Who does not see a doctor when sick in contemporary China? Exploring urban/rural difference in doctor visit rate and the potential reasons

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Abstract

Purpose: Durable and significant urban/rural difference in doctor visit rate has received increasing attention and is thought to exacerbate urban/rural health disparity. In response, the New Rural Cooperative Medical System (NRCMS) has been implemented in 2003 to provide rural residents affordable medical services and improve their doctor visit rate. This article is the first study in China that used nationally representative survey data to compare urban/rural difference in doctor visit rate and explore its potential reasons after the implementation of NRCMS.

Methods: Based on 2010 China General Social Survey (CGSS), this study used logistical regression models to predict the average marginal effects of not seeing a doctor from 1,333 rural residents and 1,568 urban residents.

Results: The results show that there is no significant difference in doctor visit rate between urban and rural residents. Nevertheless, 'high medical costs', 'not necessary', 'poor transportation', 'the distance of the hospital' and 'do not like visiting a doctor' are still important reasons for sick rural residents not seeing a doctor. In contrast, 'high medical costs' and 'long waiting time' are main reasons for the urban residents.

Conclusion: While urban/rural difference in doctor visit rate has been eliminated, the different reasons of not seeing a doctor for urban and rural residents highlight the need of the government to pay attention to the diverse health demands and obstacles to the access to medical services during the process of design and implementation of public health policies.

Introduction

In China, significant and persistent disparity between urban and rural areas in terms of health and medical resources has been for a long time an important topic of public and scholarly discussion [1]. It is widely acknowledged that the great urban/rural gap has been shaped by the 1978 reform and opening-up policy, prioritizing the development of urban areas at the expense of rural areas. The uneven development was further exacerbated by the Chinese distinctive hukou (household registration) system, which was established during the 1950s to restrict population mobility between rural and urban areas [2]. Substantial research shows that whereas urban areas have well developed health care infrastructure such as high quality hospitals and public medical insurance system, there were much fewer public medical facilities and no public medical insurance system in rural areas [3,4]. The scarcity of medical resources in rural areas, alongside increasing price of medical services due to marketization of medical industry, has significantly lowered rural residents' doctor visit rate [5]. The durable urban/rural disparity in doctor visit rate could in turn further exacerbate health disparity between urban and rural residents.

In order to increase rural residents' ability as well as willingness to use medical services, the Chinese government

has established the New Rural Cooperative Medical System (NRCMS) in 2003, which aimed to provide all rural residents affordable medical services [6-8]. The NRCMS scheme has been extensively implemented in the late 2000s. After eight years' development, in 2010 it has covered 850 million people, around 96% of total rural population [2]. Despite this prominent coverage rate, its actual effect on people's doctor visit rate is still quite controversial. Some studies show that NRCMS has failed to lower the actual burden of medical care for rural residents, and there may still be persistent urban/rural disparities in people's ability and willingness to visit a doctor [3,4]. In contrast, others find that NRCMS has to some extent lowered the medical costs and improved the willingness of patients to see a doctor, implying that the urban/rural disparity in doctor visit rate is decreasing [5,9]. These inconsistent results may partly because these studies were conducted in particular Chinese cities or provinces, which have different health policies and socioeconomic development. It is therefore necessary to re-examine the urban/rural difference in doctor visit rate at the national level, especially after the implementation of NRCMS. By using a nationally representative sample, the first contribution of this article is to compare the difference in doctor visit rate between urban and rural residents, while controlling for a wide range of demographic and socioeconomic characteristics.

