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Shuangge Ma, *Yale University*

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Kuangnan Fang[1], BenChang Shia[1,2], Yefei Jiang[1] and Shuangge Ma[*3]

[1]Department of Statistics, School of Economics, Xiamen University, Xiamen, China

[2]Department of Statistics and Information Science, FuJen Catholic University, New Taipei City, R.O.C.

[3]School of Public Health, Yale University, New Haven CT, USA

*E-mail: shuangge.ma@yale.edu

Abstract

Background Illness conditions can be expensive and potentially affect the consumption patterns of households. The main goal of this study is to examine the impact of illness conditions and out-of-pocket medical expenditure on other types of household consumptions. In November and December, 2011, a survey was conducted in three cities in western China, Lan Zhou, Gui Lin and Xi An, and their surrounding rural areas.

Results Information on demographics, income and consumption was collected on 2,899 households. Data analysis suggested that the presence of household members with chronic diseases was not associated with characteristics of households or household heads. The presence of inpatient treatments was significantly associated with the age of household head (p-value 0.03) but not other variables. The level of per capita medical expense was significantly associated with household size, presence of members younger than 18, older than 65, basic health insurance coverage, per capita income, and household head occupation. Adjusting for confounding effects, the presence of chronic disease was significantly associated with a reduction in the amount of basic consumption (p-value 0.02), but not other types of consumptions. It was also significantly associated with a reduction in the percentage of basic consumption (p-value 0.01) and an increase in the percentage of insurance expense (p-value 0.02). Increase in medical expenditure was significantly correlated with increase in all other types of consumptions (all p-values<0.001). It was also correlated with decrease in the percentage of basic consumption, saving and investment, and insurance.

Conclusions Early studies conducted in other Asian countries (mostly rural areas) and rural China found negative associations between illness conditions and medical expenditure with other

types of consumptions. In this study, the observed consumption patterns were significantly different from those in early studies, and the negative associations were not observed. Such difference could be partly explained by the fact that our survey was limited to three large cities with relatively higher socioeconomic status. This study may provide valuable information and complement the existing rural studies.

Keywords: Illness conditions; Medical expenditure; Household consumption; Western China.

Introduction

Illness conditions can be expensive. Multiple studies have suggested that medical expense may have a profound impact on other types of consumptions [1,2,3,4]. The simple rationale is that with a limited budget, when facing medical expense, individuals and households may have to reduce consumptions of food, education, farming expense, other production means, recreation and others [5,6]. Such reduction may have both short and long term impact.

China has the world's largest population and the second largest economy by nominal GDP. In the recent years, there have been a large number of empirical studies on the ill health conditions, health insurance, and medical expenditure in China [7,8,9]. However, our literature review suggested that the existing literature had been mainly focused on the distribution of illness conditions [10], distribution of medical expenditure and the associated factors [11], utility of health services [12], medical insurance coverage and impact on expenditure [13], and a few other topics. Although it is well acknowledged that medical expenditure can affect consumption patterns, few studies have investigated such an effect in China [5].

A recent study that investigated the impact of medical expense on consumption patterns was conducted by Nguyen and others in rural Vietnam [14], where the mean per capita income was about $630. It was found that households with inpatient treatments and higher levels of outpatient treatments had significantly decreased consumptions of basic capabilities such as food, education and production means. Setboonsarng and Lavado [6] made similar observations in a study conducted in rural Thailand, where the mean total household expenditure per year was about $1,723. The most relevant study was conducted by Wang and others [5], which reported a community-based survey conducted in poor rural areas of China in 2002. It was found that "medial expenditure reduced household investment in human capital, physical capital for farm production, and other consumptions that are critical to human well-being" [5].

The main goal of this study is to investigate the associations between illness conditions and medical expenditure with other types of consumptions. It differs from most of the aforementioned studies by focusing on the changes in consumption patterns due to illness. The strategy is similar to that in [5,14]. The differences from [5] include the selection of study subjects. In [5], all subjects were collected from six small towns in poor, rural areas. In this study, we collected data from three major cities in western China and their surrounding areas. With a significant percentage of rural population, particularly new working-class, migrating to cities, large cities and their surrounding areas can be of more interest. In addition, more household information was collected, providing a more comprehensive account for possible confounding effects. More importantly, with per capita GDP growing at ~10% annually during the past decade, China has been experiencing significant economic growth. Such growth has a direct impact on health care, medical expenditure, and consumption patterns. Thus, sensible differences are expected between [5] and the present study.

