

Chen, Zeyuan; Park, Albert

Working Paper

Rural pensions, intra-household bargaining, and elderly medical expenditure in the People's Republic of China

ADB Economics Working Paper Series, No. 693

Provided in Cooperation with:

Asian Development Bank (ADB), Manila

Suggested Citation: Chen, Zeyuan; Park, Albert (2023) : Rural pensions, intra-household bargaining, and elderly medical expenditure in the People's Republic of China, ADB Economics Working Paper Series, No. 693, Asian Development Bank (ADB), Manila, <https://doi.org/10.22617/WPS230373-2>

This Version is available at:

<https://hdl.handle.net/10419/298139>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/3.0/igo/>

RURAL PENSIONS, INTRA-HOUSEHOLD BARGAINING, AND ELDERLY MEDICAL EXPENDITURE IN THE PEOPLE'S REPUBLIC OF CHINA

Zeyuan Chen and Albert Park

NO. 693

.....
September 2023

**ADB ECONOMICS
WORKING PAPER SERIES**

ADB Economics Working Paper Series

Rural Pensions, Intra-Household Bargaining, and Elderly Medical Expenditure in the People's Republic of China

Zeyuan Chen and Albert Park

No. 693 | September 2023

The *ADB Economics Working Paper Series* presents research in progress to elicit comments and encourage debate on development issues in Asia and the Pacific. The views expressed are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors or the governments they represent.

Zeyuan Chen (zychen@swufe.edu.cn) is an assistant professor at the School of Public Administration, Southwestern University of Finance and Economics, Chengdu, People's Republic of China. Albert Park (afpark@adb.org) is the Chief Economist and Director General of the Economic Research and Development Impact Department, Asian Development Bank.



Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO)

© 2023 Asian Development Bank
6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 8632 4444; Fax +63 2 8636 2444
www.adb.org

Some rights reserved. Published in 2023.

ISSN 2313-6537 (print), 2313-6545 (electronic)
Publication Stock No. WPS230373-2
DOI: <http://dx.doi.org/10.22617/WPS230373-2>

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of the Asian Development Bank (ADB) or its Board of Governors or the governments they represent.

ADB does not guarantee the accuracy of the data included in this publication and accepts no responsibility for any consequence of their use. The mention of specific companies or products of manufacturers does not imply that they are endorsed or recommended by ADB in preference to others of a similar nature that are not mentioned.

By making any designation of or reference to a particular territory or geographic area, or by using the term “country” in this publication, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

This publication is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <https://creativecommons.org/licenses/by/3.0/igo/>. By using the content of this publication, you agree to be bound by the terms of this license. For attribution, translations, adaptations, and permissions, please read the provisions and terms of use at <https://www.adb.org/terms-use#openaccess>.

This CC license does not apply to non-ADB copyright materials in this publication. If the material is attributed to another source, please contact the copyright owner or publisher of that source for permission to reproduce it. ADB cannot be held liable for any claims that arise as a result of your use of the material.

Please contact pubsmarketing@adb.org if you have questions or comments with respect to content, or if you wish to obtain copyright permission for your intended use that does not fall within these terms, or for permission to use the ADB logo.

Corrigenda to ADB publications may be found at <http://www.adb.org/publications/corrigenda>.

Notes:

In this publication, “\$” refers to United States dollars and “CNY” refers to yuan.
ADB recognizes “China” as the People’s Republic of China.

ABSTRACT

The rural elderly in the People's Republic of China spend less on medical expenditures as they age despite declining health, which raises welfare concerns. This paper investigates the role of intra-household bargaining power on health expenditures of the elderly by evaluating the impact of cash transfers from a new social pension program. The program provided windfall payments to those above age 60, making it possible to employ a regression discontinuity design based on age of eligibility to estimate causal effects. Using data from the 2011 and 2013 waves of the China Health and Retirement Longitudinal Study, we find that receiving pension payments increases both the utilization of outpatient care and outpatient expenditures by the elderly who experienced illness. This result is robust to controlling for total household expenditures per capita, ruling out income effects as the main channel. Consistent with pensions increasing elderly bargaining power, we find that pensions significantly increase medical expenditures only for those elderly who co-reside with children or grandchildren but have no effect on those who live independently.

Keywords: medical expenditures, pension, elderly, intra-household bargaining, regression discontinuity design, People's Republic of China

JEL codes: J14, J26

1. Introduction

A large share of elderly in the People's Republic of China (PRC) are poor and in bad health, making them highly vulnerable. According to the China Health and Retirement Longitudinal Study (CHARLS) baseline survey conducted in 2011–2012, 22.9% of elderly (defined as those above age 60) in the PRC were consumption poor, 31.8% reported being in poor health, and 40.0% exhibited elevated depressive symptoms (Zhao et al. 2013a). The rural elderly were particularly at risk. According to CHARLS data, 28.9% were poor, and the rural elderly spent less on medical expenditures as they age despite declining health, in contrast to the urban elderly, as well as most elderly around the world, who spend substantially more on medical care as they get older (Park and Xia 2014; Yang, Norton, and Stearns 2003).

One possible reason that rural elderly in the PRC underutilize health-care services is that they are more destitute, although research suggests that this is not the explanation (Park and Xia 2014). It could also be the case that rural families are making difficult choices about how to allocate scarce resources. These decisions are being made by the elderly themselves or by their children, or are the result of intra-household bargaining processes. Given that many rural elderly co-reside with children in multigenerational households, the relative bargaining power of the elderly may be an important factor influencing the amount of resources spent on the elderly, and thus elderly well-being. Thus, investigating how intra-household bargaining affects health-care utilization by the elderly has great policy relevance.

In this study, we investigate how cash transfers from a newly introduced social pension program influences doctor visits and medical expenditures by the rural elderly in

the PRC. The New Rural Social Pension (NRSP) scheme in the PRC was introduced in 2009, and provided monthly transfers to those above age 60. In the program's early years, these transfers were essentially windfall payments because the elderly were not expected to have made any previous contributions to the program. On average, the pension amount was about 10% of mean income per capita in rural PRC. The pension payments thus can be considered exogenous shocks to the income and relative bargaining power of the elderly. We apply a regression discontinuity design based on age of eligibility under the NRSP to identify the causal effects of pension payments on elderly health-care utilization. In addition, we estimate impacts when controlling for total household expenditures per capita, and separately for those who do and do not co-reside with children or grandchildren to provide evidence that the impacts of the program are consistent with increased bargaining power of the elderly.

This study contributes to a large literature on intra-household resource allocation that finds abundant evidence that the bargaining power of individual members influences outcomes. Doss (2013) provides a review of this literature for developing countries; one common finding is that more productive family members are often favored. Challenges to studying intra-household resource allocation empirically is the difficulty of isolating exogenous determinants of relative bargaining power and of finding measurements of individual outcomes (since most surveys in developing countries are of households, not individuals). In this study, we are able to take advantage of a natural experiment based on eligibility thresholds for a new social pension program. We use data from the CHARLS 2011 and 2013 waves, which also contain detailed data on individual health-care utilization and health expenditures of elderly household members. The PRC introduced

universal health insurance coverage for rural residents in the mid-2000s; however, because the benefits from this insurance were very limited, most rural Chinese still rely mainly on out-of-pocket (OOP) payments to finance health expenditures (You and Kobayashi 2009). Since health expenditures can account for a large proportion of total household expenditure, it is reasonable to expect that household bargaining processes influence how much is spent on the medical care of individual household members.

Our study is one of only a few to study how intra-household decision-making affects the elderly (Kochar 1999, Mangyo 2008). Previous studies find that the elderly are less favored. This research also contributes to the literature on health-care utilization in the developing world. Research on medical payments in the PRC mostly focuses on evaluating features of the health insurance system or the consequences of high health payment burdens (Sun et al. 2009, Wagstaff et al. 2009). According to the Andersen model, health-care utilization depends on predisposing characteristics (demographic, social structure and health beliefs), enabling resources (from personal, family and community) and needs (both actual and perceived) (Andersen 1995). Our study helps to understand how health-care utilization is affected by an increase in enabling resources targeted to individual elderly.

Health-Care System in the People's Republic of China

The health system in the PRC has been substantially reformed over the past several decades, and is now very market-oriented. In 2012, the share of individual OOP payments in total health-care spending was 34% (National Health and Family Planning Commission of the PRC 2013). There are three main public health insurance schemes in the PRC: the Urban Employee Basic Medical Insurance (UEBMI) scheme for

employees in urban areas, the New Cooperative Medical Scheme (NCMS) starting in 2003, and the Urban Resident Basic Medical Insurance (URBMI) scheme that began in 2007. Together, they covered 92% of the population by 2011 (Yip et al. 2012). The NCMS and the URBMI both are subsidized voluntary programs. The NCMS achieved almost universal coverage in rural areas by 2007. Initially it prioritized covering hospitalization (or inpatient) costs and later it was extended to cover some outpatient expenditures. Although reimbursement rates and the types of expenses covered vary geographically, overall NCMS provides very limited insurance benefits, with high copayments, large deductibles, and low reimbursement ceilings (Wagstaff and Lindelow 2008, Yip et al. 2012).

