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The Adequacy of Health Care Services for the Elderly in China

Lexi Funk
Colby College

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The Adequacy of Health Care Services for the Elderly in China

Lexi Funk

December 8th, 2005

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This study examines the adequacy of health care services for the elderly in China, specifically focusing on the influence of location, method of payment, living situation, and financial status. The study finds that rural residents, respondents living alone and respondents unable to meet all of their daily costs have a lower probability of reporting the availability of adequate health care. It also investigates the reasons why elderly respondents do not visit the hospital when it is necessary, concluding that financial and distance constraints are main deterrents. Finally, changes in the reported adequacy of health care over time are taken into consideration, and are found to follow a likely pattern given the history of the health care system in China. This is an important investigation given the historical background of health care in China, the current cost problems facing residents, and, consequently, the policy changes that will need to be implemented by the Chinese government in the near future.

1. History of Health Care in China

After the formation of the People's Republic of China in 1949, the Chinese government established a public health system despite a limited budget. Their goal was to equalize the adequacy of health care among all areas of China, especially between rural and urban areas. The system they instituted greatly improved the health status of citizens between 1952 and 1982, lifting the average life expectancy at birth from 35 years to 68 years (Hsiao 1995). For the majority of this period, over 90% of the rural population was covered under the "Cooperative Medical System" (CMS) (Yip, Wang & Liu 1998). Funding for the CMS typically came from a collective welfare fund comprised of contributions from farmers', usually between 0.5 to 2% of their income (Carrin, et al. 1999).

In the early 1980's, widespread economic reforms shifted rural production from the communal to the household level. With this shift the collective financing of rural health care was discontinued by the government, and though a few villages attempted to support the system on the community level, most of the CMSs fell apart by 1984, leaving only 4.8% of the rural population with insurance coverage (Carrin, et al. 1999). Rural residents were expected to pay full medical expenses out-of-pocket on a fee-for-service basis to cover hospital and other medical costs.

Health care coverage for urban residents was better, with about 50% of the urban population covered by one of two types of health insurance programs in 1993 (Yip & Hsiao 1997). The two programs offered in urban areas are the Government Insurance Scheme (GIS) and the Labor Insurance Scheme (LIS). The former is funded by government budgets and covers government employees, retirees, disabled veterans, and university teachers and students; and the latter covers employees and retirees of state enterprises with more than 100 employees, and their dependents. The LIS is funded by a percent, typically 11-14%, of the total wage bill of each employee, which is put aside as a welfare fund by the enterprise to cover health expenditures of all employees. Recent problems, however, have arisen in both systems, as spending has increased in the GIS and LIS by 9.8% and 13%, respectively, in real terms between 1986 and 1993. This increase in health care costs has resulted in financial burdens for enterprises and the limited availability of funds for other services. In some instances, enterprises were unable to reimburse employees' bills, leaving them effectively uninsured. It was estimated in surveys in 1992 and 1993 that one-third of state enterprise employees were not receiving insurance-paid care (Yip & Hsiao 1997).

The supply of health care was, and continues to be, set up as a three-tier health care delivery system comprised of village health posts, township health centers, and county hospitals (Yip, Wang & Liu 1998). The village health posts offer preventive and primary care, which is provided by village workers with at least 6 months of training. They are the principle health care resource for rural residents. Township health centers are typically staffed by a physician trained for 3-5 years at medical school and assistant physicians with two years of medical training past junior middle school. Township health centers provide both primary care and some curative care. County or state enterprise hospitals are outfitted with the best equipment, and curative care is provided by doctors with a minimum of 5 years of training (Yip, Wang & Liu 1998).

When public funding for health coverage was abolished in the 1980's, the government also liberalized the private ownership of health facilities and private clinics, allowing these institutions to charge fees much greater those at the public hospitals (Hsiao 1995). Finally, the government further altered the financing of hospitals and health centers. The facilities were provided with only enough money to cover personnel wages and were largely given financial independence. However, the price of services remained restricted at levels that were less than their costs, with the exception of drugs and new procedures. These uneven restrictions resulted in the prescription of excess drugs by physicians in order for hospitals to generate higher profits (Hsiao 1995).

The combination of changes in both health care coverage and the health care system itself, as well as strong economic growth in China, has caused a change in the utilization of health care facilities over the past decade. Between 1983 and 1993, annual visits to county hospitals increased by 26.4%, while visits to township clinic decreased by

27.1%. Individuals exchange price and quality, choosing the provider that gives them the highest utility (Yip, Wang & Liu 1998). For example, with almost full coverage, the probability of GIS/LIS members visiting a county hospital increased from 15.5% to 22%, while the probability of visiting a village health post decreased from 46% to 34%: reflecting that those whose medical costs are covered by public funding, and not paid out-of-pocket, seek a higher quality of care. Residents who have a higher income and those who have a pattern of disease are also more likely to seek a higher quality medical service.