Methods

Data Collection

The study was approved by a research ethics review committee at Xiamen University, China. Three cities in western China, including Lan Zhou, Gui Lin and Xi An, and their surrounding rural areas were surveyed (Figure 1). Lan Zhou is the capital and largest city of Gansu Province in northwest China. The population was about 3.6 million according to the 2010 census, and the per capita GDP was 25,566 RMB in 2008 (NBS GDP Data [15]; 1 US dollar=6.36RMB). Gui Lin is in the Guangxi Zhuang Autonomous Region of southwest China. The population was about 4.7 million (2010 census), and the per capita GDP was 19,435RMB in 2009. Xi An is the capital of ShanXi Province in midwest China. The population was about 8.5million in 2010, and the per capita GDP was 26,259RMB. As a comparison, the per capita GDP for the whole mainland China was 23,708RMB in 2008 and 25,608RMB in 2009. The three cities are located in the north, middle, and south of western China, and were chosen as representatives of large, sub-provincial cities in those areas.

The survey was conducted by staff at the Data Mining Research Center (DMRC), Xiamen University, China, in November and December, 2011. A Computer-Assisted Telephone Survey System (CATSS) was adopted. The collection of phone numbers was purchased from China Telecom Corp. Ltd. and China Unicom Corp. Ltd. We collected samples using an RDD (random digit dialing) approach. More specifically, we draw Mitofsky-Waksberg [16] type samples of active blocks of 100 consecutive phone numbers from all possible such blocks within each city. The probability of a block's initial selection was proportional to the block's 100 numbers that

served residences. The study database was updated after each phone call to ensure that no household was sampled multiple times. As it was difficult to associate a cell phone number with a physical location, we focused on landline only.

At the beginning of each survey, the staff would collect information to determine inclusion. A household would be excluded if (1) the interviewee refused to participate, (2) the household was not officially in the three surveyed cities, defined by "Hukou" (a household registration issued by the central government), (3) the interviewee was less than 18 years old, or (4) the interviewee could not provide reliable information on the household (self-evaluation). Verbal consent was obtained for each survey, recorded using voice recording software, and stored at DMRC. The survey included "snapshot" questions (such as demographic information, insurance status) as well as "accumulation" questions (such as total income and expense over a period of twelve months). On average, one survey took eight minutes.

Statistical Analysis

Data was deidentified prior to analysis. We examined data and found no obvious outliers. In our analysis, we first examined the distributions of illness conditions (both chronic disease and inpatient treatment) and medical expenditure, and their associations with demographic variables. Differences between different illness/medical expense groups were examined using t-tests for continuous variables and chi-squared tests for categorical variables. Similar techniques were used in the univariate analysis of illness conditions on consumption. Multivariate analyses were conducted to investigate the impact of illness conditions and medical expenditure on consumption patterns, adjusting for confounding effects. Here to get a more comprehensive

description, we analyzed each consumption category separately, following [5,6]. Two sets of analyses were conducted. In the first set, we analyzed the actual amount of consumption using linear regression. In the second set, we analyzed the percentage of each category of consumption (as of the total consumption) using logistic-type regression. Model diagnostics was conducted, and no serious deviation from the model conditions was observed. All analysis was conducted using S-Plus Version 8.2 (TIBCO Software Inc.).

Results and Discussion

The study collected data on 2,899 households (Table 1). The survey response rate was 38.6%. As household remains the basic functional unit for financial decisions in China, data was collected at the household level. This strategy was consistent with [5,11]. In analysis, to account for the difference in household size, we computed and analyzed per capita income and expense.

Characteristics of illness conditions and medical expenditure

In Table 1, we presented the summary statistics of households and household heads for the whole cohort and subgroups characterized by different illness conditions and levels of medical expense. Illness condition was described using two variables: presence of (members with) chronic diseases, which are long-term, with multiple episodes and low cost per episode, and presence of (members with) inpatient treatments, which are low-frequency, high-cost health shocks. Medical cost was defined as the per capita, out-of-pocket medical expense accumulated over a period of twelve months prior to survey. Fang and others [11] recently shows that, because of the high

coverage rate of basic health insurance and increasing popularity of commercial health insurance, out-of-pocket medical cost could be considerably less than gross medical cost. We focused on the out-of-pocket cost, which may better represent financial burden to a household. Medical cost was a continuous variable. In Table 1, we dichotomized at the median, and created “high” and “low” cost groups.

