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Understanding the Health Effects of the Death of Spouses in Modern China: Evidence from the city of Qingdao[1]

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Abstract

This paper provides new empirical results to understand the impacts of the death of spouses on the surviving partner's health status. We use the survey data for elderly persons in the city of Qingdao in China, which include information for individual health status and other basic characteristics. Based on the probit estimation and the propensity-score approaches, we estimate the impacts of the death of spouses on health status. These estimation results consistently show the heterogeneous health effects between males and females; we can observe statistically significant negative effects on females' health status, while any statistically significant effects for males were unable to be found. One of the possible interpretations of these results is the unique policy in the Mao era (1949-1976).

Keywords: Health status, Death of spouse, Propensity-score matching
JEL classification: I12, J12

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1. Introduction

Heath maintenance of elderly persons becomes high priority policy objects, especially in the East Asian countries (China, Japan, and Korea) due to aging population. In such countries, the health care service for elderly persons is conventionally provided by family members, for instance their children and spouse. However, the number of children is dramatically decreased in recent years, and the roll of spouse then become more important to maintain health status. Therefore, in the East Asian countries, the death of spouse may have more serious impacts on survivor's health status than in other countries.

In this paper, we try to estimate the effect of spouse death on health status using a recent survey in urban China. This survey focuses on elderly persons in Qingdao city and includes the information of their health status and other basic characteristics. These information then allow us to estimate the health effect of spouse death with rich control variables.

Our analysis shows heterogeneous effects of spouse death between males and females. From the descriptive statistics, we first observe the gap of health status between females who lost spouse and those who do not, while there are no statistically significant differences for males. However, the descriptive statistic also

shows that other characteristics, such as age and the number of children, are also significantly different between individuals who lost spouse and those who do not. The average differences of health status may be then biased estimators, and more sophisticated methods are required to obtain more credible estimators.

To adjust for observable differences between individuals, we then use two types approach; the probit estimation with control variables and the propensity-score matching. The estimation results of both approaches also consistently show the heterogeneous effects of the spouse death between males and females: we can observe statistically significant negative effects on female health status in many specifications, while our analysis shows no statistical evidence about the health effects on males.

There are many papers which try to estimate the health effects of spouse death in U.S. and other developed countries (For recent surveys, see Manzoli et al. 2007, Randall et al. 2011, and Shor et al. 2012). However, in spite of an importance of the "roll of spouse" in East Asian countries, only few papers use data about these countries except for Japan[3].

One exception is Liang et al (2000) who estimated the relationship between

[3] For example, Ikeda et al. (2007) finds the positive effects of spouse death on only males' mortality rate, while Iwasaki et al. (2002), Nagata et al. (2003), and Okamoto et

socioeconomic status and old age mortality in Wuhan city, China. Their paper did not find any evidence about the health effect of spousal death, while our paper finds the negative effect among females using more recent survey in other Chinese city. Another exception is Fang et al (2012) who estimated the health effect of spouse death using a survey in Taiwan. They founded the evidence for existence of the negative health effects of spouse death in both sex. Moreover, their estimation also showed that the health effects for males is stronger than for females.

The paper is organized as follows. In Section 2, we explain the data more detail and show the descriptive statistics. In Section3, the methodology of this paper is explained. In Section 4, we show the estimation results. Finally, Section 5 concludes and discuss policy implications.

2. Data

We use the survey data as the "Qingdao elderly population information registration" collected by the Qingdao Committee on Ageing in 2013. The target population is old persons (more than 60 old) living in Shinan, Shibei, and Licang districts of Qingdao city. The original sample size is 250,855, in which the share of persons in Shinna,

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al. (2004) cannot find any evidence to suggest the existence of spouse death effects.

Shibei, and Licang districts are 24.7%, 61.9%, and 13.14%, respectively. Among them, we can access only 5,007 samples randomly selected from original samples (1,239 samples in Shinan district, 3,109 samples in Shibei district, and 659 samples in Licang district).

In this analysis, our attention is focused on males and females between the ages of 60 and 75[4] and who have marriage experience but not divorced. We can then use 1,537 samples for females and 1,360 samples for males. Among them, 239 females lost her husband, while 57 males lost their wife.