Numerous studies have evaluated the impacts of NCMS. Although NCMS increased health-care utilization, it did not significantly reduce OOP health-care expenditures (Wagstaff et al. 2009, Cheng et al. 2015). Generally speaking, poor people use more outpatient care and rich people use more inpatient care. As a consequence, NCMS reduced medical expenses less for poor people than for rich people. Moral hazard on the supply side may help explain why OOP expenditures did not fall significantly (Wagstaff and Lindelow 2008). Health services are paid as fee-for-service, which leads doctors to steer patients to drugs, tests, and services with higher margins. Public hospitals and clinics dominate the health system, but they are expected to rely mainly on their own revenue, which incentivizes them to maximize medical payments and shift costs to patients and insurers, resulting in more expensive care.

For these reasons, even after the introduction of NCMS, health expenditures continued to create heavy financial burdens for many families (Tang et al. 2008). You and

Kobayashi (2011) find that better-off families tend to spend more on health care but this is mainly due to greater spending by the richest households. Low-income households suffer more from high financial burdens due to medical expenditures (Meng et al. 2004), are at greater risk of incurring catastrophic medical expenses (Van Doorslaer et al. 2007), and are less likely to seek health care when diagnosed (Zhang et al. 2007). The rural elderly have been consistently poorer than the prime-age population, and thus often rely upon financial support from their children (Cai et al. 2012).

Introduction of the New Rural Social Pension Insurance

The NRSP program was launched in late 2009. It is called “New” to differentiate it from old rural pension schemes that were experimented with in some regions in the 1990s. By scaling up the NRSP as well as a new urban residents’ pension program introduced in 2011, the Government of the PRC, for the first time, provided Chinese residents without formal employment with old age benefits. However, the amount of monthly pension payments under the new schemes remained much lower than that available to urban employees. In 2009, the NRSP was piloted in 10% of counties throughout the country. NRSP expanded quickly in 2010 and 2011. By the end of 2010, 24% of counties and 143 million persons were covered, and by the end of 2011, 60% of counties and 359 million rural Chinese were covered. NRSP achieved full geographic coverage by the end of 2012.

NRSP consists of a basic social pension financed by the government, and individual accounts financed by both individual premiums and government subsidies. Rural residents who are age 16 and above and do not participate in the urban employee pension program are eligible to participate. The annual insurance premium ranges from

CNY100 to CNY500 per year.¹ The government also provides a subsidy to individual accounts. Those who select higher premiums enjoy greater subsidies. NRSP is designed to be a voluntary pension program. Rural residents can choose whether to enroll and select the payment level. The eligible age for pension benefits is 60.² Those who sign up when they are under 45 must pay premiums continuously for at least 15 years before they can claim pension benefits. Residents who are age 45 and above are required to pay the premiums each year until they reach age 60. Participants who are age 60 and over when the program began are entitled to basic pension benefits without paying premiums.³ The CHARLS baseline survey was conducted in 2011 soon after the NRSP was introduced, so that nearly all pension recipients at the time of the survey did not pay any premiums. For such individuals, pension payments can be considered to be windfall cash transfers.

The government pays the basic social pension for eligible participants. The minimum basic pension was initially set at CNY55 (\$9) per month, paid by the central government. Local governments could decide whether they wanted to top up benefits using their own resources. Generally, the basic pension is CNY55 or CNY60 per month. Some rich provinces have higher basic pension levels; for example, the basic pension is CNY280 per month in Beijing. The average rural income per capita in the PRC was CNY6,977 in 2011 (National Bureau of Statistics 2018). Meanwhile, regional differences are large. In rich provinces, rural income per capita is above CNY12,000 (Beijing, Jiangsu, Zhejiang) while it is below CNY5,000 in western provinces (Gansu, Guizhou). The elderly

¹ In some richer provinces, the categories of premium could be up to CNY1,000 per year.

² The only exception is Beijing where the eligible age of pension benefit is 55 for women and 60 for men. In some counties in Jiangsu Province women above 55 were eligible until 2011.

³ Receiving benefits was initially made conditional on enrolment by children, but later this rule was abandoned.

population has a lower income than the whole rural population. In the CHARLS 2011 and 2013 waves, the average household income per capita is CNY7,559 for those aged 50 to 69. The median household income per capita is CNY3,250, and the mean for the poorest quartile is only CNY1,050. Thus, pension income accounts for over 20% of income for 50% of the elderly. For those elderly in the bottom 25%, it accounts for two-thirds of their income. Therefore, although pension income is small in absolute value, it comprises a large share of the rural elderly's income.

The pension income has reduced the mortality among the elderly, and the possible channels are through better nutrition and perceived health-care access (Cheng et al. 2018, Huang and Zhang 2021). It is consistent with studies from other developing countries that unconditional cash transfers may improve recipients' health outcomes (Hessel et al. 2018, Pega et al. 2017). In the PRC, the price elasticity of health care is higher than in developed countries (Feng, Hong, and Zhen 2020; Lu, Shi, and Yang 2019). As pensions increase income, it is expected to affect health-care utilization and expenditure.

Intra-household Resource Allocation

The decision on whether or not an individual utilizes health-care services is the outcome of decision-making processes within households. The unitary model developed by Becker (1991) treats the family as a single unit whose members share common preferences, pool resources, and allocate them to maximize the utility of the whole family. Many studies have challenged these assumptions and provided empirical evidence inconsistent with the unitary model. For example, Lundberg, Pollak, and Wales (1997) study a benefit scheme targeting children in the United Kingdom and find that the welfare of children improves when transfers are made to mothers rather than fathers. Alternative

models recognize that family members have individual preferences, with decisions resulting from cooperative or non-cooperative bargaining processes (Lundberg and Pollak 1996). The collective model avoids making specific assumptions about the decision-making process, but does assume that household allocations are Pareto efficient; in this case, allocation decisions can be characterized by sharing rules that divide income from different sources among individual members who maximize their own utility (Chiappori, Fortin, and Lacroix 2002).

In typical bargaining models, we expect the allocation of resources to reflect the relative economic contributions of different household members. Household members who have more bargaining power are more likely to have their preferences reflected in intra-household resource allocation decisions. Bargaining power is often defined by individual characteristics, such as individual income, assets under control, or potential earning ability. Because such indicators are endogenous to unobserved preferences and abilities, many empirical studies rely upon external shocks or payments, such as cash transfer programs or changes in laws or regulations (e.g., Duflo 2003, Rangel 2006, Qian 2008).

Most empirical studies examine the allocation of money and time within couples and for children, while only a few articles investigate decision-making within extended families (Case and Deaton 1998, Duflo 2003). Studies using South African data find that cash transfers to the elderly influence educational spending on grandchildren (Duflo 2003) and that consumption patterns change differently depending on the gender of the recipient (Case and Deaton 1998). Like much research, both South African studies examine aggregate household expenditure data, making it impossible to examine impacts

on the consumption of individual household members. Interpreting the results as reflecting bargaining power thus requires making assumptions about the preferences of individual members.

Studies examining resource allocation to the elderly are rare. As the elderly in general are less productive and have less income than prime-age adults, decreasing medical expenditure with age could just reflect their declining economic contributions. Kochar (1999) finds that in rural Pakistani older males' medical expenditure is positively associated with own income but is not sensitive to increases in household income. In contrast, prime-age males gain from increases in both own income and household income. Thus, the elderly appear to be less favored, although the paper does not directly address the endogeneity of individual incomes. Mangyo (2008) studies nutrition allocation in the PRC. He finds that more productive or favored household members, including prime-age adults and men, have higher income elasticity. He uses rainfall shocks to identify the impact of changes in household expenditures, but is unable to examine the impact of exogenous changes in individual income.

2. Methodology

In the empirical analysis, we study the impact of an exogenous shock to the income of the elderly on individual medical expenditures by the elderly. Having detailed data on both exogenous individual income and individual expenditure of the elderly, as well as the income of other household members and household expenditures, provides the opportunity to credibly identify how increased bargaining power of the elderly within households affects expenditures that benefit them.

