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Sociodemographic differentials of the self-rated health of the oldest-old Chinese

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Abstract. This study explores the correlation between sociodemographic factors and the self-rated health status of the oldest-old Chinese (80 and older). The data were from the Healthy Longevity Survey in China conducted in 1998. We applied a stereotype ordered regression model to capture the ordinal nature of the response variable. We found that age group, sex, living arrangement, educational attainment, and occupational history were associated significantly with the self-rated health status of the oldest-old Chinese, and the elderly with lower social status tended to negatively evaluate health status. We reached the conclusions after controlling such variables as the capacity of physical performance of daily activities and chronic diseases.

Keywords: China, Self-rated health, Sociodemographic differentials, Stereotype regression model, The oldest-old

Introduction

Self-rated health is a concept easily measured in the social sciences. In surveys on self-rated health, the interviewees are asked to estimate their health status as poor, fair, good, or excellent (George 2001). There are other names for self-rated health, for example, self-assessed health, self-reported health, self-assessment of health, perceived health, self-ratings of health, and global health status. However, they imply the same measurement of health status. Based on the observations from 158 "in-depth" interviews in the United States, Krause and Jay (1994) found that not all respondents used the same frame of reference to self-assess their health status. Seventy percent of the subjects identified some physical health factor as the basis for self-rated health. Idler et al. (1999) conducted an investigation on the meaning of self-ratings of health. Applying both qualitative and quantitative methods, they found that narrowly biomedical measurements might induce negative responses of self-assessed health, but "social activities and relationships, psychological, emotional, or spiritual characteristics are related to an optimistic

estimation of health status". In Sweden, Thorslund and Lundberg (1994) argued that self-rated health status may not be an appropriate outcome for examining the socio-economic status gradient in health because classes may use different bases in assessing their health.

Although various studies indicate that it is impossible to obtain a totally valid and reliable assessment of health, self-rated health status seems to be an indispensable part of many social surveys, especially for studies of the elderly population. Researchers argue that health self-assessments may reflect not only personal health status, but also may summarize both objective and subjective aspects of health (Maddox & Douglass 1973). Self-rated health has been proven to be a fine predicator of mortality and the declining physical function of the elderly (Benyamini et al. 1999; Idler & Benyamini 1997; Idler, Kasl, & Lemke 1990; Wolinsky & Johnson 1992). Many other researchers have found a close correlation between self-rated health and social factors (Auslander & Litwin 1991; Ferraro 1980; Fillenbaum 1979; Hansell & Nechainc 1991; Idler 1993; Johnson & Wolinsky 1993; Leinsalu 2002). It has been confirmed that the self-rated health status is interwoven with many social, economic and psychological factors. The same degree of self-rated health status may imply completely different social elements behind it.

The oldest-old in Chinese context

China is still a developing country, although its economy has been growing rapidly for more than two decades. The living standard in China is improving quite a lot, but large disparities exist between the urban and the rural parts of the country and between the lower and the higher social strata. Social security benefits, medical care, and health services are inadequate in most parts of the country, especially in the countryside and the remote areas. The life expectancy of the population is still lower than that of the developed countries, although it is among the top in developing countries. China has the largest older population in the world, due to the huge size of its total population. China has been carrying out the most restrictive family planning policy in the world. As a result, China's population is aging rapidly. The figures from the latest population census in year 2000 in China showed that the elderly age 65 and above account for 6.96% of the total population, this is 1.39 percentage points higher than that of 1990. At the same time, population size of the oldest-old (age 80 and above) is increasing even more quickly than the total population, and than those age 60 and above (Zeng & George 2000; Zeng et al. 2002).

Although it has a relatively low level of social and economic development, China is a country rich in traditional thoughts of medical and health cares.

