life course and the implications for mental health services

Total amount awarded:
$1,158,380

ANSTEY, K.J.
NHMRC Research Fellowship: Promoting healthy ageing of brain and mind

Total amount awarded:
$630,505

STATE GOVERNMENT GRANTS

PIGGOTT, J., ANSTEY, K.J., CUMMING, R., KEANE, M.P., KENDIG, H.L., MCDONALD, P.F, SHERRIS, M., WOODLAND, A.D.
NSW Science Leveraging Grant

Total amount awarded:
$500,000

ANSTEY, K.J.
ACT Office of Ageing: Tender for WHO Age Friendly Cities Survey

Total amount awarded:
$38,177

SARGENT-COX K., ANSTEY, K.J.
ACT Health Research Grant: The influence of ageing attitudes and expectations on health behaviours and medical help-seeking

Total amount awarded:
$44,102

INDUSTRY GRANT

ANSTEY, K.J., HORSWILL, M., WOOD, J., PACHANA, N., SARGENT-COX, K.
NRMA-ACT Road Safety Trust: Do Cognitive and sensory measures predict driving outcomes and driving cessation in older drivers? A 5 year validation study

Total amount awarded:
$72,383

CENTRE FINANCE

2011 FINANCIAL STATEMENT

INCOME		2011 ($)
ARC Centre Grant distributed as follows:		1,828,350
University of New South Wales	1,203,350	
Australian National University	313,000	
University of Sydney	312,000	
University of New South Wales		678,000
Australian National University		130,250
University of Sydney		130,000
Department of Families, Housing, Community Services and Indigenous Affairs		50,000
Department of Health and Ageing		45,455
Commonwealth Treasury		50,000
Medibank		50,000
AMP		50,000
Emerging Researchers in Ageing Conference		16,636
Registration fees	10,255	
Sponsorship	6,382	
Total Income		**3,028,691**

EXPENDITURE		
Salaries		813,109
Travel		63,487
Emerging Researchers in Ageing initiative: annual contribution		60,000
Events		25,250
Other research related expenses		16,852
Recruitment and relocation expenses		16,935
Centre administration, consumables and IT maintenance		30,418
Equipment		16,738
Website, branding and marketing		48,403
Total Expenditure		**1,091,192**

Opening balance at the beginning of 2011	0

Closing balance as at 31/12/2011	1,937,499

Note:

CEPAR was awarded a $500,000 grant from the NSW Science Leveraging Fund. Under the Deed of Agreement with NSW Department of Trade & Investment, the full amount of the grant was paid to the University on trust. However, release of each year's funding allocation is contingent on approval by the funding body. As approval to expend the first year's allocation was not received until February 2012, this income is not included in the 2011 financial statement.

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ESTIMATES OF FUTURE EXPENDITURE

IN 2012 THE CENTRE PLANS TO HIRE ADDITIONAL RESEARCH PERSONNEL, CONTINUE TO BUILD ITS EARLY CAREER RESEARCHER INITIATIVES, AND EXPAND ITS OUTREACH PROGRAMS.

Funds will also be deployed to more fully engage our partner and associate investigators by supporting joint research activities and providing opportunities for face-to-face collaboration.

The Centre commences 2012 with significant funding carried forward from 2011. A number of factors account for this. The Centre was not formally established until 18 March 2011 and then it took time to recruit personnel and to determine strategies for engagement.

Towards the end of 2011, the Management Committee agreed on a number of strategic priorities and recommended that funding[14] be allocated to finance initiatives to support these goals. The activities described below will draw on 2012 income as well as funds carried forward from 2011.

PERSONNEL

It is anticipated that the Centre will spend more than $2,000,000 in 2012 on research personnel, most of whom will be ECRs. About $1,000,000 of these funds will be spent on new recruits to the Centre. In addition to the new ECRs funded by the ARC's post-award funding, there will be two new fellows appointed to work on the health and finance programs financed by the NSW Science Leveraging Fund, as well as up to nine new appointments supported by ARC and collaborating university funds. At the University of Sydney node, one new Research Fellow will commence in January to work on ageing and productivity in the workforce and it is expected another two will be recruited; one to work with Hal Kendig on the analysis of HILDA data and the other with Robert Cumming on the epidemiology of longevity. It is anticipated that a PhD scholarship to support work on the epidemiology of ageing in men will also be offered. At the UNSW node, recruitment is currently underway to fill up to three new positions for economists to support Professors Woodland, Keane and Piggott. In

addition, we are planning one or two more senior hires to share the research management of some of these new recruits and to spearhead new initiatives. At the ANU node, there are plans to appoint a research assistant to support the research team at ADSRI.

Twelve supplementary PhD scholarships valued at $5000 each have been awarded to CEPAR affiliated students commencing in 2012.

SUPPORT FOR ECRS AND STUDENTS

CEPAR will continue to support the Emerging Researchers in Ageing (ERA) initiative in 2012 by providing $60,000 to assist with the annual conference and other activities. It will also finance the Population Ageing Stream of the National Honours Colloquium at UNSW.

In 2012 we will offer our first methodology workshop for early career researchers to learn cutting edge techniques from an international leader in quantitative methods. Financed primarily by the ARC's post-award funding, it is anticipated that this will cost approximately $40,000, with the largest expense being travel bursaries for participants.

It is intended that funds also will be made available to provide opportunities for both research fellows and PhD students to spend up to three months at one of the international partner organisations with the aim of building links between these key international hubs of ageing research and the next generation of researchers.

The Centre intends to actively seek opportunities to support ECR involvement in conferences and symposia. Sponsorship of special sessions for ECRs are relatively inexpensive ways to provide excellent opportunities for young researchers to participate and network. Up to $20,000 from non-ARC funds will be set aside to finance these initiatives.

SUPPORT FOR PARTNER AND ASSOCIATE INVESTIGATORS

Involving our partner and associate investigators more fully in the research program is a priority for CEPAR in 2012. A budget of $225,000 has been allocated to support travel, research assistance and other expenditure that will assist the development and execution of collaborative research projects.

OUTREACH AND DISSEMINATION OF RESEARCH FINDINGS

Conferences and workshops showcase the Centre's research, increase our international footprint, and provide opportunities for our industry partners to engage with the Centre. A major population ageing conference focused on Australia and our regional neighbours is planned as well as workshops and seminars. In addition the Centre will co-host a conference on the Economics of Population Ageing at Harvard and sponsor special sessions on ageing-related issues at major conferences.

Leading international experts will visit the Centre under CEPAR's Distinguished Visitor Program and funds will be available for CEPAR personnel to visit international partners and present research findings at major conferences. We also intend to trial the production of research briefs. Estimated expenditure for 2012 is $350,000 - $400,000.

OTHER

It is anticipated that around $100,000 of the Science Leveraging Fund award will be spent on data acquisition and analysis platforms to support the health program. Approximately $50,000 of university funds will be used to fund a survey conducted by researchers based at ANU.

About $450,000 will be spent on supporting the operation of the Centre. Salaries for administrative personnel account for the bulk of funds.

[14] Some future expenditure is subject to ARC approval. Variations forthcoming

PWC LONGEVITY WORKSHOP, 27 OCTOBER 2011

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