Fuzzy Regression Discontinuity Design

We use a regression discontinuity (RD) approach to exploit the discontinuity in the probability of receiving treatment (NRSP benefits) when the individual turns 60. The RD design can be viewed as a randomized experiment if candidates have no control over the running variable near the threshold (Lee 2008). Therefore, it allows us to examine the causal effects of individual income changes on health-care utilization. Given incomplete compliance, a fuzzy RD approach is applied using a two-stage least squares estimator. We use the exogenous assignment to treatment eligibility (based on age) to instrument for the individuals' actual participation in the NRSP. The model can be written as follows:

$$T_i = \alpha + \gamma_0 D_i + f(\text{age}_i) + \theta X_i + \varepsilon_i \quad (1)$$

$$Y_i = \alpha + \beta_0 \hat{T}_i + f(\text{age}_i) + \theta X_i + \varepsilon_i \quad (2)$$

The first stage equation (1) models actual treatment (NRSP receipt, T_i) as a function of treatment eligibility (D_i). Individuals younger than 60 (older than 60) at the time of the survey are observed with a treatment eligibility of zero (one). To interpret the intercept of the estimates, the running variable age is centered at the cut-off point 60. Hence,

$$D_i = \begin{cases} 1 & \text{if centered age}_i \geq 0 \\ 0 & \text{otherwise.} \end{cases}$$

The first stage also controls for age (centered at age 60), as well as a vector of controls, X_i . The second stage equation (2) predicts the outcome as a function of instrumented NRSP receipt, \hat{T}_i , obtained from the first stage. Just as for the first stage, the equation controls for the function of age, a vector of individual characteristics as well as an error term. We use a linear interaction model, where the age function includes age and the interaction of age and whether the respondent is aged 60 or older. By including the interaction term, we allow for different slopes above and below the cutoff. The vector

of control variables is included to generate more robust results, but it is not required for achieving an unbiased RD design (Jacob et al. 2012). Hence, adding control variables should not alter the results greatly.

Data

We analyze data from the baseline wave of the CHARLS conducted in 2011–2012 and its follow-up survey conducted in 2013 (see Zhao et al. [2013b] for a detail description of CHARLS). The sample is limited to those who live in rural communities that had introduced the NRSP by the time of the survey and are aged 50 to 69 at the time of the survey. By the time of the baseline survey, NRSP had been launched in 118 villages in 24 provinces, out of 301 administrative villages surveyed by CHARLS. NRSP achieved nationwide coverage by the time the follow-up survey was conducted in 2013, so all villages included in 2013 are included. Since rural residents could only join the NRSP in their place of household registration (*hukou*), we exclude respondents without local *hukou*. Also, 431 respondents who are enrolled in other pension programs are excluded. Since we are investigating intra-household resource allocation, we also exclude 306 individuals who live alone.⁴ This produces a sample of 2,797 individuals from the baseline wave and 5,618 from the 2013 wave. The two waves are pooled to obtain a larger sample.

The survey records rich health-related information, including health status, type of health insurance, and health-care utilization. Individuals are asked whether they have experienced any illness during the 1-month period preceding the interview. For each illness episode reported, respondents are asked whether they sought health-care service,

⁴ All of the main results are robust to including individuals who live alone in the sample.

how many times they utilized outpatient services to treat the illness, and the total expenditures spent for the visits, including medicine and doctors' fees. The most recent visit is well-documented, including the type and location of the health facility, total expenditures, and OOP expenditures. Respondents are also asked about all episodes of inpatient care at a clinic or hospital during the past 12 months, including the number of visits and the total amount spent. Information on the most recent hospitalization is recorded at the same level of detail as the last outpatient visit.

Of our sample of CHARLS respondents, 96.5% are covered by health insurance. Most of them (93.8%) are insured by the NCMS. Only a few people (N=185) are covered by more generous insurance schemes such as the UEBMI. The reimbursement rates for outpatient care and inpatient care vary across regions. The average ratios of OOP to total expenditure are 85.8% and 65.2% for outpatient care and inpatient care, respectively. The high OOP proportion indicates that health-care expenditure is mainly financed by patients and their families. Out of 8,415 individuals, 2,520 reported illness episodes in the past month. Out of them, 1,824 persons used outpatient care in the last month and spent an average of CNY644 in OOP expenses per visit. As many as 935 persons (11.1%) utilized inpatient care in the past year with an average OOP expenditure per episode of CNY5,409. The expenditure per inpatient care visit is more than two-thirds of the average household income per capita (CNY7,776). Thus, medical expenditure creates a significant financial burden.

Variables

Dependent variables used in the analysis include indicator variables for whether respondents utilized health-care services (outpatient services in the last month and inpatient care in the last year) and the natural log of the amount of OOP medical expenditures (on outpatient care in the last month and inpatient care in the last year). To focus attention on those who have potential demand for outpatient health-care services, we restrict the sample to those elderly who ever got sick in the past month. With regards to inpatient services, respondents are not first asked whether they have had any illnesses in the past year, so we do not restrict the sample to those who have had health problems.⁵

Summary statistics for the dependent variables are presented in table 1. Conditional on experiencing illness in the past month, 73.84% and 71.04% of those above and below age 60 use outpatient care. The older group uses outpatient care more frequently when sick, but they spend less money on OOP expenditures per visit. Including the full sample not conditional on being sick, the older group utilizes slightly more health-care services and spends more per visit than the younger group in terms of both outpatient care and inpatient care. This suggests that the older group may be more vulnerable to sickness.

The main independent variable or “treatment” in which we are interested is the receipt of pension payments. To implement the “fuzzy” regression discontinuity design, we employ a dummy variable for whether the respondent’s age is above 60 as an instrumental variable. After estimating the total impacts of treatment, we estimate the

⁵ Respondents are first asked if they had inpatient care in the past year. If the answer is no, they are further asked whether they should have used inpatient care due to illness. The likelihood that individuals will rationalize their behavior means that these questions cannot be reliably used to accurately categorize which respondents had health issues that might benefit from inpatient treatment.

impacts while controlling for $\ln(\text{household expenditure per capita})$, which absorbs the effect of increased household income on health-care utilization. If the impact of pensions on household spending were solely due to a household income effect, we would expect that after controlling for total household expenditures per capita, pension receipt should not affect the amount of expenditures spent on specific goods and services. On the other hand, if bargaining power of the elderly within the household is increased by having pension income, then pension receipt should influence health expenditures even after controlling for household expenditure per capita.⁶

Other control variables include sex, education, marital status, work status, health status (whether the individual has any functional limitations), household size (defined as the number of household members who were at home for at least 6 months in the past year), number of children above age 18, co-residence with children, and co-residence with grandchildren. Besides demographics and living arrangements, we control for whether the person is covered by good health insurance,⁷ which directly affects OOP medical expenses. A year dummy variable is included to control for whether the observation is from the second wave of CHARLS in 2013.

Summary statistics for the independent variables for those above and below age 60 are presented in Table 2. Of those above age 60, 60.8% received pension payments from the NRSP. The gender composition is balanced in both cohorts. Most respondents

⁶ The results change little if we control for log of household income per capita instead of log of household expenditures per capita. The difference between the two is the household's saving rate, so controlling for household expenditures per capita absorbs the effects of pensions on both income per capita and household saving.

⁷ Good health insurance refers to health insurance that provides better health provision than NCMIS. It mainly includes Urban Employee Medical Insurance. Government Medical Insurance and private medical insurance are also considered as good insurance.

(> 90%) are married. The older group on average has slightly smaller household size and more adult children. Of those surveyed, 46.9% live with children and 45.3% live with grandchildren. A higher share of the younger cohort (60.7%) live with children, likely because more of their children are unmarried. It is not uncommon for respondents to take care of grandchildren when their children migrate to urban areas. More people from the older group report functional limitations but fewer of them have good health insurance. The older group has lower education—34% are illiterate and only 12% have completed middle school or above. The younger group are better educated, with 32% completing middle school. A smaller proportion of the older group (76.46%) is working compared with the younger group (85.82%). Nevertheless, a majority of the elderly above age 60 are still working, mostly in farming, which suggests that the elderly still rely on labor income. In terms of economic status, the younger group is richer. The average household consumption per capita is CNY8,204.47 for the younger group and CNY6,994.37 for the older group.

3. The Impact of Pensions

This section starts with graphical evidence and then presents the results of regression analysis. To verify the existence of a discontinuity in the likelihood of receiving pension benefits at age 60, we plot the receipt of pension income with respect to age. Figure 1 shows that there is a large jump in the likelihood of having pension income at age 60 from 0% to 35% and then to over 60% a year later. This confirms that the first stage of the IV is strong. The relatively low percentage of those receiving pensions at age 60 may be due to the fact that people who just reached age 60 may not claim their pension benefit right away. Figure 2 shows the patterns of using outpatient care and the amount

of outpatient OOP expenditures (in logs) among those who report illness in the past month. Although the discontinuities are not as obvious, they are still evident and it is clear that the trends are different to the left and right of the cutoff point. Figure 3 shows health-care utilization unconditional on being sick, including both the use of outpatient care and inpatient care and the amount of medical expenditures (in logs). Although the magnitudes and slopes vary, there are jumps at age 60 and the slope changes at age 60.

The graphical evidence suggests there exist discontinuities in outcomes near the cutoff. Formal regressions are run to quantify the magnitudes and statistical significance, and control for age and other variables. Table 3 shows the first stage regression results. We estimate versions of equation (1) using different bandwidths (range of ages around age 60). When the bandwidth is set to 3 years (including those age 57 to 62), being above age 60 increases the probability of receiving pensions by 25.9% without covariates and by 25.6% with covariates (columns 1 and 2). When we use a larger bandwidth of 8 years, the coefficients become larger—46.1% and 46.2% without (with) covariates.

