

## 5<sup>th</sup> Annual Workshop on Population Ageing and the Chinese Economy

Hosted by the Australia-China Population Ageing Research Hub in collaboration with the ARC Centre of Excellence in Population Ageing Research (CEPAR) and the UNSW Business School

15 July 2019, 9.00am – 5.30pm

UNSW Sydney, Tyree Room, John Niland Scientia Building

**Theme:** The economic health implications of population ageing in China

**Co-chairs:**

Hanming Fang, University of Pennsylvania, ShanghaiTech, CEPAR

Katja Hanewald, CEPAR, UNSW Sydney

John Piggott, CEPAR, UNSW Sydney



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### PROGRAM AT-A-GLANCE: 15 JULY 2019

08:30 – 09:00	Arrival and Registration
09:00 – 09:15	<b>Welcome Address and Opening Remarks</b> <u>John Piggott</u> (CEPAR, UNSW Sydney)
09:15 – 10:30	<b>Keynote Address: Property Rights and the Housing Market</b> <u>Hanming Fang</u> (University of Pennsylvania, ShanghaiTech, CEPAR)
10:30 – 11:00	Morning Tea
11:00 – 12:30	<b>SESSION 1 – Wellbeing</b> Session chair: Katja Hanewald (CEPAR, UNSW Sydney)
11:00 – 11:30	<b>Health, Elderly Care, and Subjective Well-being: Evidence from a Randomized Experiment in China</b> <u>Yi Zhang</u> , Qingqing Zong (both Shanghai University of Finance and Economics)
11:30 – 12:00	<b>Exploring the Relationship between Functional Limitations of the Elderly and the Health-related Quality of Life of Spouses in Shaanxi Province in China</b> <u>Wanyue Dong</u> (UNSW Sydney; Institute of Health Management and Policy, Xi'an Jiaotong University)
12:00 – 12:30	<b>Life Satisfaction of Older Chinese: The Role of Health and Health Insurance</b> <u>Sisi Yang</u> and Katja Hanewald (both CEPAR, UNSW Sydney)
12:30 – 13:30	Lunch

<b>13:30 – 15:00</b>	<b>SESSION 2 – Policies and Inequality</b> Session chair: Bei Lu (CEPAR, UNSW Sydney)
13:30 – 14:00	<b>Land Reallocation Responses to China’s New Rural Pension Scheme: Evidence from a Regression Discontinuity Design</b> <u>Xinjie Shi</u> (Crawford School of Public Policy, The Australian National University)
14:00 – 14:30	<b>Income Inequality among the Elderly: Evidence from China</b> <u>Katja Hanewald</u> (CEPAR, UNSW Sydney), Ruo Jia (Peking University), Zining Liu (Peking University)
14:30 – 15:00	<b>The Corporate Governance of Residential Care Institutions: Chinese Practice and Australian Experience</b> <u>Shuo Yang</u> (UNSW Law School)
<b>15:00 – 15:30</b>	Afternoon Tea
<b>15:30 – 17:30</b>	<b>SESSION 3 – Long-term Care</b> Session chair: Hazel Bateman (CEPAR, UNSW Sydney)
15:30 – 16:00	<b>Long-term Care Insurance Financing using Home Equity Release: Evidence from an Experimental Study</b> <u>Tin Long Ho</u> (CEPAR, UNSW Sydney), Hazel Bateman (CEPAR, UNSW Sydney), Hanming Fang (University of Pennsylvania, ShanghaiTech, CEPAR), Katja Hanewald (CEPAR, UNSW Sydney)
16:00 – 16:30	<b>Total Health Cost Comparison Before and After Entering Long-Term Care in China</b> <u>Bei Lu</u> (CEPAR, UNSW Sydney), Guanggang Feng (Zhejiang University), Sophie Yan (CEPAR, UNSW), H.Mi
16:30 – 17:00	<b>An Experimental Study of the Demand for Hybrid Longevity and Health Insurance Products</b> <u>Cheng Wan</u> (CEPAR, UNSW Sydney), Hazel Bateman (CEPAR, UNSW Sydney), Hanming Fang (University of Pennsylvania, ShanghaiTech, CEPAR), Katja Hanewald (CEPAR, UNSW Sydney)
17:00 – 17:30	<b>Health Status and Functional Disability with Systematic Trends: A Comparison between China and US</b> <u>Yu Fu</u> (CEPAR UNSW Sydney; Central University of Finance and Economics); Michael Sherris (CEPAR, UNSW Sydney)
<b>17:30</b>	<b>Closing Remarks</b>