Hsiao and Wang studied health care in China, investigating the demand for health care, the supply of health care and the main insurance coverage systems offered to residents. Wang examined the extent to which the CMS has reduced the risk of paying high costs in the event of an illness (Yip, Wang & Liu 1998), and concluded that price is a primary determinant of the choice of medical care. Hsiao also studied the health care system, concluding that there is a close link between financing, price and organization of health care and that market-based financing creates more unequal access to health care between the rich and the poor. For these reasons, he concludes that demand-side cost sharing mechanisms need to be coupled with appropriate supply-side constraints.

This paper furthers this research on health care in China by focusing on the elderly residents in both rural and urban areas. It explores the reasons why respondents do not visit the doctor when it is necessary and investigates what factors determine a respondent's access to adequate medical care. Further, it endeavors to study the change in the access to adequate health care of respondents over time, which is particularly interesting given the history of the health care system in China over the past 50 years.

The study finds that financial constraints and inconvenience of obtaining care are primary deterrents in why elderly Chinese citizens do not visit the doctor when it is necessary. Moreover, the study determines that rural residents and respondents without the ability to meet all of their living expenses report lower availability of adequate health care services. Elderly residents who pay for their medical expenses themselves are determined to have less access to adequate care, as are residents who have fallen seriously ill over the past two years.

This study finds that location is a significant factor in determining access to care. Also, it examines the effect of who pays for the medical care of respondents, and finds that, after controlling for location, residents who are forced to pay for care themselves are predicted to have less access to adequate care. Finally, the adequacy of care accessible to respondents between the early 1900's and the period between 1950 and 1980 shows a pattern reflecting the implementation of the public health care system by the People's Republic of China in 1952. The reported access to adequate medical care is found to have increased further from the mid 1900's to today; however, this change was not as drastic as the one seen between the two earlier periods.

2. Data and Variables

The study uses data from the Chinese Longitudinal Healthy Longevity Survey (CLHLS) conducted in 2000. The survey collected information on the health status and quality of life of elderly residents, aged 65 and older, in 22 provinces in China. The data includes rich information concerning the living situation, financial status, and health care condition of 11,199 respondents. The method of collection was based on randomly selected centenarians. For each centenarian who participated in the survey, one

octogenarian aged 89-89, one nonagenarian aged 90-99, and one younger elder aged 65-79 living nearby were also interviewed.

The sample is composed of 41.5% males and 58.5% females. The mean age of the respondents is 91.3 years with the range between 78 and 124 years. Of the 11,199 respondents, 61.6% live in a town or urban area, while 38.4% live in a rural area, as shown in Table 1.

Variables considered for analysis include the reported adequacy of health care, the living situation, the ability to meet all costs, the method of payment for medical service, the number of times sick over the past two years, and the reason why residents do not visit the doctor when they are sick, as well as sex, age and location of residence. Specifically, the answer to the question “can you get adequate medical service when you are sick?” is used to estimate access to adequate medical care. Of the 11,199 elderly participants, 94.11% responded that they indeed had access to adequate medical care.

The living situation of respondents is included in the analysis because it influences the ability of residents to travel to the medical facility. Of the respondents, 81.1% live with a family, 7% live in a nursing home, and 11.9% live alone, as shown in Table 1.

Most of the respondents in the survey are no longer employed due to age; therefore, a measurement of income, which would typically be used to represent the financial situation, is not available. Instead, the ability to meet all costs using all means of financial support acts as a measurement of the respondent’s financial status. Table 1 illustrates that 76.7% of the respondents reported that they could meet all of their daily

costs, 7.43% reported that they could barely meet all of their costs, and 15.86% reported that they could not meet all of their costs.

The method of payment for medical services is included in the analysis to capture the effect of public medical insurance on access to adequate medical care. Of the 11,199 participants, 14.5% reported that their medical costs are paid for by public medical health care, 10.3% reported paying for medical costs themselves, while 75.2% of respondents reported that their family pays their medical expenses. The number of times respondents were seriously ill over the past two years is also included to control for the adaptive behavior of respondents who are more frequently sick, moving to an area where they have access to better care. The number of times respondents were seriously ill in the past two years ranged from 0 to 16, while the average number of times this occurred per respondent was 0.29.

Two other variables included in the study correspond to the respondents' reported access to adequate health care when they were 60 years old and when they were a child. 90% of respondents report that they had access to adequate medical care at age 60, while only 52.4% report that they had access to adequate medical care as a child. These variables are used to explore the changes in the availability of adequate health care between the early 1900's, the communist era, and today.

