Family-Provided Old-Age Support and Health Shocks: Evidence from Senior Chinese Households

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Abstract

This paper uses a household fixed effects model to examine the role of the family in providing informal insurance mechanisms and the response of inter-family transfers to health shocks. Using data from the China Health and Retirement Longitudinal Study (CHARLS), we test the hypothesis that financial and time transfer from relatives are used as informal insurance mechanisms when elderly individuals experience adverse health shocks. We employ a measure of health that indicates the difficulty level of performing activities of daily living for senior households to first address how health status impacts elderly labor productivity. We find that health adversely effects labor market outcomes for elderly individuals. Next we use the health measure to determine if family provide support, both through time and money, in the face of adverse health shocks. Our results suggest that family members do provide assistance to the elderly. And finally we look at public transfers and welfare to determine if public transfers also work as insurance against health shocks or if the welfare of households is affected by poor health. Our findings indicate that public transfers do not significantly alter in response to health shocks and households experience no changes in per capita consumption of non-medical goods and services when health shocks occur.

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1 Introduction

Availability of formal insurance is sparse in many developing countries. Prior to the development of the Household Responsibility System in 2003, health insurance in rural China was virtually nonexistent and urban health insurance was directly tied to formal employment, covering only the employed individual (Strauss et al. (2010)).[1] The Urban Resident Basic Medical Insurance Scheme was introduced in 2007 to 79 cities and expanded to 229 cities in 2008, providing insurance to non-employed, urban individuals. The New Cooperative Medical Scheme was established in 2003 in rural China and expanded nationally over time.[2] Research thus far has found that these programs lack coverage of outpatient expenditures, have low and unreliable reimbursement procedures, and differ significantly across coverage and percentage of coverage (Strauss et al. (2010)).[3] The results found in previous studies suggest that formal insurance is improving in China, but there are still many health related expenses that households are responsible for covering without the assistance of the government. In this paper, we attempt to understand the role of the family in providing informal insurance mechanisms and the response of inter-family transfers to income shocks.

When formal insurance is lacking, households that experience a shock to their income must compensate for this loss by adjusting current spending. One of the challenges faced when attempting to determine how families react to income shocks is that both the decision to provide transfers and changes in income are endogenous. Using panel data and a household fixed effects model helps address this challenge. Panel data allow us to observe the same household over multiple waves of data. Thus, we can measure changes in transfers over time. Following previous researchers, we also measure changes in activities of daily living (ADL) of senior individuals in order to estimate health shocks. If health care is a large part of the household's expenses, a health shock can be seen as an income shock, as the household will have less resources for food and other expenses. In this sample, 12% of household expenses are medical expenses. A household fixed ef-

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[1]Less than 50 percent of city dwellers were covered by health insurance in 2005 (World Bank, 2009).

[2]Prior to these reforms, health insurance coverage in rural China was roughly 20 percent. By the end of 2007 coverage reached 86 percent of rural counties (The World Bank, 2009; Strauss et al., 2010).

[3]Strauss and coauthors uses the regional variations in the implementation and timing of these programs to study the impact of policies and programs. Using the China Health and Retirement Longitudinal Study (CHARLS) they find that the majority of elderly individuals have some health insurance, most being covered by the New Cooperative Medical Scheme. Reimbursement rates for inpatient services are found to be between 30-40 percent. However, outpatient reimbursement rate for rural individuals is only 8.5 percent, while urban individuals receive a 30 percent reimbursement rate.

fects model additionally controls for time-invariant unobservable heterogeneity in health endowments and past investments in health status.

Using data from the China Health and Retirement Longitudinal Study (CHARLS) and a household fixed effects model, this paper investigates informal insurance mechanisms, specifically financial and time transfers from relatives. We employ a measure of health that indicates the difficulty level of performing activities of daily living for senior households to first address how health status impacts elderly labor productivity. We find that health adversely effects labor market outcomes for elderly individuals. Next we use the health measure to determine if family provide support, both through time and money, in the face of adverse health shocks. Our results suggest that family members do provide assistance to the elderly. And finally we look at public transfers and welfare to determine if public transfers also work as insurance against health shocks or if the welfare of households is affected by poor health. Our findings indicate that public transfers do not significantly alter in response to health shocks and households experience no changes in per capita consumption of non-medical goods and services when health shocks occur.

Households in developing countries have been tasked with determining alternative methods to mitigate health and income shocks. Without reliable access to formal insurance, households must find alternative methods to smooth consumption during shocks. Alam and Mahal (2014) provide a review of recent empirical literature on measuring the economic impact of health shocks on households. They conclude that households in low- and middle- income countries use a range of sources such as income, savings, borrowing, using loans or mortgages, and selling assets and livestock to meet out of pocket health spending. Transfer flows from family members can be a means to both alleviate poverty and moderate the impact of negative income shocks (Davies (2011)). Rosenzweig (1988) explores the role of the household as a risk-mitigating institution in low-income rural settings and finds that the degree to which households succeed in mitigating risk *ex post* via transfers is significantly influenced by household structure as it facilitates extra-village ties with household relatives serving as alternative shelters in times of severe village-level income or weather shocks. When a household diversifies its family income sources and partakes in intrafamily (and interhousehold) income sharing, they are capable of acting as their own insurers and smoothing household consumption. Rosenzweig and Stark (1989) use a risk model and find that marital arrangements are used as implicit interhousehold contractual arrangements aimed to mitigate income risks and facilitate consumption smoothing in rural India. They find that nonresident in-laws in India are

the principle source of income transfers for households which experience income short-falls associated with weather shocks. Dercon and Krishnan (2000) find further evidence of risk-sharing opportunities providing powerful incentives for entering into marriage contracts, analyzing factors that determine intrahousehold allocation of nutrition within households in rural Ethiopia. Fafchamps and Lund (2003) investigate whether asset sales, gifts, and informal loans allow households to share risk within confined networks of family and friends, finding that loans and gifts vary with shocks, with an increase in gifts and informal loans when a household faces a severe shock in rural Philippines. Both Genoni (2012) and Liu (2016) find evidence of households reducing investment in human capital by removing children from school in response to negative health shocks when formal insurance is unavailable. Using a household survey of rural Tanzania, De Weerdt and Dercon (2006) find that risk-sharing via transfers is the most important coping strategy to deal with the consequences of health shocks. These studies present a similar theme, with family members providing informal insurance when formal insurance is unavailable during a health or income shock.