08:30 – 09:00	Arrival and Registration
09:00 – 09:15	<p><b>Welcome Address and Opening Remarks</b></p> <p><b><u>John Piggott</u></b> (CEPAR, UNSW Sydney)</p>  <p><b>John Piggott</b> is Director of the ARC Centre of Excellence in Population Ageing Research (CEPAR) and Scientia Professor of Economics at UNSW Sydney. He is the Director of CEPAR’s Australia-China Population Ageing Research Hub. John Piggott has a long-standing interest in retirement and pension economics and finance. His Australian policy experience includes membership of both the Henry Tax Review Panel and the Ministerial Superannuation Advisory Committee. Internationally, he has worked with the Japanese Government on pension and ageing issues; evaluated World Bank assistance on pension reform in the Asian region for the Bank's Operations Evaluation Department; and consulted to several foreign governments on pension issues, including Russia and Indonesia.</p>
09:15 – 10:30	<p><b>Keynote Address: Property Rights and the Housing Market</b></p> <p><b><u>Hanming Fang</u></b> (University of Pennsylvania, ShanghaiTech, CEPAR)</p> <p><b>Abstract:</b> Secure and complete property rights are considered a key determinant of long-term economic growth, investment and financial development. We exploit a unique feature of residential housing markets in China, where dual property rights coexist due to dual land ownership in the constitution, that is, urban land belongs to the state whereas rural land is collectively owned. The price difference between dual property rights for otherwise identical properties reflects the present value of cash flow differentials due to market liquidity, collateralization opportunities in borrowing, and uncertainty associated with future disposition. We estimate the relative annualized price of different property rights to be 61-72 percent for the limited property rights. We also study the effect of a municipal zoning change as a natural experiment on the relative price. Zoning codes reduce the uncertainty related to compensation from future demolition. Our estimates indicate government regulation plays an important role in a housing market that has experienced rapid appreciation over a long period. We further show that higher property right uncertainty may lead to more speculation as proxied by turnover rates and price volatility.</p>  <p><b>Hanming Fang</b> is Class of 1965 Term Professor of Economics at the University of Pennsylvania and Dean of the School of Entrepreneurship and Management at ShanghaiTech University. He is a Partner Investigator at the ARC Centre of Excellence in Population Ageing Research (CEPAR) and the Scientific Director of CEPAR’s Australia-China Population Ageing Research Hub. Professor Fang is an applied microeconomist with broad theoretical and empirical interests focusing on public economics. His research covers topics ranging from discrimination, social economics, psychology and economics, and welfare reform to public good provision mechanisms, auctions, health insurance markets, and population aging. In 2008, Professor Fang was awarded the 17th Kenneth Arrow Prize by the International Health Economics Association (iHEA) for his research on the sources of advantageous selection in the Medigap insurance market. Professor Fang is currently working on issues related to insurance markets, particularly the interaction between the health insurance reform and the labour market, and the alternative health insurance reform proposals. He also studies the Chinese economy, particularly on issues related to population aging and social security. He has been a co-editor for leading economics journals, including the Journal of Public Economics and the International Economic Review, and has served on the editorial board for numerous journals. He was elected as a Fellow of the Econometric Society in 2018.</p>
10:30 – 11:00	Morning Tea

11:00 – 12:30

**SESSION 1 – Wellbeing**

Session chair: Katja Hanewald (CEPAR, UNSW Sydney)

11:00 – 11:30

**Health, Elderly Care, and Subjective Well-being: Evidence from a Randomized Experiment in China**

**Yi Zhang**, Qingqing Zong (both Shanghai University of Finance and Economics)

**Abstract:** Using the data from a randomized vaccine injection experiment on elderly COPD (Chronic Obstructive Pulmonary Disease) patients, this paper analyzes the casual effect of health status on care utilization and subjective well-being among Chinese elderly people. The Difference-in-Difference(DID) regression indicates that comparing to control group, randomized vaccine injection significantly improve the health status of the elderly in treatment group, reduce their demand of formal care and informal care, and raise their subjective well-being. The reduced demand of formal care mainly happen on extensive margin, and informal care mainly on intensive margin. The triple Difference(DDD) regression shows that the raise of subjective well-being focus on the samples which utilize formal or informal cares in baseline, and only in there samples, the elderly self-value score is promoted significantly. Thus, there are two paths that the health status of the old people impacts their subjective well-being: physical improvement directly raises the subjective well-being; the health statues improvement reduce care utilization, increase the self-value, and promote subjective well-being. Surprisingly, we find the scale of indirect effect is 5-6 times of the direct effect both in statistic and economic significance. We expect the indirect effect is much stronger in high educated samples, and group-level DDD regression verify this prediction. Therefore, both formal and informal care can generate a psychological burden which is neglected by traditional policy analysis. The welfare loss of ex-post policy interventions are underestimated, care subsidy for instance. On the contrary, the welfare loss of ex-ante policy interventions like vaccine injection is overestimated.