We observed cross-city difference, with Lan Zhou reporting more households with chronic diseases (p-value 0.007). Otherwise, the presence of chronic disease was not significantly associated with household or household head characteristics. The presence of inpatient treatment was significantly associated with the age of household head (p-value 0.03). For example, when the household heads were younger than 20, 43% of the households reported inpatient treatments, while the percentage was 58% when the household heads were older than 60. However no significant linear trend was observed. Analysis of per capita medical expense suggested that larger households (p-value<0.001), a larger number of members younger than 18 (p-value <0.001), a larger number of members older than 65 (p-value <0.001), lower basic health insurance coverage (p-value 0.009), higher per capita income (p-value <0.001), and household heads working for government or state-owned or private companies, were associated with higher medical expense.

Most of the above results were intuitively reasonable. It was interesting to observe that larger households had higher per capita medical expense. Wang and others [5] and Nguyen and others [14] also collected information on household size, however did not examine its association with medical expense. The association between medical expense and household head occupation can be partly explained by the association between occupation and income (in China, government,

state-owned company, and private company employees tended to have higher income) and differences in basic health insurance systems for people with different occupations [11].

Impact of illness conditions on consumption

In the survey, consumption was measured in nine categories (Table 2). Each category was defined as the per capita consumption accumulated over a period of twelve months prior to survey. In our preliminary study, it was found that some households might purchase food, daily goods, clothes, and other items together, and had trouble separating those costs (details omitted here). Thus, unlike in [5], we created the category of "basic consumption", which included food, clothes, production means, utilities and daily goods. More details were provided in Table 2. Basic consumption was the biggest category, accounting for 31.45% of the total consumption. Other major consumptions included saving and investment (23.67%), medical expense (15.54%), and insurance (15.39%). All other categories combined accounted for 13.95% of the total consumption. The observed consumption patterns differed significantly from those in some of the existing studies. For example, in [5], the percentage of medical expense was considerably lower (7.9%), the percentage of education was considerably higher (12.0%), and the percentage of saving was much lower (3.8%). In [14], the Vietnam study, medical cost accounted for 5.9% of the total expense, insurance only accounted for 0.2%, there was no separate category for saving, but the "other" category (which was assumed to include saving) accounted for only 4.6%. In [6], the Thailand study, medical cost accounted for only 2% of the total expense, education accounted for 16%, and there was no separate category for saving or other. Multiple factors contributed to the observed differences, including for example the significant difference in total

consumption (2043.4RMB per household in [5], compared to 8284.9RMB per capita in this study), geographic differences, and rural-urban differences. It should be noted that households surveyed in this study had a much higher saving rate, reflecting their higher financial status. Households with regular savings might be able to cope with medical expense without having to lower daily living standard [11].

We investigated the associations between illness conditions and consumption patterns via univariate analysis (Table 2) and multivariate analysis (Table 3). As multivariate analysis can be more informative, all main conclusions were based on Table 3. In multivariate analysis, we adjusted for possible confounding effects of household and household head characteristics (details presented in Table 3). We conducted two sets of analyses. In the first set, we regressed the actual amount of each category of expense on illness conditions and confounders, using linear regression models. In the second set, we analyzed the percentage of each category of expense (as of the total expense). As the response variables were percentages between 0 and 1, logistic-type regression analysis was conducted [5,17]. As the number of households with "other expense" was small and the actual amount was small, this expense category was not analyzed.

Table 3 suggested that compared to households without inpatient treatment, households with inpatient treatments had a lower level of basic consumption (estimated difference=119.3RMB, p-value 0.02). The association with consumption of durable goods was borderline significant (p-value 0.06). The associations with other consumptions were not significant. The presence of inpatient treatment was not significantly associated with any consumption. In the analysis of expense percentage, it was found that the presence of chronic disease was significantly associated with a decrease in the percentage of basic consumption (odds ratio 0.96, p-value 0.01) and an increase in the percentage of insurance expense (odds ratio 1.04, p-value 0.02). Other

associations were not significant. The presence of inpatient treatment was not associated with the percentages of consumptions.