Moreover, another focus of this study is the reasons why people do not see a doctor when they were sick. Previous research shows that poor economic condition and no public medical insurance were two most important reasons holding the rural residents back from seeing a doctor when they were sick, whereas relatively few urban residents reported both reasons [10]. Moreover, the urban/rural differences in the percentage of people reporting both reasons also reflect great inequalities in socioeconomic and medical resources between urban and rural areas [11]. After the extensive implementation of NRCMS, it is reasonable to expect that reasons for not seeing a doctor may have changed especially for the rural residents. Are poor economic condition and no public medical insurance still important reasons for rural residents not using medical services? Are there any new reasons for not seeing a doctor? Do urban and rural residents still have different reasons for not seeing a doctor? Exploring the reasons for not using medical services is directly related to the future evaluation and revision of public health policies in China. Thus, the second contribution of this article is to explore the reasons for not using medical services for both urban and rural residents and compare the urban/rural differences in these reasons.

Method

Data and sample

In this research, the data are derived from the 2010 China General Social Survey (CGSS), which is one of China's largest cross-sectional surveys. Using a multi-stage stratified probability-proportional-to-size (PPS) sampling approach, the sample of CGSS is representative of the adult population (aged 18 and above) in China, and provides detailed information about health and doctor visit. The overall response rate of CGSS 2010 is 74.3%. Because the health-related questions were only asked in a self-completion module that involves a representative subsample of the original CGSS sample, we restricted our sample to the respondents who participated in this module. After dropping a very small number of missing cases (1%), the final analytical sample contained 2901 cases.

Measures

Doctor visit: The dependent variable is doctor visit, which is measured by a question: during the last year, have you intentionally not seen a doctor when you were sick? This variable is binary (Yes 1, No 0). If the answer is confirmative, respondents were then asked about the reasons why they intentionally did not see a doctor when they were sick. There are ten options: 1. Long waiting time. 2. High medical costs. 3. No hospitals in local areas. 4. Do not know where to visit a doctor. 5. Poor transportation. 6. Do not like visiting a doctor. 7. Do not have time. 8. It is not necessary. 9. No medical insurance. 10. Other reasons.

Urban/rural areas: The key independent variable in this study measures whether respondents live in urban or rural areas. Due to China's rigid hukou system, those who live in rural areas and hold rural hukou are defined as rural residents, and similarly those who live in urban areas and hold urban hukou are defined as urban residents.

Control variables: As doctor visit rate often depends on people's demographic characteristics, this article controlled for respondents' age and gender. Moreover, as respondents' health status is very likely to affect their frequency to see a doctor, this article also controlled for respondents' health status, which is a five-points scale ranging from 0 'very poor' to 5 'excellent'. Also, as China's different regions have different health policies, this article controlled for region including three categories: West, Central and East. In addition, this article controlled for two socio-economic characteristics, which are likely to affect respondents' intention to visit a doctor. They include respondents' highest educational qualification, including five categories: 'no qualification', 'primary school', 'middle school', 'high school' and 'degree or above', and occupational class that was measured using the Erikson-Goldthorpe-Portocarero (EGP) classification including five categories: no work, higher controller (EGP I, II & V), routine non-manual (EGP IIIa, IIIb, IVa & IVb), manual (EGP VI, VIIa), and farm-related and other work (EGP IVc & VIIb). Further analysis shows that there is no multicolinearity among these control variables (Variance Inflation Factor < 3).

Analytic strategy: Because the dependent variables are binary and do not follow a normal distribution, logistic regression models were widely used in previous research to analyze this type of variable [12]. In logistic regression models, logged odds of the probability of a binary variable is calculated and assumed to have a linear relationship with the independent variables [13]. As our models consist of a number of non-linear nest models, it is not appropriate to compare the coefficients or odds ratios across models due to the scaling problem, which refers to the potential bias that occurs when comparing odds ratios across different models. This is because logistic regression estimates, which are rescaled based on a fixed residual variance, are likely to be affected by omitted variables [14]. To avoid this problem, this article follows Mood's suggestion to calculate the Average Marginal Effect (AME) with a 95% confidence interval [14]. AME is interpreted as the change in the expected probability of the dependent variable with one unit increase of an independent variable. The analytical procedures proceed as follows. First, we compared the raw difference between urban and rural areas in the probability of doctor visit rate. Then we added demographic and socioeconomic characteristics stepwise into the model in order to explore whether the urban/rural disparity (if any) can be explained by these characteristics. Finally, we investigate whether residents from urban and rural areas have different reasons for refusing to see a doctor when they were sick, while controlling all demographic and socioeconomic characteristics.