3. Methodology and Expectations

3.1 Reason for Not Visiting the Doctor

A little over half of the total sample, 6,017 elderly participants, reported that they did not visit the doctor when it was necessary. The variable which asks respondents why they did not visit the doctor when it was necessary is tabulated to investigate the main

deterrents of seeking care. Due to the current fee-for-service payment structure in place at health care facilities, and the lack of health insurance in rural areas, I expect that financial constraints will be a main deterrent in resident's going to the doctor when it is necessary. Furthermore, far distances from township centers and county hospitals faced by respondents in remote areas will likely cause difficulty of travel to be another main deterrent from elderly respondents visiting the doctor.

3.2 The Adequacy of Health Care

In order to investigate the determinants of adequacy of health care, a probit model is used to predict the dummy dependent variable describing if respondents currently have access to adequate medical care. The probit model is as follows:

$$(1) \quad C_{it} = f(Z_{it}, L_{it}, P_{it}, F_{it}, R_{it}, H_{it}, I_{it}; \varepsilon)^1$$

where $C = 1$ if adequate medical care is available and $C = 0$ if not; Z is a vector of age and sex characteristics; L is a dummy variable for location of residents; P is a dummy variable representing who pays for health costs; F is a dummy variable to capture the financial situation; R is a dummy for with whom the respondent resides; H is the individual's health status; and I is a vector of interaction terms. These variables and their responses are described in more detail in Table 1.

Location of residence will likely have a significant impact on the availability of adequate medical service because rural residents often have more distance to travel to visit the county hospital, where technology is better and practitioners have more

¹ The occupation of respondents could be included in the regression, however, because the sample participants range from age 78 to 124 the employment options available to respondents across this broad age range will be very different. The oldest of the respondents likely ceased working before the economic reforms in the early 1980's, so their position would have been part of the communal structure in place under the People's Republic of China.

extensive training. For this reason, I expect that living in a rural residence will decrease the probability that respondents have access to adequate health care.

Residents lacking insurance face a high out-of-pocket cost of health care; therefore, I expect that respondents whose health care costs are not financed by public means will have a decrease in the probability that they report the availability of adequate health care. The inability to meet all costs is also expected to decrease the probability that respondents have access to adequate health care, because most residents are forced to pay for care out-of-pocket. As a result, residents who are already unable to meet all of their living expenses are less likely to have the ability to pay for adequate care.

Respondents living with family or in a nursing home are likely to have better access to adequate care than those living alone, because they have extra means of support. Living alone could imply that respondents have enough money that they do not need to move in with family, which would increase their access to health care. However, it is more likely that respondents who live alone do not have family to care for them. Therefore, residents living alone have less financial support and lack assistance when traveling to obtain adequate medical care.

The health status of the individual, represented by how many times in the past two years the individual has been seriously ill, is expected to increase the probability that the respondent has access to adequate health care. If people are chronically ill, then it is likely that they will move, at least temporarily, to obtain the care that is necessary. Including this variable in the regression could introduce a causality problem, because those who do not have access to adequate medical care are more likely to have

reoccurring illnesses, and without the proper treatment, even slight illnesses are more likely to become severe.

Lastly, two types of interaction terms are included in the regression. The first set of interaction terms is a series of dummy variables representing the interaction between living situation and financial status. It is possible that the ability for respondents to meet all costs is more likely for those who live in a nursing home, because they had the ability to pay for the home; or those who live with family, because they get financial support from these family members. Since living with family and having the ability to meet all costs were the base scenario in the regression, only four dummy variables were included. These dummy variables represent the interactions between: not being able to meet all costs and living alone; not being able to meet all costs and living in a nursing home; only barely being able to meet all costs and living alone; and only barely being able to meet all costs and living in a nursing home.

The second set of interaction terms is a series of dummy variables representing the interaction between who pays for their health care costs and location. Rural residents are less likely to have health insurance because of the lack of availability of public health insurance in these areas. The interaction of location and who pays for health care is meant to capture this variation. Once again, due to the exclusion from the regression of the urban variable and the variable representing that a family pays for medical, only two dummy variables are included. One of the variables is the interaction between rural and the public paying for a respondent's medical costs. The second is the interaction between rural and the individual paying for their own medical costs.

The variable describing who cares for the respondent when he/she is sick (spouse, friends, social services, caregiver or nobody) was considered as a determinant of the respondent's access to adequate medical care. However, collinearity problems arise between who cares for the respondent when he/she is sick and with whom the respondent resides. Respondents living with family are typically taken care of by family members when they are sick, and similarly, respondents living in a nursing home are likely tended to by a caregiver in the case of illness. Because of collinearity, this variable is excluded from the regression.

3.3 Changes in the Adequacy of Health Care

A variable representing the mean response by year to whether respondents had access to adequate medical care at age 60 and as a child was created. This was accomplished by using the year 2000 and age of the respondent. Only respondents between the ages of 80 and 110 years are included in order to limit the years during which respondents were 60 years old to after the formation of the People's Republic of China. In particular, variables were created to determine the year when residents were 10 years old by subtracting the age of the respondent plus 10 from the year 2000. This is based on the assumption that childhood is taken to be approximately age 10. The same method is used to find the year when respondents were of age 60. The mean of the response to if respondents had access to adequate care as a child, was then calculated by year. Once again, the same method is used to achieve the mean response by year to whether participants reported having access to adequate care at age 60.