**Yi Zhang** is an Associate Professor at Shanghai University of Finance and Economics(SUFE). His major research interest is on public economics, especially on social security, pension reform, population ageing, and health economics. He is doing a research project granted by National Natural Science Foundation (NSFC). He received his Ph.D. in Economics from Shanghai Jiao Tong University in 2011. And during 2014-2015, he visited the National University of Singapore as a visiting scholar.

11:30 – 12:00

**Exploring the Relationship between Functional Limitations of the Elderly and the Health-related Quality of Life of Spouses in Shaanxi Province in China**

**Wanyue Dong** (UNSW Sydney; Institute of Health Management and Policy, Xi'an Jiaotong University)

**Abstract:** With the recent increase trends towards longer life expectancy, and the prolongation of disability, the relationship between FL of the elderly and HRQoL of spouses, as well as what else factors aside from FL have strong influence in this relationship is of importance to explore because of the common preference among older people for remaining in their local community and maintaining their social networks throughout the ageing process. The sample was derived from married couples of at least one of them aged  $\geq 60$  years old from the National Health Service Surveys (NHSS) conducted in Shaanxi Province in 2013( $n = 4,514$ ). EQ-5D and VAS were used to measure HRQoL, and No FL, some FL, serious FL groups were divided based on their consequences of daily activities including mobility, auditory, and visual.  $\chi^2$  test and K-W test were used to compare the HRQoL in different groups. A 2-level mixed linear model and stratified analyses were adopted to investigate the influence factors. HRQoL of wife/ husband with a spouse who have some or serious FL was lower than that of the wife/ husband whose spouse has no FL (all  $P < 0.001$ ). Female presented worse HRQoL to their husband's serious FL than male. Ageing, lower educational level, having chronic disease, as well as lower economic status were associated with a lower reported HRQoL of the spouses. In addition, economic level was a factor associated with spouse's HRQoL only when the couple had no FL. Residential status did not relate to the HRQoL of spouses among no FL/ some FL/ serious FL groups. Elderly with FL partner tended to report poorer EQ-5D, suggesting that couples with FL partners may be particularly vulnerable to HRQoL. Economic level aside from FL also have an influence in this relationship.



**Wanyue Dong** is currently a third-year Ph.D. candidate in public health at Xi'an Jiaotong University, where she is working to evaluate the implications of health insurance and inform the policies that are designed to improve health on the elderly. She is interested in what changing elder's health mean for the family, and assessing the implications of social changes on health policies targeting urban and rural elders. She is now studying at UNSW as a research practicum student. Prior to arriving at UNSW, she earned a master's degree of public administration at Xi'an Jiaotong University with a focus on the construction of inpatient service performance index in tertiary medical institutions.

12:00 – 12:30

**Life Satisfaction of Older Chinese: The Role of Health and Health Insurance**

**Sisi Yang** and Katja Hanewald (both CEPAR, UNSW Sydney)

**Abstract:** The most salient feature of China over the past decades is its repaid continuous economic growth and rapid population aging. However, the older adults report limited health insurance coverage and poor health status under the dramatic economic and social changes. Although the Chinese government has conducted a series of health care reforms aiming to expand health insurance coverage, the older adults under the different health insurance schemes experience varied premiums and reimbursement rate of health services. The life satisfaction of the older adults would be impacted under the unbalanced health insurance system. Using the data from China Health and Retirement Longitudinal Study (CHARLS) in 2011, 2013 and 2015, this study aims to examine the impacts of the difference schemes of health care coverage on life satisfaction among Chinese older adults after controlling their health status and other factors. Our study will provide an important evidence base for policymakers addressing the economic and social challenges arising from population aging in China.



**Sisi Yang** is a CEPAR Senior Research Associate, located in the UNSW Business School. She joined the Centre in July 2018. She completed her master's degree in Demography in Chinese Academy of Social Sciences (CASS), and received the PhDs in Demography from Macquarie University and CASS in 2017.