To be healthy, some people try various means of physical training, mental excises (e.g., Taichi, Qigong), and healthful diets based on the theories of Chinese medicine. Traditional theories of Chinese medicine emphasize the balance of negative (Yin) and positive (Yang) inside the human body and seeks to cure disease through natural ways of balance. It is unrealistic that all of the elderly are familiar with traditional theories of health maintenance; however, peoples' health behaviors are more or less influenced positively by traditional ideas of health improvement, especially after they become elderly. In China, the younger generations pay high respect to the older generations. Traditionally, the elderly were dominant in the family. This social norm has been changing, but highly respecting the elderly, especially the oldest-old, is the mainstream of social norms.

The self-rated health status is a specific cultural context (Hansell & Mechanic 1991). We found no studies that explore the relationship between sociodemographic factors and the self-rated health of the oldest-old in the Chinese context. We know little about how Chinese elderly with various demographic and socio-economic profiles evaluate their overall health. Our study examines this issue. The question is, do sociodemographic profiles of the oldest-old Chinese associate with the self-rating of health status, and in what way do they influence the self-assessment of the oldest-old. The sociodemographic profiles refer to not only the actual status, but also to the early experiences of the oldest-old.

Data, method and variables

Data

A survey of the oldest-old Chinese in the People's Republic of China was conducted in 1998 as a baseline survey of a panel project on health and longevity. This is a multi-stage, stratified cluster survey with a roughly fixed number of respondents in each age group (80–89, 90–99, 100 and over). The survey was conducted in 631 randomly selected counties and cities of the 22 provinces where Han Chinese are the overwhelming majority. Provinces where Han Chinese are the majority were deliberately selected because the Han Chinese are able to report ages to a very high degree of accuracy.

The questionnaire covers many aspects of the oldest-old Chinese. From the survey, we collected data on family structure, living arrangements and proximity to children, activities of daily living, the capacity of physical performance, self-rated health, cognitive function, chronic disease, medical care, social activities, diet, smoking and drinking behavior, psychological characteristics, caregivers, and family support for the elderly. The survey provides,

for the first time, complete information about Chinese oldest-old. The survey aims to represent the profiles of the oldest-old Chinese for the country as a whole. The survey was mainly organized by the Center for Healthy Aging and Family Studies at Peking University, China Research Center on Aging, and was supported by NIA/NIH grant awarded to Duke University. The related government agencies in China also provided financial and personnel support. Max-Planck Institute for Demographic Research in Germany provided training for Chinese researchers. The interviewers were recruited among local government staffs and students of universities and colleges. The local organizers of the survey were invited to Beijing for technical training. National and international experts provided training lectures. Several survey teams were sent to each region according to the sample size. The survey teams consisted of trained interviewers, doctors, and staff from local government agencies. Researchers from Peking University and China Research Center on Aging visited the survey regions to provide instructions to the survey teams. Pilot surveys were required to find potential problems and corresponding solutions. The survey was proved to be well organized, and survey data obtained were consistent and of good quality (Zeng et al. 2001).

One of the questions that study participants were asked had the same context of self-rated health status as referred to by other researchers. Instead of asking the subjects, "Would you say your health is very good, good, fair or poor?", six levels of coding were given in our survey: very good, good, fair, poor, very poor, and cannot answer. The number of elderly who evaluated their health as "very poor" was rather small. Therefore, we consolidated this category into the category "poor". We re-coded "cannot answer" as a missing value. Later in the paper, we give the rationale as to why this was done. By doing so, our coding of self-rated health is consistent with what other scholars used previously. Figures suggest that the oldest-old Chinese (80 and older) received less education, depended largely on spouses or children, held relatively low-status occupations, were employed mostly in the agricultural sector, and females were mostly housewives (Zeng et al. 2002; Research Group of Healthy Longevity in China [RGHLC] 2001). The sociodemographic status of the oldest-old Chinese is not substantially diversified. If we classified one variable into many categories, we would produce many zero cells in the modeling process, and we would receive biased outcomes. To avoid this, we merged the categories of socio-economic status variables into more broad ones. Table 1 gives a simple description of all sociodemographic variables and the indicators reflecting physical health conditions.