Outcome variables in this study are individual health status. To check the robustness of our analysis, we use two types of health index, Health index 1 and 2, to measure individual health status. Health index 1 equals to one only if she/he has one and more kind of illness, and Health index 2 equals to one only if she/he has serious illness.

[Table 1]

First, Table 1 reports the descriptive statistics of health status of sampling males and females. This table shows that the average health index of females who do not lost spouse is higher than females who lost spouse, while there are no significant

[4] In 2011, Chinese' life expectancy at birth are 71 for males and 77 for females (see World Health Statistics 2013).

differences for males.

[Table 2]

However, from only Table 1, we cannot argue any arguments about the health impacts of spouse death because other individual characteristics may be different. In Table 2, we show the descriptive statistics of age, income, education level, housing status (ownership status of their house), the number of children, skill level and it's type, health insurance status, political status (relation to political party), and living area. This table reports statistically significant differences about some characteristics. For example, average age in individuals who lost their spouses is higher than in samples who do not lose. The number of children is also different; individuals who lost spouses tend to have more children than individuals who do not lost.

These differences of basic characteristics imply that the difference of health status among individuals may reflect differences of their characteristics than the effect of spouse death. In the next section, we then use more sophisticated approach because these difference of characteristics may bring bias to our estimators.

3. Methodology

3.1. Probit estimation with control variables

To reduce the bias coming from the difference of characteristics, we use two types of approaches. The first approach is the standard probit estimation with control variables. We specify the population model as follows:

$$\Pr[H_{Ii} = 1|T_i, X_i] = \Phi(\beta_1 T_i + \beta X_i), \qquad I \in \{1,2\},$$

where H_{Ii} is the health index I of individual i, $\Phi(\cdot)$ is the normal distribution, and X_i is the vector of the constant term and basic characteristics listed in Table 2. Our main explanation variable is T_i, which is the dummy variable; equals to one if individual i's spouse died and zero if not. Our interest is then the estimated marginal effect of T_i.

3.2. Propensity-score matching

The second approach is the propensity-score matching originally offered by Rosenbaum and Rubin (1983). This approach assumes that conditional on observed characteristics, the death of spouse is randomly occurred. In the following discussion, we call individuals who lost spouse as "treatments" and individuals who do not lost as "controls".

In the propensity-score matching approach, each individual in treatments is matched with controls who have "similar" individual characteristics. We then

regard the average difference in health status between treatments and matched controls as the average effect of spouse death in treatments.

Formally, the propensity-score matching consists of two steps. In the first step, we estimate the propensity-score by the following population model;

$$\Pr[\mathrm{T_i} = 1|\mathrm{X_i} = X] = \Omega(\beta \mathrm{X}),$$

where Ω is the normal distribution, and $\Pr[\mathrm{T_i} = 1|\mathrm{X_i} = \mathrm{X}]$ is the probability of the death of spouse given characteristics as $\mathrm{X_i} = X$.

By the probit estimation, we can obtain estimators of β as $\bar{\beta}$. Using these estimators, the estimated propensity score, $\hat{p}(X_i)$, are obtained as

$$\hat{p}(X_i) = \Omega(\hat{\beta} X_i).$$

Note that Rosenbaum and Rubin (1983) shows that rather than match on each characteristics (called as exactly matching), it is sufficient to match on the propensity score.

In the second step, we then match treatments and controls. To check the robustness of our estimation, a couple of matching methods are used. The first method is the nearest-neighbour matching in which each treatments is matched with n nearest neighbors in control group (we check cases as n =1 and n=5). The second method is the radius matching, in which each treatments is matched with control group whose

propensity score lies within a given radius (we check cases as 0.1 and 0.001). Final method is a karnel estimator which use weighted average of all controls to match treatments.

Note that in the propensity score matching approach, it is not necessary to parametrically specify the relationship between health status and spouse death. This is one of advantages over the standard probit estimation approach.

4. Results

[Table 3 and 4]

Table 3 and 4 show the estimated marginal effects in the probit estimation with control variables for male and female samples, respectively. In both health index 1 and 2, Table 4 shows that negative effects of spouse's death for females can be observed; by the spouse death, the probability that $H_{i1} = 1$ is increased with 8.8 percent, while the probabilities that $H_{i2} = 1$ is increased with 3.3 percent. Meanwhile, from Table 3, the impacts on male's average health status cannot be found.