Family-provided support has many benefits over formal financial support. Laferrère and Wolff (2006) discuss some of the advantages of family transfers, since families: incur less transaction costs than the market, have more complete information on the real situation of its members, have more mutual supervision and trust, have durable relationships, and freedom of entry and exit is limited.

Given the lack of formal insurance in developing countries, understanding the different tactics used to smooth consumption is important for improving the overall well-being of households in these areas. Our results suggest that, when formal insurance is unavailable, inter-family transfers are used to maintain living standards when a household experiences a health shock. The following sections describe the data available in the CHARLS, outline an empirical strategy to study the relationship between health shocks and elderly outcomes, and then use the CHARLS data set to estimate the role of the family in providing informal insurance mechanisms and the response of inter-family transfers to income shocks.

2   The CHARLS Data

The data are from the China Health and Retirement Longitudinal Study (CHARLS).[4] Summary statistics for the estimating sample of senior Chinese households are presented in Table 1. Each household contains information from the respondent and the spouse, if the respondent is married. Whenever the respondent is married, household variables are measured either as the average between the two individuals or the maximum value, depending on which measurement is a more appropriate household measure. If the respondent is unmarried, the household variable reports the respondent's response. An advantage of aggregating to the household level is that transfers can be viewed as part of a household activity, where a transfer might be given to one member but used to benefit multiple members (Davies (2011)). We present statistics for the sample as a whole as well as by urban-rural status.

Research investigating the effect of major illness on labor force participation and expenditures has been conducted in both developed and developing countries. Health shocks are suitable for studying the implications of the full insurance model as they are often large, idiosyncratic, and unpredicable (De Weerdt and Dercon (2006)). When an individual experiences a shock to their health, they experience two fundamental economic costs: the costs of the medical care used to diagnose and treat the illness, and the loss in income associated with reduced labor supply and productivity (Gertler and Gruber (2002); Genoni (2012)).

In order to understand how individuals respond to health shocks, we begin by defining our measure of health. Determining a reliable measurement of an exogenous health shock has been debated widely in the literature. Gertler and Gruber (2002) express some of the key limitations of measures used in previous literature, with measures reflecting only small, and potentially anticipated, changes in health shocks. These measures include self-reported illness symptoms, which are more likely to be endogenous to labor-supply decisions. To mitigate the concern of endogenous health shocks, researchers have begun to use measures of individuals' physical abilities to perform activities of daily livings (ADL), which measure severe temporary changes in health as opposed permanent deterioration. These measures have been proven reliable and valid measures of physical functioning ability to both developed and developing countries (Gertler and Gruber

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[4]These surveys are conducted by the National School of Development at Peking University, with support from the National Natural Science Foundation of China, the Behavioral and Social Research Division of the National Institute on Aging, and the World Bank.

([2002](#))). Additionally, measures of functioning such as ADL have been found to be important health indicators of the elderly ([Strauss et al. (2010)](#); [Genoni (2012)](#)). The CHARLS sample consists of the group most directly affected by changes in ADL.

The data provide information on ADL indicating the level of difficulty experienced when performing specific daily activities. These ADL are reported by individuals 50 years or older whose self-reported health status is fair, poor, or very poor.[5] Activities surveyed include difficulty with: (1) walking 100 meters, (2) stooping, kneeling, or crouching, (3) reaching or extending arms above shoulder level, (4) lifting or carrying weights over 10 jin (such as a heavy bag of groceries), (5) picking up a small coin from a table, (6) climbing several flights of stairs without resting, (7) bathing or showering, (8) eating (such as cutting up food), (9) using the toilet (including getting up and down), (10) controlling urination and defecation, (11) getting into or out of bed, (12) getting up from a chair after sitting for a long period, and (13) dressing. We sum these activities to generate a measure of ADL difficulty ranging from 0 (no difficulties) to 39 (cannot do any of the activities). Households report an average ADL difficulty score of 2.96, with rural households experiencing a higher ADL difficulty than urban households.

Our outcome measures are broken down into four categories: labor outcomes, family transfers, non-labor income, and expenditures. Labor outcomes include whether the household currently works, log of hours worked per week, number of work days missed last year due to health, and log of labor income. 74 percent of the household sample currently works, with rural households working more than urban households. Household members work an average of 22.8 hours per week, and missed an average of 16.5 days of work last year due to health. Rural households experience a higher average of missed work days than urban households. Labor income is 4,314 yuan, with urban households receiving a higher income than rural households.

We create family support measures in order to determine how families respond to health shocks and if family networks help mitigate the effects of health shocks. On average, a household receives 2,452.2 yuan in transfers from sons and 2,125.8 yuan in transfers from daughters. Relatives (other than children) provide an average of 601.2 yuan in transfers. Urban households receive larger transfer amounts than rural households from relatives, on average. [Laferrère and Wolff (2006)](#) suggest that in survey data, respondents may be tempted to report only large transfers that occur only rarely. Thus, for a given year, the probability to observe a transfer is low. This suggests that financial transfers

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[5]For each activity, individuals may report: (0) no difficulty, (1) have difficulty but can still do it, (2) have difficulty and need help, or (3) cannot do it.

may be under reported. Therefore, another form of support analyzed is whether or not the household co-resides with their children.[6] Households tend to live with 0.50 adult sons and 0.13 adult daughters.[7] Urban households appear to live with an adult daughter more than rural households, but the number of adult sons co-residing with the household is similar for both geographic areas. Our final family support measures indicate the number of children, relatives (other than children), and non-relatives who assist households with ADL.[8] Households have an average of 0.21 children, 0.49 relatives, and 0.019 non-relatives helping them with ADL. Households in rural areas experience more help, on average, than households in urban areas.