Table 1a. Frequency Distribution of the Variables (I): Social and demographic factors

Variable		Self-rated health status				
		Poor	Fair	Good	Very good	Total
		1	2	3	4	7059*
Sex	Male	234	943	1381	482	3040
	Female	413	1412	1745	449	4019
Age group	Octogenarians	255	937	1292	492	2976
	Nonagenarians	225	806	1087	262	2380
	Centenarians	167	612	747	177	1703
Ethnicity	Han Chinese	600	2175	2892	894	6561
	Minority	47	180	234	37	498
Residence	Urban	241	876	1181	418	2716
	Rural	406	1479	1945	513	4343
Living arrangement						
	With family members	550	1977	2686	810	6023
	Alone	63	268	304	81	716
	Nursing home	34	110	136	40	320
Education	No education	467	1613	1985	531	4596
	1–6 years	122	534	873	278	1807
	7+ years	58	208	268	122	656
Occupation	Non agricultural	166	712	1026	368	2272
	Agricultural	429	1642	2033	522	4626
	Housework and others	168	512	683	199	1562

Method

Despite a number of approaches available for analysis of ordinal outcome variable (Ananth & David 1997), we applied the stereotype ordered regression model proposed by Anderson (1984). We tried the cumulative logistic model, which is commonly used to capture the ordered nature of the outcome variable. However, the crucial precondition for cumulative logistic model, known as proportional odds assumption (McCullagh 1980), was rejected (the result of score test for the assumption is not shown here). Some other alternatives to proportional odds models (e.g., polytomous logistic model) fail to utilize the ordering information of the dependent variable (Engel 1988). Instead, the stereotype ordered regression model not only allows a covariate effect differentiating from different levels of the outcome, and then relaxes

Table 1b. Frequency distribution of the variables (II): Health conditions

Variable		Self-rated health status				
		Poor	Fair	Good	Very good	Total
		1	2	3	4	7059*
Need assistance when performance these daily activities?						
Bathing	No	306	1538	2394	762	5000
	Yes	341	817	732	169	2059
Dressing	No	410	1921	2826	883	6040
	Yes	237	434	3 00	48	1019
Using toilet	No	395	1863	2770	883	5911
	Yes	252	492	356	48	1148
Walking around inside of room						
	No	420	1958	2835	895	6108
	Yes	227	397	291	36	951
Sense of using toilet	No	525	2145	2945	909	6524
	Yes	122	210	181	22	535
Feeding	No	475	2060	2934	906	6375
	Yes	172	295	192	25	684
Chronic diseases reported						
Hypertension	Yes	97	359	3 87	109	952
	No	550	1996	2739	822	6107
Heart disease	Yes	91	217	170	46	524
	No	556	2138	2956	885	6535
Bronchitis, emphysema, pneumonia or asthma						
	Yes	140	360	305	81	886
	No	507	1995	2821	850	6173
Cancer	Yes	13	12	8	3	36
	No	634	2343	3118	928	7023
Gastric or duodenal ulcer						
	Yes	33	97	7	25	232
	No	614	2258	3049	906	6827
Other chronic disease						
	Yes	193	456	371	77	1097
	No	454	1899	2755	854	5962

Note for Tables 1a and 1b: The sample size of the survey is 9093. The number of the valid cases is 7059 for the final model. The total number of variables contained missing value is 2034. The modeling only applies to those cases that there are no missing values for EVERY variable.