It is expected that the reported adequacy of health care will be higher between the years of 1950 and 1980, the span of years when respondents were 60 years old, because

this is the period during which health care was publicly funded. Because this health care system was still growing in the early 1960s and did not reach its peak until around 1970, I expect to see an increase in the mean reported adequacy of health care during this time. Further, due to advancements in the medical field, reported adequacy during the period from 1900 to 1930 will likely be significantly lower. Because health care coverage was significantly higher in rural areas from 1950 to 1980 than today, the mean reported adequacy of care in 2000 will be pushed downward. However, due to advancements in medical technology, especially in urban areas, the mean reported adequacy of care in 2000 will be pushed upward. I expect that these effects will offset, so that the reported adequacy of care will be approximately the same today as it was during the 1970's.

4. Results

4.1 Deterrents of Visiting the Doctor

Of the 11,199 respondents, 6,017 reported that they did not go to the doctor when it was necessary. The reasons why these respondents did not visit the doctor are shown in Figure 1. The two leading causes are “inconvenient” and “no money to pay”, with approximately 27% and 20% giving this response respectively. “Far away” is listed approximately 10% of the time, while “nobody to go with” appears not to be a significant cause of elderly not visiting the doctor.

As expected, financial constraints play a role in inhibiting elderly residents from visiting the doctor. While “inconvenient” and “far away” are listed as two separate responses, the inconvenience is partially brought about by the proximity of the doctor, therefore we can conclude that distance is also a significant reason why elderly respondents do not visit the doctor when it is necessary.

The majority of respondents answered that the reason they did not visit the doctor when it was necessary with “other”. However, the data is limited in that we are unable to know the true reasoning behind the “other” category. Another limitation of the data is the inability to know how the term “doctor” in this question is interpreted by respondents. It is unclear if the term “doctor” applies to the health workers at the village health posts, to the physicians who staff the township health centers, to the providers at the township health centers, or to all three. This prevents precise interpretation of how these results translate to the each of the tiers of the health care system.

4.2 Determinants of the Adequacy of Health Care

The probit regression, displayed in Table 2, reveals that the sex and age of the respondent is not a significant determinant to whether the individual has access to adequate health care. The location of the respondent, however, is significant at the 95% level for those living in rural areas. The model predicts that living in a rural area will decrease the probability that respondents report the availability of adequate medical care by 1.96%. This result is in line with the prediction that rural residents are typically forced to pay for care out-of-pocket, and therefore often lack the means to pay for adequate health care. The greater average distance from a hospital that rural residents face further explains the decrease in the availability of adequate care. Despite the availability of village health posts to some rural residents, this care is well below the quality obtainable at hospitals, and therefore may not be considered “adequate” by the elderly respondents. This finding illustrates the importance of focusing improvements in health care on elderly residents living on rural areas.

Interestingly, the dummy variable for public payment of medical care is not a significant determinant in predicting the adequacy of care in the initial probit regression. However, this could be a result of collinearity between location of residence and payment method for health care, because rural residents are far less likely to have health insurance due to a lack of availability. To test this hypothesis, access to adequate medical care is again regressed using the same probit model excluding location and the interaction terms between location and who pays for a respondent's medical costs. The results of this regression are shown in the right most columns of Table 2. In this model, the effect of public means paying a respondent's medical costs on access to adequate care becomes significant at the 80% significance level. A possible reason why this variable is not of higher significance is collinearity between a respondent's financial status and whether their costs are covered by public means. Respondents who are not able to cover all of their current costs likely do not have the financial means to devote money toward the insurance premiums necessary to maintain public insurance coverage. In fact, when financial status is also excluded from the regression, the dummy variable for the public covering medical costs is a significant predictor of whether a respondent has access to adequate medical care at the 95% confidence level.

If the respondent pays for their health care services by themselves, then the model predicts that they will have a 7.45% lower probability to answering "yes" to having access to adequate care. Paying for costs themselves means the respondent likely has little or no financial support from other sources, therefore is more careful about controlling their financial funds, and has less ability to obtain care. Further, along with

having less financial support, those who pay for their own medical costs likely have less assistance from family members in traveling to obtain care.

For similar reasons, living alone versus with family decreases the probability that respondents will have access to adequate medical care by 3.45% and is significant at the 95% level. This implies that elderly residents who live with family are supported by their family members either financially, if the family pays for their health care costs, or by means of transportation, if the family helps to get the respondent to a medical facility. As expected, respondents who live in a nursing home are more likely to have access to better medical service versus those living with their family. Living in a nursing home is significant at the 90% level and increases the probability of having access to adequate health care services by 2.22%. This is likely because most residents who live in a nursing home have medical services at hand, which explains why they are predicted to have better access to adequate care.