These tables also show robust correlation between health insurance and male's health status. Males with insurance tend to be better health status than males

without insurance. It is important to note that this correlation may be caused by the variation of previous jobs and living location. Chinese health insurance system crucially depend on their job and living location. Therefore, the variation of these factors may bring correlation between health status and health insurance.

Among females, the health status is positively correlated with their skill level; females having any skill tend to be better health status than females without skill. One of natural interpretation is that skill level has a positive impact through increasing life-time income.

[Table 5]

In Table 5, we show the estimation results of the propensity-score matching approach[5]. This table also shows that in many types of matching methods, the death of spouse brings negative impacts on health status 1 of surviving female. Meanwhile, similar to the probit estimation approach, we cannot find any statistically significant effects on the average health status of males.

The results shown in Table 3, 4, and 5 can be summarized that, especially for health index 1, statistically significant effects for females can be observed. However, we cannot find any statistically significant effects for males. In contrast, previous

[5] In Table A1, we report first stage results. For example, the living area has significant correlation with spouse death rate among males, while housing status has significant

studies for other East Asian country[6] find the opposite evidence: the health impact of spouse death is stronger for males than females.

One of possible interpretation of our results is the effect of previous policy by the Chinese government. In East Asian countries except for China, primary responsibility of housework (e.g., cooking and housecleaning) is for females due to cultural and traditional reasons. Consequently, old males have less skill for housework than females and may then encounter serious difficulties in their life after losing their spouse.

Meanwhile, the social situation in China is totally different; in the Mao Era (1949-1976), one of most famous political slogan was that "women are half the sky" which means that in the new era, women have to be self-esteem, self-reliance, self-confidence and self-improvement like men. As a result, since the Mao Era, two-income families are increased and became as one of the Chinese culture. In the two-income families, the difference in responsibility in marriage between husband and wife is generally not large, and old males then may have better housework skill in China than in other countries. Consequently, it may be relatively easy to maintain health status even if they lost spouse.

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correlation among females.

[6] See, for example, Ikeda et al. (2007) in Japan and Fang et al (2012) in Taiwan.

5. Conclusion and Policy Implications

This study estimates the health effect of spouse death by using the probit estimation and the propensity-score matching approaches. The estimation results consistently show the negative health effect of spouse death among females, while we cannot find evidence for existence of the health effect among males.

Finally, we discuss policy implications and limitations of our analysis. This study shows that spouse death has the health impacts for surviving females. The policy to improve individual health status (e.g., subsidies for health expenditure and the free health examination) has "spillover" effects on their partner, especially for wife. In Japan, many medical institution provide health check service for couples, and local governments have subsidies policies to encourage it. Our results show that these policies are important for modern China. Therefore, for Chinese society, Japanese government can provide useful suggestion as their experience related to these health policies for couples.

The important limitation of this study is omitted variables problem. In this study, while we control some basic characteristics, bias from unobservable characteristics cannot be perfectly removed, and the omitted variable problem may be then still

remained. In the related papers, authors tried to remove this bias using some approach. For example, Epinosa and Evans (2008) focused on spouse death caused by uncorrelated reasons with socioeconomic characteristics. However, due to the limitation of data, we cannot follow their approach. Solving the omitted bias problem is the subject of future study.

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	Female			Male		
	Death	**Alive**	**Difference**	**Death**	**Alive**	**Difference**
Health1	0.460	0.293	0.167***	0.404	0.294	0.11
Health2	0.117	0.059	0.0578**	0.088	0.070	0.0179
Observatinos	239	1298		57	1303	

Table 1: Descriptive Statistics (Health status)