the proportional odds assumption, but also keeps the ordinal nature of the dependent variable. The stereotype ordered regression model is written as

$$\Pr(Y = y_s \mid \mathbf{x} = \frac{\exp(\alpha_s + \phi_s \beta' \mathbf{x})}{\sum_{l=1}^{k} \exp(\alpha_l + \phi_l \beta' \mathbf{x})}, \quad s = 1, \ldots, k, \tag{1}$$

where, $\mathbf{x}$ is the vector of covariates with coefficients β to be estimated; κ is the number of cut-points for the dependent variable; α_s, α_l stand for intercepts in the regression models. By specifying monotone decreasing ϕ's, $\alpha_1 > \phi_2 > \cdots \phi_k$, an ordered regression relationship is achieved. In order to make the model identifiable, Anderson (1984) recommended $\phi_1 = 1$ and $\phi_k = 0$, but other constraints are possible. Note that in our modeling, we set $0 = \phi_1 < \phi_2 < \cdots < \phi_k = 1$ corresponding to the levels from poor to very good self-rated health, and other levels of self-rated health are relative to "poor". As Anderson pointed out, the monotone increasing ϕ's are dealt with by changing the sign of β. Under such setting, as an example, a positive estimation of coefficient means that the elderly with a characteristic is more likely to report *better* health status than those without this characteristic, and say, the characteristic would positively associate the health status of the elderly represented by self-rated health. We used the SOREG command in STATA, a program written by Lunt (2001), to realize our modeling.

We first ran a group of models with a univariate feature to see if any single independent variable was associated with the dependent variable. We then ran two multivariate models. In the first multivariate model, we included only those sociodemographic variables. In the second multivariate model we added the indicators reflecting capacity of physical performance and chronic diseases. We included these indicators to get the 'net effect' of sociodemographic factors on the self-rated health status. We added all indicators reflecting capacity of physical performance and chronic diseases in the second multivariate model.

Variables

Dependent variable

The dependent variable was self-rated health status. We set the subcategories of the variable in the sequence as poor, fair, good, and very good. As mentioned earlier, the questionnaire contained six sub-categories of self-rated health: very good, good, fair, poor, very poor, and cannot answer. A problem arises from the last category. Six hundred thirteen subjects could not give an answer, which accounts for around 6.7 percent of the total. How should we deal with these cases? Since we were studying *self*-rated health, the self-rated health status should be given *subjectively*. Therefore, we preferred to treat

Table 2. Reasons not being able to self-evaluate health status

Reasons why did not answer	Frequency
1. Visually impaired, but can hear	3
2. Hearing impaired but can see	179
3. Visually and hearing impaired	194
4. Paralyzed	34
5. Did not whish to participate	18
6. Could not understand because cognitive impaired	90
7. Not able to participate at the movement due to illness	50
8. Other reasons	34
9. Missing	8
Total	613

Data sources: tabulation by the authors.

the "cannot answer" cases as missing values. We found that the main reason why the study participants could not give an answer to self-rated health was due to hearing difficulties (reasons 2 and 3 in Table 2). One may argue that having hearing difficulty per se means poor health. However, we would like to emphasize that the self-rated health status does not have to be consistent with the physical health status, because it is interwoven with psychological factors. Physical health can be checked by medical instruments or through visual judgement, but self-rated health is hard to test through physical devices.

Social and demographic variables

Demographic variables included age, sex and ethnicity. The age of the elderly was divided into three groups: 80–89, 90–99, 100 and older. We only distinguish the ethnicity of the elderly as Han Chinese and minority Chinese. The Han Chinese account for 92.6% of the study subjects (see RGHLC 2001). Our five other sociodemographic variables were residential place (urban/rural), living arrangement, educational attainment, main occupation before 60 years old, and current marital status. We set three subcategories for living arrangement of the oldest-old: living with family members (or in a household with no kinship to the elderly), living alone, and living in a nursing home or institutionalized. Considering the fact that most of the oldest-old Chinese received a relatively low level of education, we set the educational level as no education at all, 1–6 years of education, and 7 years of education or higher. The main occupation before 60 years old was categorized into three groups: non-agricultural professional, agricultural work, and housework. Marital status was classified as married and living with the spouse, separated or divorced,

widowed, and never married. However, marital status was ignored in our models, because it did not contribute at all to the goodness of model-fit, and was not associated with the self-rated health of the oldest-old.

