Save more or less? The impact of government health insurance change on saving behavior

LU, Ye Lyren*

March 15, 2025

Abstract

This research shows an overall decreasing effect on saving after the introduction of Serious Sickness Insurance (SSI) with a China survey dataset. I build a three-period model showing that SSI can influence saving via two driving forces: reducing precautionary savings for medical expenditures; increasing saving for a longer life expectancy. I employ staggered difference-in-difference estimators to show that the empirical results agree with the prediction of the model. Both the decrease in medication expenditure and longer life expectancy increase the utility of the insured. The effects differ across wealth levels, household registration types, and age groups. Interestingly, the wealthiest quantile benefits the most, which diverges from the policy's initial goal. Moreover, the effects on portfolio categories also vary across different wealth groups.

Keywords: Household, consumption behavior, health insurance, precautionary saving, life expectancy, wealth redistribution

JEL Classification: G00, G28, G50, G51, G52, H00, H31, H51, H75, I00, I13

*Department of Finance, Imperial College London, SW7 2AZ. E-mail: lyren.lu@imperial.ac.uk.
I thank all the professors and classmates who participated in my seminar and gave me careful comments and insight. Any errors are my own.

1 Introduction

Medical expense is one of the households' major expenditures. Medical expenditures are less predictable, and the amount is more uncertain than consumptions, such as food, education, transportation, and other daily consumptions. Households usually plan for medical expenditures based on their historical and current health conditions, also called health risks. Health risks can influence household savings in two ways. On the one hand, households with higher health risks have a shorter life expectancy. Therefore, their lifetime cash flows get shortened, and such affected periods are at the end of the life cycle. Because most people retire or lose their working ability, there are more outflows than inflows during the shortened period. As a result, they have fewer expected cash outflows and thus tend to have fewer savings for the future. On the other hand, these households may have more precautionary savings for future medical activities that are likely to be costlier. Individuals with a weaker current health condition and worse health history are more likely to get sick and have higher medical expenditures than those with more healthy ones. These two channels predict the savings of households with high health risks in opposite ways.

Medical insurance is an effective and widely-used way to hedge potential health risks on economic aspects. The reimbursement of medical insurance relieves the insured economic burden when encountering sickness. Therefore, households tend to have less precautionary savings, where there is a decreasing effect on households' savings. Households also can afford more and better medical treatment with the help of medical insurance. Although the total costs of the medical treatment are higher, the out-of-pocket medical payment decreases after medical insurance reimbursement.

Therefore, households with better medical treatment tend to have a longer life expectancy and need to save more. As a result, households need to save more via the life expectancy channel.

A government-provided health insurance reform, the introduction of Serious Sickness Insurance (SSI), provides an opportunity to research this question. Most of the Chinese [1] only rely on government-provided health insurance. Although some details vary across different areas, the coverage and regime are very similar in cities and across urban and rural areas. Before the introduction of SSI, the reimbursement ceilings in the existing government-provided health insurance policy cause a large potential burden and uncertainty on households' preparation for future serious sickness medical expenses. Households tend to have precautionary savings for this costly tail risk. SSI helps hedge such a risk. The insured can reimburse a large part of the expenses above the ceiling of existing government-provided health insurance. All the government-provided health insurance participants automatically participate in the SSI once their local city introduces SSI. As shown in Figure 1, except Shenzhen introduced SSI in 2011, all the other cities in my sample introduced SSI from 2013 to 2016. By taking one year as one stage, this reform provides a natural staggered difference-in-difference experiment to analyze the SSI effects on household saving behaviours.

In this research, I build a three-period model to show that the life expectancy and precautionary saving channels exist theoretically, and their influences on household saving behaviour agree with the way mentioned above. Then, I employ a Chinese

[1] More than 90% in my sample

household survey, China Health and Retirement Longitudinal Study (CHARLS), to test the overall effect of health insurance on households' saving behavior. Also, the effects of SSI on out-of-pocket medical expenditure and life expectancy help identify whether the precautionary saving and life expectancy channels mentioned above exist.

My research shows an overall effect that the Chinese saving rate decreases after the introduction of SSI. SSI helps households save money in their out-of-pocket payment for medical treatment, and households tend to have better medical treatment. Moreover, when testing households with different health conditions, I find that households with bad health conditions benefit more than healthy households in out-of-pocket medical expenditure. However, healthy households tend to save more after the introduction of SSI. The effects are different across wealth, household registration type, and age groups.

Households are divided into quartile groups based on their household net wealth in 2011. I performed the analysis in the previous section again for each wealth group. The results are surprising to the expectation. The most wealthy group benefit most, with a significant increase in their utility. Although the utility of the mid-wealth group does not increase, their total medical expenditure increases significantly. This means that with the introduction of SSI, they receive better medical treatment. The poorest group has no benefit at all, neither in the utility nor in the medical treatment received. I explain such results by the regime of SSI. SSI only proportionally reimburse the part above the ceiling of one's basic medical insurance policy. The richest can afford all needed medical treatment even without

SSI. Therefore, the amount reimbursed from SSI increased their utility. The mid-wealth group can afford more and better medical treatment with the help of SSI. The poorest group cannot even afford the self-payment part in the range of basic insurance. They cannot get any medical treatment covered by SSI.

Beyond its effects on consumption and medical expenditure, SSI also influences household portfolios. All households, except those in the wealthiest quantile, increase both the amount and percentage of their stock investments. This behavior can be attributed to mental accounting bias, where households perceive SSI benefits as separate from their regular income, making them more willing to invest in stocks. However, SSI does not impact stock market participation rates, suggesting that the costs of entry and learning outweigh the financial benefits of SSI. For the wealthiest households, the portfolio effects are insignificant, as they primarily allocate SSI benefits toward consumption.

The major contribution of this research is considering two opposite forces on household savings simultaneously from medical insurance or government policy in a broader way. The DID regression using saving and consumption can only identify the overall effect. This research provides a model showing the existence of precautionary saving and life expectancy channels. The empirical work also provides evidence that the two channels are active in the real world. The actual most beneficial group is the wealthiest quantile, which is different than the initial goal when setting the policy.

There are many empirical works of literature that have exploited households' precautionary saving and influential factors. Dynan (1993) estimates the estimators in a utility function reflecting the strength of precautionary saving. Guiso et al. (1992)

uses Italian survey data showing the consistency between precautionary saving and theoretical prediction. Starr-McCluer (1996) points lower wealth holdings take the insurance as a kind of precautionary hedging. There are other papers using different areas' data showing the behavior of precautionary saving, such as British data (Guariglia and Rossi, 2004), German data Fuchs-Schundeln and Schundeln (2005), and Chinese data (Zang et al., 2012).

Hamermesh (1985) is one of the leading papers showing the relationship between household savings and life expectancy. DeNardi et al. (2005) uses the mortality table and income shocks to analyze the influence of single elderly saving behavior. Bloom et al. (2007) finds a positive correlation between life expectancy and savings. Salm (2010) shows that a 1% subjective mortality increase corresponds with a 1.8% decrease in consumption. Heimer et al. (2019) uses a new dataset to document the overestimation of survival by the elderly and affecting their savings and risk preferences.

Government policy change is one of the main factors that change household saving and consumption behaviors. Attanasio and Brugiavini (2003) uses the 1992 Italian pension reform showing the saving rate increases when there is an unexpected reduction in pension. Other works document the impact of household savings when there are policy changes in the U.S. (Engen and Gruber, 2001), Taiwan (Chou et al., 2003), Mainland China (Wagstaff and Lindelow, 2008), and so on.

Household health status acts as an important factor in households' saving and consumption behavior. Past literature document that health condition influences households' employment and income. (Garcia-Gomez et al., 2013; Meyer and Mok,

2019). Moreover, Dobkin et al. (2018) and Kolsrud et al. (2020) show that households saving and consumption habits change when they encounter a health shock. Rosen and Wu (2004) and Doskeland and Kvaerner (2021) find that health status also affects household portfolio choices.

The remaining report is organized in this way: Section 2 illustrates my model and hypotheses. Section 3 shows the data and empirical strategies. Section 4 presents the results. Section 5 reports the SSI effect differences among groups. Section 6 is my plan for future work. Section 7 is the conclusion.

2 Conceptual Framework and Hypotheses (A life-cycle model presented in Section 6.1 will be updated here in the next version soon)

I assume a two-or-three-period model developed from a two-period model in Bai and Wu (2014). In this model, each household can live for the first two periods for sure, and the third period if having good medical treatment with medical insurance I. In the beginning, each household has an endowment e_1, and incomes in the three periods y_1, y_2, and y_3. The households choose their consumptions c_1, c_2, and c_3 and savings s_1, s_2, and s_3. The household have medical expense in each period, M_1, M_2, and M_3. However, the households only know thier medical expense M_1 in the first period, and future medical expenditures suit the AR(1) model $M_t = bM_{t-1} + \varepsilon_t$, $\varepsilon_t \sim N(0, \sigma^2)$. All the savings are risk-free and have a rate of return return r in each period. Assuming that the household has an exponential utility function $U(C) = -\frac{1}{\theta}exp(-\theta C)$ with a consumption set C and a constant absolute risk aversion (CARA) $\theta > 0$, and a discount factor β. The household faces the following utility maximization problem:

$$Max_{c_1,c_2,c_3,s_1,s_2} U(C_1) + \beta \cdot E_1 U(C_2) + \beta^2 \cdot E_1 U(C_3) \tag{2.1}$$

$$\text{s.t. } c_1 + s_1 + M_1 = e_1 + y_1 \tag{2.2}$$

$$c_2 + M_2 - I \cdot [(1-\alpha)M_2 - s_2] = y_2 + (1+r)s_1 \tag{2.3}$$

$$c_3 + I \cdot \alpha M_3 = I \cdot [y_3 + (1+r)s_2] \tag{2.4}$$

I is a dummy variable. $I = 1$ means the household can benefit from the Serious Sickness Insurance (SSI), otherwise $I = 0$. When $I = 0$, this is a two-period model. With the reimbursement of SSI, the household only needs to pay proportion p of thier medical expense, $p < 1$. Thus households have a tendancy to choose better medical treatments, which originally cost $q \cdot M_t$, $q > 1$. As a consequence, the medical expenditure with SSI is $p \cdot q \cdot M_t$. I take $\alpha = p \cdot q$, and assume $0 < \alpha < 1$.

M_2, and M_3 can be written as:

$$M_2 = bM_1 + \varepsilon_2 \tag{2.5}$$

$$M_3 = bM_2 + \varepsilon_3 = b(bM_1 + \varepsilon_2) + \varepsilon_3 = b^2 M_1 + b\varepsilon_2 + \varepsilon_3 \tag{2.6}$$

$$\varepsilon_2, \varepsilon_3 \sim N\left(0, \sigma^2\right), i.i.d$$

As shown in the mathmatics appendix, the difference of optimal saving in period 1 between $I = 0$ and $I = 1$ is

$$\begin{aligned} \triangle s_1^* = s_1^{1*} - s_1^{0*} &= \frac{(r+1)(e_1+y_1)+y_2}{(r^2+3r+3)(2+r)} - \frac{y_3}{r^2+3r+3} \\ &+ \left[\frac{(1+r)\alpha b - (2+r) + \alpha b^2}{r^2+3r+3} + \frac{1-b}{2+r}\right] M_1 \\ &+ \left[\frac{(2+r)\alpha^2 + \alpha^2 b^2}{r^2+3r+3} - \frac{1}{2+r}\right] \frac{\theta\sigma^2}{2} + \frac{(2r+3)\ln\beta(1+r)}{(r^2+3r+3)(2+r)\theta} \end{aligned} \tag{2.7}$$

My first set of hypotheses investigate how the introduction of SSI influences household's saving and consumption behavior.

H1a With the benefit of SSI, households save less and consume more than those without SSI. That is, the medical expenditure effect dominates.

H1b With the benefit of SSI, the households save more and consume less than those without SSI. That is, the life cycle effect dominates.

Equation (25) can be interpreted into three parts. The first part $\frac{(r+1)(e_1+y_1)+y_2}{(r^2+3r+3)(2+r)} - \frac{y_3}{r^2+3r+3}$ reflects that the household needs to save from period 1 to the additional period 3, because of a longer life expectancy. Since the period 3 is the last period of the life cycle, the elderly usually has much less income comparing to their youth. Also, y_3 is a small term when comparing to their accumulated savings e_1, as my sample focuses on the group older than 45 years old. Thus, this part is positive, which means that the household needs to save more and consume less when $I = 1$. I call this the life cycle effect. My second set of hypotheses is to test if introducing SSI helps the insured improve their medical treatment quality and increase their life expectancy.

H2a Household life expectancy increases after the introduction of SSI, and results more saving.

H2b The introduction of SSI has no effect or a negative effect on household life expectancy.

The second part $\left[\frac{(1+r)\alpha b-(2+r)+\alpha b^2}{r^2+3r+3} + \frac{1-b}{2+r}\right] M_1$ is negative, as proved in the appendix. It reflects the introduction of insurance I helps relieve the household's medical expenditure burden. Thus, they should save less and consume more. I call this

the medical expenditure effect. My third set of hypotheses is to test if introducing SSI helps the insured save out-of-pocket medical expenses.

H3a The introduction of SSI decreases household out-of-pocket medical expenses.

H3b The introduction of SSI increases or has no effect on household out-of-pocket medical expenses.

The remaining part of equation (25) $\left[\frac{(2+r)\alpha^2+\alpha^2b^2}{r^2+3r+3}-\frac{1}{2+r}\right]\frac{\theta\sigma^2}{2}+\frac{(2r+3)\ln\beta(1+r)}{(r^2+3r+3)(2+r)\theta}$, shows effect on household's risk. This term is negative when $\theta > 0$ and $\beta(1+r) < 1$. However, this part is minor comparing with the first two parts.

3 Data and Empirical Specification

3.1 Data and summary of statistics

I use four panel of China Health and Retirement Longitudinal Study (CHARLS) in this research. The data covers 26 provinces and 123 cities in Mainland China. The geographical allocation of respondents is shown in Figure 2 in the appendix. The data series concentrate on a Chinese representative sample aged above 45 years old. Interviewees' average age in 2011 was 55.67 years old with a standard deviation 11.11. As shown in Figure 3, most of the respondent in the sample were between 40-70 years old. The national-wide survey was performed in 2011 as the baseline, and the survey aims to follow up with the respondents every two or three years. Up to now, four waves of data are available, surveyed in 2011, 2013, 2015, and 2018. There are 14,005 households and 25,578 individuals in the sample. [2] Some households or individuals quit within the period due to several reasons, including death or unwillingness to participate later. The survey includes similar substitutes for such cases. In this research, the sample only include those individuals who were in all of the four waves. 47.92% of the household's main respondents and 50.03% of the individuals in my sample are male. All the households and individuals can be identified with the primary key "HouseholdID" and "ID".

This survey includes demographic backgrounds, family, health status and functioning, health care and insurance, work and retirement, income, expenditures and assets, and house property and housing characteristics topics. In addition to regular

[2]Only valid households and individuals are counted. A valid household (individual) refers to the main respondent (individual) having a record of gender in the data set.

waves, 2014 CHARLS Life History Survey records the household's history of education, health, wealth, and career. The CHARLS surveys provide very detailed health and consumption data. Besides the current health condition data in the regular waves, health history data from the 2014 survey provide the respondents' childhood and adulthood health and medical care conditions. Based on the health information, I can measure the interviewees' health conditions and potential health risks subjectively and objectively. The summary of statistics is shown in Table 1. And section 3.2 include more details about the key variables used in this research.

3.2 Key variables

3.2.1 Health risk

Both the interviewees' current health condition and health history are used to evaluate their health risks. The current health status is based on their self-reported health condition in the question DA080, "Would you say your health is excellent, very good, good, fair, or poor?" The answers are recorded in a categorical variable in levels 1 to 5. Such a health condition is self-reported, subject to individual differences and measurement errors. To deal with the framing bias and accident errors, there is another very similar question in the first three waves, "How would you rate your health status? Would you say your health is very good, good, fair, poor or very poor?". This question basically asks the same as the one I used, except for framing health condition levels. Answers in the first question are 1. Excellent 2. Very good 3. Good 4. Fair 5. Poor. Answers in the second question are 1. Very good 2. Good 3. Fair 4. Poor 5. Very poor. During the interview, these two questions are asked

separately at the beginning and the end of the "Health Condition" section.[3] From 4, we can see that answers to these two questions are highly correlated. Most of the respondences allocate at the 45-degree line. The high correlation shows that the self-reported health conditions are very credible and almost free from framing and accidental errors. Hurd and McGarry (1995) identified that there is a strong correlation between bad self-reported health conditions and both serious sickness and mortality. Therefore, answers in DA080 is a good measurement of the interviewees' current health status. The average of the self-reported health status is around 2 "Good". Following previous literatures, such as Rosen and Wu (2004), individuals are classified as "Sick" if their answer is "fair" or "poor," with a dummy Sick=1; others are classified with Sick=0. The averages of "Sick" are 0.765, 0.763, 0.745, 0.750 in year 2011, 2013, 2015, and 2018 respectively.

The historical health conditions are measured in two lifetime periods, before fifteen years old and after sixteen years old. These two groups of questions measure their historical health conditions in childhood and after adulthood. I employ the results from three questions in the survey for each period: (1) Before you were 15 years old /after you were 16 years old, because of a health condition, were you ever confined to bed or home for a month or more? (2) Before you were 15 years old / after you were 16 years old, because of a health condition, were you ever hospitalized for a month or more? (3) Were you ever hospitalized more than three times within a 12-month period before you were 15 years old/ after you were 16 years old? The answers to all of these questions are dichotomous. I introduce a dummy equal to 1

[3]There are about 70-80 questions in this section.

if the answer is “Yes”, 0 for “No”. By summing up all six dummies here, I get a level variable HealthHist from 0 to 6 measuring the interviewee’s historical health condition, with 0 representing “very healthy” and 6 representing “very poor”. I also introduce a dummy PoorHealthHist=1 if HealthHist is larger or equal to 4, and zero otherwise. Different from the current health condition measurement, these questions about historical health are based on objective events. There should be no subjectivity concerns in this measure.

3.2.2 Life expectancy

The survey evaluates life expectancy according to the interviewee’s subjective estimation on their estimated likelihood of reaching a certain age. The question DA081 asks "Suppose there are 5 steps, where the lowest step represents the smallest chance and the highest step represents the highest chance, on what step do you think is your chance in reaching the age of [...]?" The interviewees are divided into nine age groups. The youngest groups are those younger than 65. Then each group covers a five-year range, 65-69, 70-74, until 95-99. The oldest group is Group 9, older than 100 years old. The age in the question [. . .] is based on the interviewee’s age group. [. . .] is equal to 15 plus the youngest age in the group, with 75 for the first group. For instance, individuals between 65 and 69 were asked about their survival chance of reaching 80 years old, and individuals in the 70 to 74 group were asked about their survival chance of reaching 85. The youngest group, below 65, and the oldest group, above 100, were asked about survival probability to 75 and 115 years old, correspondingly. The answers are recorded in levels 1-5, which represent "Almost impossible",

"Not very likely", "Maybe", "Very likely", and "Almost certain". I assign probabilities of 10%, 30%, 50%, 70%, and 90% were assigned correspondingly in this research. The life expectation distribution are shown in 5 by age group.