	Female			Male		
	Death	Alive	Difference	Death	Alive	Difference
Age	68.803	65.801	3.002***	69.561	66.190	3.372***
Income	2052	2037	14.93	2360	2496	-135.5
Education level						
None	0.000	0.000	0	0.018	0.002	0.0152*
Primary school	0.310	0.206	0.103***	0.228	0.133	0.0953*
Junior school	0.393	0.480	-0.0867*	0.509	0.453	0.056
Medium occupation school	0.004	0.018	-0.0143	0.018	0.013	0.0045
High school	0.184	0.198	-0.0139	0.140	0.218	-0.0776
Occupation high school	0.000	0.009	-0.00924	0.000	0.014	-0.0138
College-Associate's degree(3 year)	0.021	0.049	-0.0276	0.070	0.099	-0.0288
College-Bachelor's degree(4 year)	0.021	0.016	0.00474	0.000	0.059	-0.0591
Master degree	0.000	0.000	0	0.000	0.001	-0.000767
Doctoral degree	0.000	0.001	-0.00077	0.000	0.000	0
Other	0.063	0.020	0.0427***	0.018	0.008	0.00987
Specialized school for technical workers	0.004	0.002	0.00187	0.000	0.001	-0.000767
House ownership						
None	0.000	0.004	-0.00385	0.035	0.008	0.0266*
Own house	0.808	0.894	-0.0869***	0.860	0.899	-0.0398
Rental house by markets	0.017	0.013	0.00364	0.018	0.010	0.00757
Rental house by government	0.013	0.002	0.0102*	0.000	0.005	-0.0046
Public housing	0.017	0.014	0.00287	0.018	0.013	0.0045
House owned by army or religious groups	0.038	0.029	0.00838	0.018	0.027	-0.00932
House owned by relatives	0.092	0.039	0.0528***	0.053	0.031	0.0219
Others	0.017	0.004	0.0129*	0.000	0.007	-0.00691
Number of children						
None	0.033	0.018	0.015	0.035	0.015	0.0197
One	0.234	0.402	-0.168***	0.228	0.478	-0.250***
Two	0.414	0.395	0.019	0.456	0.391	0.0647
Three	0.234	0.143	0.0910***	0.211	0.096	0.115**
Four	0.067	0.030	0.0369**	0.070	0.017	0.0533**
Five	0.013	0.005	0.00793	0.000	0.000	0
Six and more	0.004	0.002	0.00264	0.000	0.001	-0.000767
Dead	0.000	0.005	-0.00462	0.000	0.002	-0.00153
Skill level						
None	0.874	0.872	0.00237	0.789	0.768	0.0212
Primary	0.025	0.037	-0.0119	0.070	0.038	0.0326
Intermediate	0.054	0.060	-0.0057	0.105	0.124	-0.0183
Senior and Senior above	0.046	0.031	0.0152	0.035	0.071	-0.0355
Skill type						
None	0.874	0.880	-0.00534	0.825	0.805	0.0195
Medical Science	0.033	0.016	0.0173	0.018	0.008	0.0091
Construction(Environmental Protection)	0.000	0.012	-0.0123	0.070	0.048	0.0218
Education	0.033	0.029	0.00497	0.000	0.024	-0.0238
Financial and Economic	0.008	0.016	-0.00781	0.018	0.024	-0.00625
Scientific Research(Ocean)	0.004	0.005	-0.000438	0.000	0.010	-0.00998
Agriculture	0.004	0.001	0.00341	0.000	0.001	-0.000767
Other	0.042	0.042	0.000239	0.070	0.080	-0.00964
Health insurance status						
None	0.042	0.043	-0.0013	0.035	0.028	0.00746
Basic health insurance for urban worker	0.799	0.834	-0.0352	0.895	0.850	0.0444
Basic health insurance for urban liviner	0.075	0.067	0.00829	0.035	0.046	-0.011
New health insurance for rural liviner	0.004	0.007	-0.00275	0.000	0.006	-0.00614
Public health insurance	0.008	0.008	0.000664	0.000	0.005	-0.0046
Health insurance for public officer	0.004	0.005	-0.000438	0.000	0.018	-0.0184
Health insurance for non-profit officer	0.046	0.035	0.0106	0.018	0.042	-0.0247
Private health insurance	0.004	0.000	0.00418*	0.018	0.000	0.0175***
Other	0.017	0.001	0.0160***	0.000	0.005	-0.0046
Political status						
None	0.025	0.016	0.00893	0.053	0.012	0.0404*
Communist party	0.100	0.117	-0.0167	0.228	0.305	-0.0774
People	0.833	0.811	0.0214	0.719	0.632	0.0877
Other party	0.042	0.055	-0.0136	0.000	0.051	-0.0507
Living area						
Shinan	0.155	0.186	-0.0309	0.088	0.200	-0.113*
Shibei	0.678	0.668	0.00987	0.702	0.658	0.0433
Licang	0.167	0.146	0.021	0.211	0.141	0.0693
Observations	239	1298		57	1303	

