


# Who Is More Satisfied with Health Services? A Cross-Sectional Study in China

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## Abstract

This cross-sectional study aims to assess the Chinese population's satisfaction with health service and identify 2 types of variables, Andersen's behavioral model related variables and social environment variables associated with high satisfaction. Data were derived from the 2013 Chinese General Social Survey (CGSS). Using exploratory factor analysis, the original questionnaire's 10 health services were grouped into 2 dimensions, including "health management service" and "public health service." Then, the satisfaction was described. The associations between satisfaction and factors were assessed using a multivariable logistic regression model. As a result, a total of 5283 subjects were enrolled. The satisfaction was 56.74% for "health management service" and 54.48% for "public health service." Those with older age, lower education level, positive social environment factors (ie, higher perceived social class, higher perceived social trust, and perceived social equity), and having pension were more likely to report high satisfaction. Moreover, compared to the east region (the most prosperous region), the individuals from the central region or the north-east region (both regional economic levels were medium) had lower odds of reporting high satisfaction. In comparison, those from the west region (the least developed region) had higher odds. In conclusion, actionable measures to increase satisfaction should be proposed by the Chinese government, including increasing pension insurance coverage, increasing investment in health services, creating an excellent social environment, etc.

## Keywords

China, health services, satisfaction, social environment, cross-sectional studies

### What do we already know about this topic?

Published research regarding Chinese health service satisfaction usually focused on a specific population (such as patients) or a particular health service (eg, family doctor-contracted service). There are fewer studies on integrating specific health service items into several categories and analyzing their satisfaction. Moreover, the influence of social environment variables and Anderson's behavioral model variables on satisfaction needs further analysis.

### How does your research contribute to the field?

Firstly, the research subject of this study is the general Chinese population. Secondly, 10 specific health service items are integrated into 2 categories, "health management service" and "public health service," and their satisfaction is analyzed. Thirdly, the influence of social-environmental variables and Anderson's behavioral model variables on satisfaction is evaluated. As a result, this study could help assess the Chinese health service system and guide related policy.

### What are your research's implications toward theory, practice, or policy?

According to the findings, actionable measures to increase satisfaction should be proposed by the Chinese government, such as expanding pension insurance coverage, developing local economies, increasing investment in health services, creating an excellent social environment, promoting and ensuring social equality, and enhancing people's trust in health services.

## Introduction

China experienced rapid economic growth in recent decades, with a significantly increased demand for quality health services. For adjusting to these growing demands, the government launched an ambitious plan of health care system reform

in 2009.<sup>1</sup> The main goals were to reform essential drug policies, universal basic medical insurance, public hospitals, primary health care service, and public health service. During the past 11 years, China has achieved substantial positive results, including expanding medical insurance contents, increasing



investment in primary care (PHC), setting out the minimum public health services for all citizens, and so on.<sup>2,3</sup> However, China still has to address several remaining challenges, such as improving the quality of essential public health services and PHC service. For example, public health service packages cannot meet the general public's actual needs of the general public,<sup>4</sup> and levels of education and qualification among PHC workers are low.<sup>5</sup>

So, in the face of this vast and imperfect health service system, how should we evaluate its performance? One of the evaluation indicators is how satisfied inhabitants are with health services.<sup>6</sup> "Inhabitants' satisfaction with health service" means "a sense of contentedness, achievement or fulfillment that results from meeting inhabitants' needs, desire, and expectations with respect to healthcare service."<sup>7,8</sup> Evaluating inhabitants' satisfaction with health services could improve the quality of healthcare delivery by identifying problems.<sup>9</sup>

In developing countries, many studies have been conducted to evaluate satisfaction with health services.<sup>10,11</sup> In Pakistan, it had been validated that health services, such as laboratory and diagnostic care, preventive healthcare, and prenatal care, had a positive association with patient satisfaction. Specifically, the study also found that the relationship between health service and patient satisfaction was moderated by physicians' behavior.<sup>12</sup> In Malaysia, studies revealed a high level of satisfaction among patients who had received Traditional and complementary medicine treatment at public hospitals.<sup>13</sup> In Brazil, satisfaction with oral health services was 65.51%, and socioeconomically disadvantaged users were more satisfied with oral health services.<sup>14</sup>