Indicators of physical conditions as control variables

Most of the previous studies controlled appropriately the effects of physical health and/or disability (George 2001), and we considered these factors, too. We assumed that oldest-old Chinese with physical limitations had a negative self-perception of their overall health. A series of indicators used to represent the coping capability of daily life were bathing, dressing, using the toilet, continence (sense of needing to use the toilet), and eating. The interviewees were asked if they could independently perform these daily activities. The survey data contained self-reported chronic diseases: hypertension; heart disease; stroke, bronchitis, emphysema, pneumonia, asthma; glaucoma, gastric or duodenal ulcer; and other chronic diseases that were hard to classify. We used the terminology "reported chronic diseases" because the chronic diseases reported were not diagnosed through medical means, and there were no reliable medical records to verify the condition. Some of the reported chronic diseases were not associated with self-rated health. In the final model, we ignored those that do not contribute to improving the model fit.

Results

The univariate analysis showed that sex, age group, ethnicity, residential place, educational attainment, and occupation were significantly associated with the self-rated health of the oldest-old (Table 3). Males reported better health than did females. Octogenarians reported better health status than did centenarians, but there was no significant difference between nonagenarians and centenarians. The Hans, as the majority of the Chinese population, reported better health status than did the minority Chinese. People in urban areas reported better health status than those in rural areas. The higher the educational attainment, the better health status the elderly reported. Non-agricultural professionals reported significantly better health status than those who were outside of employment, and than those who were agricultural laborers. According to our univariate analysis, living arrangement of the oldest-old was not associated with their self-rated health status.

We used two multivariate models. The outcome from the first multivariate (see column one in Table 4), without controlling the health conditions, showed that sex, age group, and ethnic group were associated significantly with self-rated health. Living arrangement of the oldest-old picks its statistical significance back in the multivariate model. The elderly who were living with

Table 3. Sociodemographic differentials of the self-rated health of the oldest-old Chinese univariate models

	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
ϕ_1	0.	0.	0.	0.	0.	0.	0.
ϕ_2	0.30**	0.06	−0.07	−0.05	−0.34	0.24*	0.24
ϕ_3	0.52***	0.19	−0.09	0.14	0.41	0.53***	0.47***
ϕ_4	1	1	1	1	1	1	1
Sex (female = 0)	0.70***						
Age (centenarians = 0)							
Nonagenarians		0.13					
Octogenarians		0.65***					
Ethnic (Minority = 0)			0.64**				
Residence (rural = 0)				0.32**			
Living Arrangement (nursing home = 0)							
Coresident with families					0.06		
Alone					−0.12		
Educational attainment (no education = 0)							
1–6						0.64***	
7+						0.76***	
Occupation (agricultural = 0)							
Professional							0.61***
Housework							0.10
Chi 2	66.44*** 4	65.01***	22.98***	23.08***	14.59**	67.03***	42.8***
df	3	4	3	3	4	4	4

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

their family members estimated positive health status. Residential place and educational attainment did not show a significant association with self-rated health status. An interesting change came from the variable of occupational history. Differently from the result from univariate analysis, it is not non-agricultural professionals but the elderly outside of the employment who reported significantly better health status.

Our final conclusions in this study were based on the outcomes of the second multivariate model, a model in which the variables reflecting capacity of physical performance and the chronic diseases were controlled. Including such health-related variables improves greatly the model fit. The values of ϕ's, ϕ_1, $\phi_2, \ldots \phi_k$, become highly distinct with 99% level of statistical significance. It was still true that males reported better health status. The relationship between age group and self-rated health were *reversed*: the centenarians were more health optimistic, instead of the octogenarians as shown in the univariate model and in the first multivariate model without controlling the physical health status. Ethnicity lost its significant association with the self-rated health status, but place of residence did not yet become significant. Living arrangement played a similar role in the second multivariable model as it did in the first one.

The educational attainment regained significance in the second multivariate model, but the positive gradient between educational level and self-rated health disappeared. Those who received 1–6 years of education, corresponding to primary school in China, were the most health optimistic group, instead of those with 7 or more years of education as shown in the univariate model and in the first multivariate model.