Sisi's research interests focus on issues relating to migration, ageing and well-being, including subjective well-being of older adult, formal and informal settlement of migrants, migrant workers and employment, and health and inequality, mainly based on data from large scale surveys, censuses and

interview data. Her current research involves the examination of life satisfaction of older adult in China, permanent settlement intentions of China's rural-urban migrants, health status of rural-urban migrants in China, well-being of China-born migrants in Australia and the related theoretical and policy implications of ageing and migration in China, Australian and the international context. Her research has been published in both national and international academic journals, including the journal of *Urban Studies*, the journal of *Urban and Environment Studies* and *Chinese Journal of Population Science*. She has also co-authored reports and books on health and migration related issues, including The Annual Report on Chinese International Migration, which has been published recently. She has been reviewer in several academic journals, such as journal of *Population, Space and Place*.

12:30 – 13:30

Lunch

13:30 – 15:00

**SESSION 2 – Policies and Inequality**

Session chair: Bei Lu (CEPAR, UNSW Sydney)

13:30 – 14:00

**Land Reallocation Responses to China's New Rural Pension Scheme: Evidence from a Regression Discontinuity Design**

**Xinjie Shi** (Crawford School of Public Policy, The Australian National University)

**Abstract:** This paper examines how labour reallocation is associated with the land reallocation that has occurred following the introduction of the New Rural Pension Scheme (NRPS) in 2009. Drawing on pooled data from two waves (2013 and 2015) of the China Health and Retirement Longitudinal Survey (CHARLS), this paper uses the discrete changes generated by the rules of the new program to identify its impact on land reallocation, proxied by the amount of land rented out by the elderly and his or her spouse. The NRPS eligibility threshold at age 60 is associated with a large increase in land rented out, a change which is shown to be linked with labour reallocation in response to the NRPS program. The most important channel identified is the increase in the number of migrants among adult children, which reduces the number of workers for farming and may also help to relax credit constraints (although this is not verifiable in the analysis). In contrast, the NRPS program has no effects on the labour supply of the

elderly: neither their time spent caring for grandchildren nor paid work in the labour market changes. A further look into the welfare effect shows that, despite the labour and land reallocation, the NRPS has no impact on either household consumption or the well-being of the elderly.



**Xinjie Shi** is a PhD candidate (in Economics) of Crawford School of Public Policy at The Australian National University. Xinjie's research has covered a wide range of Chinese rural development issues., including rural-urban migration, agricultural production, inequality (of opportunity), rural pension scheme and ageing issues.

14:00 – 14:30

### **Income Inequality among the Elderly: Evidence from China**

**Katja Hanewald** (CEPAR, UNSW Sydney), Ruo Jia (Peking University), Zining Liu (Peking University)

**Abstract:** The income distribution of the elderly might be more, less, or similar unequal to that of the young. We analyze the income inequality among the elderly in China over the period 1989-2015 using household panel data from the China Health and Nutrition Survey (CHNS). We compare the income inequality between the elderly and the young. We decompose elderly income inequality by socioeconomic groups and by income sources to identify the cumulative process leading to the elderly income inequality. We find that the urban-rural gap, mediated by educational attainment, is the primary cause of elderly income inequality. Our results suggest that elderly income inequality in China can be reduced by equalizing benefits of different public pension programs and, in the long run, by equalizing the educational attainment of urban and rural residents.



**Katja Hanewald** is a Senior Research Fellow in CEPAR's Australia-China Population Ageing Research Hub and Senior Lecturer at UNSW Sydney. Her research addresses risk management and insurance aspects of population ageing. Her current research investigates ageing trends, the design of retirement financial products and optimal retirement financial decisions of older households in China. Previously, Katja held academic positions at Humboldt-Universität zu Berlin, Germany (2008-2010), and at the University of New South Wales (2011-2013), and worked at the German Federal Ministry of Finance (2013-2015).