As with other developing countries, many scholars have already evaluated the satisfaction with health service in China, including "diabetes patients' satisfaction with community health service,"<sup>15</sup> "patient satisfaction with county-level public hospitals' service,"<sup>16</sup> and "noncommunicable disease patients' satisfaction with family doctor-contracted services."<sup>17</sup> Most research subjects were patients with a specific disease, and most studies evaluate the satisfaction of a particular service. There are fewer studies on integrating specific health service items into several categories and analyzing their satisfaction. Moreover, the influence of social environment variables and Anderson's behavioral model variables on satisfaction needs further analysis.

Therefore, this study aimed to assess the general Chinese population's satisfaction with 2 categories of health service

and identify 2 types of variables, Andersen's behavioral model related variables and social environment variables associated with high satisfaction. It could help assess the Chinese health service system and guide related policy.

## Methods

### *Design of the Study*

This study was a cross-sectional study. It first described how satisfied Chinese people are with health services. Then, the factors influencing health services satisfaction were explored.

For this article's dependent variable, exploratory factor analysis (EFA) was used for dimensionality reduction to better understand the satisfaction with health service. By applying the EFA, health service satisfaction was reduced to 2 dimensions, "Health management service satisfaction" and "Public health service satisfaction."

For independent variables, based on the relevant literature, Andersen's behavioral model related variables<sup>18,19</sup> and social environment variables<sup>20,21</sup> were selected for this research. Generally speaking, Andersen's behavioral model is a conceptual model aimed at demonstrating the factors that lead to the use of health services. It believes that 3 dynamics determine health services usage: predisposing factors, enabling factors, and need.<sup>22</sup> Social environment refers to the immediate social setting in which people live and is also a determining factor in health services usage.<sup>23,24</sup> In this study, "perceived social trust," "perceived social equity," and "perceived social class," and economic regional was selected as the environmental variables.

The selection method and definition of the above variables are detailed in the "Measures" section below.

### *Data*

Data in this study were derived from the 2013 Chinese General Social Survey (CGSS). The detailed information on CGSS can be found on the website <http://cgss.ruc.edu.cn/English/Home.htm>.

In brief, CGSS is conducted by the department of sociology of the Renmin University of China and the survey research center of Hong Kong University of Science and Technology. It is the earliest national representative continuous survey project in China. It is aimed to explore the social structure in China and life quality for Chinese.