Table 2: Descriptive Statistics (Other characteristics)

	Male					
	Health1			Health 2		
	Marginal effects	Standard deviation	p-value	Marginal effects	Standard deviation	p-value
Death	0.047	0.059	0.425	0.025	0.031	0.432
Age	0.012	0.003	0	0.001	0.002	0.461
Income	-0.0000216	0.0000131	0.099	-8.93E-06	6.87E-06	0.194
Education level						
Primary school	-0.265	0.198	0.181	-0.093	0.080	0.248
Junior school	-0.286	0.196	0.144	-0.115	0.079	0.144
Medium occupation school	-0.288	0.222	0.195		(omitted)	
High school	-0.300	0.196	0.126	-0.144	0.080	0.071
Occupation high school	-0.495	0.225	0.027		(omitted)	
College-Associate's degree(3 year)	-0.259	0.198	0.19	-0.094	0.080	0.237
College-Bachelor's degree(4 year)	-0.189	0.200	0.345	-0.034	0.081	0.674
Master degree		(omitted)			(omitted)	
Doctoral degree		(omitted)			(omitted)	
Other	-0.550	0.249	0.027		(omitted)	
Specialized school for technical workers		(omitted)			(omitted)	
Skill level						
Primary	0.015	0.071	0.828	-0.036	0.045	0.42
Intermediate	0.019	0.060	0.743	-0.009	0.041	0.827
Senior and Senior above	0.012	0.075	0.869	-0.036	0.050	0.463
Skill type						
Medical Science	0.193	0.116	0.097	0.116	0.063	0.067
Construction(Environmental Protection)	0.117	0.075	0.116	0.032	0.047	0.486
Education	0.052	0.097	0.592	0.079	0.053	0.14
Financial and Economic	0.250	0.090	0.005	0.082	0.055	0.138
Scientific Research(Ocean)	0.092	0.126	0.465	0.046	0.073	0.523
Agriculture		(omitted)			(omitted)	
Other	0.122	0.063	0.054	0.049	0.043	0.253
Health insurance status						
Basic health insurance for urban worker	0.257	0.087	0.003	0.552	0.058	0
Basic health insurance for urban liviner	0.336	0.101	0.001	0.553	0.066	0
New health insurance for rural liviner	0.047	0.191	0.805		(omitted)	
Public health insurance	-0.023	0.207	0.912	0.514	0.098	0
Health insurance for public officer	0.377	0.127	0.003	0.579	0.071	0
Health insurance for non-profit officer	0.275	0.106	0.01	0.579	0.065	0
Private health insurance		(omitted)			(omitted)	
Other	0.469	0.181	0.01		(omitted)	
Political status						
Communist party	0.138	0.117	0.24	0.053	0.047	0.257
People	0.073	0.117	0.531	0.013	0.046	0.783
Other party	0.123	0.125	0.328	-0.003	0.057	0.959
Housing status						
Own house	-0.137	0.137	0.32	-0.001	0.049	0.978
Rental house by markets	-0.275	0.192	0.153		(omitted)	
Rental house by government	-0.061	0.208	0.77	0.116	0.084	0.168
Public housing	-0.092	0.166	0.58		(omitted)	
House owned by army or religious groups	-0.119	0.152	0.434	0.010	0.061	0.868
House owned by relatives	-0.103	0.151	0.495	-0.021	0.061	0.734
Others	0.204	0.197	0.301	0.052	0.082	0.525
Number of children						
One	-0.038	0.101	0.706	0.027	0.066	0.684
Two	0.047	0.101	0.64	0.027	0.066	0.686
Three	0.076	0.106	0.471	0.062	0.068	0.36
Four	0.153	0.126	0.226	-0.008	0.087	0.926
Five		(omitted)			(omitted)	
Six and more		(omitted)			(omitted)	
Dead	0.144	0.244	0.556		(omitted)	
Living area						
Shibei	-0.028	0.033	0.4	-0.001	0.019	0.943
Licang	-0.043	0.043	0.317	-0.037	0.028	0.193

Table 3: Probit estimation (Male)