However, this surveyed life expectancy is subjective and endogenous with household consumption and saving behavior. To address this issue, I employ a two-stage least square method. Interviewees' current health status and health history help with this endogeneity problem since individuals with better health tend to have a longer life expectancy. Also, according to De Nardi et al. (2017), people with good (bad) health history are likely to be healthy (unhealthy) later, and their historical health condition can influence the recognition of their health condition both physically and mentally. Therefore, a two-stage least square method was used. In the first stage, the life expectancy probability was estimated using the interviewee's current health status and health history. Then, the estimated life expectancy was used to test its correlation with savings and consumption.

In addition to testing the effect of life expectancy cross-sectionally, the data also provided accessibility to test such an effect across panels. The intervals between two consecutive panels of this series of surveys were two or three years. As a result, a proportion of interviewees may be classified into the same group in two consecutive panels and asked the expectancy question on the same age because their age change does not cross the group border between the intervals. For example, a 65-year-old lady in 2013 is in Group 2 at both the 2013 and 2015 surveys. This part of the interviewees' saving behavior changes as their life expectancy changes can be tested.

3.2.3 Medical insurance and serious sickness insurance

Most Chinese have government-provided health insurance plans, including Urban employee medical insurance (from 1998), Urban resident medical insurance (from 2007), and New cooperative medical insurance (from 2003). [4] The latter two are converged to Urban and rural resident medical insurance in some areas starting from 2013. The coverage of such government insurance is very high. In the data sample, 93.6% of the respondents have government-provided health insurance, while only 2.7% have private medical insurance.

Serious sickness is a kind of tail risk. Although the probability of encountering a serious sickness is low, the loss, especially the medical expense, is very high. Government-provided health insurance helps the insured ones by reimbursing their medical cost proportionally. However, a ceiling limits the maximum amount one can claim each year. Such limits are decided at city or province level. For example, the limit of Harbin in 2012 was 200,000 CNY under Urban employee medical insurance plan, and 65,000 CNY for the participants of Urban resident medical insurance. Such limits are far from enough when encountering serious sickness. As a result, households have the tendency to save for such a tail risk. Starting in 2012, China Government introduced the Serious Sickness Insurance Scheme (SSI). SSI acts as additional insurance to the current insurance holders and benefits them by reimbursing part of the high medical expense of critical illness after the part under the ceiling of the basic insurance plans. All participants in Urban resident medical insurance

[4]The introduction details of such government-provided health insurance plans are from the Ministry of Human Resources and Social Security of the PRC. http://www.mohrss.gov.cn/SYrlzyhshbzb/rdzt/syshehuibaoxianfa/bxffaguijijiedu/201208/t20120807_28573.html

and New cooperative medical insurance are included in this scheme automatically, without additional payments. The SSI protects the insured with most of the tail risk by serious sickness. The scheme was introduced in stages. Different areas, usually at the city level, have different times to start the scheme. All the 123 cities in my data sample introduced the SSI from 2011 to 2016. I collect the introduction year of each city from their official local government website, as shown in Figure 1 in the appendix. The different introduction years as a natural experiment help us understand how medical insurance influences household consumption and saving behaviors, which can also be treated as precautionary money.

3.2.4 Income and Consumption

The CHARLS surveys several categories of income. Salary after-tax earnings, pension income, and other income are recorded on the individual level. Total capital income, government/public transfer income, and income from other household members are recorded on the household level. In this research, I aggregate all the individual-level data into the household level and then sum them up as the household total income. Consumptions are surveys on the household level, including household food consumption and non-food consumption. Total household per capita consumption is used as the indicator of the consumption level.

3.3 Empirical strategy: Staggered DID

Serious sickness insurance was introduced in 2012 and covered most cities by 2016. By referring to the local government's documents, I can identify the introduction year

of each city from 2013 to 2016 as shown in Figure 1. At each stage, there are cities in developed areas and developing areas, and in different provinces. The introduction process can be understood by stages, where one stage represents one year. The later introduced cities act as the untreated group in earlier stages before the introduction. The staggered DID can help us identify the effect of SSI on household consumption in this natural experiment.

The regressions are as following:

$$y_{i,j,t} = \beta_0 + \beta_1 \times I_{j,t} + \gamma X_i + \alpha_j + \delta_t + \varepsilon_{i,j,t} \tag{3.1}$$

$y_{i,j,t}$ is the variable to be explained, household's consumption in hypothesis 1, life expectation in hypothesis 2, the medical expenditure, and out-of-pocket medical expenditure in hypothesis 3. $I_{j,t}$ is the dummy of the introduction of SSI of city i at time t. X_i is the household level control, including the respondent's and spouse's gender, age, education level, hukou type, insurance coverage, and household income. α_j and δ_t are the city level fixed effect and time fixed effect. $\varepsilon_{i,j,t}$ is the error term.

4 Overall effect to the public

4.1 Overall effect on consumptions and savings

First of all, I investigate the influence of the introduction of SSI on aggregated household savings and consumptions. As discussed in the model, the change in saving and the change in consumption are opposite numbers. An increase in consumption is equivalent to the same decrease in the saving.

The results are shown in Table 2 in the Appendix. The dependent variable is the logarithm of the household consumption. The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. The interested variable is ssi_dummy1. This variable reflects whether SSI was introduced in that city at that time. Most of the cities started the SSI in the middle of a year, and there is a several-month period to process the medical reimbursement. Moreover, the CHARLS surveys were performed around July to August in the survey year. Therefore, to best reflect the effect of SSI, I define $ssi_dummy1 = 1$ if the city has introduced SSI for at least one calendar year before, and $ssi_dummy1 = 0$ otherwise.

Columns (1) to (4) show the results of the whole sample. It can be seen that there is an increase in household consumption when there is an introduction of SSI. Thus, the SSI introduction has an overall decreasing effect on household savings. Column (1) is a standard least-square regression, and Column (2) is a panel regression with

a fixed effect on city and year levels. Both the results show a very significant positive relationship between SSI introduction and consumption. Household-level control variables are added in Column (3) and Column (4). The controls include the main respondent's gender, age, hukou type [5], education level, coverage by government health insurance, and the logarithm of household income. After adding the controls, the result in Column (3) still shows a significant positive relationship. The relationship is not significant when taking the city cluster, as there is a drop in the degree of freedom. As shown in Column (3), the introduction of SSI can increase 6.6% of household consumption.

In order to test if such a positive effect exists in both healthy and sick households, Columns (5) to (10) test both groups separately. I define a non-sick group as no household member is sick; every member has $Sick = 0$. Otherwise, if there is at least one household member with $Sick = 1$, the household is defined as in the Sick group. Columns (5) to (7) show that there is a significant consumption increase in the Non-sick group. Column (5) shows the panel regression result without controls. Controls are added in Columns (6) and (7), and Column (7) considers the city cluster. Column (6) indicates an increase of 8.2% in household consumption after the introduction of SSI.

However, I cannot find a significant relationship in the Sick group, as from the results in Columns (8) to (10). There seems to be no influence on sick household consumption with the introduction of SSI. The settings of Columns (8) to (10) are similar to that of Columns (5) to (7).

[5]Indicating whether the household belongs to an urban or a rural area.

As mentioned above, an increase in consumption is equivalent to a decrease in saving during the same period. The results show an overall increasing effect on household consumption and an overall decreasing effect on household saving. The effects are significant in non-sick households but not significant in the sick group.

4.2 Medical expenditure

This section shows the result of the influence of SSI on household medical expenditure. There are two measurements of medical expenses: out-of-pocket medical expenditure and total medical expenditure. Elementary government-provided and serious sickness insurance can only reimburse a proportion of the medical expense, which means the households still need to pay the remaining part from their pocket. These two measurements give us two dimensions of household medical activities. Out-of-pocket medical expenditure shows the amount households need to pay for medical treatment. It shows the economic burden that households face on their medical treatment. Out-of-pocket medical expenditure reflects the αM_t or $p \cdot q \cdot M_t$ in the model. Total medical expenditure evaluates the quality of medical treatment that households get. This measurement corresponds to the $q \cdot M_t$ in the model.

Table 3 shows the result of how SSI influences household out-of-pocket medical expenditure. Columns (1) to (3) test the whole sample. All regressions are panel regressions with the city and year-level fixed effects. No significant result exists when no controls are shown in Column (1). After adding household controls, Column (2) show that introducing SSI significantly decreases out-of-pocket medical expenses. The results are similar in Column (3) after considering the city clustering effect. SSI

helps households save about 762.80 Chinese Yuan per year.

Columns (4) to (6) and Columns (7) to (9) test if such an effect exists in the non-sick households and sick households separately. It shows that the introduction of SSI has no significant impact on out-of-pocket medical expenses in non-sick households. The results are the same whether there are household-level controls or a city-level cluster. On the other hand, Columns (7) to (9) identifies that SSI does help relieve the medical burden of sick households. Columns (8) and (9) show that there is a significant 1630 Chinese Yuan drop with the introduction of SSI. Similarly to the whole sample, Columns (4) and (7) are panel regressions without the controls. Columns (5) and (8) add the household controls, and Columns (6) and (9) considers the city-level clustering effect.

Table 4 shows the relationship between SSI introduction and household total medical expenditure before reimbursement. Columns (1) to (4) show the results of the whole sample. The only significant results are in Columns (1) and (3), showing there is a positive correlation. These two test the whole sample, and there are no household controls. A positive correlation shows that the households receive better medical treatment, or more expensive medical treatment, after the introduction of SSI. After adding the control, the results are insignificant in Columns (2) and (4). Columns (3) and (4) add the city-level clustering effect from Columns (1) and (2). Columns (5) to (8) and Columns (9) to (12) test the non-sick and sick household groups separately. There are no significant results when testing the two groups separately. The design of Columns (5) to (8) and Columns (9) to (12) are similar to Columns (1) and (4).

Therefore, I find a negative correlation between SSI introduction and household out-of-pocket medical expenditures. Such an effect is only significant in the sick household group. There is some but not strong evidence showing a positive correlation between SSI introduction and the medical treatment that households receive.

4.3 Life expectancy

This section tests the effect of SSI introduction on household life expectancy. Different from the tests above, only respondents aged above 60 years old are included in this section. The reason is from the design of the survey question on life expectancy. As mentioned in section 3.2.2, interviewees are asked about their subjective survival probability to a target age. The target age is based on their current age, and which age group they belong to. Because there are the same interviewees across all four panels, the numbers of interviewees in age groups except for the youngest and the oldest are dynamically balanced. For example, a 74-year-old man was in the 70-74 group in 2013. He was 76 in the 2015 panel and was divided into the 75-79 group. While someone 69 in 2013 entered the 70-74 group in 2015. As a result, each group has new entrants and leavers in a new panel, except for the youngest and the oldest. However, Group 1, under 60 in this sample, kept decreasing in this period, since those 58- 59- 60-year-old interviewees were treated as in the 60-64 group in the subsequent panel, while there were no new comings. Such an issue also exists in the oldest group. However, as this group considers the elderly more than 100 years old, the group size is small and stable, as some left the sample due to death. Therefore, I exclude the under-60 group in this part and only include the remaining sample.

As shown in Table 5, no significant results are found at this stage, Although there is a positive coefficient of ssi_dummy. Columns (1) to (4) test the whole sample. Columns (5) to (8) and Columns (9) to (12) test the non-sick and sick household groups separately.

5 Beneficial groups

Serious Sickness Insurance (SSI) was introduced as a complementary social medical insurance in addition to existing social medical insurance policies. One of the primary goals of SSI is to provide a basic guarantee to low-income and low-wealth households, preventing them from falling into poverty due to serious illness and protecting them from tail risks. Households with poor health conditions primarily benefit from reduced out-of-pocket payments for medical treatments, while healthier households are more inclined to increase consumption. Given the policy's mission and overall effect, it is expected that SSI will have varying impacts on households of different wealth levels. Additionally, as medical insurance policies differ between urban and rural areas, SSI's effects may vary based on household location. Furthermore, as shown in the three-period model, household income (y_t) is a significant factor in determining the sign and magnitude of precautionary saving and life expectancy channels. In China, most men retire at 60 years old, while the average retirement age for women is 55. Thus, the impact of SSI may also differ across age groups. In this section, we analyze the effects of SSI on different wealth levels, household types, and age groups.

5.1 Effects on different wealth conditions

This section examines the effect of SSI on households with varying wealth levels. Here, wealth includes the net value of all financial assets, such as savings, stocks, mutual funds, government funds, residential properties with percentage ownership, transportation vehicles, non-financial assets, fixed capital assets, land, and livestock.

Wealth is calculated by subtracting household debts and mortgages, leading to some individuals having negative household wealth. The numbers of such individuals were 908, 736, 1159, and 1271 in the years 2011, 2013, 2015, and 2018, respectively. We divided all individuals into four groups based on their household wealth quantiles. Table 6 provides summary statistics on household wealth by year. In the following section, we test the overall effect, precautionary saving effect, and life expectancy effect for households at each wealth level.

5.1.1 Consumption effect of wealth groups

This section investigates the consumption effect of SSI on households with different wealth levels. First, we test how consumption levels of households in various wealth categories responded to the introduction of SSI. We use the logarithm of consumption to align with the overall analysis performed in the previous section. Secondly, we consider that changes in consumption may correlate with household wealth, as wealthier groups tend to have more flexibility in consumption levels compared to poorer groups. To capture this, we use the consumption-to-wealth ratio to evaluate if households spent a larger or smaller proportion of their wealth on consumption in the survey's past year. Thus, we define consumption change in both absolute terms and as a proportion of wealth.

We first estimate the impact of SSI introduction on household consumption levels. The regressions follow the structure reported earlier in Table 7, with the first three columns representing the lowest wealth quantile, columns (4) to (6) representing the second quantile, and so on. In each group, the first regression includes no control

variables, the second regression adds city and year-level fixed effects, and the third regression includes the city-level cluster effect. We observe a positive effect on the wealthiest group, with a 14.3% increase in their annual consumption. Although the results for the first two quantiles are not significant, negative parameters are observed. The effect trends upwards from less-wealthy to more-wealthy households, indicating that wealthier households tend to increase their consumption following the introduction of SSI.

As previously demonstrated, the overall effect is significant only for healthy households. Therefore, we also examine the effect on healthy households across different wealth levels in Table 8, which shows similar results. The wealthiest healthy households experience an average 13.4% increase in consumption after SSI introduction.

Since consumption levels and habits differ across wealth groups, changes in consumption amounts cannot be directly compared across quantiles. Therefore, we also test the effect of SSI introduction on the consumption ratio. Table 9 reports regressions in the same structure as the level data, where the consumption ratio is defined as total household consumption minus medical expenses, divided by total household wealth. The consumption ratios for the wealthiest and second wealthiest groups significantly increase by 0.029 and 0.033, respectively. These results mirror those of the consumption level data, with negative but not significant parameters for the lowest and second lowest wealth quantiles. For healthy households shown in Table 10, only the top wealth group shows a positive and significant increase in consumption ratio of 0.404.

The introduction of SSI appears to have an increasing consumption effect on

the wealthiest households. This can be explained by several factors that influence wealth accumulation, with medical expenses being only one of them. While SSI alleviates some of the burden of medical expenses, less wealthy households might allocate this relief to other other difficulties they need to solve rather than immediate consumptions. In contrast, wealthier households, with fewer concerns about other aspects, are more likely to increase their short-term consumption.

5.1.2 Medical expenses of wealth groups

This section investigates the effect of the introduction of SSI on the medical expenses of households across different wealth levels. The primary function of the policy is to reimburse part of the medical costs. Therefore, we need to examine two types of medical expenses: total medical expenses and out-of-pocket medical expenses. In principle, out-of-pocket medical expenses are equal to the total medical expenses minus the reimbursed medical expenses, which include reimbursements from both SSI and existing basic medical insurance policies[6]. The results from the previous section show that the impact on medical expenses is more significant for households with poor health conditions than for non-sick households. We also analyze sick households separately within each wealth quantile.

To assess whether the policy affects the medical burden of households, we investigate the effect on the out-of-pocket medical expenses of households in different wealth quantile groups. Since out-of-pocket medical expenses are the portion actually paid by households, they best reflect medical expenses in their lifetime budgeting and

[6]1. If households have any private health insurance policies apart from government-provided ones, the reimbursed part is also subtracted when calculating out-of-pocket medical expenses.

precautionary saving. Table 11 presents the results. We find a significant decrease in out-of-pocket medical expenses for the wealthiest group, with SSI helping them save 1545 CNY per capita per year. The saving effect for sick households in the Q4 group is even larger, at 5410 CNY per year, as shown in Table 12. The results for the other three lower wealth-level groups are not significant.

While out-of-pocket medical expenses more directly impact household financial activities and budgeting, total medical expenses measure the level of medical treatment households receive. Generally, higher total medical expenses indicate better medical treatment in terms of quality and quantity. Table 13 shows the effect on the total medical expenses of all households, with no significant results for any wealth-level groups. However, Table 14, focusing solely on sick households, reveals increases in total medical expenses for the middle two quantiles. Specifically, Q2 and Q3 see increases of 2638 CNY and 2211 CNY, respectively, indicating that households in these groups with poor health conditions received more medical treatments.

The groups benefiting from total medical expenses and out-of-pocket medical expenses differ. One possible explanation for these results is that the wealthiest households already received sufficient medical treatment before the introduction of SSI. Consequently, SSI primarily reduces their out-of-pocket expenses by covering costs above the existing insurance ceiling, resulting in no significant change in total medical treatment received. In contrast, the middle two quantiles could not afford satisfactory medical treatment before SSI due to financial constraints. They had a limited budget for amounts exceeding the ceiling of existing policies, fully paying these costs out-of-pocket. After SSI's introduction, the policy reimburses part

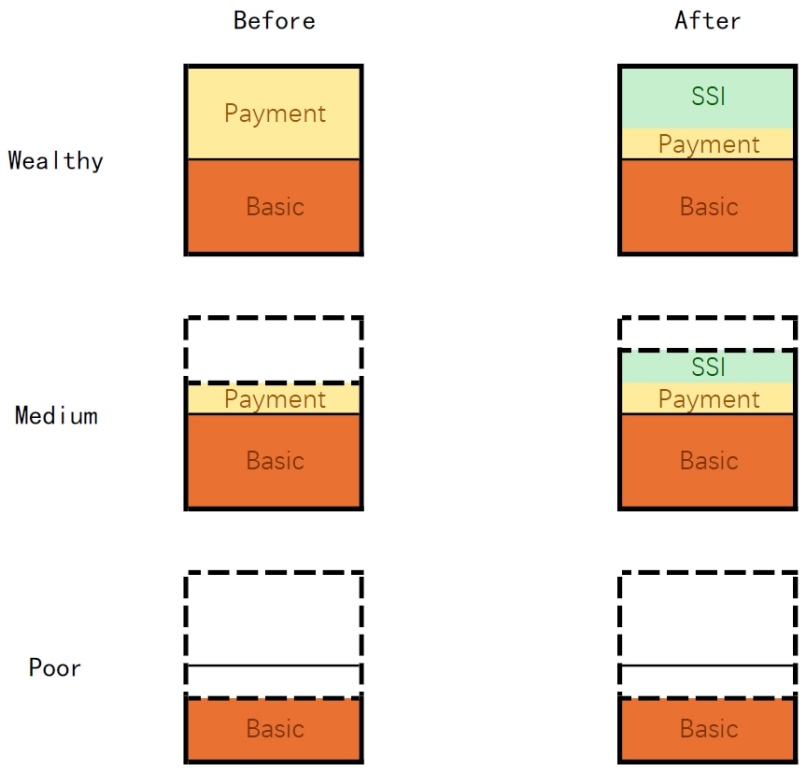
of these expenses, allowing them to receive more valuable medical treatment while maintaining the same out-of-pocket costs. Households in the lowest quantile face a significant burden due to their limited wealth budgets, as existing policies' ceilings still represent a considerable expense. Consequently, SSI has little impact on this group, as their medical treatment remains below the ceiling where SSI reimbursements would apply. This explains why the only significant decrease in out-of-pocket medical expenses is observed in the wealthiest group, while the middle two groups experience an increase in total medical expenses.