Impact of medical expense on other expenses

We also directly studied the impact of medical expense on other types of expenses. More specifically, we regressed other types of expenses on medical expense, adjusting for possible confounding effects (details presented in Table 4). As for illness conditions, two sets of analyses were conducted, one on actual amount of consumption and the other on percentage.

Table 4 suggested that an increase in medical expense was positively associated with increases in all other types of expenses (all p-values<0.001). The biggest increase was for basic consumption, with one RMB increase in medical expense correlated with 0.75 RMB increase in basic consumption. The analysis of percentage expense showed that an increase in medical cost led to significant decreases in the percentages of basic expense (odds ratio 0.67, p-value<0.001), saving and investment (odds ratio 0.90, p-value<0.001), and insurance expense (odds ratio 0.86, p-value <0.001).

Discussions

In the analysis of illness conditions, we observed negative associations between the presence of chronic disease and basic consumption and saving and investment. Such associations were also observed in [5,14]. However, associations with other consumption categories were not observed,

and the amount of reduction in basic consumption was about 4.1% of total consumption, which was considerably smaller than that observed in [5]. Multiple factors may have contributed to such a difference. First of all, significant economic growth had happened during the past decade, making households less sensitive to health shocks. The total household consumption in rural China in [5] was 2043.4RMB (average household size unspecified), and that in Vietnam in [14] was 12517.5VND (740USD, approximately 4706.7RMB) for a household with 3.8 members on average. It is noted that in our survey, on average 23.67% of household expense was saving/investment. With a high saving rate, households were able to cope with medical expense without having to reduce basic living expenses. Second, Wang and others [5] surveyed remote, relatively poor towns, whereas we surveyed three large cities and their surrounding areas. In addition, as has been observed in recent studies (such as [11] and references therein), the existing basic and commercial health insurance systems in China were able to effectively reduce medical cost for households, protecting them from having to lower living standard because of illness.

In the analysis of medical expense (actual amount), the positive associations between medical expense and other expenses differed significantly from what was observed in [5], and may seem counterintuitive. However, it should be noted that the survey was an observational study, and the regression analysis could only reveal association, not causation [18]. In multiple publications, a positive association between out-of-pocket medical cost and income/expense has been observed [19]. Households with a higher budget could have higher levels of expenses in multiple categories, leading to the positive associations. In China, the positive associations between medical expense and household income and total household consumption were recently reported in [11]. Compared to [14], medical expense accounted for a much smaller percentage of total expense. Thus, change in medical expense did not necessarily result in a significant amount of

change in other expenses. The discrepancy between this study and [5,14] could also be explained by the argument offered in [20], which stated that the observation that poor households spending more on healthcare were typically based on small samples in rural areas. The second set of analysis on expense percentage might better describe the scenario with a fixed budget, as the percentages summed to one. Here we observed that an increase in the percentage for medical expense led to reductions in the percentages for other expenses. The most notable change arose from basic consumption (odds ratio 0.67). Such an observation was consistent with [5, 6] and other studies.

Limitations

Ideally, longitudinal data is needed to allow one to fully track the changes in non-medical expenditures following illness conditions and estimate the impact caused by medical expenditure. In this study, only cross-sectional data was available, and some assumptions (like the stationary conditions) had to be made [6]. In this study, data was collected via phone call survey. The advantage was that a large number of samples could be collected. However, the nature of survey inevitably led to certain drawbacks. For example, interviewees were asked to recall the total amount of income and expense for a period of twelve months. It has been suggested that such an approach may lead to a biased estimation (usually under estimation) [21]. The illness condition of a household was measured by the presence of chronic disease and inpatient treatment. Such measures did not take into account the types of illness and number of episodes. Of note, similar measures had been adopted in [5,14] and others. In addition, the expense data reflected the aggregation or average over one year, which made it impossible to investigate whether the

impact was long- or short-term. In the survey, all the samples were drawn from three large cities and their surrounding areas in western China. Comparing the GDP figures [15] suggested that there was considerable geographic variation in income in China, and the surveyed cities might not be representative of the whole China.