Being able to barely meet all costs and not being able to meet all costs are both significant predictors of having access to adequate health care at the 95% level. Being able to barely cover all costs is predicted to lower the probability of having access to adequate care by 10.5%. As expected, not being able to cover all costs lowers the probability of having access to adequate medical care by 14.3% from respondents who can cover all of their daily costs. This illustrates that financial status is a main factor in the access of elderly residents to adequate medical care.

The number of times a respondent was severely ill over the past two years is also a significant predictor of whether that individual has access to adequate medical care. Becoming severely ill over the past two years once is predicted to decrease the

probability that an individual has access to adequate medical care by .3% from those who have not been severely ill during this period. This result is opposite from what was expected, but reflects that there is likely a reverse-causality problem. Instead of seeing an effect that suggests individuals adapt to obtain better care when they are sick more often, the overwhelming effect is that respondents who do not have access to adequate medical care become severely sick more frequently.

The interaction terms between living situation and financial status are not significant at the 90% level, suggesting that the among elderly residents living alone and elderly residents living in a nursing home, the effect of not being able to cover all costs on having access to adequate medical care is not significantly different from the effect of being able to cover all costs. The effect of barely being able to cover all costs on having access to adequate medical care is also not significantly different from having the ability to cover all costs among residents living alone and residents living in a nursing home.

The interaction term between location and who pays for the respondents' medical costs is also not significant at the 90% level. This concludes that among rural residents, the effect of having public coverage to pay medical expenses on access to adequate medical care is not significantly different from the effect of a respondent's family paying medical expenses. It is important to note that a possible reason why this interaction term is not significant is due to a relatively small sample size. Out of the total 1,522 participants whose costs are covered by public financing, only 177 respondents live in a rural area.

4.3 Changes in the Adequacy of Health Care

The elderly respondents report a significant increase in the adequacy of health care available from when they were children. While 52.4% of respondents said that they could receive adequate health care as a child, 94% reported that they could receive adequate health care today. There was also a large increase in the availability of adequate health care reported between when the respondent was a child and when they were 60 years old. Asked to remember the health care they had at age 60, 90% answered that they could indeed receive adequate health care.

Assuming childhood is about age 10, the years corresponding to when the elderly respondents, age 80 to 110, were children is 1900 to 1930. The years between 1950 and 1980 covers the period when these respondents were 60 years old. The increase in the adequacy of health care between the early 1900's and the 1950's to 1980's is in part caused by advancement in medical training and treatment; however, there may be other causes as well. In fact, this is the same period during which social health care was implemented by the Chinese government. If this is truly a cause of the increase, then I would expect to see the adequacy of care continuing to rise during this period, as the health care system was in place from 1952 to 1982.

Figure 2 illustrates the pattern between access to adequate medical care at 60 and the corresponding year. The mean reported availability of adequate health care increases during the period; as shown clearly by the simple linear regression line included in the graph. The regression line is positively sloped, illustrating an increase in the access to adequate medical care during the period. This improvement could be due to both an increase in medical technology and the implementation of the social health care system.

The slope of the regression line in Figure 3, the plot of adequate medical care as a child, is slightly positively sloped. However, it is apparent that the average access to adequate medical care increased significantly more during the period between 1950 and 1980 than between 1900 and 1930. This difference indicates that the social health care system implemented by the government in 1952 was likely an important factor in improving the access to adequate medical care.

One concern in these results is the similar pattern seen in both Figure 2 and Figure 3. These corresponding patterns reflect the possibility of a recall bias. If this in fact the case, then older respondents should be more likely to report the availability of adequate health service on a less frequent basis, due to the positive trend. However, the probit regression found that the coefficient for age is not significant, meaning that, at least for the current reported adequacy of health care, there does not appear to be a correlation between reported adequacy of care and age.

Another point of interest is the differentiation between rural and urban location of respondents both when they were 60 and when they were a child. Fortunately, the data includes information on whether respondents were born in rural or urban areas. Assuming that respondents still lived in the same type of area when they were children, results differentiated by location can be found. In fact, 49.6% of respondents born in rural areas reported access to adequate medical care, on average, while 65.7% of respondents born in urban areas reported access to adequate medical care.

The data does not include precise information on the location in which respondents lived when they were 60, so we must assume that respondents lived in the same area when they were 60 as they do now. With this assumption, 86.7% of

respondents who lived in a rural area report having access to adequate medical care at age 60, while 91.9% of respondents who lived in an urban area report having access to adequate medical care at age 60. These results illustrate that the social health care system implemented in the People's Republic of China partially accomplished the goal of equalizing health care among rural and urban residents.