5.1.3 Life expectancy of wealth groups

This section reports the effects of the introduction of SSI on household life expectancy, stratified by wealth level. We examine the self-reported life expectancy for the entire sample and for sick households only. The results are presented in Tables 15 and 16. We observe an increase in life expectancy only in the Q2 group. This aligns with the previously mentioned increase in total health expenses for this group.

These findings can be attributed to the SSI regime. SSI only provides reimbursement for the portion of medical expenses exceeding the ceiling of basic medical insurance coverage. The wealthiest individuals can afford all necessary medical treatments even without SSI, so the reimbursement they receive from SSI enhances their utility. The middle-wealth group benefits from SSI as it allows them to afford more and higher-quality medical treatments. However, the poorest group cannot even cover the out-of-pocket expenses required under basic insurance, thus they are unable to access any medical treatments reimbursed by SSI. Such effect are shown in

the following figure.



5.1.4 Portfolio changes of wealth groups

This section examines the impact of SSI introduction on household portfolio distributions across different wealth levels. Using self-reported household portfolio data, we analyze both the amount and percentage share of each portfolio component. The portfolio categories include cash, stocks, government bonds, other savings, primary residence, other residences, vehicles, non-financial assets, fixed capital, land, monetary assets, and debt.

Table 17 presents evidence of how SSI affects portfolio amounts. We find a significant increase in stock investment across all quantiles except the highest one. The increase ranges from 339.69 CNY to 1039.68 CNY, suggesting that households allocate a substantial portion of their SSI benefits to the stock market. Interestingly, we do not observe a universal or significant change in cash holdings or other risk-free savings, which contradicts the "household stock investment puzzle"—the notion that individual investors typically underinvest in the stock market. This discrepancy can be explained by the mental accounting bias: households perceive SSI benefits as a "gift" from the government rather than regular income, making them more willing to take on investment risks. We also identify significant changes in other asset categories, such as fixed capital and land. However, since only a small fraction of households hold these assets, the findings are not broadly applicable to the entire sample.

Table 18 shows the effect of SSI on portfolio percentage shares. We observe an increase in the stock investment share for Q1, Q2, and Q3. The negative coefficient for Q1 is due to negative total assets—households in the lowest wealth quantile tend to have higher debt than assets. Additionally, Table 19 assesses stock market participation, where participation is defined as holding a nonzero stock amount in the household portfolio. The results indicate that SSI has no effect on stock market participation across any quantile group. Collectively, these findings suggest that households who were already investing in stocks before SSI introduction tend to increase their stock investments using SSI reimbursements. However, non-participants do not enter the stock market, as the costs associated with entry and learning out-

weigh the mental accounting effect.

We find no significant portfolio adjustments among households in the highest wealth quantile. Combined with our findings from the consumption analysis, this suggests that the wealthiest households allocate all SSI benefits toward consumption to enhance their utility.

5.2 Effects on different households registration types

The Hukou system in China is a household registration mechanism that categorizes citizens according to their place of residence and socio-economic status. Typically, households are labeled as urban or rural. This system was introduced in the 1950s and began to be phased out in 2014. There are different insurance policies for urban and rural households. Basic medical insurance includes various plans for working urban residents, non-working urban residents, and the rural population. Working urban residents contribute the highest insurance funds and receive the highest reimbursement rates, followed by non-working urban residents, with the rural population contributing the least and receiving the lowest reimbursement ratios.[7] Therefore, SSI may influence urban and rural households differently. Although some of the panel data is from after 2014, when the Hukou system was phased out, most households had already entered the social medical system in the 2000s, allowing us to use their household registration type as an indicator of the type of insurance policy they follow. In this section, we investigate whether such differences exist in the overall effect and the effects of both channels.

[7]More information about the China Health Insurance System can be found at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10292030/.

Table 20 shows the results for the effects of SSI on the consumption levels of urban and rural households. Columns (1) to (3) present the results for the rural group, and columns (4) to (6) show the results for urban households. We observe a significant increase in consumption for urban households but not for the rural group. Urban households increase their consumption by 10.4% after the introduction of SSI. Similar to previous sections, Table 21 provides evidence for the effects on sick and non-sick households separately. Column (2) shows that non-sick households in rural areas increase their consumption by about 8.34% after the introduction of SSI. However, urban households show different results. No significant increase is observed in healthy households, while a 17.2% increase is observed in the consumption of sick urban households.

Table 22 also provides evidence for the effect of SSI on out-of-pocket medical expenses. We observe a significant decrease for the entire urban group, with the introduction of SSI helping them save about 1017 CNY in medical expenses. The results for the rural group are not significant. When focusing solely on sick households, as shown in Table 23, there are no significant results. The effects on total medical expenses for households with different registration types are shown in Tables 24 and 25, with no significant results.

When examining the influence of SSI introduction on life expectancy across different household registration types, Table 26 shows no significant results, consistent with the findings for the entire sample in the previous section.

5.3 Effects on different ages

The effects of health insurance on consumption, medical expenditure, and life expectancy vary significantly across different age groups. Younger households may experience different changes in consumption patterns and medical expenses compared to older households, who typically have greater medical needs and different financial priorities. For example, younger individuals may prioritize immediate consumption and savings over life expectancy, whereas older individuals may focus more on healthcare expenditures. These age-related differences result in varying impacts of SSI on household saving behaviour, medical expenditure, and life expectancy. In this section, we divide the sample into four age groups: (1) 64 years old and younger; (2) 65-74 years old; (3) 75-84 years old; (4) 85 years old and older.

The results in Table 27 illustrate the effects of SSI on different age groups. The youngest group, those 64 years old and younger, experienced a significant increase in consumption, with an 8.24% rise following the introduction of SSI. The consumption effects for the other age groups were not significant.

To determine whether the SSI policy impacts medical expenditure differently across age groups, we examine both out-of-pocket medical expenses and total medical expenses. Table 29 shows that the SSI policy helps the 65-to-74-year-old group save 1410 CNY in out-of-pocket expenses. The effects for other age groups are not very significant. However, when focusing solely on sick households, as shown in Table 30, we find that the oldest group (85 years and older) actually increases their out-of-pocket expenditure with the introduction of SSI. This surprising result can be explained by the higher likelihood of serious illness in this age group. Before SSI,

they may have been unable to afford the full medical costs due to high out-of-pocket payments. After SSI, they could access necessary medical treatments by covering only the unreimbursed portion themselves.

Regarding total medical expenses, the effects are not significant for any age group, as shown in Table 31. However, when focusing on sick households in Table 32, we observe that the youngest group (64 years and younger) received an additional 1328 CNY worth of medical treatment following the introduction of SSI. This aligns with the observed increase in life expectancy for this group, as shown in Table 33. Improved access to medical treatment likely contributes to the longer life expectancy for sick households in the youngest age group.

6 Future work

6.1 Life-Cycle model revision

A life-cycle model is useful for understanding the impact of SSI introduction on household consumption, portfolio allocation, and medical decisions. This model incorporates both risk-free and risky assets.

Current results show that the impact of SSI introduction and consumption differs in sick and non-sick households. The effect of out-of-pocket medical expenditure also varies between the two groups. It reminds me that health conditions are missing in my current model.

There is a strong assumption in the current model that the individual can only live to period three by introducing medical insurance via better medical treatment. However, expenses in medical treatment are not a panacea. Better and more medical treatment can help increase the probability of living longer, but it is never guaranteed. So it is better to include a survival rate from periods two to three in the model.

To build the survival model, I first suppose there are two groups of individuals: the non-sick group and the sick group. Individuals in the non-sick group have a survival probability S_h, which is irrelevant to the medical expense. Those in the sick group have a starting survival probability S_u, where $S_u < S_h$. They can increase the survival probability by having better medical treatment, which costs M. The medical expenses and the survival probability have a positive correlation and a diminishing marginal effect. Thus, I assume the survival probability function is:

$$S(H,M) = \begin{cases} S_h & , H = h \\ S_h - e^{-M} \cdot (S_h - S_u) & , H = u \end{cases} \tag{6.1}$$

, where H represents the health condition. $H = h$ means the individual belongs to the non-sick group, while $H = u$ means the individual belongs to the sick group.

The household faces the following life-cycle utility maximization problem:

$$Max_{\{C_t,\alpha_t\}_{t=1}^{T}} E \sum_{t=1}^{T} \beta^{t-1} \left(\prod_{j=1}^{t} S_j \right) \frac{C_t^{1-\gamma}}{1-\gamma} + U(H_t) \tag{6.2}$$

$$\text{s.t. } W_{t+1} = \left[\alpha_t R_{t+1} + (1-\alpha_t) R_f \right] (W_t - C_t - O_t) + Y_{t+1} \tag{6.3}$$

$$W_t \geq 0, \alpha_t \in [0,1] \tag{6.4}$$

$$R_t = \mu + R_f + \varepsilon_t, \text{ where } \varepsilon_t \sim N\left(\mu, \sigma_R^2\right) \tag{6.5}$$

$$H_t = f(t) \tag{6.6}$$

$$M(t) = \frac{O(t)}{1 - I_t \cdot b}, \text{ where } I_t = \begin{cases} 1 & , \text{ if covered by SSI} \\ 0 & , \text{ if not covered by SSI} \end{cases} \tag{6.7}$$

$$S_j(H, M) = \begin{cases} S_j^h & , H = h \\ S_j^h - e^{-M} \cdot (S_j^h - S_j^u) & , H = u \end{cases} \tag{6.8}$$

Here, β is the discount factor, γ represents risk aversion, S_t is the individual survival probability, C_t is the consumption level, H_t denotes health condition, α_t is the percentage invested in the risky asset, R_t is the return on the risky asset, R_f is the risk-free rate, O_t represents out-of-pocket medical payments, Y_t is income, and b is the percentage of medical expenses reimbursed by insurance.

This model is currently a work in progress and will be updated in the next version of the paper.

6.2 Revision in DID

Pre-trend check is a necessity when performing the DID analysis. However, the current dataset, CHARLS, only has four panels covering 2011 to 2018, which overlaps the introduction of SSI from 2012 to 2016. It is impossible to perform the pre-trend check with this dataset only. Other China household surveys started earlier can help with this. Although the sample and the surveyed households are different from CHARLS, it can still identify the income and medical expenditure at the city level. Chinese Household Income Project (CHIP) is a suitable dataset to test the pre-trend. It started in 1988 and has 1995, 1999, 2002, 2007, 2008, 2013, and 2018 panels covering 160 thousand households in 31 provinces. [8]I will access this dataset and perform related pre-trend analysis in the next steps.

[8]More information about CHIP can be found at http://www.ciidbnu.org/chip/chips.asp?year=2018&lang=EN.

As shown in the current analysis results, SSI introduction's effects are different in sick and non-sick households. Adding another household health status dummy in the current regression model can help identify the difference between the two groups. Therefore, the model will become a difference-in-difference-in-difference (DDD) model. The DDD regressions are as following:

$$y_{i,j,t} = \beta_0 + \beta_1 I_{j,t} + \beta_2 H_{i,t} + \beta_3 I_{j,t} \times H_{i,t} + \gamma X_i + \alpha_j + \delta_t + \varepsilon_{i,j,t} \tag{6.9}$$

$y_{i,j,t}$ is the variable to be explained, household's consumption in hypothesis 1, life expectation in hypothesis 2, the medical expenditure, and out-of-pocket medical expenditure. $I_{j,t}$ is the dummy of the introduction of SSI of city i at time t. $H_{i,t}$ is the health condition of household i at time t.I will incorporate both the current health status and health history (including childhood and adulthood) in the identification of household health status. X_i is the household level control, including the respondant's and spounse's gender, age, education level, hukou type, insurance coverage, and household income. α_j and δ_t are the city level fixed effect and time fixed effect. $\varepsilon_{i,j,t}$ is the error term.

The spatial differ-in-diff method comparing the households living near the border of two cities with different SSI introduction years is a better identification to test the SSI effect. Especially for two cities in one province, households living on the border of the two cities have very similar environments and resources. The spatial DID concentrates on the border households and gives a more precise evaluation. The public CHARLS data does not include the county-level address of households. I am actively contacting the CHARLS management team to seek the possibility of this

data to perform this part of the research.

6.3 Risk term and robust check

I have not discussed so much on the third part of equation (25) $\left[\frac{(2+r)\alpha^2+\alpha^2b^2}{r^2+3r+3}-\frac{1}{2+r}\right]\frac{\theta\sigma^2}{2}+\frac{(2r+3)\ln\beta(1+r)}{(r^2+3r+3)(2+r)\theta}$, the risk on households. After revising my model, I will first test if this term is minor compared with the first two parts, using parameters from my data and and other economic indicators in the real world, including σ in household medical expenditure. Then, I will investigate if there are any questions in the CHARLS dataset that can help to identify the risk attitude of a household.

Robust checks will be performed later. An event study including dummies indicating years before and after the SSI introduction can help identify the dynamic impact of the introduction of SSI on household savings and medical expenses.

7 Conclusion

In this research, I build a three-period model to illustrate the medical insurance influences household savings via both the precautionary saving and life expectancy channels. I use CHARLS dataset and SSI health insurance reform empirically to show an overall negative correlation between the introduction of SSI and household savings. The SSI introduction relieves the household burden of out-of-pocket medical expenses. Such effects are different between sick and non-sick households.

References

Attanasio, O. P. and Brugiavini, A. (2003). Social security and households' saving. *The Quarterly Journal of Economics*, 118(3):1075–1119. 1

Badarinza, C., Campbell, J. Y., and Ramadorai, T. (2016). International comparative household finance. *Annual Review of Economics*, 8(1):111–144.

Bai, C.-E. and Wu, B. (2014). Health insurance and consumption: Evidence from china's new cooperative medical scheme. *Journal of Comparative Economics*, 42(2):450–469. Economic Systems in the Pacific Rim Region Symposium. 2

Bloom, D. E., Canning, D., and Graham, B. (2003). Longevity and life-cycle savings. *The Scandinavian Journal of Economics*, 105(3):319–338.

Bloom, D. E., Canning, D., Mansfield, R. K., and Moore, M. (2007). Demographic change, social security systems, and savings. *Journal of Monetary Economics*, 54(1):92–114. Carnegie-Rochester Conference Series on Public Policy: Economic Consequences of Demographic Change in a Global Economy April 21-22, 2006. 1

Chou, S.-Y., Liu, J.-T., and Hammitt, J. K. (2003). National health insurance and precautionary saving: evidence from taiwan. *Journal of Public Economics*, 87(9):1873–1894. 1

DeNardi, M., French, E., and Jones, J. (2005). Sex, income shocks, and the savings of elderly singles. *Working Paper*. 1

Dobkin, C., Finkelstein, A., Kluender, R., and Notowidigdo, M. J. (2018). The economic consequences of hospital admissions. *American Economic Review*, 108(2):308–52. 1

Doskeland, T. and Kvaerner, J. S. (2021). Cancer and Portfolio Choice: Evidence from Norwegian Register Data. *Review of Finance*, 26(2):407–442. 1

Dynan, K. E. (1993). How prudent are consumers? *Journal of Political Economy*, 101(6):1104–1113. 1

Engen, E. M. and Gruber, J. (2001). Unemployment insurance and precautionary saving. *Journal of Monetary Economics*, 47(3):545–579. 1

Fuchs-Schundeln, N. and Schundeln, M. (2005). Precautionary savings and self-selection: Evidence from the german reunification "experiment". *Quarterly Journal of Economics*, 120(3):1085–1120. Cited by: 96. 1

Garcia-Gomez, P., van Kippersluis, H., Donnell, O. O., and van Doorslaer, E. (2013). Long-term and spillover effects of health shocks on employment and income. *Journal of Human Resources*, 48(4):873–909. 1

Gomes, F., Haliassos, M., and Ramadorai, T. (2021). Household finance. *Journal of Economic Literature*, 59(3):919–1000.

Gomes, F. and Michaelides, A. (2005). Optimal life-cycle asset allocation: Understanding the empirical evidence. *The Journal of Finance*, 60(2):869–904.

Guariglia, A. and Rossi, M. (2004). Private medical insurance and saving: evidence from the british household panel survey. *Journal of Health Economics*, 23(4):761–783. Contains contributions from the Grossman Symposium. 1

Guiso, L., Jappelli, T., and Terlizzese, D. (1992). Earnings uncertainty and precautionary saving. *Journal of Monetary Economics*, 30(2):307–337. 1

Hamermesh, D. S. (1985). Expectations, life expectancy, and economic behavior. *The Quarterly Journal of Economics*, 100(2):389–408. 1

Heimer, R. Z., Myrseth, K. O. R., and Schoenle, R. S. (2019). Yolo: Mortality beliefs and household finance puzzles. *The Journal of Finance*, 74(6):2957–2996. 1

Huang Jialin, Fu Hongqiao, S. Z. (2022). The impact of supplementary health insurance on residentsapos; consumption: Evidence from critical illness insurance. *Journal of Financial Research*, 508(10):58.

Kantor, S. E. and Fishback, P. V. (1996). Precautionary saving, insurance, and the origins of workers' compensation. *Journal of Political Economy*, 104(2):419–442.