Conclusions

Studies conducted in other Asian countries (mostly rural areas) and rural areas in China suggested that illness conditions and medical expenditure could be correlated with significant reductions in households' basic capabilities. In our survey although certain correlations between illness/medical expenditure and consumption patterns were observed, serious reduction in basic capabilities was not observed. Instead, the surveyed households were found to be able to finance medical expense in a way that did not have long-term detrimental impacts. The policy implication was that under the current economic condition, the financial aspect of health care system was reasonably effective. By studying large cities and their surrounding areas in western China, this study may provide valuable information into these areas and complement studies conducted in rural areas. Studies that can better describe the causal effects (as opposed to simply association) of medical expense on other expense categories are needed in the future.

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References

1. Flores G, Krishnakumar J, O'Donnell O, Van Doorslaer E (2008) Coping with Health-Care Costs: Implications for the Measurement of Catastrophic Expenditures and Poverty. Health Economics 17: 1393-412.

2. Foster A (1994) Poverty and illness in low-income rural areas. American Economic Review 84: 216–220.

3. Kabir MA, Rahman A, Salway S, Pryer J (2000) Sickness among the urban poor: A barrier to livelihood security. Journal of International Development 12: 707–722.

4. Wagstaff A (2007) The economic consequences of health shocks: evidence from Vietnam. Journal of Health Economics 26: 82-100.

5. Wang H, Zhang L, Hsiao W (2006) Ill health and its potential influence on household consumptions in rural China. Health Policy 78: 167-177.

6. Setboonsarng S, Lavado RF (2008) Does organic agriculture lead to better health among organic and conventional farmers in Thailand? An investigation of health expenditure among organic and conventional farmers in Thailand. ADB Institute Working Paper No129.

7. Morrison J, Eggleston K (2008) Developing commercial health insurance in China. Field Note in Perspectives: China and the World. 10: 141-155.

8. You X, Kobayashi Y (2011) Determinants of out-of-pocket health expenditure in China: analysis using China Health and Nutrition Survey Data. Applied Health Economics and Health Policy 9: 39-49.

9. Xiao S, Yan H, Shen Y, Dang S, Hemminki E et al. (2010) Utilization of delivery care among rural women in China: does the health insurance make a difference? A cross-sectional study. BMC Public Health 10: 695.

10. Jian W, Chan KY, Reidpath DD, Xu L (2010) China's rural-urban care gap shrank for chronic disease patients, but inequalities persist. Health Affairs 29: 2189-2196.

11. Fang K, Shia BC, Ma S (2012) Health insurance coverage and impact: a survey in three cities in China. PLoS One 7: e39157.

12. Chen WX, Li NX, He D, Ren XH. (2009) An eight-year study on maternal and child health service utility in Sichuan province (article in Chinese). Zhonghua Liu Xing Bing Xue Za Zhi 30: 243-246.

13. Sun Q, Liu X, Meng Q, Tang S, Yu B, Tollhurst R. (2009) Evaluating the financial protection of patients with chronic disease by health insurance in rural China. International Journal for Equity in Health. 8: 42.

14. Nguyen K, Khuat OTH, Ma S, Pham DC, Khuat GTH, Ruger JP (2012) Effect of health expenses on household capabilities and resource allocation in Vietnam. Available at SSRN: http://dx.doi.org/10.2139/ssrn.1435820

15. NBS GDP DATA: Revisions of China GDP 2004-2008 by province-level divisions. Available at http://219.235.129.58/welcome.do Accessed on 2012 Aug. 16th.

16. Waksberg J (1978) Sampling methods for random digit dialing. Journal of the American Statistical Association 361: 40-46.

17. Hosmer DW, Lemeshow S (2000) Applied Logistic Regression. Wiley-Interscience Publication.

18. Freedman D (1999) From association to causation: some remarks on the history of statistics. Statistical Science 14: 243-258.

19. Kopecky KA, Koreshkova T (2010) The impact of medical and nursing home expenses and social insurance policies on savings and inequality. Federal Reserve Bank of Atlanta. Working paper 2010-19.

20. van Doorslaer E, O'Donnell O, Rannan-Eliya RP, Somanathan A, Adhikari SR, Garg CC, Harbianto D, Herrin AN, Huq MN, Ibragimova S, Karan A, Lee TJ, Leung GM, Lu JF, Ng CW, Pande BR, Racelis R, Tao S, Tin K, Tisayaticom K, Trisnantoro L, Vasavid C, Zhao Y. (2007) Catastrophic payments for health care in Asia. Health Economics. 16: 1159-1184.