To estimate the fuzzy RD model, we employ a robust RD estimation method (rdrobust command in STATA).⁸ The method chooses the optimal power of the polynomial for the running variable, and controls for predicted bias of using observations further from the threshold (Calonico, Cattaneo, and Titiunik 2014). The method also chooses an optimal bandwidth (on average, about 3 years). As seen from Table 3, the first stage estimate from using a bandwidth of 3 years is relatively weak. To include more observations in the model, we increase the bandwidths to 5 years and use this as the baseline model. We

⁸ Two-stage-least-squares regression is run for comparison. The results are very similar with results from rdrobust.

control for community fixed effects by subtracting community means from all variables. This helps control for all unobserved differences across communities. The standard error is clustered at the community level since we rely on the community questionnaire to define whether a village has introduced the rural pension and access to medical services can vary considerably across communities.

Table 4 presents the baseline estimates from the fuzzy RD regression. In addition to the coefficient on the treatment variable (receipt of pension), we also present the mean value of the sample under age 60 (given the selected bandwidth) to help interpret the size of effects. We also report the first-stage coefficient, the bandwidth, and the order of the polynomial for age. In most models in the paper, the polynomial order is 1.

Receipt of pension income increases the probability of using outpatient care by 50% among those elderly who experienced illness in the past month. The coefficient is significant at the 95% confidence level. Given that the mean value of using outpatient care conditional on being sick in the sample under age 60 is 71.2%, the treatment effect seems quite large. However, note that there is a downward trend with age among the elderly under age 60 (Figure 2), which makes the value just below age 60 lower than the mean. Moreover, the treatment effect is a LATE which could only be interpreted as the effect among compliers, i.e. those who actually receive pension income. The pension benefit also significantly increases outpatient expenses conditional on being sick. Therefore, having pension benefits allows the elderly to seek health-care services and spend more on themselves when they fall sick. Using the full sample including those who do not report illness in the past month, we find that the likelihood of an outpatient visit, outpatient spending, the use of inpatient care and inpatient spending also increases

substantially (but is not statistically significant) (last four columns of Table 4).

To examine whether the effects of pension receipt are driven by increases in total household income, we further control for $\ln(\text{household expenditure per capita})$ and the results are presented in Table 5. All the coefficients and significance levels are very similar to the case when household expenditure per capita is not controlling for. Therefore, the income effect cannot explain the increase in health-care utilization. The results are consistent with pensions increasing the bargaining power of those who receive pensions and thus control more income.⁹

4. Bargaining with Whom?

Previous research finds that the rural elderly spend less as they age even though their health is deteriorating, and that this is not explained by declining incomes (Park and Xia 2014). It could be that the elderly themselves are reluctant to spend scarce family resources on their health care as they approach the end of their lives, reflecting altruistic motivations. If elderly preferences were aligned with those of their children, then we are approaching a unitary model, and pension receipt should not affect health-care utilization after controlling for household expenditure per capita. However, it could also be the case that these difficult choices reflect the preferences of other family members, especially children, who may prioritize investments in their own children over health care for their parents. In this case, increased bargaining power due to pensions should affect health-

⁹ Estimated impacts of the pension program could be larger in the first years of implementation due to pent-up demand, but the large effects of pension could also remain if the rural elderly are liquidity constrained. We examined data for 2015 and found similar impacts of pensions on health-care utilization and spending using the same R-D estimation approach, which shows that the large effects of pension do not diminish with time.

care utilization by the elderly. Thus, the results presented thus far suggest that elderly preferences are not aligned with those of their children.

We can push the analysis further to confirm this interpretation by conducting the analysis separately for those who live with children or grandchildren and those who do not (since we have excluded those living alone, this group includes those living with their spouses and/or others).¹⁰ If the impact of pension receipt is driven by increased bargaining power when preferences differ from those of children or grandchildren, we would expect large impacts for the sample that live in the same households as their children or grandchildren, and smaller or no effects when the elderly are not co-resident with such family members. For those living independently, expenditures are more likely to reflect their own preferences even without pensions, so that pension receipt will have less influence on intra-household resource allocation decisions.

Table 6 shows the regression results for those who live with children or grandchildren, controlling for household expenditure per capita. To better compare the estimates with the full sample, we use the same bandwidths as Table 5. Pensions increase both outpatient utilization and expense conditional on being sick. Thus, pensions significantly increase doctor visits and medical expenditures for those living with children or grandchildren. The significant results for the full sample are mainly driven by this group.

Table 7 gives estimates for those who do not live with children or grandchildren. None of the coefficients are significant and one of them is even negative. This subgroup has a smaller sample size, which may partly explain the lack of statistical significance,

¹⁰ There is a concern that the living arrangement itself is endogenous, as it could be affected by whether one receives a pension. We estimate the regression discontinuity design specification using whether the elderly coresides with their children as the outcome variable (Appendix 1). The regression result shows that the pension does not significantly affect the probability of living with children.

and it is worth noting that for a number of the outcomes the effect magnitude is comparable to those who co-reside with children or grandchildren. Nevertheless, the contrasting results between tables 5 and 6 suggest that those who cohabit with children or grandchildren benefit more from pension income, especially with respect to medical expenditures conditional on being sick. This implies that the elderly have different preferences than their children regarding spending money on their own health-care needs, so that in extended households, the elderly's health needs may be neglected if they lack bargaining power.

The results from Tables 6 and 7 support the bargaining power story, but other explanations cannot be ruled out. Several alternative stories could explain the contrasting results for those with different living arrangements. First, those who live in extended families could be poorer, so that pensions may have a greater impact on health expenditure. In other words, they are more likely to be credit constrained. Table 8 presents the household income and consumption per capita by living arrangement.¹¹ Interestingly, those who live with their spouse only on average have lower income but higher consumption than those who live with children or grandchildren. The mean household income of those living alone is CNY6,634 compared to CNY8,031 for those living with children or grandchildren. Further calculations reveal that those who live independently are poorer than those living with children or grandchildren in every income quantile. Thus, greater impacts of pensions on health-care utilization when living in extended families cannot be explained by such families being poorer.

¹¹ The bandwidth used in the baseline models is 5. We show the income distribution for the elderly between 55 and 65.

On the other hand, those elderly living independently have a higher average household expenditure per capita (CNY9,145) compared with those who are living with extended family (CNY6,396) (Table 7). The extended family earns more but spends less, meaning that it saves more. It makes sense for older people living independently to save less, since people typically dissave when they are old, and extended families need to save for future retirement and children's education and future housing. These differences in saving priorities also suggest that pensions could reduce saving by extended families and so increase expenditure per capita by more than the value of the pensions themselves. This effect is not captured in the regressions that control for household income per capita. The table reveals that the elderly are poorer than the non-elderly. Their median household income per capita is much lower than the median household income per capita (CNY6,197) of rural families (National Bureau of Statistics 2018). Given that rural households in the PRC, especially poor people, typically lack access to credit markets, it is difficult to smooth consumption. This reduces the concern that the elderly may change their consumption before age 60 in anticipation of an expected increase in income at age 60, which would require that they borrow from the future. The fact that we find significant effects of turning age 60 on health spending itself provides *prima facie* evidence that many households are liquidity constrained. To the extent that some households are not liquidity constrained, our estimates underestimate the impact of rural pensions on those who are liquidity constrained.

The second possible explanation for the contrasting results between two types of living arrangement is that those who have poorer health are more likely to live with children. They may have greater demand for health-care services, and thus be more

affected by pension income. We compare the self-reported health and functional limitations of those who live in extended families and those who do not, and find there is no significant difference (Appendix 2). This helps to rule out the poorer health explanation.

A third possible explanation is that those who co-reside with their children or grandchildren may have an advantage in accessing health-care services while others have a higher opportunity cost for visiting health-care facilities. However, not living with children does not mean not getting support from children. Previous studies show that those who do not live with their children usually have a child living nearby to provide support when needed (Lei et al. 2015). Out of 3,826 persons that do not live with their children, 39.75% (N=1,521) have at least one adult child living in the same village or neighborhood, and 70.33% (N=2,691) have at least one adult child living in the same county or city. To test whether having support from children makes a difference, we compare the health-care utilization and expenses between those who have at least one adult child living nearby and those who do not (Appendix 3). The results reveal that in most cases, whether having children nearby or not does not affect the utilization of health care significantly. We also show that directly comparing those who live with children or grandchildren and those who do not, there is no systematic difference in health status or health-care utilization behavior (Appendix 2). These findings make it much less likely that living with children increases the accessibility of health-care services and leads to a greater effect of pensions on health-care utilization.

Although living arrangements may be endogenous and correlated with other factors, we have been able to rule out several possible alternative explanations for the pattern of results that we find. Being poorer, less healthy, or having better access to

health-care facilities cannot explain the larger effect among those who live in extended families. Although other explanations cannot be ruled out, a change in bargaining power remains the explanation most consistent with the contrasting results for those with different living arrangements.