Kolsrud, J., Landais, C., and Spinnewijn, J. (2020). The value of registry data for consumption analysis: An application to health shocks. *Journal of Public Economics*, 189:104088. 1

Meyer, B. D. and Mok, W. K. (2019). Disability, earnings, income and consumption. *Journal of Public Economics*, 171:51–69. Trans-Atlantic Public Economics Seminar 2016. 1

Rosen, H. S. and Wu, S. (2004). Portfolio choice and health status. *Journal of Financial Economics*, 72(3):457–484. 1

Salm, M. (2010). Subjective mortality expectations and consumption and saving behaviours among the elderly. *Canadian Journal of Economics*, 43(3):1040–1057. 1

Starr-McCluer, M. (1996). Health insurance and precautionary savings. *American Economic Review*, 86(1):285–295. 1

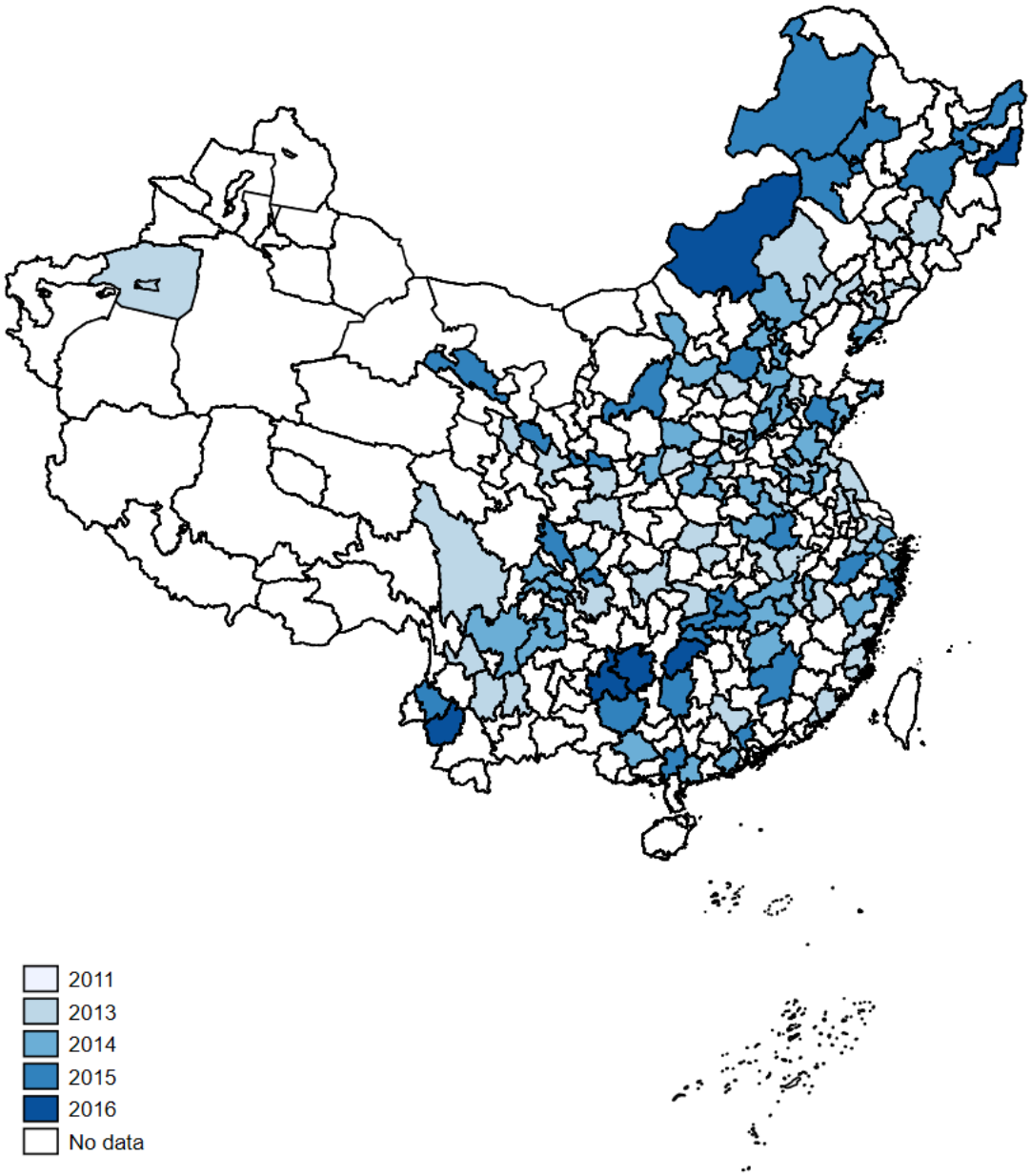
Wagstaff, A. and Lindelow, M. (2008). Can insurance increase financial risk?: The curious case of health insurance in china. *Journal of Health Economics*, 27(4):990–1005. 1

Zang, W., Liu, G., Fei, X., and Xianjun, X. (2012). The effect of urban medical insurance on consumption. *Journal of Economic Research*, 7:75–86. 1

Zhao, Y., Strauss, J., Chen, X., Wang, Y., Gong, J., Meng, Q., Wang, G., and Wang, H. (2020). China health and retirement longitudinal study wave 4 user's guide. Technical report, National School of Development, Peking University.

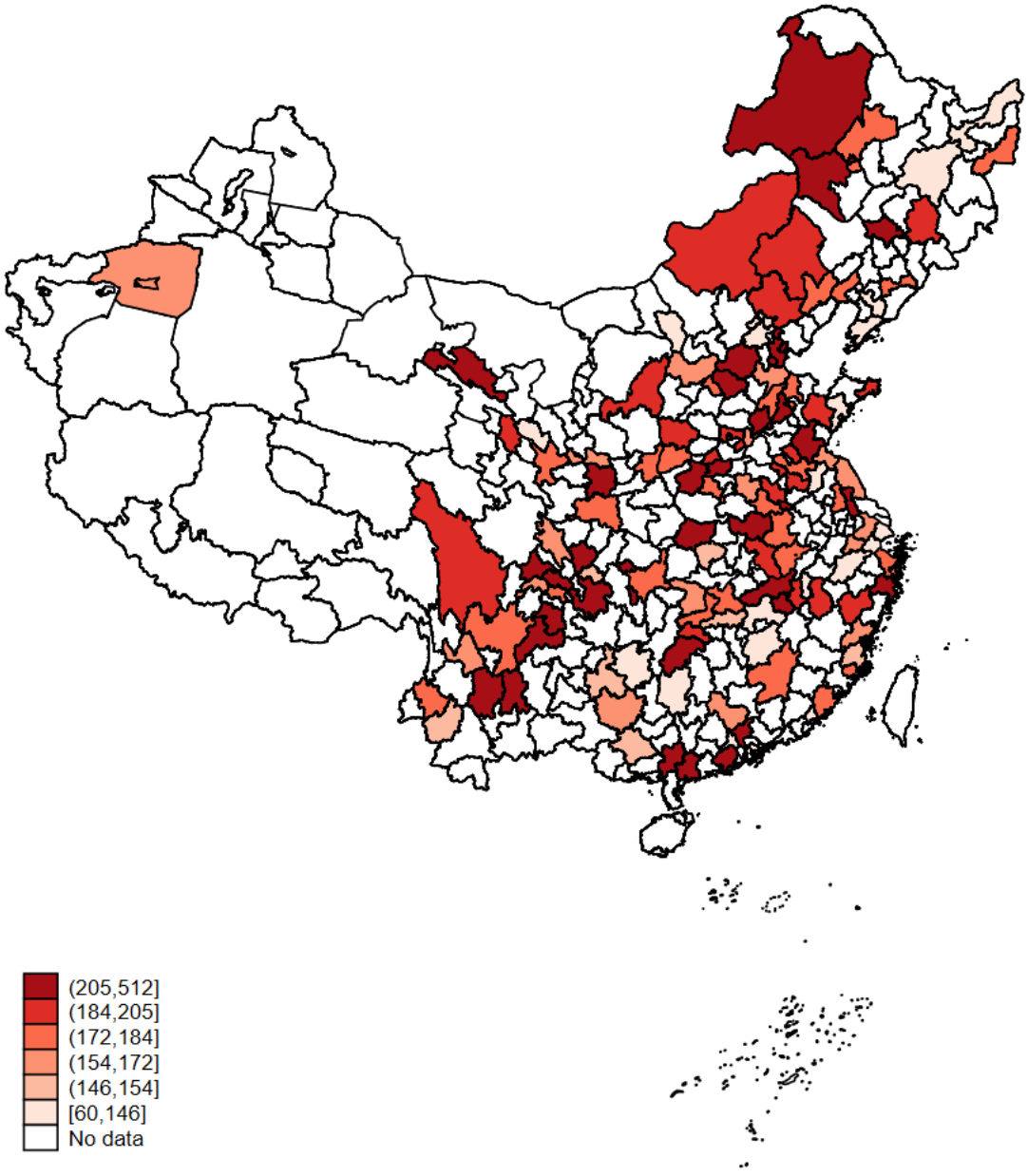
Figures

Figure 1: SSI Introduction Year



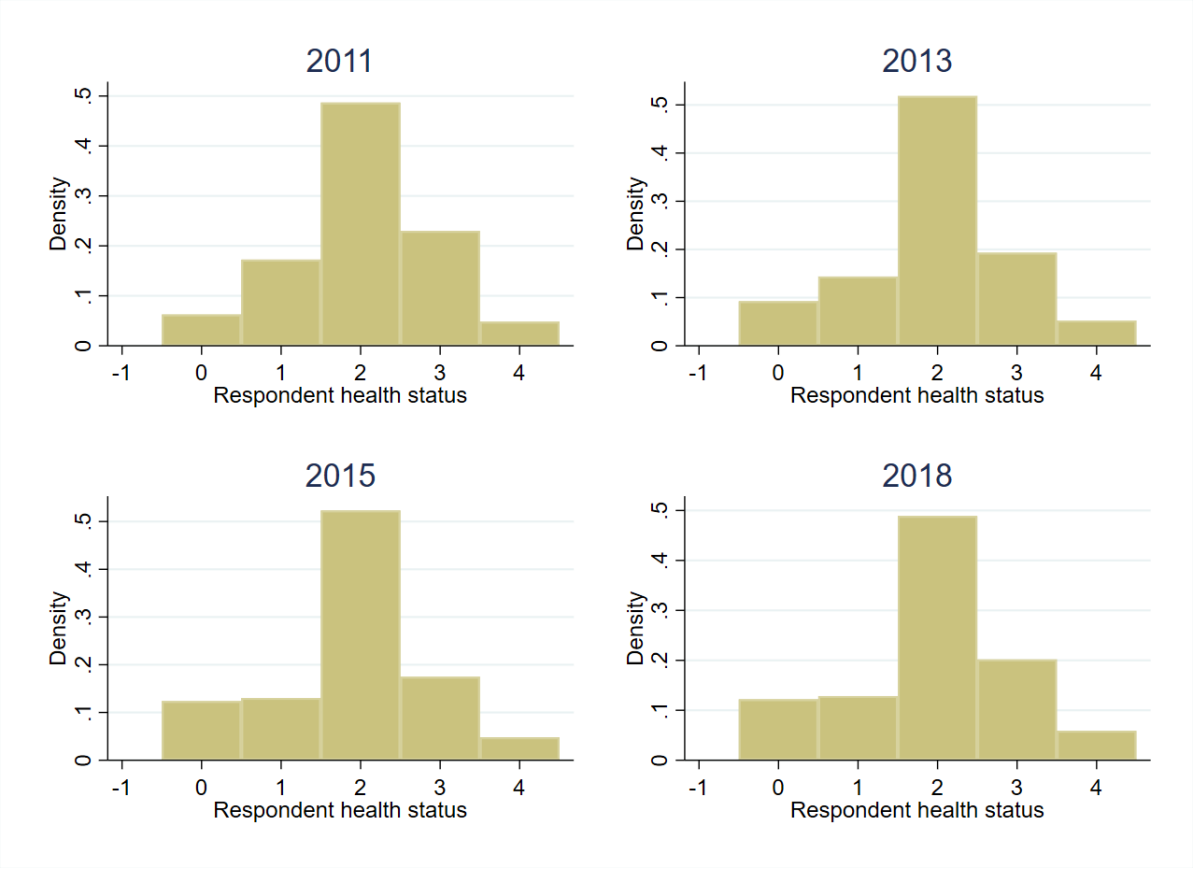
Note: The figure shows the the introduction of Serious Sickness Insurance in China. The map only covers the 123 cities in my sample. The data is from the official website or document of local governments. No data only means such cities are not covered in this research's sample, but does not mean that the data is unavailable from the mentioned source.

Figure 2: Geographical Distribution of Respondents



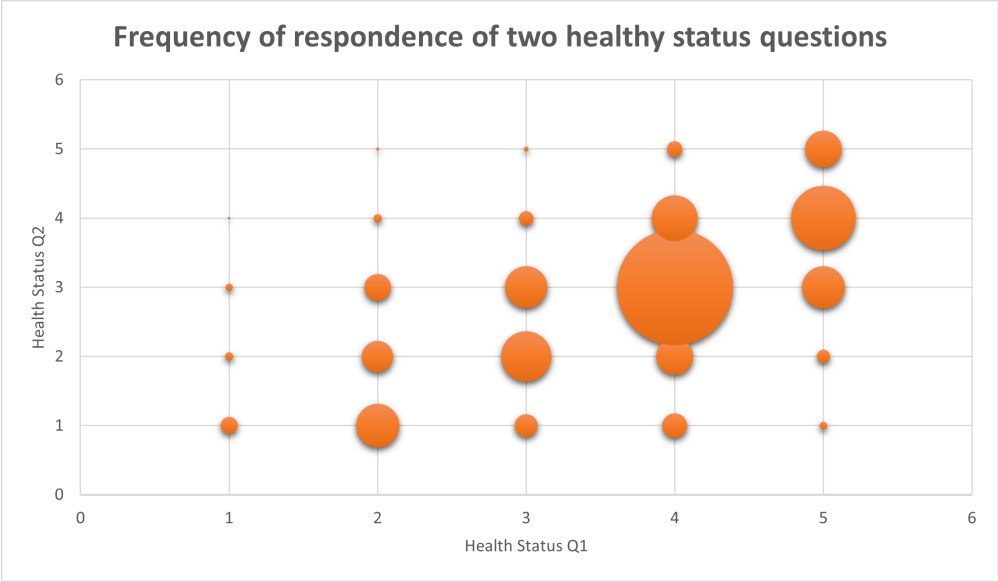
Note: The figure shows the geograohical distribution of sample respondents. The number of respondents are as of in the 2018 sample.

Figure 3: Respondent Age Distribution



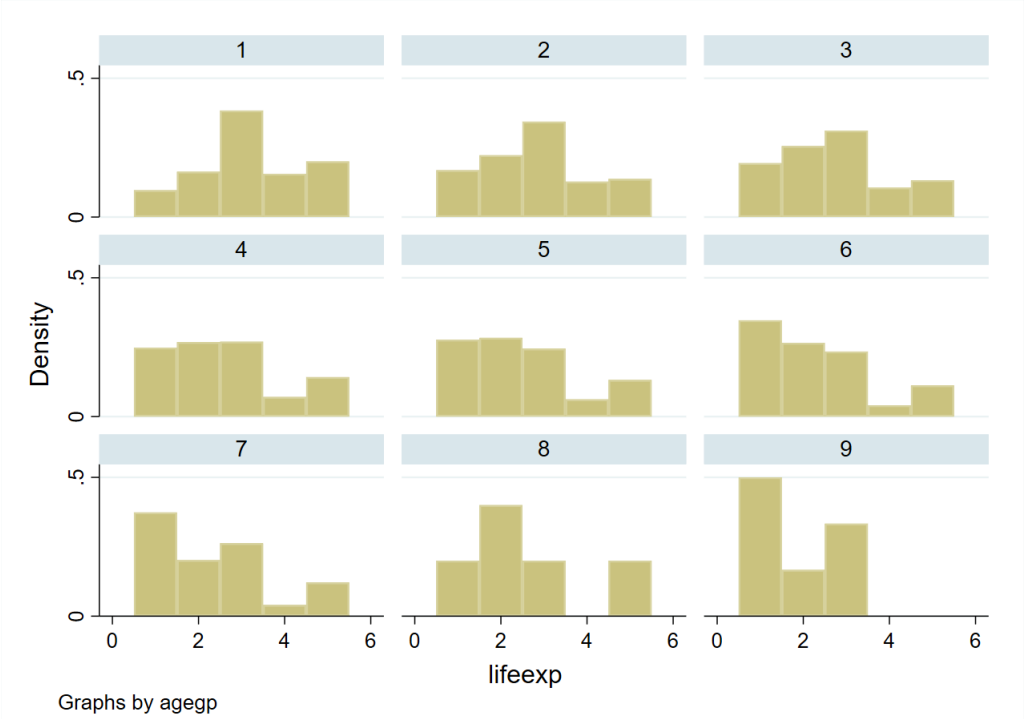
Note: The figure shows the distribution of the individual's age distribution in 2011 2013, 2015, and 2018.

Figure 4: Frequency of Respondence of Two Health Status Questions



Note: The figure shows the frequency of respondence of two health status questions in all waves. Respondents are asked their health condition twice in 2011, 2013, and 2015. The only difference between the two questions are the framing of the answers. Answers 1-5 in the x-axis are 1. Excellent 2. Very good 3. Good 4. Fair 5. Poor. Answers 1-5 in the y-axis are 1. Very good 2. Good 3. Fair 4. Poor 5. Very poor.

Figure 5: Life Expectancy by Age Group



Note: The figure shows the distribution of the individual'slofe expectations of each age group. The x-axis represents the self-estimated chance to live to a certain age, which is ten years plus the oldest age in each group. 1 Almost impossible; 2 Not very likely; 3 Maybe; 4 Very likely; 5 Almost certain. The nine groups are divided as the following: 1. $<$ 65 YEAR; 2. 65 $-$ 69 YEAR; 3. 70 $-$ 74; 4. 75 $-$ 79; 5. 80 $-$ 84; 6. 85 $-$ 89 YEAR; 7. 90 $-$ 94 YEAR; 8. 95 $-$ 99 YEAR; 9. $\geq$ 100 YEAR.

Tables

Table 1: Summary of Statistics for Cross Sectional Variables

Descriptive statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max	(6) p10	(7) p25	(8) p50	(9) p75	(10) p90
Main Respondent gender	102,312	0.518	0.500	0	1	0	0	1	1	1
Main Respondent Age	101,124	58.88	11.45	10	118	45	50	58	66	75
Spouse Age	64,227	58.36	9.623	10	115	47	51	58	65	72
Hukou Type	72,737	0.248	0.473	0	3	0	0	0	0	1
Household average health status	73,140	1.957	0.976	0	4	0	2	2	3	3
Household net non-housing financial wealth	56,085	13,211	752,226	-1.100e+07	1.100e+08	-59,000	0	1,200	20,000	80,000
Household total household income	42,110	33,492	217,115	-2.985e+06	3.906e+07	500	2,400	13,900	42,100	80,000
Household food consumption, past 7 days	65,800	355.1	1,160	0	144,000	50	100	213	400	700
Household non-food consumption, last month	66,665	447.8	2,356	0	401,050	70	140	270	500	865
Household other non-food consumption, past year	66,334	14,265	40,033	0	2.320e+06	600	2,000	5,300	13,000	30,000
Household total household consumption	57,703	38,419	86,067	0	7.500e+06	6,920	12,825	23,850	42,356	74,700
Household total household per capita consumption	57,703	13,438	25,429	0	1.500e+06	2,462	4,420	8,094	14,846	26,800
Household hospitalization out-of-pocket expenditure last year	75,711	938.9	7,101	0	1,000,000	0	0	0	0	850
Household hospitalization total expenditure last year	75,665	1,706	11,620	0	1.400e+06	0	0	0	0	2,000
Household doctor visit out-of-pocket expenditure last month	75,177	169.9	1,774	0	170,000	0	0	0	0	190
Household doctor visit total expenditure last month	75,430	263.7	3,911	0	800,000	0	0	0	0	200
Proportion with public health insurance	72,685	0.937	0.244	0	1	1	1	1	1	1
Proportion with private health insurance	72,579	0.0273	0.163	0	1	0	0	0	0	0
Number of respondents in the household	77,233	3.251	1.633	1	16	2	2	3	4	6
Childhood health history	80,644	0.0901	0.356	0	3	0	0	0	0	0
Adulthood health history	80,644	0.342	0.704	0	3	0	0	0	0	1
Household total medical expenditure	75,867	4,794	17,297	-9,999	1.200e+06	0	259	1,000	4,000	10,000

Note: The table shows the summary of statistics for the document filings in my sample, including variable description, number of observations, mean, standard deviation, minimum, maximum, deciles, quartiles, and medium.