	Female					
	Health1			Health 2		
	Marginal effects	Standard deviation	p-value	Marginal effects	Standard deviation	p-value
Death	0.088	0.032	0.005	0.033	0.017	0.05
Age	0.017	0.003	0	0.004	0.002	0.029
Income	-0.0000244	0.000016	0.128	-7.34E-06	7.27E-06	0.313
Education level						
Primary school	0.074	0.268	0.781	0.015	0.042	0.724
Junior school	0.042	0.267	0.876	0.011	0.042	0.798
Medium occupation school	0.132	0.280	0.637	-0.029	0.068	0.67
High school	0.069	0.268	0.797	0.030	0.044	0.495
Occupation high school	-0.238	0.336	0.479		(omitted)	
College-Associate's degree(3 year)	-0.022	0.274	0.937	0.020	0.053	0.708
College-Bachelor's degree(4 year)	-0.227	0.290	0.433	-0.051	0.070	0.466
Master degree		(omitted)			(omitted)	
Doctoral degree		(omitted)			(omitted)	
Other	0.075	0.276	0.786		(omitted)	
Specialized school for technical workers		(omitted)			(omitted)	
Skill level						
Primary	0.242	0.076	0.001	0.061	0.035	0.08
Intermediate	0.126	0.075	0.094	0.071	0.039	0.068
Senior and Senior above	0.229	0.101	0.023	0.057	0.050	0.257
Skill type						
Medical Science	0.118	0.096	0.217	-0.090	0.054	0.094
Construction(Environmental Protection)	0.016	0.127	0.9	0.027	0.055	0.632
Education	-0.082	0.101	0.422	-0.021	0.048	0.656
Financial and Economic	0.183	0.105	0.08	-0.110	0.062	0.078
Scientific Research(Ocean)	0.266	0.195	0.172		(omitted)	
Agriculture		(omitted)			(omitted)	
Other	0.001	0.077	0.995	-0.037	0.040	0.349
Health insurance status						
Basic health insurance for urban worker	0.039	0.053	0.461	0.054	0.040	0.178
Basic health insurance for urban liviner	0.018	0.066	0.781	0.014	0.046	0.755
New health insurance for rural liviner	-0.220	0.190	0.247		(omitted)	
Public health insurance	0.095	0.140	0.498	0.106	0.068	0.121
Health insurance for public officer	-0.009	0.210	0.964		(omitted)	
Health insurance for non-profit officer	0.081	0.088	0.36	0.094	0.049	0.056
Private health insurance		(omitted)			(omitted)	
Other	0.040	0.177	0.82		(omitted)	
Political status						
Communist party	-0.084	0.091	0.356	-0.035	0.049	0.473
People	-0.069	0.085	0.415	-0.048	0.046	0.295
Other party	-0.010	0.095	0.915	-0.026	0.053	0.627
Housing status						
Own house	0.112	0.219	0.61	-0.114	0.083	0.169
Rental house by markets	-0.002	0.238	0.993		(omitted)	
Rental house by government	-0.103	0.284	0.715		(omitted)	
Public housing	0.137	0.237	0.563	-0.087	0.097	0.371
House owned by army or religious groups	0.249	0.228	0.276	-0.083	0.087	0.343
House owned by relatives	0.168	0.224	0.453	-0.177	0.092	0.055
Others	-0.016	0.258	0.949	-0.078	0.104	0.455
Number of children						
One	-0.048	0.082	0.56	-0.005	0.054	0.92
Two	-0.006	0.080	0.936	0.019	0.052	0.715
Three	0.040	0.083	0.627	0.037	0.052	0.471
Four	-0.017	0.098	0.865	0.057	0.057	0.32
Five	0.010	0.166	0.952	0.101	0.078	0.196
Six and more		(omitted)			(omitted)	
Dead	0.240	0.187	0.2		(omitted)	
Living area						
Shibei	-0.022	0.032	0.49	0.007	0.018	0.719
Licang	-0.004	0.042	0.918	-0.029	0.025	0.242

Table 4: Probit estimation (Female)

		NN_1		NN_5		Radius_0.1		Radius_0.001		Karnel	
		Health1	Health4	Health1	Health4	Health1	Health4	Health1	Health4	Health1	Health4
Male	**ATET**	0.161*	0.0536	0.0857	0.0321	0.0885	0.0145	0.0701	0.0191	0.0708	0.011
		-0.0886	-0.0521	-0.0837	-0.0435	-0.064	-0.0392	-0.0798	-0.0322	-0.0609	-0.0332
Female	**ATET**	0.113**	0.0378	0.104***	0.0378	0.106***	0.0503**	0.0926**	0.0443*	0.101***	0.0442
		-0.0573	-0.0378	-0.0393	-0.0269	-0.0385	-0.0243	-0.0417	-0.0257	-0.0369	-0.0271