14:30 – 15:00

### **The Corporate Governance of Residential Care Institutions: Chinese Practice and Australian Experience**

**Shuo Yang** (UNSW Law School)

**Abstract:** The current research is going to throw discussion on the corporate governance issues of nursing homes operating in China and Australia from a legal perspective. Owing to the accelerated aging phenomenon of China, there has been a rapid increase in the number of nursing homes. As of September 2017, the total number of nursing homes in China exceeded 146,600, suggests an increase of 226% in comparison with 44,300 at the end of 2012. In the meantime, the regulation system of residential care institutions has also been enhanced continuously: In response to the development and service standards of the residential care institutions, the Ministry of Civil Affairs has put forward regulations, for instance, the *Licensing Measures for the Establishment of Residential Care Institutions*, *The Administrative Measures for the Residential Care Institutions*, *Basic Rules for the Residential Care Institutions* and *Quality Management Rules for the Residential Care Institutions*. Currently, there have been issued twelve operating standards in the field of aged care, besides nineteen standards being developed since the year 2017. Nevertheless, Chinese legislators have not attached sufficient significance to governing residential care institutions, in particular, ignoring the governance for the non-profit nursing homes, accounting for 43.9% of service suppliers in the residential care sector. Considering this deficiency, the current research work is going to carry out an analysis of the legislative status of the Chinese residential care institution from two aspects, which include internal governance (organisation constitutions and governance structure) and external governance (regulatory authorities and regulatory content). In the meantime, the researcher is going to provide an introduction of the internal governance practice and regulatory framework of residential care institution in Australia. To learn from the other countries' experiences may help promote and standardize the development of China's aged care industry.



**Shuo Yang** is a PhD candidate at the UNSW Law Faculty, and a member of the Herbert Smith Freehills China International Business and Economic Law (CIBEL) Centre. She holds two Masters from the Queen Mary University, UK and Shan Dong University of Finance and Economics, China. Shuo's primary research area is civil and commercial law, with a particular focus on company law, corporate governance, non-profit organisations and social enterprise.

15:00 – 15:30

Afternoon Tea

15:30 – 17:30

**SESSION 3 – Long-term Care**

Session chair: Hazel Bateman (CEPAR, UNSW Sydney)

15:30 – 16:00

**Long-term Care Insurance Financing using Home Equity Release: Evidence from an Experimental Study**

**Tin Long Ho** (CEPAR, UNSW Sydney), Hazel Bateman (CEPAR, UNSW Sydney), Hanming Fang (University of Pennsylvania, ShanghaiTech, CEPAR), Katja Hanewald (CEPAR, UNSW Sydney)

**Abstract:** Long-term care (LTC) insurance protects against future unexpected LTC costs. However, due to the costly nature of LTC insurance, take-up rates are relatively low internationally. At the same time, home equity release products, including reverse mortgages and home reversion plans, are also unpopular, as individuals use their housing assets to hedge against future unexpected LTC cost. To solve the difficulties of funding LTC insurance and the substitution effect of housing wealth, we develop a new financial product which allows individuals to use their housing wealth to fund LTC insurance premiums. To ascertain the demand for this new product, we conduct and analyse an experimental online survey that focuses on Chinese homeowners aged 45-64. We make two key contributions to the literature: (1) We suggest viable solutions to both the LTC insurance and the reverse mortgage puzzles; and (2) we analyse the potential demand for different product designs linking LTC insurance and home equity release products. We test how accessible housing wealth and socioeconomic covariates impact the demand for LTC insurance. Our results will allow policymakers and businesses to assess the potential demand for the new products and to develop a successful and mature private market for LTC insurance.



**Tin Long Ho** is a PhD candidate at the School of Risk and Actuarial Studies at UNSW Sydney and the ARC Centre of Excellence in Population Ageing Research (CEPAR). His research currently focuses on retirement planning in China and the role of housing and new retirement financial products. His research interests are pricing and design of financial products; home equity release for retirement financial planning. Tin Long Ho obtained a Bachelor of Commerce in Actuarial Studies (Honours) from the University of Melbourne.

16:00 – 16:30

**Total Health Cost Comparison Before and After Entering Long-Term Care in China**

**Bei Lu** (CEPAR, UNSW Sydney), Guanggang Feng (Zhejiang University), Sophie Yan (CEPAR, UNSW), H.Mi

**Abstract:** In China, most of the long-term care that has been provided by top and second tier hospitals, which are already overcrowded. However, for most cases such facilities are not required. This was the motivation for the implementation of the Comprehensive Care Insurance for Disabled Elderly (CCIDE) which began as a pilot in Qingdao in 2006. In this pilot, the Qingdao government shifted resources from the top and second tier hospitals to lower tier hospitals to (1) reduce the burden on the top and second tier hospitals, (2) improve delivery (from a time and geographic perspective) of long term care to those that need such attention and (3) reduce the cost of provision of long term care (LTC) to the government.