Table 2: Effect of the SSI introduction on household consumption

VARIABLES	(1) log_comsump	(2) log_comsump	(3) log_comsump	(4) log_comsump	(5) log_comsump	(6) log_comsump	(7) log_comsump	(8) log_comsump	(9) log_comsump	(10) log_comsump
ssi_dummy1	0.498***	0.0379**	0.0657**	0.0657	0.0594***	0.0822**	0.0822*	0.000813	0.0428	0.0428
	(0.00840)	(0.0180)	(0.0282)	(0.0430)	(0.0221)	(0.0364)	(0.0494)	(0.0306)	(0.0447)	(0.0787)
ragender			-0.00416	-0.00416		9.60e-05	9.60e-05		-0.0114	-0.0114
			(0.00968)	(0.00706)		(0.0126)	(0.00894)		(0.0150)	(0.00794)
rwagey			-0.0142***	-0.0142***		-0.0138***	-0.0138***		-0.0135***	-0.0135***
			(0.000506)	(0.00104)		(0.000651)	(0.00108)		(0.000813)	(0.00147)
rwhukou			0.231***	0.231***		0.215***	0.215***		0.248***	0.248***
			(0.0128)	(0.0309)		(0.0161)	(0.0332)		(0.0213)	(0.0370)
raeducl			0.212***	0.212***		0.223***	0.223***		0.165***	0.165***
			(0.0142)	(0.0183)		(0.0169)	(0.0179)		(0.0269)	(0.0322)
rwhigov			0.0495**	0.0495*		0.0452	0.0452		0.0688**	0.0688
			(0.0219)	(0.0263)		(0.0284)	(0.0360)		(0.0343)	(0.0422)
log_income			0.144***	0.144***		0.142***	0.142***		0.135***	0.135***
			(0.00356)	(0.00794)		(0.00465)	(0.00891)		(0.00560)	(0.0103)
Constant	8.632***	8.806***	8.259***	8.259***	8.912***	8.323***	8.323***	8.625***	8.178***	8.178***
	(0.00517)	(0.00779)	(0.0516)	(0.0951)	(0.00974)	(0.0675)	(0.116)	(0.0128)	(0.0803)	(0.136)
Observations	57,632	57,632	30,478	30,478	36,316	18,009	18,009	21,316	12,469	12,469
R-squared	0.058	0.202	0.314	0.314	0.204	0.318	0.318	0.191	0.291	0.291
HH control	NO	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	NON-SICK	NON-SICK	NON-SICK	SICK	SICK	SICK

Note: The table presents the effect of the SSI introduction on household consumption. The dependent variable is the logarithm of the household consumption. The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (4) show the results of the whole sample. Columns (5) to (7) test the non-sick household group, and columns (8) to (10) sick household group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Effect of the SSI introduction on household out-of-pocket medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y
ssi_dummy1	242.5	-762.8*	-762.8*	87.85	-342.0	-342.0	525.7	-1,630*	-1,630*
	(229.9)	(451.8)	(410.0)	(213.7)	(436.2)	(452.7)	(504.7)	(913.6)	(903.7)
log_income		-43.71	-43.71		37.49	37.49		125.5	125.5
		(55.74)	(63.93)		(55.21)	(75.37)		(111.6)	(134.5)
Constant	2,504***	3,552***	3,552***	1,653***	1,734***	1,734***	3,891***	3,829***	3,829***
	(96.08)	(517.6)	(555.4)	(91.11)	(525.9)	(636.1)	(203.5)	(991.8)	(1,176)
Observations	62,915	27,605	27,605	39,068	16,186	16,186	23,847	11,419	11,419
R-squared	0.013	0.018	0.018	0.015	0.021	0.021	0.028	0.044	0.044
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	NON-SICK	NON-SICK	NON-SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the whole sample. Columns (4) to (6) test the non-sick household group, and columns (7) to (9) sick household group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

Table 4: Effect of the SSI introduction on household total medical expenditure

VARIABLES	(1) rwtothos1y	(2) rwtothos1y	(3) rwtothos1y	(4) rwtothos1y	(5) rwtothos1y	(6) rwtothos1y	(7) rwtothos1y	(8) rwtothos1y	(9) rwtothos1y	(10) rwtothos1y	(11) rwtothos1y	(12) rwtothos1y
ssi_dummy1	352.9*	277.3	352.9*	277.3	143.1	142.1	143.1	142.1	662.0	471.7	662.0	471.7
	(195.5)	(218.4)	(180.1)	(175.5)	(165.9)	(189.4)	(141.0)	(172.5)	(462.2)	(499.0)	(454.4)	(382.5)
ragender		-389.6***		-389.6***		-166.7**		-166.7*		-692.6***		-692.6***
		(90.42)		(101.3)		(79.50)		(91.01)		(200.8)		(213.8)
rwagey		53.86***		53.86***		47.88***		47.88***		43.40***		43.40***
		(4.542)		(5.193)		(3.956)		(6.406)		(10.47)		(9.293)
rwhukou		868.5***		868.5***		691.2***		691.2***		1,473***		1,473***
		(116.1)		(146.3)		(98.86)		(142.6)		(276.6)		(282.8)
raeducl		28.87		28.87		2.940		2.940		902.0***		902.0*
		(123.7)		(157.8)		(99.79)		(123.4)		(339.8)		(498.3)
rwhigov		592.1***		592.1***		413.4**		413.4**		931.7**		931.7***
		(187.0)		(193.1)		(162.8)		(207.1)		(423.5)		(355.8)
Constant	1,578***	-2,177***	1,578***	-2,177***	1,093***	-2,228***	1,093***	-2,228***	2,449***	-1,017	2,449***	-1,017
	(82.18)	(347.9)	(65.04)	(348.1)	(70.99)	(299.9)	(51.84)	(330.5)	(187.8)	(810.4)	(158.9)	(761.2)
Observations	75,665	68,804	75,665	68,804	48,067	43,111	48,067	43,111	27,598	25,693	27,598	25,693
R-squared	0.008	0.013	0.008	0.013	0.010	0.016	0.010	0.016	0.021	0.025	0.021	0.025
HH control	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO	YES	YES
Health	ALL	ALL	ALL	ALL	NON-SICK	NON-SICK	NON-SICK	NON-SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (4) show the results of the whole sample. Columns (5) to (8) test the non-sick household group, and columns (9) to (12) sick household group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Effect of the SSI introduction on household life expectancy

VARIABLES	(1) lifeexp	(2) lifeexp	(3) lifeexp	(4) lifeexp	(5) lifeexp	(6) lifeexp	(7) lifeexp	(8) lifeexp	(9) lifeexp	(10) lifeexp	(11) lifeexp	(12) lifeexp
ssi_dummy0	0.0411	0.0515	0.0411	0.0512	0.0380	0.0594	0.0380	0.0585	0.0216	0.00720	0.0216	0.00977
	(0.0479)	(0.0504)	(0.0557)	(0.0529)	(0.0626)	(0.0666)	(0.0744)	(0.0697)	(0.0709)	(0.0740)	(0.0743)	(0.0734)
ragender		-0.148***		-0.148***		-0.134***		-0.135***		-0.170***		-0.170***
		(0.0188)		(0.0220)		(0.0249)		(0.0275)		(0.0273)		(0.0291)
rwagey				0.0134**				0.00676				0.0185*
				(0.00596)				(0.00741)				(0.0102)
rwhukou		0.284***		0.285***		0.261***		0.261***		0.221***		0.221***
		(0.0233)		(0.0325)		(0.0299)		(0.0326)		(0.0358)		(0.0465)
raeducl		0.117***		0.117***		0.0746**		0.0743*		0.144***		0.145**
		(0.0279)		(0.0356)		(0.0334)		(0.0380)		(0.0484)		(0.0562)
rwhigov		0.0470		0.0485		0.0308		0.0315		0.0548		0.0573
		(0.0375)		(0.0387)		(0.0499)		(0.0477)		(0.0543)		(0.0583)
Constant	2.701***	2.630***	2.701***	1.668***	2.957***	2.893***	2.957***	2.408***	2.398***	2.371***	2.398***	1.040
	(0.0263)	(0.0463)	(0.0287)	(0.433)	(0.0350)	(0.0619)	(0.0391)	(0.526)	(0.0381)	(0.0670)	(0.0374)	(0.753)
Observations	17,598	16,904	17,598	16,904	9,693	9,253	9,693	9,253	7,904	7,650	7,904	7,650
R-squared	0.110	0.127	0.110	0.127	0.124	0.138	0.124	0.138	0.109	0.125	0.109	0.125
HH control	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Age Group FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO	YES	YES
60+ only	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Health	ALL	ALL	ALL	ALL	NON-SICK	NON-SICK	NON-SICK	NON-SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on household life expectancy. The dependent variable is the household's subjective probability of being able to live to the target age. Only individuals at or older than 60 years old are included in this table. Columns (1) to (4) show the results of the whole sample. Columns (5) to (8) test the non-sick household group, and columns (9) to (12) sick household group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

Table 6: Household wealth level summary of statistics

	n	Mean	SD	Min.	25th Perc.	50th Perc.	75th Perc.	Max.
2011	12486	163917.49	971987.89	-1072080.00	13890.00	58500.00	153850.00	40754800.00
2013	8081	302215.67	2746326.36	-4247550.00	13600.00	73360.00	212950.00	108004064.00
2015	12079	286199.44	1966250.02	-3512000.00	14200.00	86250.00	240100.00	80024704.00
2018	15211	870310.20	6673225.09	-7098850.00	10650.00	80760.00	305800.00	270221792.00