Non-labor income variables include log of non-labor income, log of public pension income, and log of public transfers. On average, households receive 5,268.4 yuan, 691.6 yuan, and 1,023.2 yuan, respectively. Urban households receive a higher amount than rural households in all non-labor income categories except public transfers. Expenditure variables include log of per capita medical expenses, log of per capita essential expenses, log of per capita food expenses, and log of per capita non-essential expenses. These variables are used to determine how spending is altered when the household experiences a health shock, with the hypothesis that spending will not alter significantly if the household is well insured by family transfers. These expenses range from 1,543.2 yuan per year (medical) to 4,434.2 yuan per year (food). All of the expense variables present higher averages for urban households than rural households.

Summary statistics presented in this section highlight household health, which may be a determinant of the level of (financial and time) support received from children and relatives of senior households, and a variety of elderly outcomes. An economic analysis must be conducted in order to determine how health shocks influence outcomes of senior households.

3   Household Fixed-Effects Model

As stated in the introduction, when formal insurance is lacking, households that experience a shock to their income must compensate by adjusting current spending. One of the

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[6]Co-residing with children helps to spread the fixed costs of living over a larger number of people (Banerjee and Duflo (2007)).

[7]Adult is defined as an individual 22 years or older.

[8]Recall, ADL is measured for individuals 50 years or older. If both the respondent and the spouse report no ADL difficulties and do not report receiving any assistance from relatives or non-relatives, this variable equals zero.

challenges faced when attempting to determine how families react to income shocks is that both the decision to provide transfers and changes in income are endogenous. Using panel data and a household fixed effects model helps address this challenge. Panel data allow us to observe the same household over multiple waves of data. Thus, when using a household fixed effects model, we measure changes in both transfers and health status, which mitigates the endogeneity concern.

To estimate the impact of health shocks on elderly outcomes, we propose the following specification

$$\text{Outcome}_{hct} = \alpha_0 + \alpha_1 \text{ADL}_{hct} + \mathbf{X}_{hct}\alpha_2 + \alpha_{ct} + \alpha_h + u_{hct}, \tag{1}$$

where h indexes the household, c the community/village, and t the survey year; ADL_{hct} measures the degree of activities of daily living (ADL) difficulties in household h, living in community c in year t; α_{ct} is community-survey-year fixed effects, and allows us to control for community-level variables that are potentially correlated with health, such as the supply of health care facilities, access to publicly-provided health insurance and other public safety nets, local economic shocks, among others; α_h is a household fixed effect which controls for time-invariant unobservable heterogeneity in health endowments and past investments in health status; as additional controls, $\mathbf{X}_{hct}$, we add birth-year-survey-year and birth-place-survey-year indicators to capture any differences in time trends in outcomes across cohorts and rural/urban status. The main identifying assumption is that once these fixed effects are accounted for, short-term changes in need for help with daily activities are uncorrelated with the error term. This assumption only holds if the variance of our outcome variables and ADL are exogenous.

Adverse effects on labor market outcomes

Roughly 74% of the elderly households in the estimating sample report that either the main respondent or his/her spouse is active in the labor force. Thus, the first question we ask is how health status impacts elderly labor productivity. We estimate Equation (1) using as outcomes: an indicator for labor force participation, the log of hours worked, the number of work days missed due to health issues, and the log of income from labor sources. Because these variables are measured at the individual level, we use the average between respondent and spouse to create household-level measures for married couples. We expect increased difficulties with activities of daily living to reduce labor supply and

labor income in senior households.

Panel A from Table 2 presents the results for labor market outcomes. Column (2) shows estimates of Equation (1) which include household fixed effects. For comparison, we show estimates without household fixed effects in column (1). Pooled OLS estimates are not consistent since current health is likely correlated with unobservable household characteristics that govern labor supply choices and income levels such as health endowment, labor market productivity, and taste for healthy lifestyle. For example, individuals with poorer overall health might have a higher utility from leisure and choose to work less; or individuals with lower attachment to the labor force are likely to earn less income, and be less able to afford health care, leading to a reverse causality bias. It is expected, therefore, that the pooled OLS estimates will overstate the negative impact of current health on work and income. Indeed, the pooled OLS estimates point to a stronger negative association between difficulties with ADL and labor market outcomes compared to the household fixed effect estimates. The coefficient on ADL in a regression estimating the probability of participating in the labor force reveals that if the health status were to change so that individuals who were able to perform a certain ADL, say walking 100 meters, can no longer execute it (that is, ADL score increases by 3), the likelihood of working is 2.4 percentage points lower. Hours worked is also adversely impacted by increased difficulties with ADL: a 3-unit increase in ADL score reduces hours worked by 8.1% on average.[9] The same increase in difficulties with ADL leads to a 5.1 day increase in the number of missed days at work for those who reported working in the previous year. Finally, there is an expected 15.2% decrease in income from labor sources due to a 3-unit increase in ADL score.

Family support responds to health shocks

Next we turn to the main question: Does family provide support in the face of adverse health shocks? To answer this question, we estimate Equation (1) on various measures of family-provided assistance to elderly households: the log of financial transfers received from non-resident children and whether the household co-resides with any children, both presented by gender; the log of financial transfers received from other relatives (excluding children); and the number of children, relatives (excluding children), and non-relatives who helped with ADL. Panel B from Table 2 showcases the estimates. Daughters do not provide more old-age support when senior households experience an increase in difficul-

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[9]We adjust the partial effect by calculating: $\Delta\%$ outcome $= 100 \times [\exp(\hat{\alpha}_1 \times \Delta\text{ADL}) - 1]$.

ties with ADL, neither in the form of financial transfers nor in the form of co-residence; there is evidence, however, that senior households receive support in the form of co-residence from sons. A change in health status whereby individuals who were able to perform a certain ADL can no longer execute it (that is, ADL score increases by 3) implies an increase in the probability of co-residence with sons by less than one percentage point. The same change is associated with an 8.8% increase in financial transfers from other relatives. Finally, there is also evidence that senior households receive more help with ADL from children, relatives, and non-relatives when they face difficulties with those activities.

Consumption and public transfers do not respond to health shocks

Do public transfers work as insurance against health shocks? We then estimate Equation (1) on log of household per capita income from non-labor sources, log of public pension income, and log of public transfers.[10] Panel A from Table 3 displays the results. Pooled OLS estimates suggest poor health bears a negative association with pension income but a positive association with public transfers. Our preferred estimates, however, indicate that pension and public transfer income do not change as households experience difficulties with ADL. These findings suggest that public transfers received by senior households do not significantly alter following an adverse health shock.