5. Robustness Analysis

To validate the main empirical results, we perform a series of sensitivity tests. RD estimates may be sensitive to the function of age and the bandwidth. We first run regressions using different bandwidths. In addition to bandwidths of 5 years, we use the optimal bandwidths chosen by `rdrobust` (on average 3 years) and bandwidths of 8 years (Appendix 4). Overall, the direction and significance are similar across different bandwidths, while the magnitude decreases as the bandwidth increases. These results are as expected, as the biggest jump in the outcome should exist near the threshold. Taking outpatient expense conditional on sick as an example, having pension income increases outpatient expenditures for all bandwidths. The results suggest that the treatment effects are robust and not overly sensitive to the choice of bandwidths. Then we calculate the Akaike's criterion (penalized cross-validation) to examine the optimal order of the polynomial. Since it is better to use the same order of the polynomial in the first and the second stage of a fuzzy RD design (Lee and Lemieux 2010), we test the order of the polynomial based on a sharp RD design. The effect of turning age 60 on health-care utilization and expenditure is quite stable across different orders of the polynomial and bandwidths, though it becomes less significant when higher orders of polynomials are used (Appendix 5). The optimal order of the polynomial chosen using

Akaike Information Criterion is order 1 for all bandwidths, which supports our choice of the linear model in the main regression.

One underlying assumption of the RD design is that no other variables influencing health-care utilization are also changing discontinuously at the cutoff. We verify this assumption by checking whether other covariates jump at age 60 using a sharp RD regression design (Appendix 6). We find that there are no significant changes at age 60 in functional limitations, self-reported health status, educational attainment, household expenditure per capita, or labor supply.

We also perform the McCrary test, which is designed to test whether there is manipulation of the running variable (age) (Appendix 7). If people just under the cutoff can change their age to age 60 to claim pension benefits earlier, we should see a concentration of persons at age 60 and fewer people aged 59. The McCrary test examines whether there is discontinuity in the density of running variable. We report the test results for different bandwidths. We pass the tests for all bandwidths except for the bandwidth of 8 years. This does not threaten our main results that are all based on much smaller bandwidths.

Finally, two placebo tests are performed. One examines whether there is a discontinuity in the outcome variables absent the NRSP. Half of villages did not introduce NRSP at the time of the baseline wave of CHARLS in 2011. We use respondents from these villages to test whether there are jumps in health-care utilization and health expenses at age 60. As the NRSP had not been introduced, we estimate a sharp RD design (Appendix 8). There are no significant changes in health-care utilization at age 60

in villages where NRSP did not exist. Thus, there is no reason to expect such changes to happen elsewhere when there is no NRSP.

The other placebo test uses another age instead of age 60 to implement the RD regression. We choose a nearby age—age 61—as there is another jump in the probability of receiving pensions at age 61 (Figure 1). Sharp RD is used (Appendix 9). Passing age 61 does not significantly change health-care utilization and the coefficients are much smaller in magnitude.

6. Conclusion

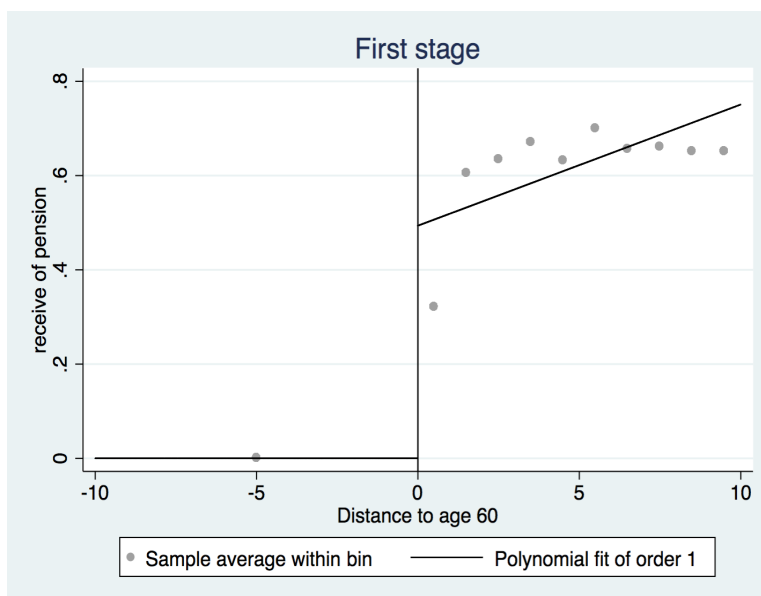
This paper uses a recently introduced pension reform—the NRSP—to explore the intra-household decision-making process in rural PRC. NRSP provided windfall payments to those above age 60. We examine the effect of pension receipt on elderly health-care utilization. Overall, we find that for those experiencing illness episodes, receiving pensions increases the probability of seeking health services and the amount of medical expenditures spent OOP. Having more income indeed facilitates health-care utilization in rural PRC. The result persists even when we control for household expenditure per capita, ruling out the effect of pensions being mainly an income effect. Our finding supports intra-household bargaining power models that predict that household members with more income will be favored in intra-household resource allocation.

While the result reveals that the elderly spend more on health care when they have more bargaining power, it is not clear with whom they bargain. If it is mainly children and grandchildren who have different spending priorities, the impacts of pensions should be greater for those who live in extended families. Indeed, we find significant positive effects

among elderly who live with children or grandchildren but not for those who live only with their spouses or others.

Our findings show that recently introduced pensions may significantly improve elderly well-being by increasing their bargaining power within their families, which may enable them to spend more on health care. This should alert policy makers that the family support system may not be as protective of the needs of the elderly as is often assumed. Our results suggest that the rural elderly (or at least their health) are not prioritized in intra-household resource allocation, highlighting the need for greater institutional support for rural elderly in the PRC. Our study also has an implication for other developing countries, particularly for those countries where the elderly mainly relies on family support systems. It shows that targeting benefits directly to the elderly and building better social security systems can significantly improve the well-being of the elderly.

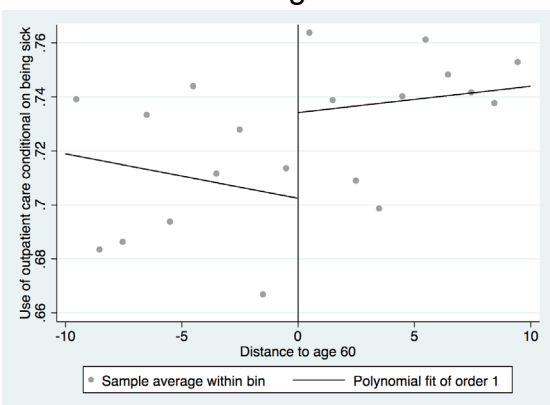
Figure 1: Receipt of Pension by Age



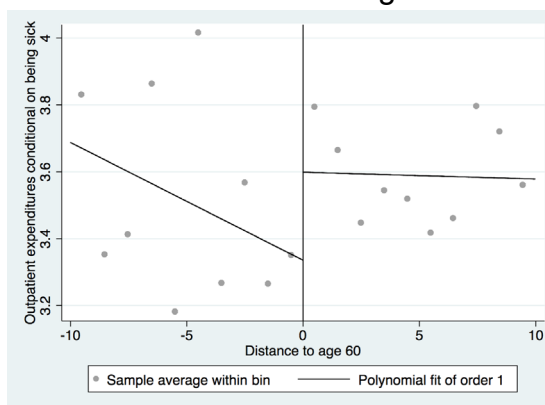
Source: Authors' calculations.

Figure 2: Use of Outpatient Care and Outpatient Expenditures Conditional on Being Sick