Table 7: Effect of the SSI introduction on consumption of different wealth-level households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump
ssi_dummy1	0.0363	0.0229	0.0229	-0.00766	-0.0807	-0.0807	0.0141	0.0755	0.0755	0.164***	0.143**	0.143*
	(0.0492)	(0.0685)	(0.0779)	(0.0413)	(0.0596)	(0.0848)	(0.0381)	(0.0600)	(0.0724)	(0.0401)	(0.0616)	(0.0838)
ragender		-0.00939	-0.00939		-0.00952	-0.00952		0.00428	0.00428		-0.00191	-0.00191
		(0.0225)	(0.0133)		(0.0201)	(0.00933)		(0.0208)	(0.0111)		(0.0207)	(0.0106)
rwagey		-0.0147***	-0.0147***		-0.0116***	-0.0116***		-0.00746***	-0.00746***		-0.0121***	-0.0121***
		(0.00117)	(0.00186)		(0.00114)	(0.00181)		(0.00116)	(0.00176)		(0.00118)	(0.00171)
rwhukou		0.138***	0.138**		0.178***	0.178***		0.177***	0.177***		0.118***	0.118***
		(0.0372)	(0.0582)		(0.0325)	(0.0447)		(0.0270)	(0.0380)		(0.0239)	(0.0426)
raeducl		0.184***	0.184***		0.144***	0.144***		0.153***	0.153***		0.212***	0.212***
		(0.0492)	(0.0498)		(0.0416)	(0.0460)		(0.0317)	(0.0325)		(0.0219)	(0.0231)
rwhigov		0.120**	0.120*		0.0187	0.0187		0.0851*	0.0851		-0.0267	-0.0267
		(0.0490)	(0.0623)		(0.0468)	(0.0625)		(0.0466)	(0.0527)		(0.0506)	(0.0679)
log_income		0.131***	0.131***		0.0973***	0.0973***		0.0820***	0.0820***		0.155***	0.155***
		(0.00884)	(0.0141)		(0.00769)	(0.0110)		(0.00758)	(0.0112)		(0.00853)	(0.0156)
Constant	8.474***	8.201***	8.201***	8.544***	8.433***	8.433***	8.775***	8.335***	8.335***	9.291***	8.462***	8.462***
	(0.0223)	(0.123)	(0.169)	(0.0171)	(0.111)	(0.162)	(0.0162)	(0.109)	(0.154)	(0.0223)	(0.124)	(0.189)
Observations	9,603	6,146	6,146	10,245	6,480	6,480	10,169	5,876	5,876	10,217	5,727	5,727
R-squared	0.175	0.248	0.248	0.202	0.251	0.251	0.186	0.256	0.256	0.170	0.300	0.300
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different wealth-level households.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Effect of the SSI introduction on consumption of different wealth-level non-sick households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump
ssi_dummy1	0.113	0.122	0.122	0.0737	0.0132	0.0132	-0.00619	0.0752	0.0752	0.208***	0.134*	0.134
	(0.0691)	(0.102)	(0.114)	(0.0553)	(0.0826)	(0.128)	(0.0465)	(0.0750)	(0.0927)	(0.0456)	(0.0725)	(0.0989)
ragender		-0.00792	-0.00792		-0.00677	-0.00677		0.00264	0.00264		0.00144	0.00144
		(0.0344)	(0.0231)		(0.0277)	(0.0136)		(0.0261)	(0.0145)		(0.0239)	(0.0119)
rwagey		-0.0135***	-0.0135***		-0.0139***	-0.0139***		-0.00548***	-0.00548***		-0.0128***	-0.0128***
		(0.00173)	(0.00229)		(0.00155)	(0.00227)		(0.00147)	(0.00198)		(0.00138)	(0.00175)
rwhukou		0.196***	0.196***		0.182***	0.182***		0.134***	0.134***		0.117***	0.117**
		(0.0545)	(0.0661)		(0.0461)	(0.0593)		(0.0338)	(0.0454)		(0.0274)	(0.0465)
raeducl		0.199***	0.199***		0.186***	0.186***		0.121***	0.121***		0.213***	0.213***
		(0.0725)	(0.0736)		(0.0538)	(0.0533)		(0.0380)	(0.0392)		(0.0243)	(0.0248)
rwhigov		0.0808	0.0808		0.0296	0.0296		0.104*	0.104		0.0709	0.0709
		(0.0700)	(0.0939)		(0.0677)	(0.0891)		(0.0580)	(0.0670)		(0.0590)	(0.0747)
log_income		0.122***	0.122***		0.0811***	0.0811***		0.0918***	0.0918***		0.148***	0.148***
		(0.0137)	(0.0195)		(0.0103)	(0.0125)		(0.00969)	(0.0145)		(0.0102)	(0.0174)
Constant	8.548***	8.252***	8.252***	8.558***	8.692***	8.692***	8.835***	8.180***	8.180***	9.324***	8.504***	8.504***
	(0.0321)	(0.187)	(0.252)	(0.0230)	(0.151)	(0.202)	(0.0202)	(0.141)	(0.188)	(0.0255)	(0.145)	(0.225)
Observations	4,641	2,834	2,834	5,656	3,463	3,463	6,685	3,728	3,728	7,638	4,141	4,141
R-squared	0.174	0.254	0.254	0.218	0.269	0.269	0.193	0.275	0.275	0.188	0.324	0.324
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different wealth-level non-sick households only.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Effect of the SSI introduction on consumption ratio of different wealth-level households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio
ssi_dummy1	-2.168	-2.267	-2.267	-0.1000	-0.125	-0.125	0.0179	0.0330*	0.0330	0.0548***	0.0286***	0.0286
	(4.893)	(5.303)	(3.038)	(0.0807)	(0.0886)	(0.0859)	(0.0170)	(0.0188)	(0.0257)	(0.0128)	(0.00856)	(0.0211)
ragender		2.753	2.753**		0.0281	0.0281		-0.00262	-0.00262		-0.00305	-0.00305***
		(1.985)	(1.324)		(0.0337)	(0.0206)		(0.00751)	(0.00278)		(0.00338)	(0.00106)
rwagey		0.513***	0.513***		-0.00930***	-0.00930***		-0.00244***	-0.00244***		-0.00135***	-0.00135***
		(0.100)	(0.111)		(0.00187)	(0.00236)		(0.000422)	(0.000351)		(0.000195)	(0.000261)
rwhukou		-1.849	-1.849		0.0315	0.0315		0.0256***	0.0256		-0.00206	-0.00206
		(3.169)	(3.442)		(0.0535)	(0.0381)		(0.00972)	(0.0171)		(0.00373)	(0.00307)
raeducl		-11.55***	-11.55		0.178***	0.178***		0.00326	0.00326		0.00480	0.00480*
		(4.024)	(12.87)		(0.0642)	(0.0485)		(0.0111)	(0.00996)		(0.00346)	(0.00279)
rwhigov		-2.657	-2.657		0.0871	0.0871		0.0208	0.0208*		0.00549	0.00549
		(4.171)	(2.265)		(0.0750)	(0.0607)		(0.0160)	(0.0118)		(0.00797)	(0.00912)
Constant	6.125***	-23.83***	-23.83***	0.753***	1.202***	1.202***	0.220***	0.329***	0.329***	0.0783***	0.162***	0.162***
	(2.214)	(7.950)	(8.473)	(0.0334)	(0.142)	(0.128)	(0.00722)	(0.0305)	(0.0240)	(0.00711)	(0.0148)	(0.0140)
Observations	9,539	8,975	8,975	10,247	9,658	9,658	10,170	9,336	9,336	10,220	8,983	8,983
R-squared	0.022	0.028	0.028	0.053	0.059	0.059	0.054	0.060	0.060	0.044	0.062	0.062
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different wealth-level households.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Effect of the SSI introduction on consumption ratio of different wealth-level non-sick households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio	consump_ratio
ssi_dummy1	-1.433	-3.004	-3.004	-0.0318	-0.0588	-0.0588	-0.00223	0.0176	0.0176	0.0799***	0.0404***	0.0404
	(7.614)	(8.534)	(5.333)	(0.131)	(0.146)	(0.128)	(0.0231)	(0.0259)	(0.0303)	(0.0164)	(0.0105)	(0.0309)
ragender		0.845	0.845		0.0380	0.0380		8.26e-07	8.26e-07		-0.00240	-0.00240**
		(3.295)	(1.696)		(0.0559)	(0.0252)		(0.0105)	(0.00338)		(0.00416)	(0.00108)
rwagey		0.489***	0.489***		-0.0117***	-0.0117***		-0.00212***	-0.00212***		-0.00123***	-0.00123***
		(0.161)	(0.0954)		(0.00307)	(0.00412)		(0.000592)	(0.000481)		(0.000245)	(0.000291)
rwhukou		-5.498	-5.498		0.0179	0.0179		0.0328**	0.0328		-0.00465	-0.00465
		(5.007)	(5.124)		(0.0878)	(0.0454)		(0.0136)	(0.0251)		(0.00453)	(0.00356)
raeducl		-23.97***	-23.97		0.191*	0.191***		0.00287	0.00287		0.00294	0.00294
		(6.353)	(23.97)		(0.0993)	(0.0658)		(0.0149)	(0.0140)		(0.00410)	(0.00341)
rwhigov		-0.413	-0.413		0.193	0.193*		0.0120	0.0120		0.0236**	0.0236*
		(6.576)	(1.871)		(0.124)	(0.0976)		(0.0222)	(0.0171)		(0.00980)	(0.0132)
Constant	4.817	-22.33*	-22.33***	0.746***	1.231***	1.231***	0.236***	0.327***	0.327***	0.0678***	0.134***	0.134***
	(3.524)	(12.52)	(6.612)	(0.0542)	(0.231)	(0.193)	(0.0100)	(0.0425)	(0.0313)	(0.00915)	(0.0182)	(0.0213)
Observations	4,590	4,265	4,265	5,657	5,285	5,285	6,686	6,086	6,086	7,640	6,651	6,651
R-squared	0.057	0.067	0.067	0.064	0.071	0.071	0.061	0.065	0.065	0.064	0.072	0.072
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different wealth-level non-sick households only.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Effect of the SSI introduction on different wealth-level household out-of-pocket medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y
ssi_dummy1	-81.21	-701.9	-701.9	827.7*	106.7	106.7	349.2	-153.7	-153.7	-782.6*	-1,545**	-1,545
	(559.3)	(1,056)	(1,370)	(448.5)	(534.9)	(663.3)	(318.4)	(596.3)	(861.9)	(401.1)	(745.7)	(1,026)
log_income		-157.9	-157.9		-165.0**	-165.0		-185.5**	-185.5		228.9**	228.9*
		(130.8)	(193.6)		(68.36)	(111.3)		(77.03)	(146.4)		(99.65)	(137.3)
Constant	2,414***	4,218***	4,218***	1,484***	2,967***	2,967***	1,252***	3,207***	3,207**	2,331***	999.1	999.1
	(251.7)	(1,128)	(1,604)	(184.9)	(590.8)	(853.7)	(134.7)	(701.7)	(1,286)	(220.0)	(1,055)	(1,310)
Observations	9,142	4,963	4,963	10,330	5,812	5,812	10,557	5,464	5,464	10,929	5,745	5,745
R-squared	0.045	0.073	0.073	0.037	0.070	0.070	0.030	0.047	0.047	0.037	0.067	0.067
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different wealth-level household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Effect of the SSI introduction on different wealth-level sick household out-of-pocket medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly	hwoophosly
ssi_dummy1	-379.2	-1,086	-1,086	1,724*	-247.2	-247.2	1,396**	1,533	1,533	-2,814**	-5,410**	-5,410**
	(862.8)	(1,571)	(2,333)	(915.1)	(934.1)	(1,172)	(698.1)	(1,268)	(2,345)	(1,314)	(2,408)	(2,670)
log_income		-219.7	-219.7		13.94	13.94		-148.7	-148.7		831.4***	831.4
		(184.2)	(327.8)		(123.7)	(134.7)		(156.6)	(219.1)		(309.6)	(569.9)
Constant	3,149***	5,310***	5,310*	2,113***	2,317**	2,317**	1,605***	2,996**	2,996	5,716***	271.5	271.5
	(373.8)	(1,572)	(2,727)	(369.9)	(1,052)	(1,109)	(279.8)	(1,404)	(2,283)	(722.3)	(3,234)	(4,970)
Observations	4,933	2,856	2,856	4,754	2,795	2,795	3,714	2,016	2,016	2,812	1,562	1,562
R-squared	0.112	0.141	0.141	0.062	0.098	0.098	0.067	0.136	0.136	0.098	0.199	0.199
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different wealth-level sick household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Effect of the SSI introduction on different wealth-level household total medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly
ssi_dummy1	26.17	-407.0	-407.0	1,263**	1,035	1,035	366.7	805.4	805.4	-874.9	-1,475	-1,475
	(940.5)	(1,025)	(995.9)	(605.8)	(655.3)	(1,195)	(464.8)	(513.0)	(823.2)	(852.9)	(969.2)	(1,176)
ragender		364.2	364.2***		207.3	207.3***		241.5	241.5***		649.8	649.8***
		(401.2)	(129.7)		(258.7)	(69.36)		(210.7)	(66.81)		(398.6)	(140.6)
rwagey		67.04***	67.04**		80.05***	80.05***		90.24***	90.24***		241.4***	241.4***
		(21.67)	(26.83)		(15.06)	(20.20)		(12.80)	(18.01)		(24.32)	(38.51)
rwhukou		3,065***	3,065***		1,470***	1,470***		1,058***	1,058***		2,089***	2,089***
		(632.5)	(1,023)		(409.5)	(547.7)		(276.0)	(330.3)		(441.7)	(529.3)
raeducl		36.07	36.07		-536.3	-536.3		-52.47	-52.47		-401.3	-401.3
		(770.8)	(1,178)		(476.9)	(458.2)		(308.6)	(312.6)		(411.3)	(436.0)
rwhigov		1,723**	1,723***		-193.9	-193.9		1,570***	1,570***		989.2	989.2
		(866.5)	(507.3)		(600.3)	(1,253)		(451.6)	(407.4)		(949.0)	(786.9)
Constant	3,961***	-2,121	-2,121	2,453***	-2,263**	-2,263	2,256***	-4,921***	-4,921***	4,593***	-11,055***	-11,055***
	(423.9)	(1,652)	(1,869)	(250.1)	(1,118)	(1,453)	(196.8)	(891.2)	(1,208)	(468.4)	(1,780)	(2,585)
Observations	9,126	8,523	8,523	10,309	9,696	9,696	10,548	9,660	9,660	10,910	9,519	9,519
R-squared	0.068	0.074	0.074	0.045	0.058	0.058	0.043	0.054	0.054	0.038	0.061	0.061
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different wealth-level household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Effect of the SSI introduction on different wealth-level sick household total medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly
ssi_dummy1	49.78	-797.2	-797.2	2,650**	2,638**	2,638	1,804*	2,211**	2,211	-1,878	-3,332	-3,332
	(1,441)	(1,541)	(1,327)	(1,164)	(1,244)	(2,458)	(933.8)	(1,003)	(1,543)	(2,773)	(3,018)	(4,303)
ragender		254.5	254.5		94.52	94.52		454.9	454.9***		1,058	1,058**
		(568.1)	(167.5)		(472.2)	(133.2)		(388.3)	(147.7)		(1,199)	(431.2)
rwagey		-15.31	-15.31		62.22**	62.22*		113.7***	113.7***		297.3***	297.3***
		(31.72)	(35.62)		(28.47)	(33.95)		(23.81)	(33.28)		(74.05)	(100.6)
rwhukou		4,440***	4,440***		1,362*	1,362		1,428***	1,428**		3,896***	3,896**
		(976.6)	(1,595)		(755.8)	(827.2)		(529.3)	(587.5)		(1,447)	(1,726)
raeducl		1,120	1,120		-1,488	-1,488**		1,361**	1,361**		-2,177	-2,177*
		(1,234)	(1,496)		(1,005)	(682.3)		(635.1)	(651.8)		(1,477)	(1,200)
rwhigov		1,668	1,668**		-1,385	-1,385		2,756***	2,756***		1,817	1,817
		(1,316)	(758.2)		(1,138)	(2,790)		(854.0)	(629.2)		(3,049)	(2,815)
Constant	4,873***	3,873	3,873	3,347***	817.9	817.9	2,935***	-7,158***	-7,158***	9,990***	-10,313*	-10,313
	(624.7)	(2,489)	(2,373)	(469.7)	(2,140)	(2,752)	(373.0)	(1,681)	(2,188)	(1,525)	(5,727)	(7,479)
Observations	4,907	4,648	4,648	4,741	4,512	4,512	3,709	3,460	3,460	2,796	2,501	2,501
R-squared	0.200	0.202	0.202	0.073	0.085	0.085	0.106	0.129	0.129	0.138	0.164	0.164
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK
SICK	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different wealth-level sick household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 15: Effect of the SSI introduction on different wealth-level household life expectancy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp
ssi_dummy0	0.116	0.106	0.119	0.167	0.179	0.156*	0.137	0.116	0.114	-0.0271	-0.0490	-0.0396
	(0.111)	(0.116)	(0.113)	(0.114)	(0.121)	(0.0874)	(0.133)	(0.140)	(0.131)	(0.134)	(0.142)	(0.134)
ragender		-0.0571	-0.0608		-0.150***	-0.154***		-0.206***	-0.208***		-0.133***	-0.144***
		(0.0398)	(0.0399)		(0.0436)	(0.0437)		(0.0504)	(0.0500)		(0.0502)	(0.0514)
rwagey			-0.0180***			-0.0231***			-0.0265***			-0.0302***
			(0.00451)			(0.00451)			(0.00602)			(0.00530)
rwhukou		0.273***	0.272***		0.186***	0.201***		0.129**	0.140**		0.172***	0.182**
		(0.0608)	(0.0831)		(0.0611)	(0.0692)		(0.0596)	(0.0699)		(0.0574)	(0.0728)
raeducl		0.0631	0.0733		0.272***	0.272***		0.140*	0.145*		0.0696	0.0826
		(0.118)	(0.141)		(0.0965)	(0.0926)		(0.0751)	(0.0778)		(0.0497)	(0.0583)
rwhigov		0.115	0.0821		0.0627	0.00696		-0.0406	-0.0782		-0.0143	-0.0361
		(0.0785)	(0.0735)		(0.0945)	(0.0825)		(0.100)	(0.0928)		(0.114)	(0.131)
Constant	2.396***	2.289***	3.619***	2.562***	2.526***	4.233***	2.770***	2.864***	4.780***	3.085***	3.056***	5.209***
	(0.0641)	(0.103)	(0.358)	(0.0635)	(0.114)	(0.356)	(0.0717)	(0.125)	(0.427)	(0.0861)	(0.145)	(0.422)
Observations	3,944	3,833	3,833	3,176	3,111	3,111	2,472	2,391	2,391	2,430	2,310	2,310
R-squared	0.112	0.119	0.125	0.111	0.124	0.132	0.126	0.135	0.147	0.143	0.152	0.167
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on wealth-level household life expectancy. The dependent variable is the household's subjective probability of being able to live to the target age. Only individuals at or older than 60 years old are included in this table. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 16: Effect of the SSI introduction on different wealth-level sick household life expectancy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp
ssi_dummy0	0.0367	0.00896	0.0142	0.0926	0.131	0.101	0.122	0.0597	0.00784	0.0389	0.0799	0.0944
	(0.155)	(0.163)	(0.137)	(0.162)	(0.169)	(0.153)	(0.224)	(0.238)	(0.210)	(0.265)	(0.292)	(0.305)
ragender		-0.0308	-0.0379		-0.189***	-0.195***		-0.306***	-0.321***		-0.202**	-0.210***
		(0.0520)	(0.0496)		(0.0596)	(0.0547)		(0.0798)	(0.0763)		(0.0874)	(0.0801)
rwagey			-0.00892*			-0.0136**			-0.0240***			-0.0173**
			(0.00534)			(0.00632)			(0.00824)			(0.00818)
rwhukou		0.244***	0.243**		0.132	0.142		0.00198	0.0134		0.150	0.171*
		(0.0876)	(0.114)		(0.0824)	(0.0904)		(0.110)	(0.122)		(0.110)	(0.100)
raeducl		0.104	0.105		0.196	0.203		0.210	0.211		0.0700	0.0835
		(0.171)	(0.205)		(0.147)	(0.142)		(0.140)	(0.139)		(0.103)	(0.0953)
rwhigov		0.149	0.129		-0.0252	-0.0667		-0.0941	-0.146		-0.140	-0.181
		(0.110)	(0.102)		(0.128)	(0.126)		(0.164)	(0.169)		(0.228)	(0.235)
Constant	2.201***	2.063***	2.726***	2.323***	2.380***	3.401***	2.471***	2.721***	4.498***	2.695***	2.811***	4.065***
	(0.0859)	(0.143)	(0.436)	(0.0903)	(0.155)	(0.499)	(0.112)	(0.204)	(0.623)	(0.171)	(0.297)	(0.689)
Observations	2,137	2,089	2,089	1,520	1,492	1,492	968	934	934	833	797	797
R-squared	0.127	0.133	0.134	0.142	0.158	0.161	0.217	0.236	0.244	0.245	0.262	0.266
Quantile	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4	Q4	Q4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on wealth-level sick household life expectancy. The dependent variable is the household's subjective probability of being able to live to the target age. Only individuals at or older than 60 years old are included in this table. Columns (1) to (3) show the results of the households in the lowest wealth quantile. Columns (4) to (6) are for the second quantile wealth group. Columns (7) to (9) are for the third quantile wealth group. Columns (10) to (12) are for the highest quantile wealth group. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 17: Effect of the SSI introduction on different wealth-level household portfolio amount changes

Portfolio	Q1_coef	Q1_pval	Q2_coef	Q2_pval	Q3_coef	Q3_pval	Q4_coef	Q4_pval
cash	226.2861	0.585122	-183.696	0.814377	-2189.16	0.286339	-15230.6	0.175958
stock	339.6866	6.27E-06	333.6847	7.74E-05	1039.679	0.003273	-2402.29	0.528479
gov bonds	35.62102	0.666844	123.6249	0.000445	-136.096	0.000904	-612.036	0.547402
other savings	2153.514	0.140403	-668.133	0.034562	-2007.63	0.104899	4222.339	0.529125
other real estate	68.84664	0.966603	-673.475	0.471371	1568.335	0.574559	-262043	0.608219
primary residence	74.37206	0.982405	1241.102	0.580555	-17513.6	0.000256	-397385	0.361958
vehicles	1855.086	0.004566	-239.729	0.55311	-951.759	0.401446	-4300.56	0.449208
non-financial assets	55.61944	0.754293	233.3366	0.226164	139.1778	0.723194	-2497.34	0.86688
fixed capital	-2200.93	0.486259	-895.79	0.072213	-1946.84	0.039901	-6155.85	0.804169
land	-258.215	0.143676	-142.465	0.528758	1641.864	0.003806	39473.14	0.185777
monetary assets	3019.654	0.514517	548.8123	0.612428	8137.078	0.000111	18346.41	0.237535
debt	7520.966	0.511915	-893.241	0.52111	-8446.22	0.002108	4962.59	0.497784

Note: The table presents the effect of the SSI introduction on wealth-level household portfolio amount changes. The dependent variable is the amount of each category portfolio. Due to the large numbers of regressions, only the best and the p-value is reported. The cells with a p-value less than 0.05 are shown as green.

Table 18: Effect of the SSI introduction on different wealth-level household portfolio percentage changes

Portfolio	Q1_coef	Q1_pval	Q2_coef	Q2_pval	Q3_coef	Q3_pval	Q4_coef	Q4_pval
cash	-0.12375	0.78401	-0.0113	0.556962	-0.02186	0.143648	-0.00935	0.462363
stock	-0.00489	0.004121	0.004603	0.001238	0.004901	0.024168	0.000149	0.950421
gov bonds	-0.00991	0.467719	0.001637	0.20773	-0.00097	0.000295	-0.00015	0.874144
other savings	-0.10883	0.686316	-0.02303	0.005136	-0.00835	0.274354	-0.00346	0.538938
other real estate	0.10572	0.470533	-0.00833	0.70082	0.013215	0.485102	0.00912	0.67458
primary residence	-2.833	0.033983	0.076903	0.206038	-0.1228	0.000175	0.019337	0.45862
vehicles	-0.35954	0.137161	-0.00111	0.914156	-0.00871	0.276843	-0.00416	0.509096
non-financial assets	-0.76905	0.035606	0.011743	0.110682	0.001308	0.62238	0.000816	0.628915
fixed capital	-1.7068	0.00051	-0.0386	0.027369	-0.01423	0.034329	-0.00791	0.331552
land	-0.27714	0.127613	-0.00589	0.401231	0.011257	0.016424	0.007438	0.043577
monetary assets	3.014097	0.023532	-0.02304	0.489443	0.057378	0.000237	0.007438	0.325953
debt	-2.78978	0.061228	-0.02198	0.619355	-0.07403	0.000461	0.010222	0.148573

Note: The table presents the effect of the SSI introduction on wealth-level household portfolio percentage changes. The dependent variable is the percentage of each category portfolio. Due to the large numbers of regressions, only the best and the p-value is reported. The cells with a p-value less than 0.05 are shown as green.

Table 19: Effect of the SSI introduction on different wealth-level household stock participation rate

	(1)	(2)	(3)	(4)
VARIABLES	hwastkp	hwastkp	hwastkp	hwastkp
ssi_dummy1	0.000245	0.000505	0.00505	-0.0162
	(0.00306)	(0.00330)	(0.00497)	(0.0168)
Observations	6,151	6,481	5,877	5,730
R-squared	0.091	0.051	0.105	0.144
Quantile	Q1	Q2	Q3	Q4
HH control	YES	YES	YES	YES
City FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
City Cluster	NO	NO	NO	NO
Health	ALL	ALL	ALL	ALL

Note: The table presents the effect of the SSI introduction on wealth-level sick household life expectancy. The dependent variable is the household's stock participation rate. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 20: Effect of the SSI introduction on consumption of different registration (hukou) type households

VARIABLES	(1) log_comsump	(2) log_comsump	(3) log_comsump	(4) log_comsump	(5) log_comsump	(6) log_comsump
ssi_dummy1	0.0105	0.0448	0.0448	0.0869***	0.104**	0.104*
	(0.0233)	(0.0360)	(0.0569)	(0.0267)	(0.0440)	(0.0562)
ragender		-0.0243*	-0.0243***		-0.00365	-0.00365
		(0.0125)	(0.00744)		(0.0150)	(0.0102)
rwagey		-0.0170***	-0.0170***		-0.0111***	-0.0111***
		(0.000657)	(0.00140)		(0.000781)	(0.00143)
rwhukou		0.125***	0.125***		0.139***	0.139***
		(0.0250)	(0.0227)		(0.0170)	(0.0315)
raeducl		0.145***	0.145***		0.177***	0.177***
		(0.0255)	(0.0289)		(0.0166)	(0.0201)
rwhigov		0.0448	0.0448		0.0413	0.0413
		(0.0296)	(0.0356)		(0.0315)	(0.0422)
log_income		0.111***	0.111***		0.204***	0.204***
		(0.00437)	(0.00789)		(0.00635)	(0.0154)
Constant	8.628***	8.668***	8.668***	9.074***	7.681***	7.681***
	(0.0100)	(0.0664)	(0.109)	(0.0116)	(0.0847)	(0.189)
Observations	34,792	19,290	19,290	22,840	11,188	11,188
R-squared	0.183	0.250	0.250	0.228	0.372	0.372
HH control	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES
HHType	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN
Health	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different registration (hukou) type households.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01

Table 21: Effect of the SSI introduction on consumption of different registration (hukou) type sick and non-sick households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump
ssi_dummy1	0.0259	0.0834*	0.0834	0.000651	0.00757	0.00757	0.106***	0.0674	0.0674	0.0276	0.172**	0.172*
	(0.0296)	(0.0480)	(0.0628)	(0.0372)	(0.0545)	(0.0992)	(0.0314)	(0.0545)	(0.0753)	(0.0502)	(0.0754)	(0.0987)
ragender		-0.0220	-0.0220**		-0.0254	-0.0254**		-0.00187	-0.00187		-0.0108	-0.0108
		(0.0169)	(0.0105)		(0.0183)	(0.00968)		(0.0185)	(0.0120)		(0.0252)	(0.0132)
rwagey		-0.0175***	-0.0175***		-0.0150***	-0.0150***		-0.0106***	-0.0106***		-0.0111***	-0.0111***
		(0.000873)	(0.00144)		(0.00100)	(0.00190)		(0.000965)	(0.00159)		(0.00137)	(0.00225)
rwhukou		0.0694**	0.0694**		0.184***	0.184***		0.142***	0.142***		0.123***	0.123***
		(0.0330)	(0.0304)		(0.0382)	(0.0330)		(0.0212)	(0.0332)		(0.0289)	(0.0434)
raeducl		0.168***	0.168***		0.0918**	0.0918*		0.182***	0.182***		0.147***	0.147***
		(0.0317)	(0.0324)		(0.0429)	(0.0478)		(0.0195)	(0.0206)		(0.0329)	(0.0397)
rwhigov		-0.00206	-0.00206		0.117***	0.117**		0.0690*	0.0690		-0.00998	-0.00998
		(0.0397)	(0.0542)		(0.0443)	(0.0525)		(0.0399)	(0.0520)		(0.0518)	(0.0546)
log_income		0.102***	0.102***		0.111***	0.111***		0.216***	0.216***		0.169***	0.169***
		(0.00580)	(0.00854)		(0.00673)	(0.0105)		(0.00822)	(0.0173)		(0.0103)	(0.0206)
Constant	8.717***	8.873***	8.873***	8.501***	8.395***	8.395***	9.155***	7.571***	7.571***	8.886***	7.932***	7.932***
	(0.0130)	(0.0887)	(0.118)	(0.0156)	(0.0996)	(0.162)	(0.0139)	(0.109)	(0.219)	(0.0207)	(0.137)	(0.244)
Observations	20,215	10,557	10,557	14,577	8,733	8,733	16,101	7,452	7,452	6,739	3,736	3,736
R-squared	0.187	0.254	0.254	0.189	0.250	0.250	0.222	0.367	0.367	0.238	0.373	0.373
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
HHType	RURAL	RURAL	RURAL	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN	URBAN	URBAN	URBAN
Health	NON-SICK	NON-SICK	NON-SICK	SICK	SICK	SICK	NON-SICK	NON-SICK	NON-SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different registration (hukou) type sick and non-sick households.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01