The association between occupation and self-rated health became stronger in the second multivariate model than in the first multivariate model. Non-agricultural professionals and those who were undertaking housework reported significantly better health status than did agricultural workers. Non-agricultural professionals were the most optimistic group. In the first multivariate model, only those who stayed outside of employment estimated significantly different health status than did agricultural laborers.

Indicators of capacity of physical performance significantly influenced the reporting of health status. As expected, the oldest-old who could independently bathe, dress, use the toilet, and walk around inside the room; who have a sense of needing toilet; and who could eat independently reported a better health status than those who could not independently perform these daily activities. The elderly who reported that they had hypertension; heart disease; bronchitis, emphysema or asthma; cancer; gastric or duodenal ulcer; or any other chronic diseases were more permissive to their overall health than those who did not reported that they suffered from these chronic diseases.

Table 4. Sociodemographic differentials of the self-rated health of the oldest-old Chinese Two multivariate models

	First multivariate model, *without* control of health conditions	Second multivariate model, with control of health conditions
	Coef.	Coef.
ϕ_1	0	0
ϕ_2	0.08	0.35***
ϕ_3	0.28***	0.69***
ϕ_4	1	1
Sex (female = 0)	0.42***	0.29**
Age (centenarians = 0)		
Nonagenarians	0.01	−0.42**
Octogenarians	0.47***	−0.37**
Ethnic (minority = 0)	0.54**	0.35
Residence (rural = 0)	0.16	0.23
Living Arrangement (nursing home = 0)		
Co-residence with families	0.43*	0.53′′*
lone	−0.01	−0.08
Educational attainment (no education = 0)		
1–6 years	0.18	0.37**
7+ years	0.26	0.25
Occupation (agricultural = 0)		
Professionals	0.13	0.37*
Housework	0.28*	0.25**
Capacity of physical performance		
Bathing (with assistance = 0)		0.52**
Dressing (with assistance = 0)		0.70***
Using toilet (with assistance = 0)		0.62**
Walking around inside of room (with assistance = 0)		0.54*
Sense of using toilet (not self-controlled = 0)		0.72***
Feeding (with assistance = 0)		0.71**
Chronic diseases (self-reported)		
Hypertension (no = 0)		−0.40**
Heart disease (no = 0)		−1.22***
Bronchitis, emphysema, pneumonia or asthma (no = 0)		−1.13***
Cancer (no = 0)		−1.94**
Gastric or duodenal ulcer (no = 0)		−0.72***
Others chronic diseases (hard to classify) (no = 0)		−1.24***
χ^2	160.85***	886.41***
Df	13	886.41^{888}

$^{p} < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Discussion

This study underlines the assertion that the relationships between sociodemographic elements and self-rated health are inconsistent from one study to another. According to our study, males tended to be more health-optimistic. This finding is not consistent with Ferraro's (1980) study, which claimed that elderly females were more health-optimistic, but consistent with Fullenbaum's (1979) study, which found that elderly men had a better self-assessment of health status than did elderly women.

Fries et al. (2000) found that all measures of physical and cognitive dysfunction increased rapidly with each year of age among the very oldest-old; therefore, it should be that the older the elderly, the lower the level of self-rated health status. Our study shows, however, that the centenarians were more likely to report positively their health status; nonagenarians and octogenarians were less likely to report better health status. Our result is consistent with Idler (1993), who suggested that older survey subjects reported disproportionately positive health assessments, and "processes of aging, selective survivorship, and cohort differences all appear to play a role in creating this pattern". We believe that Chinese centenarians also are among the highly selected population groups. This finding reflected the strong role of Chinese cultural values. In Chinese societies, the oldest-old receive very high respect in many ways within family and community. If the older people become 100 years old, so-called *Shou Xing* (meaning stars of longevity), not only the family and community, but also local government gives them particular support or care. This may lead to an optimistic self-rating of health status. Our study showed that ethnicity was not related to self-rated health of the oldest-old Chinese. This deviates from studies in the United States, which found that African Americans reported lower levels of self-rated health than whites (George 2001; Gibson 1991).