Table 5: Propensity Score Mathcing

	Male			Female		
	Coefficients	Standard deviation	p-value	Coefficients	Standard deviation	p-value
Age	0.065	0.016	0	0.066	0.011	0
Income	0.0000576	0.0000842	0.494	0.0000436	0.000056	0.435
Education level						
Primary School	-0.585	0.519	0.26	-0.767	0.602	0.202
Junior School	-0.606	0.503	0.229	-0.973	0.600	0.105
Medium Occupation School	-0.551	0.688	0.424	-1.777	0.797	0.026
High School	-0.839	0.515	0.103	-0.934	0.603	0.122
Occupation High School	0.000	(omitted)			(omitted)	
College-Associate's Degree(3 year)	-0.616	0.535	0.249	-1.406	0.670	0.036
College-Bachelor's Degree(4 year)		(omitted)		-1.081	0.660	0.101
Master Degree		(omitted)			(omitted)	
Doctoral Degree		(omitted)			(omitted)	
Other	-0.386	0.683	0.572	-0.563	0.635	0.376
Specialized School for technical workers		(omitted)		-0.264	0.968	0.785
Skill level						
Primary	0.232	0.323	0.472	-0.264	0.278	0.341
Intermediate	-0.225	0.354	0.524	-0.180	0.305	0.555
Senior and Senior above	-0.170	0.384	0.658	0.178	0.357	0.619
Skill type						
Medical Science	0.942	0.683	0.168	0.392	0.360	0.276
Construction(Environmental Protection)	0.455	0.375	0.224		(omitted)	
Education		(omitted)		0.008	0.378	0.982
Financial and Economic	0.198	0.567	0.727	-0.235	0.412	0.567
Scientific Research(Ocean)		(omitted)		0.102	0.570	0.859
Agriculture		(omitted)		0.769	0.822	0.349
Other	0.046	0.312	0.884	0.207	0.263	0.43
Health insurance status						
Basic health insurance for urban worker	-0.105	0.375	0.779	0.110	0.197	0.577
Basic health insurance for urban liviner	-0.343	0.472	0.466	0.058	0.239	0.808
New health insurance for rural liviner		(omitted)		-0.410	0.651	0.529
Public health insurance		(omitted)		-0.066	0.508	0.897
Health insurance for public officer		(omitted)		0.127	0.613	0.837
Health insurance for non-profit officer	-0.464	0.586	0.429	0.388	0.297	0.192
Private health insurance		(omitted)			(omitted)	
Other		(omitted)		2.178	0.612	0
Political status						
Communist party	-0.690	0.506	0.173	-0.330	0.315	0.295
People	-0.606	0.490	0.216	-0.216	0.293	0.46
Other party		(omitted)		-0.278	0.331	0.401
Housing status						
Own house	0.534	0.374	0.153	1.039	0.560	0.064
Rental house by markets	0.965	0.708	0.173	1.316	0.623	0.035
Rental house by government		(omitted)		2.408	0.731	0.001
Public housing	0.988	0.633	0.118	1.315	0.645	0.041
House owned by army or religious groups	0.770	0.596	0.196	1.185	0.591	0.045
House owned by relatives	0.666	0.482	0.167	1.631	0.582	0.005
Others		(omitted)		1.974	0.669	0.003
Number of children						
One	0.045	0.550	0.935	-0.417	0.258	0.106
Two	0.134	0.557	0.81	-0.367	0.250	0.142
Three	0.343	0.578	0.553	-0.401	0.261	0.125
Four	0.583	0.637	0.36	-0.302	0.301	0.317
Five		(omitted)		-0.215	0.457	0.637
Six and more		(omitted)		0.005	0.728	0.994
Dead		(omitted)			(omitted)	
Living area						
Shibei	0.357	0.200	0.075	0.061	0.118	0.604
Licang	0.550	0.256	0.032	0.120	0.147	0.416
Constant	-5.879	1.100	0	-5.258	0.928	0

Table A1: Probit estimation