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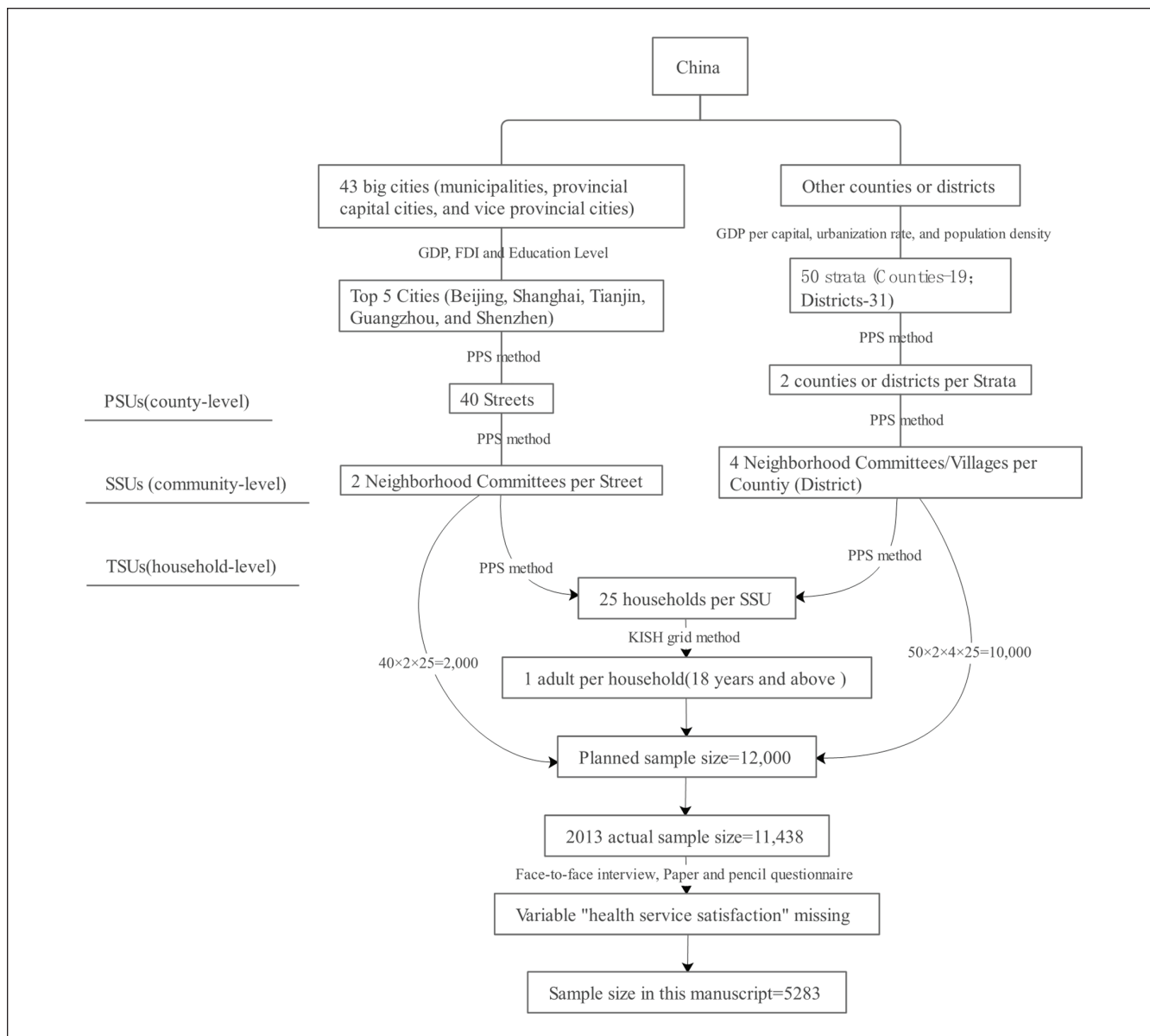
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**Figure 1.** Sampling flowchart of 2013 Chinese General Social Survey (CGSS). PSU = primary sampling units; SSU = secondary sampling units; TSU = third-level sampling units; PPS = probability proportionate to size sampling.

As shown in the flowchart (Figure 1), 2013 design is a multi-stage stratified design. Firstly, China was divided into 2 strata: one is 43 big cities (municipalities directly under the central government, provincial capital cities, and vice provincial cities), and the other one is the rest counties or districts. Comprehensive ranking by GDP, FDI and Education Level, the top 5 big cities were chosen (Beijing, Shanghai, Tianjin, Guangzhou, and Shenzhen). These 5 cities are set as self-representative stratum. Moreover, according to GDP per capital, urbanization rate, and population density, the rest counties or districts are equally classified into 50 strata. Secondly, 3 sampling stages were conducted: Primary sampling units (PSUs) is county-level units; Secondary sampling

units (SSUs) are community-level units (villages [Cun] and neighborhood committees [Ju wei hui]); in selected SSUs, 25 households (third-level sampling units, TSUs) are sampled with PPS method; in each selected household, 1 adult aged 18 years or above will be sampled with Kish grid.