In China, urban residence is prerequisite for an individual to access various public resources such as better health-care service and public pension benefits. We assumed that residential place as a variable could be an important proxy indicator of social and economic status. Accordingly, residential place could be a strong predicator of self-rated health. However, after considering two more indicators of SES (i.e., main occupation before age 60 and educational attainment), residential place (urban/rural) was not associated with self-rated health, despite sharp disparities between rural and urban areas. This implies that the impact of occupational history and educational level outweigh the influence of residential place. Indeed, farmers live in rural areas, and non-agricultural professionals usually live in urban areas. People residing in the countryside have a lower level of education than those living in towns and cities. An early study of non-Chinese context by Kivett

(1985) did not find significant association between urban/rural residence and self-rated health of the elderly. However, the reasons attributed to the non-significance could be different. In industrialized countries, no social and economic differentials were found between urban areas and rural areas.

We found that living arrangements of the oldest-old Chinese were associated with their self-rated health. In fact, living with family members raised the level of self-rated health. The elderly in China traditionally love to live with family members, especially when they need daily help. The provision of social health services is inadequate in China, even in urban areas. The elder people do not like to leave home unless they have to do so. There are no similar studies using the same variable of living arrangement as we used, hence, we cannot compare its effects with outcomes from previous studies in other contexts.

We found a non-linear pattern of association between educational level and self-assessment of the health status of the oldest-old. The elderly who received 1 to 6 years of education reported better health status than those never went to school. The elderly who received 7 or more years of education reported better health status than those who were uneducated, but the difference was not statistically significant. The reason why the highest educated group did not significantly report better health status probably stems from the fact that they have higher expectations of their health status, whereas non-educated people have the worse physical health. Our study partly supports the assertion that education is associated positively with self-rated health (Hirdes & Forbes 1993).

Non-agricultural professionals reported a better health status than did agricultural workers. Those who stayed outside the labor market also reported better health status than did agricultural laborers. The latter group reported the lowest health status of the three occupational groups. In China before 1949, most of women were housewives, especially in the countryside; therefore, the "housework" occupational category to a large extent represents the employment status of females. This may weaken our estimate for the male/female differential in health reporting. The occupational classification in China is not comparable with that of other countries, and it does not make sense to compare our result with other contexts.

The stereotype model is constructed based on the polytomous logistic model (Ananth 1997). The latter model only processes observations where all variables have valid values. This precondition of the model is highly rigid. The usual method of reducing the size of missing values is to replace them with the most possible value, or mean value. In our case, however, it was not feasible to replace the missing values with the mean values. Therefore, we preferred to retain only those cases where every variable had valid values. For

the dependent variable, we treated 613 cases of “cannot answer" as missing values, which might produce a large number of missing values. Consequently, we left these cases out of our finding. There was no missing value for age of the elderly in our data. In the survey, the oldest-old were over sampled to maintain the ample observations of the oldest-old.

Conclusion

Our finding that males were more health optimistic was quite stable from one modeling to another. Centenarians reported better health status than did octogenarians. Ethnic identification and residential place were not associated with self-rated health when considered with other sociodemographic covariates. The oldest-old Chinese who were living with family members reported better heath status than those living alone, and than those institutionalized. The elderly who received 1 to 6 years of education reported better health status than those with no education. As for occupational history, the elderly who worked mainly as professionals in non-agricultural sectors were the most health optimistic people. The elderly who were mainly responsible for housework reported better health status than did agricultural workers. Those in the latter group reported the lowest status of health.

The oldest-old Chinese were born at least 80 years before 1998, when the survey was conducted. They lived most of their lives when China was an undeveloped country, socially and economically. They suffered from starvation, war, and prevalence of diseases. They lived in a traditional society where women had a lower social status. Our study suggests that, in general, the lower the social status, the more pessimistic the self-rated health status, if physical health status is being controlled.

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