How is the welfare of households affected by poor health? Panel B from Table 3 shows estimates on household per capita expenses by four categories: medical expenses, food expenses, essential expenses (excluding food), and non-essential expenses.[11] If a household is able to fully insure against a health shock there will be no effect of the change in health on the change in consumption. Unsurprisingly, households spend more on medical costs when they face increased difficulties with ADL. While pooled OLS estimates suggest that a decline in health leads to lower consumption of essential and non-essential items, household fixed effect estimates point to no changes in per capita consumption of

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[10]Non-labor income is the amount of income in the past year from financial assets, rents, pension, public transfers, alimony/child support, and fringe benefits; it excludes transfers from family members. Public pension is amount of public pension received in the past year from rural pension, residents' pension, urban residents' pension, new rural social pension insurance, land expropriation pension insurance, and old age pension allowance. Public transfer is amount of transfers from unemployment compensation, pension subsidy, workers compensation, elderly family planning, medical aid, social assistance, other government subsidies, and donations from society.

[11]Essential expenditures include expenditures on communication fees, utility fees, fuel fees, daily household items (detergent, soap, toothpaste, etc.), clothing and bedding, and heating. Non-essential expenditures include spending on alcohol, cigars, cigarettes, tobacco, matron, housekeepers, servants, entertainment, long distance traveling, furniture and consumption of durable goods, fitness, beauty, maintenance, repair, education, automotive fees, electronics, property management fees, and donations.

non-medical goods and services. However, both pooled OLS estimates and household fixed effect estimates suggest a decrease in per capita consumption of food when an individual can no longer perform a certain ADL, with those individuals spending 6.7% less on food expenses (column 2 of Table 3). Changes in health may directly impact the utility of food consumption for the sick household member (Liu (2016)). Therefore a decrease in per capita consumption of food does not necessarily indicate a decrease in the ability to purchase food.

Physical Assets

The results presented thus far suggest that families provide support, either financially or through physical assistance, when senior Chinese households experience a health shock. Households may additionally attempt to mitigate the effects of lost income due to the inability to perform physical labor by selling household assets, which would reduce the total value of physical assets within the household. We estimate Equation (1) on log value of fixed capital assets, log value of consumer durable assets, log value of agricultural assets, log value of vehicle, log value of irrigable land, and the sum of assets owned. Both pooled OLS and household fixed effect estimates are presented in Table 4.

Value of fixed capital assets include value of: tractor, thresher, tractor tools, water pump, processing equipment, fixed capital used in household production or self-employment activities, and other durable or fixed assets worth 500 yuan and more. When an individual can no longer perform a certain ADL, the household decreases the value of fixed capital assets by 5.8% (column 2 of Table 4). These results suggest that households that experience a health shock compensate for the shock by selling fixed capital assets or trading in higher valued fixed capital assets for lower valued assets.

The next outcome variable examined, consumer durable assets, is found to be insignificant. Consumer durable assets consist of refrigerators, washing machines, televisions, computers, stereo systems, cameras, air conditioners, mobile phones, furniture, musical instruments, valuable decorations, treasures and precious metal, and antiques. The effect of an increase in ADL difficulty on value of vehicle is also insignificant, suggesting households do not sell their automobile, electric bike, or motorcycle when they experience a health shock.

Both value of agricultural assets and irrigable land are found to significantly decrease when an individual can no longer perform a certain ADL. Agricultural assets include all livestock and aquatic life. Irrigable land includes cultivated land, forest land, pastures,

and ponds. These assets are most commonly associated with households who work in agriculture. In a following subsection, we observe that households which initially worked in agriculture experience decreases in labor outcomes (including labor income) and non-labor income when ADL difficulty increases. The findings presented in Table 4 suggest that agricultural households encounter both an increase in family support and a reduction in asset value in order to fully insure against health shocks.

Urban vs rural areas

Resources available to urban areas may not be available to rural areas and thus it is useful to estimate Equation (1) separately for rural and urban households. Tables 5 and 6 present estimates by household rural/urban status in order to estimate whether rural and urban households respond differently to health shocks.

Our results for labor income outcomes are found to be similar when Equation (1) is estimated separately for urban and rural households. The likelihood of working decreases, the hours worked decrease, the number of missed days at work increase, and labor income decreases when an individual can no longer perform a certain ADL. The differences between the coefficients on ADL for rural and urban households are insignificant.

Observing family-provided assistance by geographic status, we see that transfers from sons respond differently to elderly parents' health shocks depending on whether the household is located in an urban or rural area. Urban households experience an increase in financial support from sons, with an estimated increase in transfers from sons of 15.8% when an individual can no longer perform a certain activity that they previously could perform (ADL score increases by 3). Rural households are supported through co-residence with adult sons rather than through financial transfers, increasing the probability of residing with an adult son by 1.2 percentage points, on average, when they can no longer execute a certain activity. There is evidence that both urban and rural households receive financial transfers from other relatives. An increase in ADL score by 3 is associated with a 12.4% and 8.1% increase in financial transfers from other relatives for households living in urban and rural areas, respectively. Both urban and rural senior households receive more help with ADL from children and relatives, but neither receive significant increases in help from non-relatives when they face difficulties with ADL.

In the full sample, the estimates suggest that public pension income and public transfers do not change as households experience difficulties with ADL. This is consistent in both urban and rural samples. The full sample estimates a decrease in per capita non-

labor income when an individual experiences an increase in difficulty performing an activity. This significant decrease appears only in the urban sample, with those individuals experiencing a 10% decrease in per capita non-labor income when they can no longer perform an activity that they were initially capable of performing. Both urban and rural households experience increases in medical costs when they face increased difficulties with ADL. In addition to this expense, urban households decrease food expenses when ADL difficulties increase. No longer being able to perform a certain ADL that they could previously perform implies a 15.7% decrease in food expenses.

Analyzing the urban/rural results as a whole, it appears that urban and rural households receive help from their sons in different forms. The welfare of rural households appears to be unaffected (except for medical expenses) when they experience a change in health. While urban households do receive financial support from sons and other relatives as well as in-person ADL support from children and relatives, it appears that this assistance does fully not insure against changes in health, and thus urban households experience a decrease in their non-labor income and food consumption.