5. Limitations and Conclusion

While this study attempted to investigate the determinants of the adequacy of health care in China, it must be noted that the variable concerning the access to adequate care is subjective to the respondent's outlook on life. Due to this potential bias, there could be error in the reported adequacy of health service; therefore these results must be interpreted with some caution. The other factor to be considered is the age of these respondents. Because the respondents are all elderly individuals, the responses may be subject to recall bias. This is especially true with the questions regarding health care at age 60 and at childhood. Asking respondents to remember health care as a child is asking them to look back 80 or 90 years ago and then judge the condition of care they received.

Residents who have reached old age probably also did not have many health complications as a child, meaning they were not exposed to the available health care system at the time. The responses of this select group do not likely provide an accurate depiction of the true condition of the health care availability in China during this period. Further, elderly participants could also be expected to have a more optimistic outlook on life, resulting in an upward bias of the reported availability of adequate health service during all three periods. The possibility of an upward bias means that conditions have likely improved by more than the estimates suggest.

Measurement error is also a potential problem in this study. Some of the variables given in the data are not exact measurements of what they are trying to control for in the regression. While the ability to cover all costs gives an overall picture of the respondent's financial situation, it is not as accurate as a measurement of income or consumption. This data set does not include either of these measurements. The lack of income is not too disappointing, because it would not be appropriate in this survey. The age of the participants implies that most are no longer working and many are supported financially by their family. An interesting variable to include, had it been available, would be the per capita expenditure of respondents based on the household's total expenditure divided by the number of people in the household. Not including this term could subject the results to omitted variable bias.

Despite these shortcomings, this study confirms that financial and distance constraints are primary deterrents preventing elderly Chinese citizens from visiting the doctor when it is necessary. Further, the study finds that rural residents, and respondents without the ability to meet all of their living expenses, report lower availability of adequate health care services. Finally, the adequacy of care available to respondents between the early 1900's and period between 1950 and 1980 shows a pattern reflecting the implementation of the public health care system by the People's Republic of China in 1952.

These discoveries lead to the conclusion that the current financial constraints medical care places on elderly Chinese citizens needs to be addressed by the government. The government did, in fact, make an attempt to remedy the situation in 1994 by establishing the New Cooperative Medical System under a pilot project. Implemented in

14 counties of seven provinces, the project was operated on a voluntary basis. Although preliminary reports (Carrin, et al. 1999) provided a hopeful outlook for the future expansion of this program, in 1998 the China National Health Service Survey still estimated that more than 87% of farmers in rural areas did not have any form of health insurance and were forced to pay full medical expenses (Wang, et al. 2005). This study suggests that any health care program that is implemented should focus on supporting these poor, rural residents. Although this system will most likely present challenges of its own, government action is shown to be necessary.