21. Lu C, Chin B, Li G, Murray CJL (2009) Limitations of methods for measuring out of pocket and catastrophic private health expenditures. Bull World Health Organization 87: 238-244.

Table 1. Sample characteristics for the whole cohort and subgroups with different illness conditions and medical expense levels. Values are means (standard deviations) and percentages (for variables marked by *).

		Whole cohort	Presence of chronic disease		Presence of inpatient treatment		Medical expense	
Variables			**Yes**	**No**	**Yes**	**No**	**High**	**Low**
Total sample		2899	1247	1652	1693	1206	1445	1454
Lan Zhou		954	450	504	506	388	448	506
Gui Lin		979	401	578	582	397	497	482
Xi An		966	396	570	545	421	500	466
p-value			0.007		0.32		0.085	
Data on household								
Household size		4.84 (1.50)	4.84 (1.50)	4.84 (1.50)	4.84 (1.50)	4.84 (1.50)	5.05 (1.57)	4.66 (1.40)
p-value			0.79		0.82		<0.001	
Younger than 18*	0	19.52	20.21	19.01	19.37	19.73	17.72	21.32
	1	59.95	59.5	60.29	60.72	58.87	58.62	61.28
	2	17.73	17.32	18.04	17.31	18.33	19.93	15.54
	3	2.28	2.41	2.18	2.19	2.4	3.18	1.38
	4	0.38	0.32	0.42	0.3	0.5	0.35	0.41
	5	0.1	0.16	0.06	0.06	0.17	0.14	0.07
	6	0.03	0.08	0	0.06	0	0.07	0
p-value			0.79		0.78		<0.001	
Older than 65*	0	64.68	63.11	65.86	64.44	65.01	59.86	69.46
	1	18.59	19.73	17.74	19.02	17.99	17.92	19.26
	2	14.18	14.27	14.1	13.76	14.76	17.92	10.45
	3	1.35	1.68	1.09	1.59	1	2.08	0.62
	4	0.48	0.48	0.48	0.53	0.41	0.76	0.21
	5	0.52	0.48	0.54	0.47	0.58	1.04	0
	6	0.17	0.24	0.12	0.18	0.17	0.35	0
	7	0.03	0	0.06	0	0.08	0.07	0
p-value			0.58		0.71		<0.001	
Basic insurance*		91.53 (17.48)	91.34 (17.88)	91.68 (17.17)	91.69 (17.23)	91.31 (17.83)	90.68 (18.17)	92.38 (16.73)
p-value			0.6		0.57		0.009	
Commercial insurance*		83.41 (21.93)	83.53 (21.89)	83.32 (21.96)	82.82 (21.88)	82.84 (21.99)	82.67 (22.45)	84.15 (21.37)
p-value			0.8		0.24		0.07	
Hukou*	Urban	65.16	65.12	65.19	65.09	65.26	66.3	64.03
	Rural	34.84	34.88	34.81	34.91	34.74	33.7	35.97
p-value			0.99		0.96		0.21	
Income (RMB)		7341 (5347)	7156 (5392)	7480 (5310)	7304 (5321)	7391 (5384)	10851 (5001)	3852 (2781)
p-value			0.11		0.67		<0.001	
Data on household head								
Age*	<20	1.93	2.17	1.76	1.71	2.24	1.8	2.06
	21-30	8.07	7.78	8.29	8.68	7.21	7.96	8.18
	31-40	2.93	3.05	2.85	2.95	2.9	2.63	3.23