Agricultural vs non-agricultural work

The requirements of physical strength differ depending on the type of work an individual performs. Some occupations require an extensive amount of manual labor, while others involve minimal physical ability. Thus we turn to job type, examining if senior Chinese households who experience a health shock respond differently to the shock depending on the type of work performed. We estimate Equation (1) separately for respondents whose first occupation was agricultural work and respondents whose first occupation was non-agricultural work, anticipating that shocks to physical ability will be more detrimental to households that rely on manual labor. We use the respondent's first occupation rather than current occupation, as occupational choice is endogenous. Tables 7 and 8 present estimates by household agricultural/non-agricultural work.

Estimates for labor outcomes support our hypothesis, with households initially working in agricultural positions experiencing a decrease in the probability of working, a decrease in the hours worked per week, an increase in the number of working days missed, and a decrease in labor income when ADL difficulties increase. Households who initially participated in non-agricultural work experience insignificant changes in labor outcomes.[12]

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[12]Number of work days missed last year is only reported for individuals currently participating in agri-

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Since households initially working in agriculture are found to experience changes in labor force participation when they suffer a health shock, we anticipate those households to require assistance from relatives in order to smooth consumption. Panel B of Table 7 supports this, suggesting an increase in difficulties with ADL being associated with an increase in co-residence with sons, an increase in financial transfers from relatives (other than children), and an increase in the number of children, relatives, and non-relatives who helped with ADL. Households that initially engaged in agricultural work appear to be compensated for the inability to fully perform in the labor market by receiving assistance from children, relatives, and non-relatives.

The full sample results, presented in Table 3, suggest that public transfers do not alter significantly following an adverse health shock. However, when partitioning the sample by work type, no longer being able to perform a certain ADL (increase ADL score by 3) implies a 7.2% decrease in public transfers for households whose initial job type was agricultural work (column 1 of Table 8). This significant result occurs only for households who initially performed agricultural work.

Increases in medical costs are found for both agricultural and non-agricultural work households when faced with an increase in ADL difficulties. Households initially working in agriculture decrease per capita consumption in food when ADL difficulty increases. As suggested in the full sample results, changes in health may directly impact the utility of food consumption thus this decrease does not necessarily indicate a decrease in the ability to purchase food.

Analyzing the sample partitioned by initial job type, the results suggest that households who begin their working career in agricultural positions potentially perform work requiring more physical abilities. Thus when these households experience a health shock, labor outcomes are negatively affected and individuals require assistance to smooth consumption. These agricultural households receive both financial and time transfers from relatives in order to compensate for lost wages. Family-provided old-age support appears to be an effective informal insurance tool in agricultural households.

Basic vs Intermediate ADL

As a final estimation, we alter our specification to estimate the impact of health shocks on elderly outcomes while controlling for the severity of the health shock to determine whether families respond differently to health shocks depending on the severity of the

cultural work.

shock. Dividing ADL into two levels of severity, similar to Gertler and Gruber (2002), we propose the following specification

$$\text{Outcome}_{hct} = \alpha_0 + \alpha_1 \text{basic ADL}_{hct} + \alpha_2 \text{int ADL}_{hct} + \mathbf{X}_{hct}\alpha_3 + \alpha_{ct} + \alpha_h + u_{hct}, \quad (2)$$

where all variables and indexes are consistent with Equation (1) except the degree of activities of daily living difficulties. We divide ADL activities into basic and intermediate activities. Basic ADL activities consist of: (1) bathing or showering, (2) eating (such as cutting up food), (3) using the toilet (including getting up and down), (4) controlling urination and defecation, (5) getting into or out of bed, (6) getting up from a chair after sitting for a long period, and (7) dressing. These activities are basic living functions, thus being unable to perform one of these activities would be considered a more severe health shock. Intermediate ADL activities consist of: (1) walking 100 meters, (2) stooping, kneeling, or crouching, (3) reaching or extending arms above shoulder level, (4) lifting or carrying weights over 10 jin (such as a heavy bag of groceries), (5) picking up a small coin from a table, and (6) climbing several flights of stairs without resting. These activities are more advanced activities, and thus a shock to an intermediate ADL would be less severe than a shock to a basic ADL.

Tables 9 and 10 present estimates using Equation (2). All estimated labor outcomes are significantly altered as soon as a household experiences an increase in intermediate ADL difficulties. Households are found to decrease the probability of working, decrease hours worked per week, increase the number of work days missed, and decrease labor income when they experience an increase in intermediate (less severe) ADL difficulties. A household that experiences changes in basic ADL difficulties almost certainly also experiences changes in intermediate ADL difficulties. The labor outcome results suggest that it does not take a severe health shock to alter labor force participation among senior Chinese households.[13]

Full sample results suggested insignificant increases in financial transfers from children when senior Chinese households experience an increase in difficulty with ADL (Table 2). However, Table 9 suggests that both sons and daughters increase transfers to their parents when their parents experience an increase in basic ADL difficulties. Parents receive physical help from children and relatives when they experience increases in both

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[13]Performing the same regressions controlling for basic ADL only (rather than both basic and intermediate ADL in the same regression), all basic ADL coefficients are larger than intermediate ADL coefficients obtained using Equation 2 (controlling for both basic and intermediate ADL, presented in column 2 of Table 9) and are significant when estimating labor outcomes.

basic and intermediate ADL difficulties, with larger increases when the difficulties are more severe (basic ADL difficulties increase). These results suggest that more family assistance is provided when health shocks are more severe.

Panel A from Table 10 displays the results estimating Equation (2) on log of household per capita income from non-labor sources, log of public pension income, and log of public transfers, indicating an increase in public transfers when households experience increases in difficulties with basic ADL and a decrease in public transfers when households experience increases in difficulties with intermediate ADL.[14] As the coefficients are similar in magnitude and of opposite signs, the results suggest that public transfers do not alter significantly following an adverse health shock.

Households spend more on medical costs when they face increased difficulties with ADL, increasing spending more with more severe ADL difficulty increases. Spending on food increases when a household experiences an increase in basic ADL difficulty, and decreases when a household experiences an increase in intermediate ADL difficulty. Again, changes in health may directly impact the utility of food consumption.