(a) Use of Outpatient Care Conditional on Being Sick

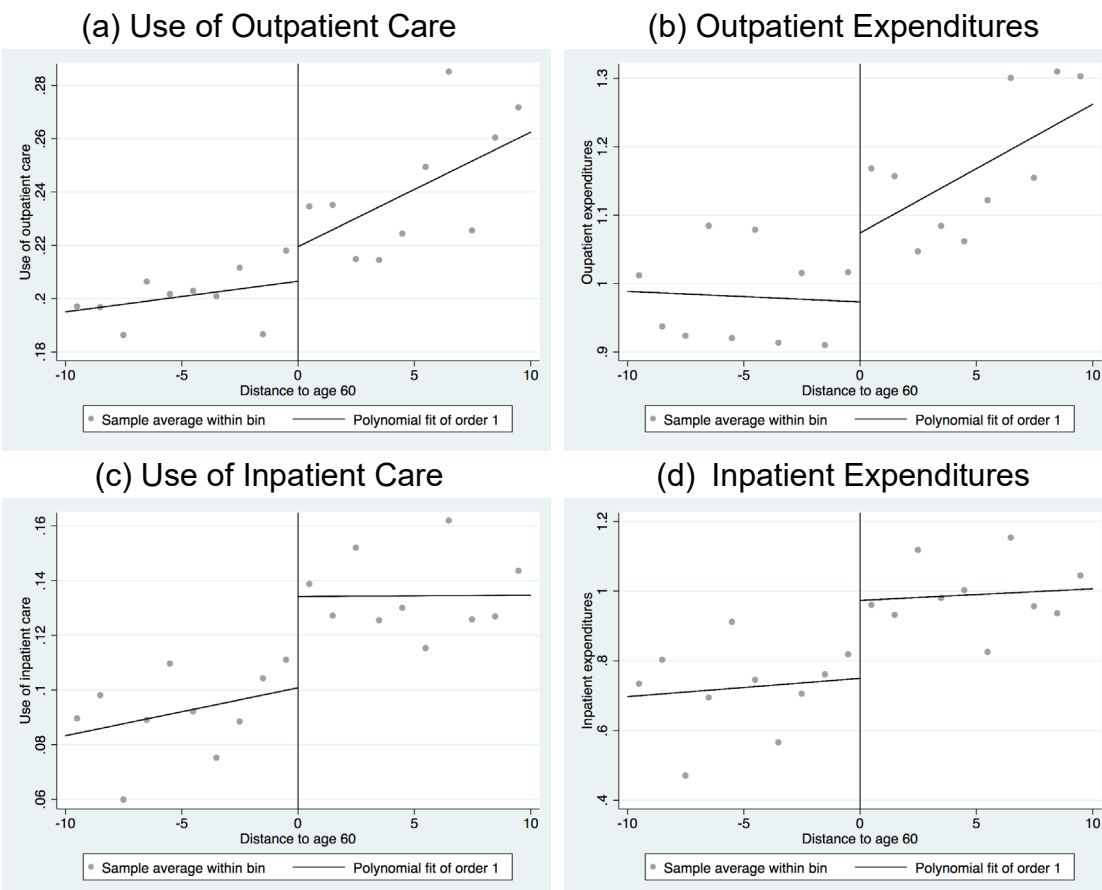


(b) Outpatient Expenditures Conditional on Being Sick



Source: Authors' calculations.

Figure 3: Use of Outpatient Care, Outpatient Expenditures, Use of Inpatient Care and Inpatient Expenditures



Source: Authors' calculations.

Table 1: Summary of Dependent Variables

Dependent Variable	Above 60		Below 60	
	N	Percentage/ Mean(CNY)	N	Percentage/ Mean(CNY)
Use of outpatient care conditional on being sick	1,208	73.84%	1,312	71.04%
Outpatient expenditures conditional on being sick	1,211	510.32	1,305	583.15
Use of outpatient care	3,742	23.84%	4,634	20.11%
Outpatient expenditures	3,759	164.40	4,656	163.45
Use of inpatient care	3,754	13.43%	4,653	9.26%
Inpatient expenditures	3,759	865.45	4,656	805.17

Source: Authors' calculations.

Table 2: Summary of Independent Variables

Independent Variable	Above 60		Below 60	
	N	Percentage/Mean (CNY)	N	Percentage/Mean (CNY)
Age	3,759	4.40	4,656	-4.73
Receipt of pension benefit	3,759	60.84%	4,656	0%
Male	3,759	49.69%	4,656	48.82%
Household size	3,759	3.67	4,656	3.90
Currently working	3,759	76.46%	4,656	85.82%
Number of adult children	3,759	3.21	4,656	2.37
Whether coresident with grandchildren	3,759	45.28%	4,656	41.54%
Whether coresident with children	3,759	46.90%	4,656	60.70%
Married	3,759	91.03%	4,656	95.60%
Functional limitation	3,759	25.59%	4,656	15.27%
Good health insurance	3,759	1.14%	4,647	3.06%
CHARLS second wave	3,759	68.34%	4,656	65.49%
Total consumption per capita	3,759	6994.37	4,654	8204.47
<i>Education level</i>				
illiterate	1,282	34.10%	1,317	28.29%
primary school and below	1,913	50.89%	1,687	36.23%
middle school and above	467	12.42%	1,498	32.17%
missing	97	2.58%	154	3.31%

CHARLS = China Health and Retirement Longitudinal Study.

Source: Authors' calculations.

Table 3: First Stage: Regressing Receipt of Pension Benefits on Being Older than Age 60 and Age

Variable	(1) Bandwidth=3	(2) Bandwidth=3 with covariates	(1) Bandwidth=5	(2) Bandwidth=5 with covariates	(3) Bandwidth=8	(4) Bandwidth=8 with covariates
D60	0.259***	0.256***	0.387***	0.386***	0.461***	0.462***
	-0.024	-0.024	-0.019	-0.018	-0.015	-0.015
age	0.000	-0.004	0.000	-0.003	0.000	-0.004
	-0.010	-0.010	-0.005	-0.005	-0.002	-0.002
D60*age	0.176***	0.187***	0.075***	0.081***	0.039***	0.043***
	-0.014	-0.014	-0.007	-0.007	-0.004	-0.003
Constant	0.000	0.014	0.000	-0.059	0.000	-0.004
	-0.017	-0.133	-0.013	-0.103	-0.010	-0.085
Observations	2,987	2,982	4,807	4,800	6,958	6,947
R-squared	0.420	0.524	0.441	0.529	0.465	0.538

Note: Model (2) and (4) controlled for household size, work status, gender, education, number of adult children, living with children, living with grandchildren, married, functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 4: Fuzzy Regression Discontinuity Approach without Controlling for Household Expenditure per Capita

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(patient expenditures)
Receipt of pension	0.500** (0.199)	3.983*** (1.253)	0.144 (0.119)	0.907 (0.620)	0.136 (0.102)	0.529 (0.750)
p value	0.012	0.001	0.227	0.144	0.182	0.481
Mean value of sample under age 60	0.712	506.722	0.204	143.505	0.0938	686.561
Observations	2,502	2,498	8,367	8,406	8,398	8,406
Coef. of first stage	0.127***	0.123***	0.122***	0.120***	0.120***	0.120***
Bandwidth	5	5	5	5	5	5
Eff. Number of obs left to the cutoff	726	722	2541	2555	2553	2555
Eff. Number of obs right to the cutoff	690	692	2236	2247	2245	2247
Order of Loc. Poly.(p)	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2

Notes: Controlling for household size, work status, gender, education, number of adult children, living with children, living with grandchildren, married, having a functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 5: Fuzzy Regression Discontinuity Approach Controlling for Ln (Household Expenditure per Capita)

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(inpatient expenditures)
Receipt of pension	0.496** (0.199)	3.859*** (1.246)	0.144 (0.119)	0.900 (0.619)	0.134 (0.102)	0.514 (0.751)
p value	0.013	0.002	0.229	0.146	0.190	0.494
Mean value of sample under age 60	0.712	506.722	0.204	143.505	0.0938	686.561
Observations	2,502	2,498	8,365	8,404	8,396	8,404
Coef. of first stage	0.127***	0.123***	0.122***	0.120***	0.120***	0.120***
Bandwidth	5	5	5	5	5	5
Eff. Number of obs left to the cutoff	726	722	2539	2553	2551	2553
Eff. Number of obs right to the cutoff	690	692	2236	2247	2245	2247
Order of Loc. Poly.(p)	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2

Notes: Controlling for Ln(household expenditure per capita), household size, work status, gender, education, number of adult children, married, having a functional limitation, having good insurance and CHARLS wave. Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 6: Regression Discontinuity Approach Estimates for Elderly Living with Children or Grandchildren
(with controlling for household expenditure per capita)

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(inpatient expenditures)
Receipt of pension	0.437* (0.227)	4.331*** (1.437)	0.103 (0.152)	0.929 (0.792)	0.133 (0.123)	0.852 (0.912)
p value	0.055	0.003	0.498	0.241	0.280	0.350
Mean value of sample under age 60	0.739	483.665	0.224	144.738	0.097	675.77
Observations	1,735	1,729	5,568	5,591	5,586	5,591
Coef. of first stage	0.095**	0.090**	0.122***	0.120***	0.120***	0.120***
Bandwidth	5	5	5	5	5	5
Eff. Number of obs left to the cutoff	524	520	1729	1737	1736	1737
Eff. Number of obs right to the cutoff	459	461	1406	1413	1412	1413
Order of Loc. Poly.(p)	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2

Notes: Controlling for ln(household expenditure per capita), household size, work status, gender, education, number of adult children, married, having a functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 7: Regression Discontinuity Approach Estimates for Elderly Living with Neither Children nor Grandchildren
(with controlling for household expenditure per capita)

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(inpatient expenditures)
Receipt of pension	0.509 (0.410)	2.079 (2.213)	0.262 (0.215)	1.018 (1.059)	0.143 (0.164)	-0.032 (1.277)
p value	0.215	0.348	0.222	0.336	0.382	0.980
Mean value of sample under age 60	0.642	565.605	0.161	140.883	0.088	709.506
Observations	767	769	2,797	2,813	2,810	2,813
Coef. of first stage	0.225***	0.225***	0.121***	0.120***	0.120***	0.120***
Bandwidth	5	5	5	5	5	5
Eff. Number of obs left to the cutoff	202	202	810	816	815	816
Eff. Number of obs right to the cutoff	231	231	830	834	833	834
Order of Loc. Poly.(p)	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2

Notes: Controlling for ln(household expenditure per capita), household size, work status, gender, education, number of adult children, married, having a functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 8: Income/Consumption Distribution by Living Arrangement for those Age 55-65 (CNY)

	N	Mean	Median	p(25)	p(75)
Household income per capita					
All sample	4,804	7,550.56	4,526.00	1,418.75	9,890.00
Living with children/grandchildren	3,151	8,031.40	5,220.00	1,830.00	10,353.33
Living with neither	1,653	6,633.97	3,200.00	970.00	8,650.00
Household expenditure per capita					
All sample	4,805	7,341.78	5,018.07	2,771.67	8,478.00
Living with children/grandchildren	3,152	6,396.37	4,403.00	2,488.47	7,473.33
Living with neither	1,653	9,144.50	6,234.00	3,620.00	10,694.80

Source: Authors' calculations.