Results

Table 1 reports the descriptive statistics for rural and urban residents respectively. Overall, round 45% of Chinese residents have ever intentionally not seen a doctor when sick during the last year, and rural residents are slightly more likely to intentionally refuse seeing a doctor when ill than urban residents. While both groups have similar age and gender composition, rural residents are more likely to have worse health. Moreover, rural residents are more likely to reside in China's central and west areas, whereas urban residents are more likely to live the east areas.

Finally, urban residents have much higher education levels and occupational status than rural residents.

Table 2 reports the AME of three logistic regression models. Model compares the raw difference in probability of intentionally not seeing a doctor when ill between rural and urban residents. While urban residents are slightly less likely (1% point) to intentionally not see a doctor when they were ill than rural residents, the difference is non-significant. Model 2 further included demographic characteristics, health status and region. Specifically, those who have better health and live in

Table 1. Descriptive statistics (M = Means, % = Proportions).

	Rural residents	Urban residents
Intentionally not see a doctor if sick (%)	45.60	44.48
Male (%)	48.84	47.00
Age (M)	47.80	47.09
Standard deviations	14.63	16.46
Self-rated health (M)	3.39	3.58
Standard deviations	1.19	1.06
Region (%)		
East	18.08	56.06
Central	52.96	28.57
West	28.96	15.37
Education (%)		
No qualification	22.73	5.80
Primary school	37.96	12.12
Middle school	32.48	25.96
High school	5.18	16.01
University/college	1.65	40.11
EGP occupational class (%)		
No work	60.17	13.58
Higher controller	7.50	31.89
Routine non-manual	2.78	21.62
Manual	26.41	28.95
Farm-related and other work	3.15	3.95
N	1,333	1,568

Table 2. Average marginal effects (AME) of logistic regression models predicting the probability of not seeing a doctor when sick.

	Model 1		Model 2		Model 3	
	AME	SE	AME	SE	AME	SE
Urban/rural (ref = Rural)	-0.01	(0.02)	-0.03	(0.02)	0.01	(0.03)
Age			-0.00	(0.00)	-0.00**	(0.00)
Gender (ref = Male)			-0.01	(0.02)	-0.03	(0.02)
Self-rated health			-0.04***	(0.01)	-0.04***	(0.01)
Region (ref = East)						
Central			-0.07**	(0.02)	-0.08***	(0.02)
West			-0.08**	(0.03)	-0.09***	(0.03)
Education (ref = No education)						
Primary school					-0.03	(0.03)
Middle school					-0.03	(0.04)
High school					-0.03	(0.04)
University/college					-0.09*	(0.04)
EGP class (ref = No work)						
Higher controller					-0.07*	(0.03)
Routine non-manual					-0.00	(0.03)
Manual					-0.04	(0.03)
Farm-related and other work					-0.01	(0.05)
Pseudo R²	0.00		0.07		0.12	
Observations	2,901		2,901		2,901	
Note: *** p<0.001, ** p<0.01, * p<0.05.						

Table 3. Comparing reasons for not seeing a doctor when sick between urban and rural residents.

Reasons	Rural residents (ref. group) (%)	Urban residents (%)	AME (SE) of logistic regression models controlling for all variables in Table 2
(1) Long waiting time	3.15/100.00	15.95	0.08** (0.03)
(2) High medical costs	55.13	43.82	0.08* (0.04)
(3) No hospitals in local areas	6.46	0.72	-0.06** (0.02)
(4) Do not know where to visit a doctor	1.49	1.01	-0.02 (0.02)
(5) Poor transportation	11.42	3.02	-0.08** (0.02)
(6) Do not like visiting doctors	10.43	15.09	0.01(0.02)
(7) Do not have time	7.45	8.33	-0.01(0.02)
(8) It is not necessary	53.48	51.01	-0.14***(0.04)
(9) No medical insurance	2.49	3.02	0.02(0.02)
(10) Other reasons	0.33	2.73	0.03* (0.01)
Note: *** p<0.001, ** p<0.01, * p<0.05.			