4 Conclusion

This paper explores rich longitudinal data on senior households health and economic outcomes to examine the extent to which family networks provide support in the face of adverse health shocks. Estimates produced by a model that controls for household time-invariant unobservables indicate that increased difficulties with ADL lower household labor supply and income from labor sources. Non-labor income decreases even though households receive more financial support from other relatives; we find no effect on public transfers. Finally, households spend more with medical costs but consumption of non-medical goods and services is not adversely impacted by health shocks. Together, these findings suggest that family-provided support helps to mitigate the adverse effects of health shocks on consumption. Public transfers do not seem to serve the same purpose. This is true of both rural and urban areas, despite the ampler access to formal safety net systems available for urban workers.

Further exploring the data, our results suggest that changes in labor outcomes most directly occur within households that initially perform agricultural work. It is those house-

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[14]Performing the analysis separately for basic and intermediate ADL, households receive insignificant increases in public transfers when basic ADL difficulties increase and significant but smaller magnitude decreases in public transfers when intermediate ADL difficulties increase.

holds that receive financial and physical assistance from their families when they experience a health shock. Again, agricultural work requires more physical capabilities and thus the results support the belief that shocks to ADL will significantly impact agricultural workers.

In addition to partitioning the sample by job type, we also analyze the effect of a health shock on labor outcomes and family support distinguishing by severity of the shock. Our results suggest that labor outcomes are adversely effected even when the shock is only intermediate (less severe). However, financial transfers from children and relatives do not occur until the shock is more severe, affecting basic ADL. Children and relatives assist with ADL difficulties regardless of severity, increasing their assistance when the difficulty becomes more severe.

From a public policy viewpoint, research on private transfers should be less concerned about the motivation as the extent to which financial and time transfers change the living standards of the recipient (Dimova and Wolff (2008)). The results in this paper suggest that family members, especially those in rural households and agricultural work, assist with maintaining current living standards and making senior households that experience a health shock better off through transfers. However, we cannot answer the question of whether these transfers are enough to lift the elderly out of poverty with our model. When trying to determine ways to decrease poverty among the elderly, policy makers must first understand how the family works as a risk mitigating unit before creating policies intended to help smooth consumption during income and health shocks. It is unclear if family-provided support is a complement or a substitute to government programs. Extending the current study to include information on available insurance programs may bring us one step closer to determining the most effective way to assist the elderly in further improving their living standards when they experience a health shock.

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Table 1: Summary statistics for estimating sample of senior Chinese households

Variable	Whole sample (1) Means/S.d.	Urban hhs (2) Means/S.d.	Rural hhs (3) Means/S.d.
Difficulties with ADL	2.96	2.47	3.26
	(3.93)	(3.66)	(4.06)
Currently works	0.74	0.57	0.84
	(0.44)	(0.50)	(0.37)
Hours worked per week	22.8	15.5	27.3
	(25.0)	(23.3)	(24.9)
N. days missed work last year	16.5	12.7	17.4
	(43.3)	(38.3)	(44.4)
Labor income	4314.0	6166.3	3173.7
	(15320.4)	(20887.5)	(10355.1)
Transfers from sons	2452.2	2717.8	2304.8
	(9000.3)	(11713.4)	(7052.1)
N. co-resid adult sons	0.50	0.49	0.50
	(0.65)	(0.62)	(0.67)
Transfers from daughters	2125.8	2679.1	1817.0
	(8008.1)	(10131.5)	(6509.7)
N. co-resid adult dght	0.13	0.17	0.10
	(0.37)	(0.40)	(0.34)
Transfers from relatives	601.2	729.5	522.2
	(6769.2)	(5079.9)	(7624.3)
N. children who helped with ADL	0.21	0.17	0.23
	(0.67)	(0.62)	(0.69)
N. relatives who helped with ADL	0.49	0.39	0.54
	(0.84)	(0.78)	(0.87)
N. non-relatives who helped with ADL	0.019	0.013	0.023
	(0.14)	(0.11)	(0.15)
PC non-labor income	5268.4	9438.9	2701.0
	(26968.9)	(18717.1)	(30694.0)
Public pension income	691.6	1105.1	437.0
	(2524.2)	(3608.2)	(1452.4)
Public transfers	1023.2	888.9	1105.9
	(20903.3)	(12553.3)	(24676.3)
PC medical expenses	1543.2	1811.1	1378.3
	(5557.9)	(6379.0)	(4978.7)
PC essential expenses	1956.5	2676.9	1513.0
	(2698.6)	(3200.9)	(2223.2)
PC food expenses	4434.2	5928.4	3514.3
	(8843.4)	(10968.9)	(7075.8)
PC non-essential expenses	3156.3	4054.2	2603.6
	(12961.5)	(14429.6)	(11935.4)
No. of observations	32236	12283	19953
No. households			

Notes: Summary statistics in column (2) calculated from estimating sample. Table presents means and standard deviation (in parentheses).

Table 2: The impact of difficulties with ADL on labor outcomes and family-provided support to senior Chinese households

Dependent variables	(1) Pooled OLS	(2) Household FE	(3) Mean Dep var
Panel A: Labor outcomes			
Currently works	-0.016***	-0.008***	0.743
	(0.001)	(0.001)	
Log hours worked per week	-0.068***	-0.028***	2.337
	(0.003)	(0.004)	
N. days missed work last year	2.615***	1.709***	16.027
	(0.215)	(0.281)	
Log labor income	-0.082***	-0.055***	3.636
	(0.007)	(0.011)	
Panel B: Family support			
Log transfers from sons	-0.013**	0.005	3.178
	(0.007)	(0.010)	
Co-resid adult son?	0.003***	0.003**	0.396
	(0.001)	(0.001)	
Log transfers from daughters	-0.018***	0.007	3.763
	(0.006)	(0.010)	
Co-resid adult dght?	0.002***	0.000	0.122
	(0.001)	(0.001)	
Log transfers from relatives	0.029***	0.028***	1.013
	(0.004)	(0.007)	
N. children who helped with ADL	0.042***	0.039***	0.245
	(0.002)	(0.006)	
N. relatives who helped with ADL	0.055***	0.062***	0.471
	(0.002)	(0.006)	
N. non-relatives who helped with ADL	0.002***	0.002*	0.023
	(0.000)	(0.001)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). N = 21966 for all labor market outcomes except n. of days missed work (N = 12249); N = 22692 for financial transfers and co-residence with sons, as the sample is restricted to households with at least one surviving male child; N = 20550 for transfers and co-residence with daughters; N = 27557 for transfers from relatives (parents and other relatives); N = 8558 in estimates for help with ADL outcomes, as sample excludes year 2011 due to missing data. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 3: The impact of difficulties with ADL on non-labor income and household per capita expenditures of senior Chinese households