Appendix 1: Regression Discontinuity Estimates: The Effect of NRSP on Whether the Elderly Live with their Children

Variable	Living with children
Receipt of pension	0.060 (0.092)
Observations	8,406
Coef. of first stage	0.120***
Bandwidth	5
Eff. Number of obs left to the cutoff	2555
Eff. Number of obs right to the cutoff	2247
Order of Loc. Poly.(p)	1
Order bias (q)	2

NRSP = New Rural Social Pension.

Notes: Controlling for household size, work status, gender, education, number of adult children, living with grandchildren, married, functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Appendix 2: Health-Care Utilization/Expense and Health Status by Living Arrangement (age 50–69)

Variable	<u>Living with children or grandchildren</u>		<u>Living with neither</u>		Difference in means
	N	Percentage/ Mean(CNY)	N	Percentage/ Mean(CNY)	
Use of outpatient care conditional on being sick	1,745	0.72	775	0.74	-0.02
Outpatient expenditures conditional on being sick	1,739	494.92	777	667.09	-172.17
Use of outpatient care	5,574	0.22	2,802	0.20	0.02**
Outpatient expenditures	5,597	153.77	2,818	183.94	-30.17
Use of inpatient care	5,592	0.11	2,815	0.12	-0.01
Inpatient expenditures	5,597	797.32	2,818	901.18	-103.86
Functional limitation	5,597	20.05%	2,818	19.55%	0.01
Poor health (Self-reported)	5,490	28.21%	2,773	29.50%	0.012

Source: Authors' calculations.

**Appendix 3: Health-Care Utilization and Expenditures
among those Who Do Not Live with Children
(age 50–69)**

	<u>No child lives nearby</u>		<u>At least one child lives nearby</u>		Difference in means
	N	Percentage /Mean (CNY)	N	Percentage/ Mean (CNY)	
Use outpatient care conditional on sick	672	0.708	433	0.732	-0.024
Outpatient expense conditional on sick	673	586.644	435	458.071	128.573
Use outpatient care	2,291	0.208	1,515	0.209	-0.001
Outpatient expense	2,305	171.285	1,521	131.006	40.278
Use inpatient care	2,304	0.109	1,519	0.125	-0.017
Inpatient expense	2,305	691.376	1,521	1,010.994	-319.618*

Source: Authors' calculations.

**Appendix 4: Regression Discontinuity Estimates Using Different Bandwidths (Linear Interaction Model)
Controlling for Household Expenditure per Capita**

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(inpatient expenditures)
Bandwidth						
rdrobust auto	1.181**	3.921**	0.209	1.345	0.390*	2.468
5	0.496**	3.859***	0.144	0.900	0.134	0.514
8	0.297**	2.182***	0.104	0.663*	0.095	0.456

Notes: Controlling for household size, work status, gender, education, number of adult children, living with children, living with grandchildren, married, having a functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Appendix 5: Regression Discontinuity Estimates Using Different Bandwidth and Polynomial of Different Orders without Controlling for Household Expenditure per Capita

	(1) Use outpatient care conditional on sick	(2) Ln(outpatient expenditures conditional on sick)	(3) Use outpatient care	(4) Ln(outpatient expenditures)	(5) Use inpatient care	(6) Ln(inpatient expenditures)
Polynomial of order						
One						
Bandwidth 3	0.142**	0.966**	0.0236	0.133	0.0748*	0.417
Bandwidth 5	0.115*	0.858**	0.0272	0.169	0.0282	0.110
Bandwidth 8	0.101**	0.698**	0.0350	0.207	0.0260	0.112
Two						
Bandwidth 3	0.180*	0.815	0.0523	0.135	0.0868	0.492
Bandwidth 5	0.143*	1.050**	0.0193	0.144	0.0557	0.261
Bandwidth 8	0.119*	0.623	0.0363	0.187	0.0243	0.0610
Three						
Bandwidth 3	0.237**	0.844	0.103	0.312	0.101	0.590
Bandwidth 5	0.183*	0.851	0.0435	0.152	0.0694	0.319
Bandwidth 8	0.134	0.759	0.0121	0.112	0.0493	0.253
Optimal order of the polynomial						
Bandwidth 3	1	1	1	1	1	1
Bandwidth 5	1	1	1	1	1	1
Bandwidth 8	1	1	1	1	1	1

Notes: The optimal order of polynomials is chosen using Akaike's criterion (penalized cross-validation). Standard errors in parentheses.
 *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Appendix 6: Discontinuity of Other Variables

Variable	(1) Functional limited	(2) Self-reported health	(3) Education attainment	(4) Ln(household consumption per capita)	(5) Currently working
D60	-0.023 (0.036)	0.111 (0.083)	0.105 (0.077)	0.025 (0.108)	0.013 (0.032)
Observations	8,415	8,263	8,415	8,413	8,415
Bandwidth	5	5	5	5	5
Eff. Number of obs left to the cutoff	2,560	2,517	2,560	2,558	2,560
Eff. Number of obs right to the cutoff	2,247	2,208	2,247	2,247	2,247
Order of Loc. Poly.(p)	1	1	1	1	1
Order bias (q)	2	2	2	2	2

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Appendix 7: McCrary Test Results

Bandwidth	Order of Loc. Poly.(p)	Bandwidth on the left	Bandwidth on the right	T	p-value
Rddensity-data driven bandwidth selection (default)	2	2.598	3.377	0.049	0.961
Rddensity-data driven bandwidth selection	1	1.994	1.982	-0.212	0.833
Rdrobust-data driven bandwidth	1	2.849	2.849	-1.4485	0.148
Set bandwidth==5	1	5	5	-0.8647	0.387
Set bandwidth==8	1	8	8	-2.002	0.045

Source: Authors' calculations.

**Appendix 8: Regression Discontinuity Approach (RDA) Estimates from Areas
without Introduction of New Rural Social Pension**
(Sharp RDA based on China Health and Retirement Study 2011)

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(inpatient expenditures)
D60	-0.008 (0.086)	0.169 (0.471)	0.063 (0.057)	0.276 (0.269)	-0.047 (0.034)	-0.320 (0.277)
Observations	910	909	3,202	3,223	3,220	3,223
Bandwidth	5	5	5	5	5	5
Eff. Number of obs left to the cutoff	282	281	1,044	1,051	1,049	1,051
Eff. Number of obs right to the cutoff	257	256	843	847	846	847
Order of Loc. Poly.(p)	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2

Notes: Controlling for household size, work status, gender, number of adult children, living with children, living with grandchildren, married, functional limitation and having good insurance. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Appendix 9: Placebo Test Using Age 61 as the Cutoff Age

Variable	(1) Use of outpatient care conditional on being sick	(2) Ln(outpatient expenditures conditional on being sick)	(3) Use of outpatient care	(4) Ln(outpatient expenditures)	(5) Use of inpatient care	(6) Ln(inpatient expenditures)
D60	-0.025 (0.061)	-0.618 (0.402)	0.007 (0.036)	-0.090 (0.203)	-0.017 (0.028)	-0.080 (0.219)
Observations	2,502	2,498	8,365	8,404	8,396	8,404
Bandwidth	5	5	5	5	5	5
Eff. Number of obs left to the cutoff	752	750	2,571	2,584	2,583	2,584
Eff. Number of obs right to the cutoff	655	657	2,108	2,120	2,118	2,120
Order of Loc. Poly.(p)	1	1	1	1	1	1
Order bias (q)	2	2	2	2	2	2

Notes: Controlling for household size, work status, gender, number of adult children, living with children, living with grandchildren, married, having a functional limitation, having good insurance and CHARLS wave2. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