central or west areas are less likely to intentionally not see a doctor when they were ill than those who have worse health and live in east areas. However, with these characteristics entered, the rural/urban difference remains similar and non-significant. Model 3 further included education and occupation class. Specifically, those who have a university/college degree and have a higher controller job are significantly less likely to intentionally not see a doctor when sick than those who have no qualification or no work.

Despite no urban/rural difference, given a large number of people who have ever intentionally refused to see a doctor, it is important to further explore its potential reasons and whether the reasons differ between urban and rural residents. Table 3 first reports the raw percentage of rural and urban residents who chose each of the ten reasons. The statistics is interpreted as follows. For example, there are 3.15% of all rural residents who think long waiting time is a reason why they do not want to see doctor even if they were sick. Overall, we find that 'high medical costs' and 'unnecessary' are the two most important reasons why people do not want to see a doctor. When comparing rural and urban residents, we find that 'long waiting time' is a more important reason for not seeing a doctor in urban than rural areas, and the difference is significant after controlling for demographic and socioeconomic characteristics. In terms of 'high medical costs', although more rural residents think this as a reason for not seeing a doctor than urban residents, after controlling for confounding variables the pattern has been reversed. In other words, 'high medical costs' is a more important reason for not seeing a doctor among urban than rural residents. Moreover, 'no hospitals in local areas', 'poor transportation' and 'unnecessary' are the three reasons which are important among rural than urban residents. These patterns are significant even after controlling for various confounding variables.

Discussion and Conclusion

Durable and significant urban/rural difference in doctor visit rate, which is thought to exacerbate urban/rural health disparity, has received increasing public and scholarly attention [1]. In order to provide affordable medical care to the Chinese rural

residents and improve their doctor visit rate, the government has established the NRCMS [8]. After several years' extensive implementation of NRCMS, does the rural-urban gap in doctor visit rate still exist? Are there still any reasons that prevent the both urban and rural residents from using medical services? Are there any urban/rural differences in the reasons for not using medical services? By exploring these questions, this article has obtained two important findings.

First, our results show that there is no significant difference between urban and rural residents in doctor visit rate, after controlling for respondents' demographic and socioeconomic characteristics. This result implies that the NRCMS may be effective in eliminating the urban/rural gap in doctor visit rate by improving the economic ability and willingness of rural residents to use medical services when needed. Although there are still disputes about whether the NRCMS has significantly lowered the medical costs for rural residents [5,6], the medical care provided by the NRCMS should at least have a psychological effect that could greatly improve the willingness of seeing doctor among sick rural residents. Otherwise, high medical costs could lead to the sense of helplessness and powerlessness among those with financial difficulties and prevent them from using medical services.

Second, regarding the reasons that why people choose not to see a doctor, we find that high medical costs are still an important issue for both urban and rural residents. In addition, for the rural residents 'poor transportation', 'the distance of the hospital', 'not necessary' and 'do not like visiting a doctor' are also crucial issues preventing them from using medical services. This highlights the need of the government to further ameliorate the local transportation and medical infrastructure in rural areas, and improve the health awareness and literacy of rural residents. For the urban residents, long waiting time is more important reason for not seeing a doctor. This may possible be due to large-scale rural-to-urban migration and increasing population density in urban areas, which have posed significant challenges to the health care system in urban areas. Overall, the different reasons for not using medical services between urban and rural areas highlight the increasingly diverse health demands as well as obstacles to access to health care in contemporary China. Instead of searching for a one-size-fits-all solution, our results stress the need of the government to pay particular attention to the geographic diversity and uneven socioeconomic development in China during the process of design and implementation of public health policies.

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