Dependent variables	(1) Pooled OLS	(2) Household FE	(3) Mean Dep var
Panel A: Non-labor income			
Log pc non-labor income	-0.035***	-0.020**	5.888
	(0.005)	(0.009)	
Log public pension income	-0.018***	-0.012	1.948
	(0.006)	(0.010)	
Log public transfers	0.011*	-0.014	3.206
	(0.006)	(0.009)	
Panel B: Expenditures			
Log pc medical expenses	0.073***	0.071***	3.793
	(0.005)	(0.009)	
Log pc essential expenses	-0.017***	0.001	7.109
	(0.003)	(0.004)	
Log pc food expenses	-0.040***	-0.023**	7.258
	(0.005)	(0.011)	
Log pc non-essential expenses	-0.061***	0.007	5.807
	(0.007)	(0.011)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). N = 21966 for all outcomes. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 4: The impact of difficulties with ADL on physical assets of senior Chinese households

Dependent variables	(1) Pooled OLS	(2) Household FE	(3) Mean Dep var	(4) N. obs
Physical Assets				
Log fixed capital assets	-0.048***	-0.020**	2.711	25594.000
	(0.005)	(0.009)		
Log consumer durable assets	-0.055***	-0.008	7.039	26008.000
	(0.005)	(0.007)		
Log agricultural assets	-0.016***	-0.014*	1.048	25785.000
	(0.004)	(0.008)		
Log vehicle value	-0.051***	-0.000	4.294	26008.000
	(0.007)	(0.009)		
Log irrigable land value	-0.032***	-0.016*	3.099	26000.000
	(0.005)	(0.009)		
N. assets	-0.047***	-0.010**	4.690	26212.000
	(0.004)	(0.005)		

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 5: The impact of difficulties with ADL on labor outcomes and family-provided support to senior Chinese households, by rural/urban status

Dependent variables	Urban hhs		Rural hhs	
	(1)	(2)	(3)	(4)
	HH FE	Mean Dep var	HH FE	Mean Dep var
Panel A: Labor outcomes				
Currently works	-0.007***	0.615	-0.007***	0.828
	(0.003)		(0.002)	
Log hours worked per week	-0.032***	1.850	-0.025***	2.663
	(0.008)		(0.006)	
N. days missed work last year	1.578*	13.332	1.773***	16.707
	(0.831)		(0.317)	
Log labor income	-0.043*	4.278	-0.058***	3.206
	(0.025)		(0.013)	
Panel B: Family support				
Log transfers from sons	0.049**	2.792	-0.011	3.418
	(0.022)		(0.012)	
Co-resid adult son?	0.002	0.387	0.004**	0.402
	(0.002)		(0.002)	
Log transfers from daughters	0.027	3.381	-0.001	4.004
	(0.021)		(0.012)	
Co-resid adult dght?	0.001	0.159	-0.000	0.099
	(0.002)		(0.001)	
Log transfers from relatives	0.039***	1.027	0.026***	1.004
	(0.013)		(0.009)	
N. children who helped with ADL	0.058***	0.210	0.040***	0.267
	(0.011)		(0.008)	
N. relatives who helped with ADL	0.084***	0.384	0.055***	0.527
	(0.014)		(0.007)	
N. non-relatives who helped with ADL	0.003	0.017	0.002	0.027
	(0.002)		(0.001)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). N = 8144 (urban) and = 13488 (rural) for all labor market outcomes except n. of days missed work (N = 1803 urban, and = 10029 rural); N = 7830 (urban) and = 14552 (rural) for financial transfers and co-residence with sons, as the sample is restricted to households with at least one surviving male child; N = 7082 (urban) and = 13134 (rural) for transfers and co-residence with daughters; N = 10254 (urban) and = 16983 (rural) for transfers from relatives (parents and other relatives); N = 2667 (urban) and = 5327 (rural) in estimates for help with ADL outcomes, as sample excludes year 2011 due to missing data. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 6: The impact of difficulties with ADL on non-labor income and household per capita expenditures of senior Chinese households, by rural/urban status

	Urban hhs		Rural hhs	
	(1)	(2)	(3)	(4)
	HH FE	Mean Dep var	HH FE	Mean Dep var
Dependent variables				
Panel A: Non-labor income				
Log pc non-labor income	-0.035**	6.509	-0.008	5.471
	(0.018)		(0.010)	
Log public pension income	0.004	1.738	0.001	2.089
	(0.022)		(0.012)	
Log public transfers	-0.009	2.278	-0.011	3.827
	(0.018)		(0.012)	
Panel B: Expenditures				
Log pc medical expenses	0.087***	3.883	0.066***	3.733
	(0.018)		(0.012)	
Log pc essential expenses	0.003	7.479	-0.001	6.861
	(0.007)		(0.006)	
Log pc food expenses	-0.057***	7.648	-0.011	6.997
	(0.020)		(0.013)	
Log pc non-essential expenses	-0.002	6.206	0.021	5.539
	(0.021)		(0.014)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). N = 8144 (urban) and = 13488 (rural) for all outcomes. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 7: The impact of difficulties with ADL on labor outcomes and family-provided support to senior Chinese households, by Agricultural/Non-Agricultural work