**Bei Lu** is a CEPAR Research Fellow located at the UNSW Business School and a Research Fellow with Tsinghua University and Zhejiang University, China. Bei returned to academia in 2002 to undertake a PhD in Economics at UNSW after working as an international trader for 12 years. Her research focuses on demographics, health, pensions and population ageing related social welfare and economic issues. Bei has been very successful in developing international linkages over the past ten years with organisations such as the provincial government of Zhejiang, China, the World Bank China and academic institutions. She is currently participating in a Chinese Key National Science Project. She has presented her research at a number of international conferences including the StanfordHarvard Population Ageing Conference and the London School of Economics Long-Term Care Conference. Her research has appeared in the International Social

Security Review, the Journal of the Economics of Aging, Population Review, CESifo Economic Studies and the Journal of Aging and Social Policy. She also has published in Chinese newspapers, journals and books.

16:30 – 17:00

### **An Experimental Study of the Demand for Hybrid Longevity and Health Insurance Products**

**Cheng Wan** (CEPAR, UNSW Sydney), Hazel Bateman (CEPAR, UNSW Sydney), Hanming Fang (University of Pennsylvania, ShanghaiTech, CEPAR), Katja Hanewald (CEPAR, UNSW Sydney)

**Abstract:** We conduct an online experimental survey to elicit and analyse preferences for hybrid longevity and health insurance products in China. Participants are asked to advise the allocation of retirement savings across a portfolio of life annuities, critical illness insurance, long-term care insurance, and a savings account for vignette households which differ by wealth and health. Participants also report reasons for allocation choices, exposure to health risks, and retirement planning experience and we collect a comprehensive array of covariates including preferences, financial competence and demographic, and socio-economic factors. The study provides empirical evidence of the interaction between longevity and health insurance products, the impact of having access to hybrid annuity/critical illness/long-term care insurance products on the demand for longevity insurance, as well as insights about the preferences for product attributes. Overall, this research will inform the development of retirement products in China and other developing economies facing population ageing and incomplete insurance markets.



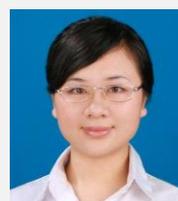
**Cheng Wan** is a 2<sup>nd</sup> year PhD candidate at the School of Risk and Actuarial Studies at UNSW Sydney and the ARC Centre of Excellence in Population Ageing Research (CEPAR). His research currently focuses on longevity risk management, the design of retirement insurance products, and behavioural economics in retirement planning. Cheng obtained a Master degree of Statistics from Katholieke Universiteit Leuven and a Bachelor degree of Mathematics from Wuhan University. Before starting his PhD in Sydney, Cheng worked as an Associate Statistician in Willis Towers Watson Research and Innovation Centre in Wuhan.

17:00 – 17:30

### **Health Status and Functional Disability with Systematic Trends: A Comparison between China and US**

**Yu Fu** (CEPAR UNSW Sydney; Central University of Finance and Economics); Michael Sherris (CEPAR, UNSW Sydney)

**Abstract:** Estimating and predicting the disability rate at the individual level are the fundamental work for the financing and service providing of Long Term Care, especially in the ageing China where such studies are of a limited amount. We extend previous studies on China to a more comprehensive framework which takes competing risk of recovery and death as well as uncertainty into account by adopting the Multi-state Latent Factor Intensity model. Based on the model, we further studied the interactions between disability rates, recovery and mortality rates on the representative's life path by calculating the life expectancy, disability distribution and survival curves using simulation. We provide a cross-country analysis on these subjects by comparing China with the US. The data used is of the same age range (65 and above) and the same period (1998 to 2014), CLHLS for China and HRS for the US. The empirical results show a systematic improvement of the disability rates in both countries. However, as recovery rates deteriorates and disabled mortality improves, people in the two countries spends more time with disability over time. Although both countries experienced an expanding life expectancy, we find the Chinese are living longer active lives as well as longer lives, while the Americans' active life expectancy is shrinking. Besides, the Chinese people averagely have a higher disability-free life expectancy ratio in the total life expectancy. In terms of the uncertainty, it plays a vital role in the incidence of disability in China. We further extend the model of China to include a residence factor to study the urban-rural disparity, and find higher disability risk and lower mortality risk in the urban residents than their rural peers.



**Yu Fu** is a PhD candidate in the China Institute for Actuarial Science at Central University of Finance and Economics, and currently visiting CEPAR at UNSW Sydney under the Research Practicum Scheme. Prior to this, Yu Fu worked at the Sino Life Insurance Co. Ltd. and the Beijing Insurance Research Institute.

17:30

**Closing Remarks**