6. Appendix

Figure 1 – Reasons Why Respondents Did Not Visit the Doctor When Necessary

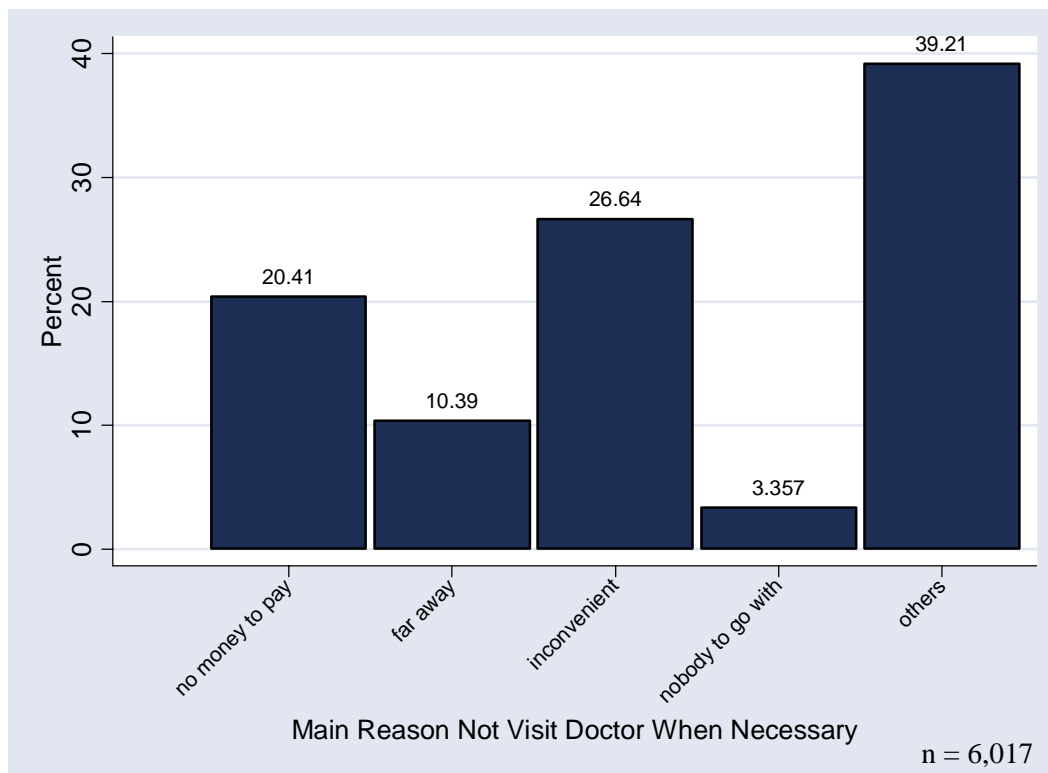


Table 1 – Variable Definitions with Summary Statistics

Variables	Definitions	% of respondents
<i>Male</i>	DV = 1 for male; 0 for female	41.53
<i>Age</i>	number	-
Location		
<i>urban</i>	base: 1 for people in urban area	61.60
<i>rural</i>	DV = 1 for people in rural; 0 for town or urban	38.40
Payment of medical costs		
<i>familypay</i>	base: 1 if medical costs paid for by family; 0 otherwise	75.15
<i>publicpay</i>	DV = 1 if medical costs paid for by public medical health; 0 otherwise	14.53
<i>selfpay</i>	DV = 1 if medical costs paid for by self; 0 otherwise	10.32
Financial situation		
<i>ycosts</i>	base: 1 if able to meet all costs	76.72
<i>scosts</i>	DV = 1 if barely able to meet all costs; 0 otherwise	7.42
<i>ncosts</i>	DV = 1 if not able to meet all costs; 0 otherwise	15.86
Residence type		
<i>livefamily</i>	base: 1 if live with family	81.12
<i>livealone</i>	DV = 1 if live alone; 0 otherwise	11.88
<i>livenursing</i>	DV = 1 if live in nursing home; 0 otherwise	7.00
Health Status		
<i>numsick</i>	number of times suffering from a serious illness in the past two years	-
Interaction terms		
<i>alonen</i>	livealone*ncosts	-
<i>alones</i>	livealone*scosts	-
<i>nursingn</i>	livenursing*ncosts	-
<i>nursings</i>	livenursing*scosts	-
<i>ruralpp</i>	rural*publicpay	-
<i>ruralsp</i>	rural*selfpay	-

Note: DV = dummy variable

Sample size = 1,199

Table 2 - Probit Regression for Access to Adequate Medical Care

Variables	<i>With Location</i>		<i>Without Location</i>	
	Marginal Effects	Robust SE	Marginal Effects	Robust SE
<i>Male</i>	0.0054082	0.0039475	.0040435	.0040399
<i>Age</i>	0.0001405	0.0002605	.0000957	.0002657
Location				
<i>urban</i>	base	base
<i>rural</i>	-0.0196194**	0.0051004
Payment of medical costs				
<i>familypay</i>	base	base	base	base
<i>publicpay</i>	0.0019154	0.0076301	.0089046~	.0060591
<i>selfpay</i>	-0.0744933**	0.0139673	-.063835**	.0103897
Financial situation				
<i>ycosts</i>	base	base	base	base
<i>scosts</i>	-0.1049882**	0.0183483	-.1100915**	.0188668
<i>ncosts</i>	-0.1431768**	0.0130980	-.1475736**	.0132436
Residence type				
<i>livefamily</i>	base	base	base	base
<i>livealone</i>	-0.0344591**	0.0112295	-.035114**	.0113128
<i>livenursing</i>	0.0222286*	0.0080233	.0235307*	.0078161
Health Status				
<i>numsick</i>	-0.0028756**	0.0013476	-.0027752**	.0013769
Interaction terms				
<i>alonen</i>	-0.0071718	0.0120904	-.0087508	.0126581
<i>alones</i>	0.0143557	0.0092928	.0149291	.0093036
<i>nursingn</i>	-0.0152879	0.0315790	-.0165538	.0326435
<i>nursings</i>	-0.0380725	0.0522787	-.0409687	.0538412
<i>ruralpp</i>	0.0051843	0.0160266
<i>ruralsp</i>	0.0040434	0.0083835

Note: ~ denotes significance at the 80% level; * denotes significance at the 90% level;