| | Agricultural work | | Non-Agricultural work | |
| | (1) | (2) | (3) | (4) |
Dependent variables	HH FE	Mean Dep var	HH FE	Mean Dep var
Panel A: Labor outcomes				
Currently works	-0.007***	0.799	-0.001	0.637
	(0.002)		(0.006)	
Log hours worked per week	-0.029***	2.541	-0.022	1.952
	(0.005)		(0.019)	
N. days missed work last year	1.709***	15.986		
	(0.313)			
Log labor income	-0.051***	3.297	-0.058	4.671
	(0.013)		(0.065)	
Panel B: Family support				
Log transfers from sons	0.003	3.435	0.039	2.946
	(0.012)		(0.062)	
Co-resid adult son?	0.005***	0.430	0.002	0.339
	(0.002)		(0.006)	
Log transfers from daughters	0.004	4.125	0.090	3.640
	(0.011)		(0.062)	
Co-resid adult dght?	0.001	0.120	-0.014***	0.156
	(0.001)		(0.005)	
Log transfers from relatives	0.021***	1.001	0.030	1.084
	(0.008)		(0.041)	
N. children who helped with ADL	0.036***	0.250	0.054	0.174
	(0.007)		(0.042)	
N. relatives who helped with ADL	0.056***	0.510	0.062	0.339
	(0.007)		(0.069)	
N. non-relatives who helped with ADL	0.002*	0.023	0.010	0.014
	(0.001)		(0.011)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). N = 15235 (agricultural) and = 3421 (non-agricultural) for all labor market outcomes except n. of days missed work (N = 10283 agricultural, and = 78 (non-agricultural); N = 16518 (agricultural) and = 3162 (non-agricultural) for financial transfers and co-residence with sons, as the sample is restricted to households with at least one surviving male child; N = 14799 (agricultural) and = 2685 (non-agricultural) for transfers and co-residence with daughters; N = 18924 (agricultural) and = 4332 (non-agricultural) for transfers from relatives (parents and other relatives); N = 5937 (agricultural) and = 276 (non-agricultural) in estimates for help with ADL outcomes. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 8: The impact of difficulties with ADL on non-labor income and household per capita expenditures of senior Chinese households, by Agricultural/Non-Agricultural work

	Agricultural work		Non-Agricultural work	
	(1)	(2)	(3)	(4)
	HH FE	Mean Dep var	HH FE	Mean Dep var
Dependent variables				
Panel A: Non-labor income				
Log pc non-labor income	-0.020*	5.644	0.021	6.714
	(0.010)		(0.046)	
Log public pension income	-0.008	2.160	-0.004	1.457
	(0.012)		(0.054)	
Log public transfers	-0.025**	3.584	-0.024	2.327
	(0.011)		(0.045)	
Panel B: Expenditures				
Log pc medical expenses	0.074***	3.864	0.113**	4.036
	(0.011)		(0.052)	
Log pc essential expenses	0.002	6.962	0.002	7.603
	(0.005)		(0.016)	
Log pc food expenses	-0.021*	7.078	0.009	7.787
	(0.013)		(0.046)	
Log pc non-essential expenses	0.015	5.628	0.001	6.521
	(0.013)		(0.046)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on ADL, a variable that measures the degree of difficulty with ADL (scale of 0 to 39). N = 15235 (agricultural) and = 3421 (non-agricultural) for all outcomes. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 9: The impact of difficulties with ADL on labor outcomes and family-provided support to senior Chinese households, by ADL severity

Dependent variables	Basic ADL (1) HH FE	Int. ADL (2) HH FE	(3) Mean Dep var
Panel A: Labor outcomes			
Currently works	-0.004	-0.010***	0.743
	(0.003)	(0.002)	
Log hours worked per week	-0.016	-0.036***	2.337
	(0.010)	(0.007)	
N. days missed work last year	2.063***	1.507***	16.027
	(0.708)	(0.518)	
Log labor income	-0.037	-0.067***	3.636
	(0.027)	(0.018)	
Panel B: Family support			
Log transfers from sons	0.049**	-0.025	3.178
	(0.025)	(0.019)	
Co-resid adult son?	-0.002	0.006***	0.396
	(0.003)	(0.002)	
Log transfers from daughters	0.047*	-0.020	3.763
	(0.025)	(0.019)	
Co-resid adult dght?	-0.001	0.001	0.122
	(0.002)	(0.002)	
Log transfers from relatives	0.041**	0.018	1.013
	(0.017)	(0.013)	
N. children who helped with ADL	0.047***	0.034***	0.245
	(0.014)	(0.009)	
N. relatives who helped with ADL	0.059***	0.064***	0.471
	(0.016)	(0.010)	
N. non-relatives who helped with ADL	0.002	0.002	0.023
	(0.003)	(0.002)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on basic ADL (scale 0 to 21) and intermediate ADL (scale 0 to 18) that measures the degree of difficulty with ADL. N = 17695 for all labor market outcomes except n. of days missed work (N = 9541); N = 18404 for financial transfers and co-residence with sons, as the sample is restricted to households with at least one surviving male child; N = 16767 for transfers and co-residence with daughters; N = 22164 for transfers from relatives (parents and other relatives); N = 8177 in estimates for help with ADL outcomes. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.

Table 10: The impact of difficulties with ADL on non-labor income and household per capita expenditures of senior Chinese households, by ADL severity

	Basic ADL	Int. ADL	
	(1)	(2)	(3)
	HH FE	HH FE	Mean Dep var
Dependent variables			
Panel A: Non-labor income			
Log pc non-labor income	0.009	-0.040**	5.888
	(0.021)	(0.016)	
Log public pension income	-0.017	-0.009	1.948
	(0.024)	(0.017)	
Log public transfers	0.045*	-0.052***	3.206
	(0.023)	(0.017)	
Panel B: Expenditures			
Log pc medical expenses	0.080***	0.065***	3.793
	(0.022)	(0.016)	
Log pc essential expenses	0.005	-0.002	7.109
	(0.011)	(0.008)	
Log pc food expenses	0.057**	-0.075***	7.258
	(0.026)	(0.019)	
Log pc non-essential expenses	0.011	0.005	5.807
	(0.029)	(0.020)	

Notes: Dependent variables are listed in the first column. Table presents coefficients on basic ADL (scale 0 to 21) and intermediate ADL (scale 0 to 18) that measures the degree of difficulty with ADL. N = 17695 for all outcomes. All regressions control for community-survey year, birth year-survey year, birth place-survey year fixed effects, where birth place is rural or urban. Standard errors clustered at the household level in parentheses. Data source: CHARLS 2011, 2013, and 2015. Stars indicate statistical significance. $*** < 0.01, ** < 0.05, * < 0.1$.