Table 22: Effect of the SSI introduction on different registration (hukou) type household out-of-pocket medical expenditure

VARIABLES	(1) hwoophos1y	(2) hwoophos1y	(3) hwoophos1y	(4) hwoophos1y	(5) hwoophos1y	(6) hwoophos1y
ssi_dummy1	114.6	-122.4	-122.4	23.34	-1,017*	-1,017
	(204.7)	(381.4)	(431.2)	(276.3)	(597.4)	(661.3)
log_income		-141.0***	-141.0*		-25.06	-25.06
		(46.91)	(71.71)		(85.60)	(94.34)
Constant	1,682***	3,009***	3,009***	2,039***	3,077***	3,077***
	(85.38)	(414.3)	(580.8)	(115.6)	(842.7)	(956.7)
Observations	37,876	17,384	17,384	25,118	10,224	10,224
R-squared	0.011	0.014	0.014	0.017	0.025	0.025
HH control	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES
HHType	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN
Health	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different registration (hukou) type household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 23: Effect of the SSI introduction on different registration (hukou) type sick household out-of-pocket medical expenditure

VARIABLES	(1) hwoophos1y	(2) hwoophos1y	(3) hwoophos1y	(4) hwoophos1y	(5) hwoophos1y	(6) hwoophos1y
ssi_dummy1	128.6	-630.7	-630.7	338.8	-1,398	-1,398
	(418.0)	(706.9)	(919.3)	(722.5)	(1,409)	(1,565)
log_income		-14.33	-14.33		102.9	102.9
		(87.63)	(145.8)		(188.4)	(202.5)
Constant	2,587***	3,018***	3,018**	3,551***	3,526**	3,526*
	(170.6)	(748.9)	(1,162)	(283.7)	(1,788)	(2,092)
Observations	16,168	7,982	7,982	7,728	3,444	3,444
R-squared	0.020	0.026	0.026	0.044	0.073	0.073
HH control	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES
HHType	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN
Health	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different registration (hukou) type sick household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

Table 24: Effect of the SSI introduction on different registration (hukou) type household total medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	hwtothos1y	hwtothos1y	hwtothos1y	hwtothos1y	hwtothos1y	hwtothos1y
ssi_dummy1	228.1	309.3	309.3	847.6	416.3	416.3
	(284.5)	(312.7)	(404.8)	(558.8)	(635.7)	(767.7)
ragender		202.1	202.1***		563.3**	563.3***
		(131.7)	(36.40)		(261.4)	(102.2)
rwagey		71.42***	71.42***		208.6***	208.6***
		(7.282)	(8.553)		(14.42)	(24.87)
rwhukou		498.9*	498.9*		1,332***	1,332***
		(256.7)	(273.2)		(294.7)	(434.6)
raeducl		-277.7	-277.7		169.6	169.6
		(243.6)	(221.2)		(270.3)	(344.9)
rwhigov		674.6**	674.6*		1,125**	1,125**
		(300.8)	(388.6)		(526.7)	(550.8)
Constant	2,655***	-2,318***	-2,318***	3,915***	-10,173***	-10,173***
	(118.8)	(544.9)	(670.5)	(234.1)	(1,043)	(1,500)
Observations	37,820	34,728	34,728	25,024	22,285	22,285
R-squared	0.015	0.019	0.019	0.021	0.034	0.034
HH control	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES
HHType	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN
Health	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different registration (hukou) type household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 25: Effect of the SSI introduction on different registration (hukou) type sick household total medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	hwtothos1y	hwtothos1y	hwtothos1y	hwtothos1y	hwtothos1y	hwtothos1y
ssi_dummy1	400.8	566.5	566.5	2,283	1,260	1,260
	(564.5)	(608.6)	(819.6)	(1,497)	(1,648)	(2,178)
ragender		133.9	133.9**		895.4	895.4***
		(247.3)	(62.63)		(647.8)	(249.4)
rwagey		32.45**	32.45**		208.1***	208.1***
		(13.83)	(14.69)		(35.80)	(49.62)
rwhukou		1,336***	1,336**		2,409***	2,409**
		(498.4)	(528.3)		(737.7)	(981.4)
raeducl		-689.1	-689.1		1,143	1,143
		(537.2)	(475.3)		(780.9)	(1,122)
rwhigov		386.8	386.8		3,307***	3,307***
		(587.0)	(919.3)		(1,276)	(751.6)
Constant	3,991***	1,509	1,509	6,598***	-10,423***	-10,423***
	(229.7)	(1,069)	(1,264)	(588.9)	(2,618)	(3,500)
Observations	16,140	15,134	15,134	7,660	7,016	7,016
R-squared	0.028	0.031	0.031	0.058	0.072	0.072
HH control	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES
HHType	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN
Health	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different registration (hukou) type sick household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 26: Effect of the SSI introduction on different registration (hukou) type household life expectancy

VARIABLES	(1) lifeexp	(2) lifeexp	(3) lifeexp	(4) lifeexp	(5) lifeexp	(6) lifeexp
ssi_dummy0	0.0320	0.0482	0.0459	0.0798	0.0670	0.0663
	(0.0599)	(0.0633)	(0.0651)	(0.0794)	(0.0844)	(0.0945)
ragender		-0.167***	-0.166***		-0.149***	-0.148***
		(0.0242)	(0.0310)		(0.0305)	(0.0364)
rwagey			-0.0238***			-0.0293***
			(0.00310)			(0.00366)
rwhukou		0.237***	0.230***		0.134***	0.144***
		(0.0429)	(0.0603)		(0.0350)	(0.0524)
raeducl		0.186***	0.185**		0.0746**	0.0788**
		(0.0675)	(0.0774)		(0.0317)	(0.0393)
rwhigov		0.105**	0.0639		0.0744	0.0205
		(0.0493)	(0.0460)		(0.0583)	(0.0633)
Constant	2.557***	2.510***	4.252***	2.905***	2.819***	4.972***
	(0.0329)	(0.0598)	(0.228)	(0.0436)	(0.0758)	(0.279)
Observations	10,579	10,239	10,239	7,019	6,665	6,665
R-squared	0.086	0.100	0.110	0.131	0.122	0.138
HH control	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Age Group FE	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES
60+ only	YES	YES	YES	YES	YES	YES
HHType	RURAL	RURAL	RURAL	URBAN	URBAN	URBAN
Health	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different registration (hukou) type household life expectancy. The dependent variable is the household's subjective probability of being able to live to the target age. Only individuals at or older than 60 years old are included in this table.Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

Table 27: Effect of the SSI introduction on consumption of different age-group households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump
ssi_dummy1	0.0318	0.0824**	0.0824	0.00216	-0.0225	-0.0225	0.226***	0.114	0.114	0.0428	0.219	0.219
	(0.0201)	(0.0347)	(0.0507)	(0.0415)	(0.0542)	(0.0714)	(0.0824)	(0.106)	(0.124)	(0.314)	(0.444)	(0.564)
ragender		-0.0159	-0.0159**		0.0196	0.0196		0.00991	0.00991		0.0169	0.0169
		(0.0118)	(0.00740)		(0.0192)	(0.0163)		(0.0355)	(0.0276)		(0.120)	(0.105)
rwagey		-0.0149***	-0.0149***		-0.0194***	-0.0194***		-0.00280	-0.00280		0.0112	0.0112
		(0.00100)	(0.00145)		(0.00343)	(0.00393)		(0.00666)	(0.00750)		(0.0183)	(0.0141)
rwhukou		0.193***	0.193***		0.238***	0.238***		0.281***	0.281***		0.243	0.243
		(0.0162)	(0.0364)		(0.0247)	(0.0363)		(0.0461)	(0.0519)		(0.176)	(0.182)
raeducl		0.213***	0.213***		0.206***	0.206***		0.213***	0.213***		-0.0156	-0.0156
		(0.0172)	(0.0210)		(0.0297)	(0.0345)		(0.0508)	(0.0506)		(0.238)	(0.240)
rwhigov		0.0276	0.0276		0.0659	0.0659		0.112	0.112		-0.102	-0.102
		(0.0274)	(0.0358)		(0.0454)	(0.0510)		(0.0682)	(0.0794)		(0.187)	(0.211)
log_income		0.121***	0.121***		0.179***	0.179***		0.185***	0.185***		0.225***	0.225***
		(0.00415)	(0.00833)		(0.00791)	(0.0134)		(0.0146)	(0.0190)		(0.0479)	(0.0450)
Constant	8.884***	8.505***	8.505***	8.658***	8.346***	8.346***	8.458***	6.968***	6.968***	8.525***	5.606***	5.606***
	(0.00828)	(0.0741)	(0.111)	(0.0199)	(0.255)	(0.275)	(0.0400)	(0.540)	(0.618)	(0.176)	(1.680)	(1.474)
Observations	41,335	19,457	19,457	11,702	7,876	7,876	4,038	2,748	2,748	546	375	375
R-squared	0.221	0.310	0.310	0.228	0.344	0.344	0.262	0.372	0.372	0.333	0.433	0.433
agegpreg	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different age-group households.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 28: Effect of the SSI introduction on consumption of different age-group non-sick households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump	log_comsump
ssi_dummy1	0.0400*	0.0620	0.0620	0.0758	0.0767	0.0767	0.243**	0.180	0.180	0.405	-0.162	-0.162
	(0.0241)	(0.0441)	(0.0567)	(0.0544)	(0.0724)	(0.104)	(0.109)	(0.144)	(0.151)	(0.465)	(0.614)	(0.653)
ragender		-0.00708	-0.00708		0.0327	0.0327		-0.0416	-0.0416		0.146	0.146
		(0.0150)	(0.00792)		(0.0263)	(0.0228)		(0.0493)	(0.0423)		(0.173)	(0.138)
rwagey		-0.0134***	-0.0134***		-0.0198***	-0.0198***		-0.00461	-0.00461		0.00115	0.00115
		(0.00128)	(0.00167)		(0.00474)	(0.00478)		(0.00905)	(0.00990)		(0.0241)	(0.0175)
rwhukou		0.190***	0.190***		0.187***	0.187***		0.261***	0.261***		0.314	0.314
		(0.0197)	(0.0407)		(0.0326)	(0.0391)		(0.0636)	(0.0663)		(0.245)	(0.217)
raeducl		0.231***	0.231***		0.224***	0.224***		0.197***	0.197***		-0.303	-0.303
		(0.0200)	(0.0223)		(0.0366)	(0.0438)		(0.0645)	(0.0564)		(0.334)	(0.227)
rwhigov		0.0155	0.0155		0.136**	0.136**		0.00119	0.00119		-0.126	-0.126
		(0.0348)	(0.0433)		(0.0603)	(0.0636)		(0.0938)	(0.106)		(0.303)	(0.267)
log_income		0.118***	0.118***		0.185***	0.185***		0.188***	0.188***		0.316***	0.316***
		(0.00532)	(0.00927)		(0.0109)	(0.0159)		(0.0208)	(0.0268)		(0.0747)	(0.0549)
Constant	8.987***	8.542***	8.542***	8.744***	8.293***	8.293***	8.529***	7.234***	7.234***	8.391***	5.921**	5.921***
	(0.0102)	(0.0955)	(0.139)	(0.0264)	(0.351)	(0.345)	(0.0536)	(0.743)	(0.794)	(0.302)	(2.301)	(1.646)
Observations	27,104	11,825	11,825	6,531	4,328	4,328	2,335	1,602	1,602	325	226	226
R-squared	0.228	0.328	0.328	0.232	0.340	0.340	0.273	0.361	0.361	0.318	0.449	0.449
agegpreg	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK	NON-SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on consumption of different age-group non-sick households only.The consumption here excludes the household total medical expense and is divided by the number of family members to get the per capita consumption to make it comparable across different households. In order to deal with zero, all the consumptions add one before taking the logarithm. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01

Table 29: Effect of the SSI introduction on different age-group household out-of-pocket medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y
ssi_dummy1	274.5	-352.2	-352.2	-821.9*	-1,410*	-1,410*	-34.14	1,550	1,550	-1,745	2,507	2,507
	(180.5)	(352.9)	(390.8)	(420.7)	(754.1)	(789.9)	(898.2)	(1,972)	(1,285)	(2,364)	(3,629)	(2,956)
log_income		-127.4***	-127.4*		2.228	2.228		442.8*	442.8		595.5**	595.5**
		(42.50)	(65.70)		(104.0)	(127.1)		(265.5)	(312.3)		(238.9)	(241.8)
Constant	1,521***	2,949***	2,949***	2,810***	3,261***	3,261***	2,850***	-1,353	-1,353	3,432***	-4,880*	-4,880*
	(72.50)	(396.1)	(533.6)	(195.5)	(943.7)	(1,137)	(418.7)	(2,471)	(2,850)	(1,154)	(2,734)	(2,541)
Observations	47,024	19,332	19,332	12,228	6,505	6,505	3,439	1,646	1,646	277	87	87
R-squared	0.012	0.015	0.015	0.030	0.049	0.049	0.055	0.089	0.089	0.209	0.607	0.607
AgeGroup	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different age-group household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 30: Effect of the SSI introduction on different age-group sick household out-of-pocket medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y	hwoophos1y
ssi_dummy1	560.8	-400.0	-400.0	-779.6	-2,060	-2,060	-1,548	-283.2	-283.2	-581.2	7,725*	7,725**
	(441.5)	(744.7)	(869.8)	(766.0)	(1,424)	(1,702)	(1,316)	(2,780)	(2,113)	(1,490)	(4,134)	(3,396)
log_income		-16.19	-16.19		-37.21	-37.21		825.9**	825.9		533.5	533.5*
		(89.55)	(131.5)		(191.1)	(222.9)		(346.2)	(579.5)		(400.8)	(296.3)
Constant	2,626***	2,966***	2,966***	3,694***	4,958***	4,958**	3,880***	-3,223	-3,223	1,621***	-6,056*	-6,056**
	(168.3)	(795.4)	(1,073)	(347.4)	(1,680)	(2,126)	(589.6)	(3,092)	(4,988)	(577.1)	(3,498)	(2,711)
Observations	16,333	7,497	7,497	5,747	3,071	3,071	1,649	780	780	145	42	42
R-squared	0.030	0.040	0.040	0.057	0.112	0.112	0.146	0.203	0.203	0.381	0.729	0.729
AgeGroup	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different age-group sick household out-of-pocket medical expenditure. The dependent variable is the amount of household out-of-pocket medical expenditure. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 31: Effect of the SSI introduction on different age-group household total medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly
ssi_dummy1	390.0	372.2	372.2	-411.1	-458.1	-458.1	2,683	1,132	1,132	12,920	12,586	12,586
	(272.6)	(309.5)	(455.6)	(793.2)	(833.7)	(869.6)	(1,996)	(1,950)	(1,862)	(10,653)	(9,855)	(17,861)
ragender		333.8***	333.8***		406.7	406.7		1,859**	1,859***		177.1	177.1
		(127.8)	(68.52)		(354.1)	(248.8)		(856.5)	(638.9)		(4,454)	(2,794)
rwagey		106.3***	106.3***		41.12	41.12		267.9*	267.9		298.4	298.4
		(10.84)	(13.77)		(62.70)	(64.90)		(158.1)	(165.3)		(1,004)	(499.0)
rwhukou		1,035***	1,035***		1,997***	1,997***		5,386***	5,386***		13,007**	13,007
		(167.9)	(247.9)		(426.4)	(477.1)		(1,019)	(1,375)		(6,139)	(10,210)
raeducl		-250.8	-250.8		207.9	207.9		5,055***	5,055*		-7,955	-7,955*
		(167.3)	(199.7)		(537.8)	(619.4)		(1,104)	(2,841)		(7,723)	(4,264)
rwhigov		702.5**	702.5*		1,783**	1,783***		1,290	1,290		1,206	1,206
		(279.5)	(359.8)		(783.8)	(514.5)		(1,649)	(1,094)		(6,333)	(7,920)
Constant	2,517***	-4,271***	-4,271***	5,018***	-209.0	-209.0	5,522***	-19,154	-19,154	2,982	-26,916	-26,916
	(109.5)	(661.8)	(717.9)	(370.2)	(4,424)	(4,536)	(934.3)	(12,547)	(12,497)	(5,328)	(88,430)	(47,560)
Observations	46,889	41,632	41,632	12,210	11,766	11,766	3,436	3,320	3,320	283	270	270
R-squared	0.015	0.021	0.021	0.041	0.045	0.045	0.067	0.088	0.088	0.221	0.457	0.457
AgeGroup	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different age-group household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 32: Effect of the SSI introduction on different age-group sick household total medical expenditure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly	hwtothosly
ssi_dummy1	1,306**	1,328*	1,328	171.3	-31.30	-31.30	-2,517	-2,625	-2,625	-373.9	4,391	4,391
	(651.5)	(711.1)	(1,128)	(1,435)	(1,489)	(1,512)	(3,487)	(3,588)	(2,690)	(5,893)	(6,135)	(3,715)
ragender		537.4*	537.4***		165.2	165.2		2,170	2,170**		-592.0	-592.0
		(284.0)	(166.7)		(605.4)	(436.4)		(1,494)	(1,059)		(2,374)	(2,345)
rwagey		110.8***	110.8***		-119.2	-119.2		-108.4	-108.4		442.8	442.8
		(24.71)	(33.17)		(107.0)	(101.6)		(284.9)	(292.4)		(574.8)	(507.0)
rwhukou		2,269***	2,269***		3,425***	3,425***		8,319***	8,319***		1,539	1,539
		(413.1)	(611.7)		(774.8)	(1,086)		(1,766)	(2,595)		(3,816)	(3,079)
raeducl		-18.27	-18.27		1,605	1,605		7,712***	7,712		-2,661	-2,661
		(461.9)	(540.1)		(1,127)	(1,805)		(2,131)	(7,277)		(9,366)	(2,880)
rwhigov		1,099*	1,099		2,293*	2,293**		2,314	2,314		6,799**	6,799*
		(648.4)	(916.0)		(1,366)	(960.4)		(2,795)	(1,712)		(3,343)	(3,758)
Constant	3,979***	-3,843**	-3,843**	6,465***	11,637	11,637	9,154***	11,619	11,619	5,021**	-41,415	-41,415
	(247.5)	(1,525)	(1,874)	(653.7)	(7,585)	(7,178)	(1,558)	(22,498)	(21,948)	(2,371)	(50,449)	(47,891)
Observations	16,270	14,832	14,832	5,727	5,566	5,566	1,635	1,589	1,589	144	138	138
R-squared	0.032	0.039	0.039	0.082	0.092	0.092	0.174	0.200	0.200	0.523	0.577	0.577
AgeGroup	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on differentage-group sick household total medical expenditure. The dependent variable is the amount of household total medical expenditure before the insurance reimbursement. Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 33: Effect of the SSI introduction on different age-group household life expectancy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp
ssi_dummy0	0.0399	0.0508	0.0499	0.0213	0.0199	0.0207	0.0448	0.114	0.112	0.357	0.386	0.396
	(0.0291)	(0.0327)	(0.0408)	(0.0557)	(0.0585)	(0.0588)	(0.0978)	(0.103)	(0.140)	(0.298)	(0.329)	(0.324)
ragender		-0.175***	-0.175***		-0.169***	-0.170***		-0.0903**	-0.0892**		-0.0931	-0.0997
		(0.0120)	(0.0155)		(0.0219)	(0.0225)		(0.0385)	(0.0435)		(0.132)	(0.114)
rwagey			0.00113			-0.0176***			-0.0120			0.0125
			(0.00154)			(0.00417)			(0.00773)			(0.0194)
rwhukou		0.250***	0.250***		0.289***	0.290***		0.272***	0.272***		0.164	0.152
		(0.0157)	(0.0300)		(0.0270)	(0.0340)		(0.0481)	(0.0600)		(0.189)	(0.206)
raeducl		0.209***	0.210***		0.146***	0.152***		0.0761	0.0735		-0.145	-0.142
		(0.0153)	(0.0244)		(0.0334)	(0.0342)		(0.0534)	(0.0749)		(0.214)	(0.314)
rwhigov		0.0341	0.0292		0.00532	-0.00347		0.112	0.109*		0.301	0.302*
		(0.0261)	(0.0296)		(0.0468)	(0.0494)		(0.0680)	(0.0637)		(0.186)	(0.160)
Constant	3.180***	3.141***	3.086***	2.786***	2.769***	3.987***	2.535***	2.343***	3.289***	2.122***	1.907***	0.808
	(0.0143)	(0.0298)	(0.0875)	(0.0307)	(0.0563)	(0.289)	(0.0528)	(0.0879)	(0.614)	(0.171)	(0.276)	(1.747)
Observations	42,210	37,577	37,367	12,621	12,117	12,117	4,450	4,282	4,282	515	489	489
R-squared	0.081	0.104	0.105	0.100	0.120	0.122	0.162	0.178	0.178	0.288	0.283	0.284
AgeGroup	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different age-group household life expectancy. The dependent variable is the household's subjective probability of being able to live to the target age. Only individuals at or older than 60 years old are included in this table.Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01