	41-50	37.22	36.17	38.01	35.91	39.05	36.4	38.03
	51-60	38.36	38.41	38.32	37.8	39.14	40.28	36.45
	>60	11.49	12.43	10.77	12.94	9.45	10.93	12.04
p-value			0.65		0.03		0.39	
Gender*	Male	75.82	75.3	76.21	76.2	75.29	76.82	74.83
p-value			0.60		0.60		0.23	
Education*	<middle school	48.57	47.47	49.39	48.08	49.25	48.37	48.76
	High school	40.63	40.82	40.5	40.87	40.3	40.07	41.2
	Bacholar	9.14	9.94	8.54	8.98	9.37	9.83	8.46
	>Bacholar	1.66	1.76	1.57	2.07	1.08	1.73	1.58
p-value			0.52		0.21		0.61	
Marital status*	Single	24.35	24.22	24.46	24.1	24.71	24.22	24.48
	Married	62.99	63.03	62.95	63.85	61.77	63.25	62.72
	Divorced	6.28	6.5	6.11	5.67	7.13	6.64	5.91
	Widowed	6.38	6.26	6.48	6.38	6.38	5.88	6.88
p-value			0.97		0.39		0.62	
Occupation*	Government	17.45	16.68	18.04	17.54	17.33	28.44	6.53
	State-owned Company	21.18	21.17	21.19	20.73	21.81	37.37	5.09
	Private Company	5.35	4.81	5.75	5.2	5.56	10.17	0.55
	Self-employed	18.73	21.17	16.89	18.84	18.57	2.28	35.08
	Farmer	30.94	29.43	32.08	30.42	30.27	21.18	40.65
	Unemployed	1.97	1.76	2.12	2.13	1.74	0.07	3.85
	Retired	3.31	3.69	3.03	3.07	3.65	0.42	6.19
	Other	1.07	1.28	0.91	1.06	1.08	0.07	2.06
p-value			0.076		0.95		<0.001	

Table 2. Per capita expense (mean and standard deviation) and percentage (as of the total expense) for the whole cohort and subgroups with different illness conditions and medical expense levels.

	Whole cohort	Presence of chronic disease		Presence of inpatient treatment		Medical expense	
		Yes	No	Yes	No	High	Low
Amount of expense (RMB)							
Basic (food, produce, etc)	2884.0	2741.1	2991.9	2854.1	2926.1	4426.3	1351.3
sd	2397.4	2332.0	2440.8	2377.6	2425.3	2382.7	1051.2
p-value		0.005		0.43		<0.001	
Education	462.6	451.2	471.3	461.6	464.0	732.3	194.6
sd	386.6	389.2	384.6	389.1	383.3	353.6	172.5
p-value		0.17		0.87		<0.001	
Saving/Investment	2710.3	2097.8	2225.0	2169.3	2171.6	3346.5	1001.4
sd	1713.0	1688.2	1729.9	1727.8	1692.6	1602.1	747.2
p-value		0.05		0.97		<0.001	
Entertainment	465.8	449.2	478.3	463.7	468.7	736.0	197.3
sd	394.7	387.4	399.8	396.6	392.3	367.9	177.6
p-value		0.05		0.74		<0.001	
Insurance	1410.9	1376.0	1437.2	1391.1	1438.6	2183.2	643.4
sd	1176.6	1174.9	1177.6	1161.1	1198.0	1148.1	518.2
p-value		0.17		0.29		<0.001	
Durable goods	245.0	232.2	254.7	242.6	248.3	398.6	92.3
sd	242.5	234.9	247.8	239.0	247.4	244.7	105.1
p-value		0.01		0.53		<0.001	
Alcohol/Tobacco	101.5	97.6	104.4	101.2	101.9	175.4	28.0
sd	119.9	119.5	120.1	120.7	118.7	123.2	52.3
p-value		0.13		0.87		<0.001	
Other	4.8	7.5	2.7	4.0	6.0	6.4	3.2
sd	58.2	74.6	41.8	43.0	74.6	75.5	33.0
p-value		0.04		0.40		0.13	
Percentage of expense							
Basic (food, produce, etc)	31.45	31.03	31.75	31.33	31.62	30.92	33.32
Education	5.04	5.11	5.00	5.07	5.04	5.11	4.80
Saving/Investment	23.67	23.75	23.61	23.81	23.47	23.37	24.69
Entertainment	5.08	5.09	5.08	5.09	5.07	5.14	4.87
Insurance	15.39	15.58	15.25	15.27	15.55	15.25	15.87
Durable goods	2.67	2.63	2.70	2.66	2.68	2.78	2.28
Alcohol/Tobacco	1.11	1.10	1.11	1.11	1.10	1.23	0.69
Other	0.05	0.09	0.03	0.04	0.06	0.04	0.08

*Basic consumption includes food (rice, meet, vegetable, fruit, etc), clothes, production means (e.g. farming equipment, fertilizer, seed, etc), utilities (electricity, water, heating, cooking, renting, etc), and daily goods (toiletries, kitchen supplies); Education includes tuition, book, and other education-related expenses; Saving/investment includes banking, stock; Entertainment includes entertainment, travel, holidays and other social activities; Insurance: for property, farm product, health, etc; Durable goods include furniture and electronic devices; Alcohol/Tobacco: cigarette, tobacco, wine, liqueur; Medical expense: outpatient and inpatient services, drugs; Other: expenses not listed above.