** denotes significance at the 95% level

Number of observations = 7777

Figure 2 - Adequate Medical Service at Age 60

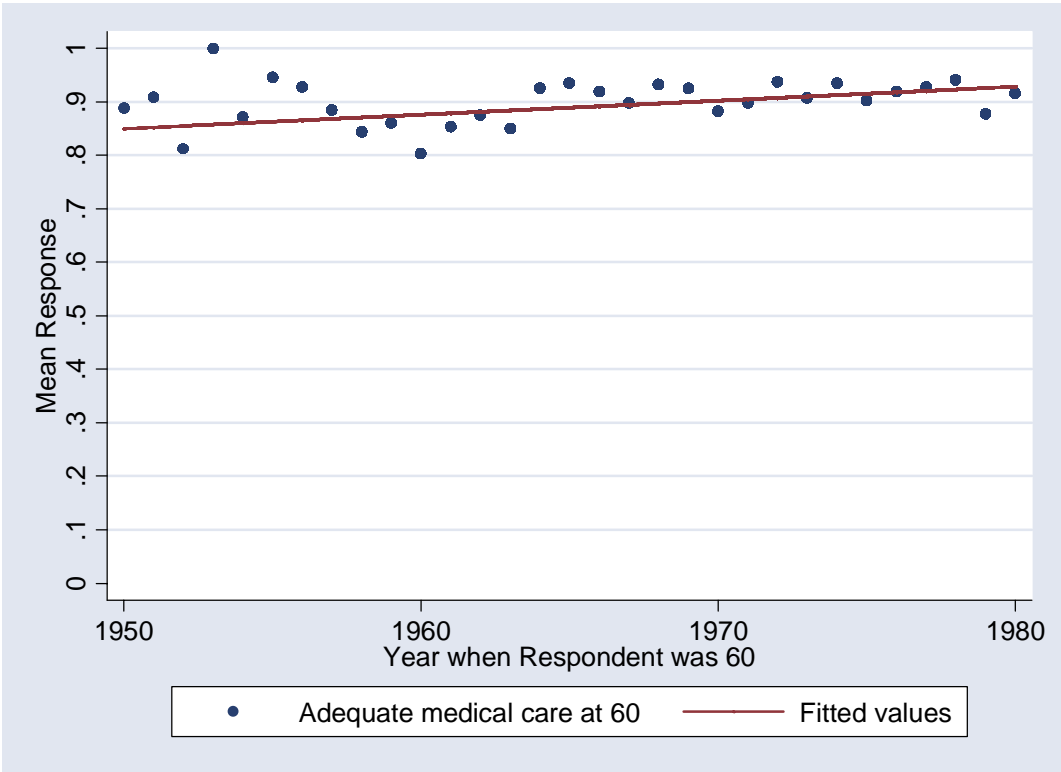
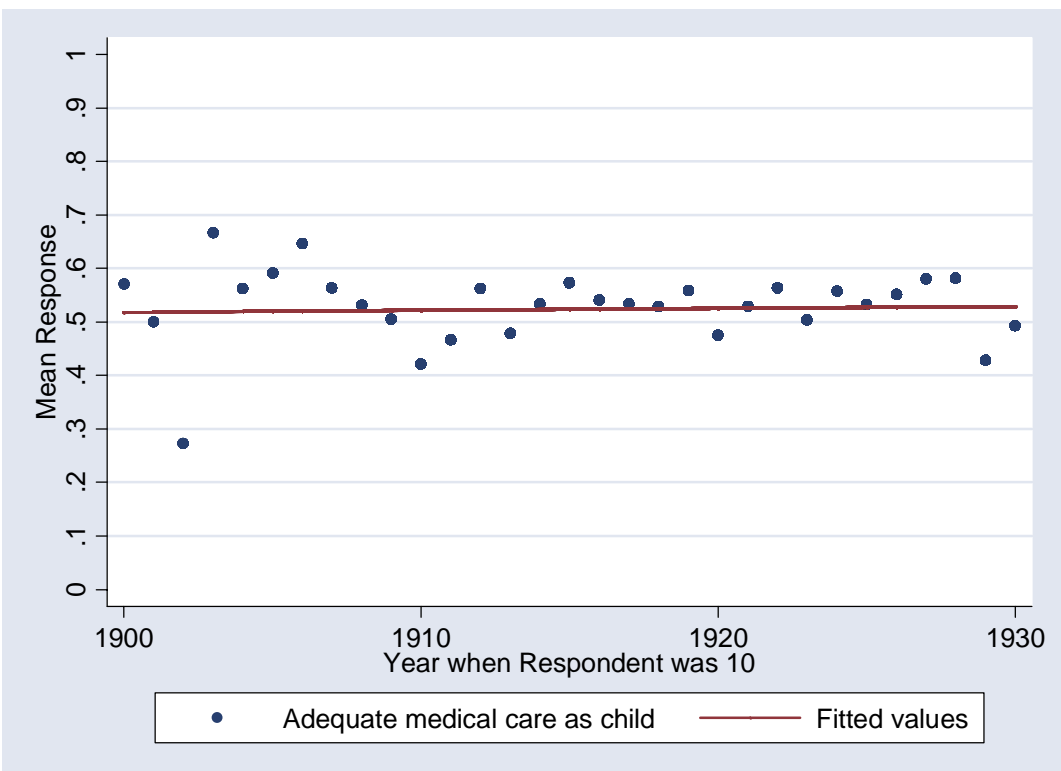


Figure 3 - Adequate Medical Service as a Child



7. Bibliography

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