Table 34: Effect of the SSI introduction on different age-group sick household life expectancy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp	lifeexp
ssi_dummy0	0.104**	0.0978*	0.0938	0.0138	-0.0388	-0.0406	-0.0190	0.0676	0.0604	0.329	0.182	0.178
	(0.0509)	(0.0566)	(0.0594)	(0.0829)	(0.0866)	(0.0797)	(0.146)	(0.152)	(0.152)	(0.480)	(0.508)	(0.487)
ragender		-0.240***	-0.239***		-0.194***	-0.196***		-0.0980*	-0.0988		-0.165	-0.160
		(0.0206)	(0.0242)		(0.0317)	(0.0318)		(0.0570)	(0.0621)		(0.208)	(0.196)
rwagey			0.00717***			-0.0115**			-0.0136			-0.0202
			(0.00201)			(0.00568)			(0.0112)			(0.0478)
rwhukou		0.222***	0.217***		0.228***	0.230***		0.191***	0.192***		0.147	0.151
		(0.0300)	(0.0397)		(0.0425)	(0.0579)		(0.0712)	(0.0714)		(0.325)	(0.327)
raeducl		0.147***	0.154***		0.176***	0.179**		0.142	0.138		-0.156	-0.152
		(0.0333)	(0.0405)		(0.0603)	(0.0709)		(0.0912)	(0.0955)		(0.349)	(0.443)
rwhigov		0.0211	0.00884		0.00783	0.000139		0.177*	0.176**		-0.482	-0.502
		(0.0463)	(0.0490)		(0.0686)	(0.0703)		(0.0984)	(0.0843)		(0.332)	(0.319)
Constant	2.703***	2.769***	2.385***	2.444***	2.494***	3.295***	2.321***	2.087***	3.152***	2.098***	2.666***	4.438
	(0.0235)	(0.0521)	(0.119)	(0.0446)	(0.0825)	(0.404)	(0.0781)	(0.127)	(0.888)	(0.226)	(0.425)	(4.251)
Observations	14,594	13,368	13,260	5,684	5,499	5,499	1,991	1,928	1,928	195	191	191
R-squared	0.066	0.085	0.087	0.108	0.124	0.125	0.186	0.201	0.202	0.379	0.392	0.393
AgeGroup	1	1	1	2	2	2	3	3	3	4	4	4
HH control	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES
City FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
City Cluster	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES
Health	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK	SICK

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The table presents the effect of the SSI introduction on different age-group sick household life expectancy. The dependent variable is the household's subjective probability of being able to live to the target age. Only individuals at or older than 60 years old are included in this table.Columns (1) to (3) show the results of the households with hukou registration in rural areas. Columns (4) to (6) are for households with hukou registration in urban areas. The numbers of observations vary across regressions due to some variables missing in some entries in the survey data. Standard errors clustered at the level of the individual are reported in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

A Mathematic proof

The household faces the following utility maximization problem:

$$Max_{c_1,c_2,c_3,s_1,s_2} U(C_1) + \beta \cdot E_1 U(C_2) + \beta^2 \cdot E_1 U(C_3) \tag{A.1}$$

$$\text{s.t. } c_1 + s_1 + M_1 = e_1 + y_1 \tag{A.2}$$

$$c_2 + M_2 - I \cdot [(1-\alpha)M_2 - s_2] = y_2 + (1+r)s_1 \tag{A.3}$$

$$c_3 + I \cdot \alpha M_3 = I \cdot [y_3 + (1+r)s_2] \tag{A.4}$$

I is a dummy variable. $I = 1$ means the household can benefit from the Serious Sickness Insurance (SSI), otherwise $I = 0$. When $I = 0$, this is a two-period model. With the reimbursement of SSI, the household only needs to pay proportion p of thier medical expense, $p < 1$. Thus households have a tendancy to choose better medical treatments, which originally cost $q \cdot M_t$, $q > 1$. As a consequence, the medical expenditure with SSI is $p \cdot q \cdot M_t$. I take $\alpha = p \cdot q$, and assume $0 < \alpha < 1$.

M_2, and M_3 can be written as:

$$M_2 = bM_1 + \varepsilon_2 \tag{A.5}$$

$$M_3 = bM_2 + \varepsilon_3 = b(bM_1 + \varepsilon_2) + \varepsilon_3 = b^2 M_1 + b\varepsilon_2 + \varepsilon_3 \tag{A.6}$$

$$\varepsilon_2, \varepsilon_3 \sim N\left(0, \sigma^2\right), i.i.d$$

First of all, I calculate the optimal saving when there is no SSI, $I = 0$. In this case, $s_2 = 0$, and (3) and (4) become

$$c_2 + M_2 = y_2 + (1+r)s_1 \tag{A.7}$$

$$c_3 = 0 \tag{A.8}$$

Plugging (5) into (7), I get

$$\begin{aligned} E_1 U(c_2) &= E_1\left[-\frac{1}{\theta}\exp(-\theta c_2)\right] = E_1\left\{-\frac{1}{\theta}\exp\left[-\theta\left(s_1\cdot(1+r)+y_2-bM_1-\varepsilon_2\right)\right]\right\} \\ &= -\frac{1}{\theta}\exp\left[-\theta\left(s_1\cdot(1+r)+y_2-bM_1\right)\right]\times E_1\left[\exp(\theta\varepsilon_2)\right] \end{aligned} \tag{A.9}$$

Since

$$\begin{aligned} E_1\left[\exp(\theta\varepsilon_2)\right] &= \int \exp(\theta\varepsilon_2)\frac{1}{\sqrt{2\pi}\sigma}\exp\left(-\frac{{\varepsilon_2}^2}{2\sigma^2}\right)d\varepsilon_2 \\ = \int \frac{1}{\sqrt{2\pi}\sigma}\exp\left(-\frac{{\varepsilon_2}^2-2\sigma^2\theta\varepsilon_2+\sigma^4\theta^2}{2\sigma^2}+\frac{\sigma^2\theta^2}{2}\right)d\varepsilon_2 &= \exp(\frac{\sigma^2\theta^2}{2}) \end{aligned} \tag{A.10}$$

(9) can be written as

$$E_1 U(c_2) = -\frac{1}{\theta}\exp\left[-\theta\left(s_1\cdot(1+r)+y_2-bM_1\right)+\frac{\sigma^2\theta^2}{2}\right] \tag{A.11}$$

Plugging (11) into (1), and taking the first derivative, the first order condition is

$$\begin{aligned} \frac{d\left[U(c_1)+\beta\cdot E_1U(c_2)\right]}{ds_1} &= \exp\left\{-\theta\left[e_1+y_1-M_1-s_1\right]\right\} \\ -\beta(1+r)\frac{1}{\theta}\exp\left\{-\theta\left[s_1\cdot(1+r)+y_2-bM_1\right]+\frac{\sigma^2\theta^2}{2}\right\} &= 0 \end{aligned} \tag{A.12}$$

The optimal saving in period 1, s_1^{0*}, is

$$s_1^{0*} = \frac{e_1+y_1-y_2-M_1+bM_1}{2+r}+\frac{\ln\beta(1+r)}{\theta(2+r)}+\frac{\theta\sigma^2}{2(2+r)} \tag{A.13}$$

Taking (13) into (2), the optimal consumption $c_1^{0*}$when $I=0$ is

$$c_1^{0*} = \frac{(1+r)(e_1+y_1)+y_2-(1+r+b)M_1}{2+r} - \frac{\ln\beta(1+r)}{\theta(2+r)} - \frac{\theta\sigma^2}{2(2+r)} \tag{A.14}$$

When $I = 1$, (3) and (4) become

$$c_2 + \alpha M_2 + s_2 = y_2 + (1+r)s_1 \tag{A.15}$$

$$c_3 + \alpha M_3 = y_3 + (1+r)s_2 \tag{A.16}$$

Similar to the process in (10), I can get $E_1\left[\exp\left(\alpha\theta\varepsilon_2\right)\right] = E_1\left[\exp\left(\alpha\theta\varepsilon_3\right)\right] = \exp(\frac{\alpha^2\theta^2\sigma^2}{2})$, and $E_1\left[\exp\left(\alpha b\theta\varepsilon_2\right)\right] = \exp(\frac{\alpha^2 b^2\theta^2\sigma^2}{2})$. Plugging (5) into (15), and (6) into (16), I obtain

$$\begin{aligned} E_1U\left(c_2\right) &= E_1\left[-\frac{1}{\theta}\exp\left(-\theta c_2\right)\right] = E_1\left\{-\frac{1}{\theta}\exp\left[-\theta\left((1+r)s_1+y_2-s_2-\alpha bM_1-\alpha\varepsilon_2\right)\right]\right\} \\ &= -\frac{1}{\theta}\exp\left[-\theta\left((1+r)s_1+y_2-s_2-\alpha bM_1\right)\right]\times E_1\left[\exp\left(\alpha\theta\varepsilon_2\right)\right] \\ &= -\frac{1}{\theta}\exp\left[-\theta\left((1+r)s_1+y_2-s_2-\alpha bM_1\right)+\frac{\alpha^2\theta^2\sigma^2}{2}\right] \end{aligned} \tag{A.17}$$

$$\begin{aligned} E_1U\left(c_3\right) &= E_1\left[-\frac{1}{\theta}\exp\left(-\theta c_3\right)\right] = E_1\left\{-\frac{1}{\theta}\exp\left[-\theta\left((1+r)s_2+y_3-\alpha b^2M_1-\alpha b\varepsilon_2-\alpha\varepsilon_3\right)\right]\right\} \\ &= -\frac{1}{\theta}\exp\left[-\theta\left((1+r)s_2+y_3-\alpha b^2M_1\right)\right]\times E_1\left[\exp\left(\alpha b\theta\varepsilon_2\right)\right]\times E_1\left[\exp\left(\alpha\theta\varepsilon_3\right)\right] \\ &= -\frac{1}{\theta}\exp\left[-\theta\left((1+r)s_2+y_3-\alpha b^2M_1\right)+\frac{(\alpha^2\theta^2+\alpha^2b^2\theta^2)\sigma^2}{2}\right] \end{aligned} \tag{A.18}$$

Plugging (17) and (18) into (1), the household's utility is

$$
\begin{aligned}
U\left(c_1, c_{2,} c_3\right) &= -\frac{1}{\theta} \exp\left[-\theta(e_1 + y_1 - M_1 - s_1)\right] \\
-\beta \cdot \frac{1}{\theta} \exp &\left[-\theta\left((1+r)s_1 + y_2 - s_2 - \alpha b M_1\right) + \frac{\alpha^2\theta^2\sigma^2}{2}\right] \\
-\beta^2 \cdot \frac{1}{\theta} \exp &\left[-\theta\left((1+r)s_2 + y_3 - \alpha b^2 M_1\right) + \frac{(\alpha^2\theta^2 + \alpha^2 b^2\theta^2)\sigma^2}{2}\right]
\end{aligned} \tag{A.19}
$$

The optimal saving s_1^{1*} and s_2^{1*}can be solved from the following first order condition,

$$
\begin{aligned}
0 = \frac{\partial U}{\partial s_1} &= \exp\left\{-\theta\left[e_1 + y_1 - M_1 - s_1\right]\right\} \\
-\beta(1+r) \exp &\left\{-\theta\left[s_1 \cdot (1+r) + y_2 - \alpha b M_1 - s_2\right] + \frac{\alpha^2\theta^2\sigma^2}{2}\right\}
\end{aligned} \tag{A.20}
$$

and we can get

$$
s_1^{1*} = \frac{e_1 + y_1 - y_2 - M_1 + \alpha b M_1 + s_2}{2+r} + \frac{\alpha^2\theta\sigma^2}{2(2+r)} + \frac{\ln\beta(1+r)}{\theta(2+r)} \tag{A.21}
$$

The first order condition for s_2 is

$$
\begin{aligned}
0 = \frac{\partial U}{\partial s_2} &= \beta \cdot \exp\left\{-\theta\left[s_1 \cdot (1+r) + y_2 - \alpha b M_1 - s_2\right] + \frac{\alpha^2\theta^2\sigma^2}{2}\right\} \\
-\beta^2(1+r)\frac{1}{\theta} \exp &\left\{-\theta\left((1+r)s_2 + y_3 - \alpha b^2 M_1\right) + \frac{(\alpha^2\theta^2 + \alpha^2 b^2\theta^2)\sigma^2}{2}\right\}
\end{aligned} \tag{A.22}
$$

and we can get

$$
s_2^{1*} = \frac{s_1(1+r) + y_2 - y_3 - \alpha b M_1 + \alpha b^2 M_1}{2+r} + \frac{\alpha^2 b^2\theta\sigma^2}{2(2+r)} + \frac{\ln\beta(1+r)}{\theta(2+r)} \tag{A.23}
$$

Taking (21) and (23) together, the optimal saving s_1^{1*} at $I = 1$ is

$$
\begin{aligned}
s_1^{1*} = \frac{1}{r^2+3r+3}\{&(2+r)e_1 + (2+r)y_1 + [(1+r)\alpha b - (2+r) + \alpha b^2]M_1 \\
&-(1+r)y_2 - y_3 + \frac{[(2+r)\alpha^2 + \alpha^2 b^2]\theta\sigma^2}{2} + (3+r)\frac{\ln\beta(1+r)}{\theta}
\end{aligned}
\tag{A.24}
$$

The difference of optimal saving in period 1 between $I = 0$ and $I = 1$ is

$$
\begin{aligned}
\triangle s_1^* = s_1^{1*} - s_1^{0*} &= \frac{(r+1)(e_1+y_1)+y_2}{(r^2+3r+3)(2+r)} - \frac{y_3}{r^2+3r+3} \\
&+ \left[\frac{(1+r)\alpha b - (2+r) + \alpha b^2}{r^2+3r+3} + \frac{1-b}{2+r}\right] M_1 \\
&+ \left[\frac{(2+r)\alpha^2 + \alpha^2 b^2}{r^2+3r+3} - \frac{1}{2+r}\right]\frac{\theta\sigma^2}{2} + \frac{(2r+3)\ln\beta(1+r)}{(r^2+3r+3)(2+r)\theta}
\end{aligned}
\tag{A.25}
$$

$\triangle s_1^*$ reflects how the introduction of insurance I influence households' savings. From (2) $c_1 = e_1 + y_1 - s_1 - M_1$, we can get $\triangle c_1^* = -\triangle s_1^*$, that is the influence on households' consumptions at $t = 1$.

The second part $\left[\frac{(1+r)\alpha b-(2+r)+\alpha b^2}{r^2+3r+3} + \frac{1-b}{2+r}\right] M_1$ reflects the influence on savings for household's medical expenditure. This term is negative, as shown in the following:

$$
\begin{aligned}
&\frac{(1+r)\alpha b - (2+r) + \alpha b^2}{r^2+3r+3} + \frac{1-b}{2+r} \\
&= \frac{(r^2+3r+2)\alpha b - (2+r)^2 + (2+r)\alpha b^2 + (r^2+3r+3)(1-b)}{(r^2+3r+3)(2+r)} \\
&= \frac{(r^2+3r+2)\alpha b - (r^2+3r+2) - (2+r) + (2+r)\alpha b^2 + (r^2+3r+3)(1-b)}{(r^2+3r+3)(2+r)} \\
&= \frac{-(2+r)(1-\alpha b^2) - (r^2+3r+2)(1-\alpha b) + (r^2+3r+3)(1-b)}{(r^2+3r+3)(2+r)}
\end{aligned}
\tag{A.26}
$$

The first part of the numerator

$$\begin{aligned} & -(2+r)(1-\alpha b^2) \\ & < -(2+r)(1-b^2) \\ & = -(2+r)(1+b)(1-b) \end{aligned} \tag{A.27}$$

The second part of the numerator

$$\begin{aligned} & -(r^2+3r+2)(1-\alpha b) + (r^2+3r+3)(1-b) \\ & = [-(r^2+3r+2) + (r^2+3r+3)] + [(r^2+3r+2)\alpha b - (r^2+3r+3)b] \\ & < 1 + [(r^2+3r+2)b - (r^2+3r+3)b] = 1-b \end{aligned} \tag{A.28}$$

, as $\alpha < 1$. Thus the numerator is smaller than

$$\begin{aligned} & -(2+r)(1+b)(1-b) + (1-b) \\ & = -(rb+2b+r+1)(1-b) < 0 \end{aligned} \tag{A.29}$$

Therefore, the whole term $\left[\frac{(1+r)\alpha b-(2+r)+\alpha b^2}{r^2+3r+3} + \frac{1-b}{2+r}\right] M_1 < 0$.