Table 3. Multivariate analysis of presence of chronic disease and inpatient treatment on expense, measured by both the actual amount and percentage.

	Amount of expense				**Percentage of expense**			
	Presence of chronic disease		**Presence of inpatient treatment**		**Presence of chronic disease**		**Presence of inpatient treatment**	
	Est.	**p-value**	**Est.**	**p-value**	**OR**	**p-value**	**OR**	**p-value**
Basic (food, produce, etc)	-119.30	0.02	-47.80	0.34	0.96	0.01	0.98	0.18
Education	2.34	0.72	1.60	0.81	1.02	0.10	1.01	0.26
Saving/Investment	-30.51	0.31	14.34	0.64	1.00	0.70	1.02	0.17
Entertainment	-6.63	0.33	-1.32	0.85	1.01	0.36	1.01	0.66
Insurance	0.55	0.98	-37.19	0.13	1.04	0.02	0.98	0.19
Durable goods	-9.71	0.06	-3.33	0.51	0.99	0.58	1.00	0.81
Alcohol/Tobacco	-1.19	0.66	0.75	0.78	1.01	0.74	1.01	0.60

* Adjusted for household information (household size, presence of younger than 18, presence of older than 65, basic insurance coverage, commercial insurance coverage, per capita income, city, Hukou) and household head information (age, gender, education, occupation, marital status). Est: estimated regression coefficient in linear regression. OR: odds ratio in logistic regression.

Table 4. Multivariate analysis of medical expense on other household expenses, measured by both the actual amount and percentage.

	Amount of expense		Percentage of expense	
	Est.	**p-value**	**OR**	**p-value**
Basic (food, produce, etc)	0.75	<0.001	0.67	<0.001
Education	0.13	<0.001	1.00	0.77
Saving/Investment	0.53	<0.001	0.90	<0.001
Entertainment	0.13	<0.001	0.98	0.16
Insurance	0.35	<0.001	0.86	<0.001
Durable goods	0.08	<0.001	0.98	0.49
Alcohol/Tobacco	0.04	<0.001	0.98	0.54

* Adjusted for household information (household size, presence of younger than 18, presence of older than 65, basic insurance coverage, commercial insurance coverage, per capita income, city, urban) and household head information (age, gender, education, occupation, marital status). Est: estimated regression coefficient in linear regression. OR: odds ratio in logistic regression.

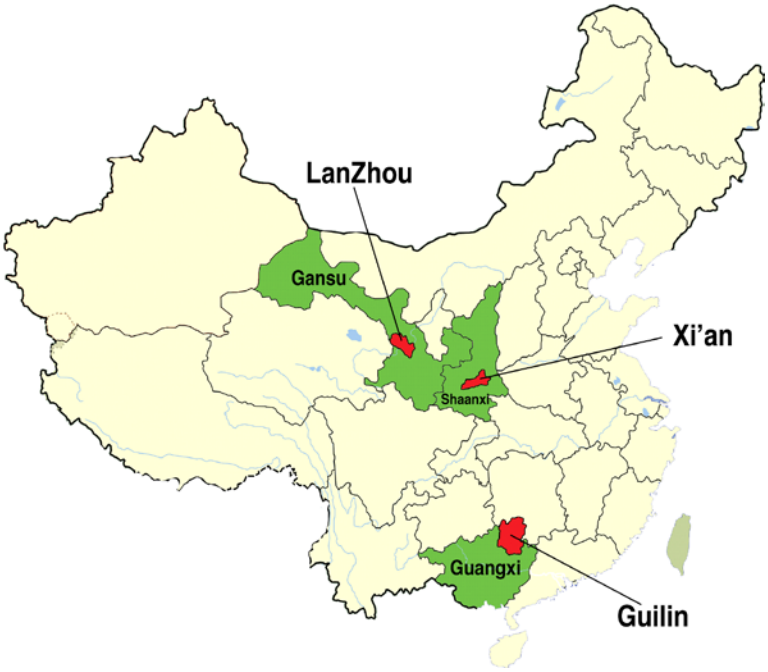

Figure 1. Map of the three surveyed cities.