REFERENCES

- Andersen, Ronald M. 1995. "Revisiting the Behavioral Model and Access to Medical Care: Does It Matter?" *Journal of Health and Social Behavior* 36 (1): 1–10.
- Becker, Gary S. 1991. *A Treatise on the Family*. Cambridge: Harvard University Press.
- Cai, Fang, John Giles, Philip O'Keefe, and Dewen Wang. 2012. *The Elderly and Old Age Support in Rural China: Challenges and Prospects*. Washington, DC: World Bank.
- Calonico, Sebastian, Matias D. Cattaneo, and Rocio Titiunik. 2014. "Robust Nonparametric Confidence Intervals for Regression-Discontinuity Designs." *Econometrica* 82 (6): 2295–326.
- Case, Anne, and Angus Deaton. 1998. "Large Cash Transfers to the Elderly in South Africa." *The Economic Journal* 108 (450): 1330–61.
- Cheng, Lingguo, Hong Liu, Ye Zhang, Ke Shen, and Yi Zeng. 2015. "The Impact of Health Insurance on Health Outcomes and Spending of the Elderly: Evidence from China's New Cooperative Medical Scheme." *Health Economics* 24 (6): 672–91.
- Cheng, Lingguo, Hong Liu, Ye Zhang, and Zhong Zhao. 2018. "The Health Implications of Social Pensions: Evidence from China's New Rural Pension Scheme." *Journal of Comparative Economics* 46 (1): 53–77.
- Chiappori, Pierre-André, Bernard Fortin, and Guy Lacroix. 2002. "Marriage Market, Divorce Legislation, and Household Labor Supply." *Journal of Political Economy* 110 (1): 37–72.
- Doss, Cheryl. 2013. "Intrahousehold Bargaining and Resource Allocation in Developing Countries." *The World Bank Research Observer* 28 (1): 52–78.
- Duflo, Esther. 2003. "Grandmothers and Granddaughters: Old - Age Pensions and Intrahousehold Allocation in South Africa." *The World Bank Economic Review* 17 (1): 1–25.

- Feng, Jin, Song Hong, and Wang Zhen. 2020. "The Elderly's Response to a Patient Cost-Sharing Policy in Health Insurance: Evidence from China." *Journal of Economic Behavior & Organization* 169 (January 2020): 189–207.
- Hessel, Philipp, Mauricio Avendano, Carlos Rodríguez-Castelán, and Tobias Pfutze. 2018. "Social Pension Income Associated with Small Improvements in Self-Reported Health of Poor Older Men in Colombia." *Health Affairs* 37 (3): 456–63.
- Huang, Wei, and Chuanchuan Zhang. 2021. "The Power of Social Pensions: Evidence from China's New Rural Pension Scheme." *American Economic Journal: Applied Economics*, 13 (2): 179–205.
- Jacob, Robin Tepper, Pei Zhu, Marie-Andrée Somers, and Howard S. Bloom. 2012. *A Practical Guide to Regression Discontinuity*. New York: MDRC.
- Kochar, Anjini. 1999. "Evaluating Familial Support for the Elderly: The Intrahousehold Allocation of Medical Expenditures in Rural Pakistan." *Economic Development and Cultural Change* 47 (3): 621–56.
- Lee, David S. 2008. "Randomized Experiments from Non-random Selection in Us House Elections." *Journal of Econometrics* 142 (2): 675–97.
- Lee, David S., and Thomas Lemieux. 2010. "Regression Discontinuity Designs in Economics." *Journal of Economic Literature*, 48 (2): 281–355
- Lei, Xiaoyan, John Strauss, Meng Tian, and Yaohui Zhao. 2015. "Living Arrangements of the Elderly in China: Evidence from the CHARLS National Baseline." *China Economic Journal* 8 (3): 191–214.
- Lu, Yi, Julie Shi, and Wanyu Yang. 2019. "Expenditure Response to Health Insurance Policies: Evidence from Kinks in Rural China." *Journal of Public Economics*, 178 (October 2019): 104049.
- Lundberg, Shelly, and Robert A. Pollak. 1996. "Bargaining and Distribution in Marriage." *The Journal of Economic Perspectives* 10 (4): 139–58.
- Lundberg, Shelly J., Robert A. Pollak, and Terence J. Wales. 1997. "Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit." *Journal of Human Resources* 32 (3): 463–80.

- Mangyo, Eiji. 2008. "Who Benefits More from Higher Household Consumption? The Intra-Household Allocation of Nutrients in China." *Journal of Development Economics* 86 (2): 296–312.
- Meng, Q., R. Li, G. Cheng, and E. Blas. 2004. "Provision and Financial Burden of TB Services in a Financially Decentralized System: A Case Study from Shandong, China." *The International Journal of Health Planning and Management* 19 (S1): S45–S62.
- National Bureau of Statistics. 2018. Database.
<https://data.stats.gov.cn/english/easyquery.htm?cn=C01>.
- National Health and Family Planning Commission. 2013. *China Health Statistical Yearbook 2012*. Beijing.
- Park, A., and Q. Xia. 2014. *Age-Expenditure Patterns for Healthcare in China: Are the Rural Elderly Vulnerable?* Unpublished.
- Pega, Frank, Sze Yan Liu, Stefan Walter, Roman Pabayo, Ruhi Saith, and Stefan K. Lhachimi. 2017. "Unconditional Cash Transfers for Reducing Poverty and Vulnerabilities: Effect on Use of Health Services and Health Outcomes in Low - and Middle - Income Countries." *Cochrane Database of Systematic Reviews* (11).
- Qian, Nancy. 2008. "Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance." *The Quarterly Journal of Economics* 123 (3): 1251–85.
- Rangel, Marcos A. 2006. "Alimony Rights and Intrahousehold Allocation of Resources: Evidence from Brazil." *The Economic Journal* 116 (513): 627–58.
- Sun, Xiaoyun, Sukhan Jackson, Gordon Carmichael, and Adrian C. Sleight. 2009. "Catastrophic Medical Payment and Financial Protection in Rural China: Evidence from the New Cooperative Medical Scheme in Shandong Province." *Health Economics* 18 (1): 103–19.
- Tang, Shenglan, Qingyue Meng, Lincoln Chen, Henk Bekedam, Tim Evans, and Margaret Whitehead. 2008. "Tackling the Challenges to Health Equity in China." *The Lancet* 372 (9648): 1493–501.

- Van Doorslaer, Eddy, Owen O'Donnell, Ravindra P. Rannan-Eliya, Aparanaa Somanathan, Shiva Raj Adhikari, Charu C. Garg, Deni Harbianto, Alejandro N. Herrin, Mohammed Nazmul Huq, and Shamsia Ibragimova, Anup Karan, Tae-Jin Lee, Gabriel M. Leung, Jui-Fen Rachel Lu, Chiu Wan Ng, Badri Raj Pande, Rachel Racelis, Sihai Tao, Keith Tin, Kanjana Tisyaticom, Laksono Trisnantoro, Chitpranee Vasavid, Yuxin Zhao. 2007. "Catastrophic Payments for Health Care in Asia." *Health Economics* 16 (11): 1159–84.
- Wagstaff, Adam and Magnus Lindelow. 2008. "Can Insurance Increase Financial Risk?: The Curious Case of Health Insurance in China." *Journal of Health Economics* 27 (4): 990–1005.
- Wagstaff, Adam, Magnus Lindelow, Gao Jun, Xu Ling, and Qian Juncheng. 2009. "Extending Health Insurance to the Rural Population: An Impact Evaluation of China's New Cooperative Medical Scheme." *Journal of Health Economics* 28 (1): 1–19.
- Yang, Zhou, Edward C. Norton, and Sally C. Stearns. 2003. "Longevity and Health Care Expenditures the Real Reasons Older People Spend More." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 58 (1): S2–10.
- Yip, Winnie Chi-Man, William C. Hsiao, Wen Chen, Shanlian Hu, Jin Ma, and Alan Maynard. 2012. "Early Appraisal of China's Huge and Complex Health-Care Reforms." *The Lancet* 379 (9818): 833–42.
- You, Xuedan, and Yasuki Kobayashi. 2009. "The New Cooperative Medical Scheme in China." *Health Policy* 91 (1): 1–9.
- _____. 2011. "Determinants of Out-of-Pocket Health Expenditure in China." *Applied Health Economics and Health Policy* 9 (1): 39–49.
- Zhang, Tuohong, Shenglan Tang, Gao Jun, and Margaret Whitehead. 2007. "Persistent Problems of Access to Appropriate, Affordable TB Services in Rural China: Experiences of Different Socio-Economic Groups." *BMC Public Health* 7 (19).
- Zhao, Yaohui, John Strauss, Gonghuan Yang, John Giles, Peifeng (Perry) Hu, Yisong Hu, Xiayan Lei, Albert Park, James P. Smith, and Yafeng Wang. 2013a. "China Health and Retirement Longitudinal Study, 2011–2012 National Baseline Users' Guide." National School of Development, Peking University.

_____. 2013b. *Challenges of Population Aging in China: Evidence from the National Baseline Survey of the China Health and Retirement Study (CHARLS)*.

Rural Pensions, Intra-Household Bargaining, and Elderly Medical Expenditure in the People's Republic of China

This study investigates the impact of a new social pension program in the People's Republic of China on the health expenditures of rural elderly people. Results show that receiving pension payments increases outpatient care utilization and expenditures among ill elderly people. Pensions improve bargaining power for elderly people who live with their children or grandchildren. This enables elderly people to spend more on health care. However, pensions have no significant effect on medical expenditures of elderly people who live independently.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