The planned sample size of 2013 design is 12 000 and the actual size is 11 438. Therefore, the 2013 CGSS data was broadly representative of the whole of China. However, after excluding observations where there were missing values to “health service satisfaction” variables, our analysis data set contained 5283 survey respondents.

The mode of survey administration of CGSS was a face-to-face interview. The 2013 CGSS questionnaire structure

**Table 1.** Factor Analysis for Health Service Satisfaction.

Factor	Health service satisfaction items	Components		Rotation sums of squared loadings		
		Factor 1 (rotation factor loadings)	Factor 2 (rotation factor loadings)	Total	% of Variance	Cumulative %
Health management	Essential drug regime	0.846		3.457	34.565	34.565
	Drug safety management	0.818				
	Hygiene supervision management (food, drinking water, public places, etc.)	0.768				
	Severe mental illness management	0.693				
	Chronic disease management	0.612				
	Urban and rural residents' health file service	0.509				
Public health service	Preventive vaccination		0.801	2.848	28.484	63.049
	Infectious disease prevention		0.781			
	Special population health care (children, women, and the old)		0.722			
	Health education Service		0.595			

include 4 parts: core module, retrospect for 2003 items, social morality and public service satisfaction. The core module has 11 dimensions (social demographic, health, life style, migration, social attitude, class identity, political attitude and behavior, cognitive ability, labor market participation, social welfare, and family), and 152 variables.

### Measures

**Health service satisfaction (outcome variables).** In the 2013 CGSS questionnaire, 10 health services' satisfaction was investigated separately, including: (a) essential drug regime, (b) drug safety management, (c) hygiene supervision management (food, drinking water, public places, etc.), (d) severe mental illness management, (e) chronic disease management, (f) urban and rural residents' health file service, (g) preventive vaccination, (h) infectious disease prevention, (i) special population health care (children, women, and the old), and (j) health education service. Five scores measured each health service's satisfaction: 5—very satisfied, 4—satisfied, 3—neutrality, 2—dissatisfied, and 1—very dissatisfied.

For better understanding the satisfaction with health service, exploratory factor analysis (EFA) was used for dimensionality reduction. Before applying the EFA, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test and Bartlett Test of Sphericity were applied to find the applicability of factor analysis. After calculation, KMO was 0.89, which exceeded 0.5, and Bartlett's Test of Sphericity also vindicated the applicability of factor analysis ( $\chi^2$ : 27036.973,  $P < .001$ ). Then the EFA was conducted. The extraction method is principal component analysis (PCA). The results were presented in Table 1 and the 10 health services were described as items in the table. The table showed that out of 10 variables used in the study, 2 factors were

explored, which were capable of explaining 63.049% of the variance among variables. Of which 34.565% was explained by factor 1, and 28.484% was explained by factor 2. Overall, the results of the factor analysis were acceptable.

Further combining each health service's specific content, factor 1 could be labeled "Health management service" and factor 2 could be labeled "Public health service" according to the main content covered by each factor and related research.<sup>25</sup> The total satisfaction score for each factor was calculated. The medians of the total score were 18 for factor 1 and 14 for factor 2. For each factor, the satisfaction was defined as "satisfied" if the score  $\geq$  median score; otherwise, the satisfaction was described as "not satisfied."

**Andersen's behavioral model related variables (independent variables).** Andersen's Behavioral Model has been used extensively in studies on health services.<sup>18,19</sup> It assumes that a person's use of health services is affected by 3 factors, including predisposing, enabling, and demand factors. The predisposing factors refer to sociodemographic variables (such as age, sex, education, and marital status). The enabling factors include resources that can inhibit or promote health services usage (namely, income, access to health insurance or pension), and demand factors mean the demand for health care services (ie, health status).

In this study, the predisposing factors included sex, age, marital status, education level, and hukou (household registration). China's hukou system is a system to control population mobility. Individuals must register in one and only one fixed place of residence. Generally, the most common classification of hukou is urban hukou and rural hukou.<sup>26</sup> As for enabling factors, they included personal annual income (RMB), perceived household income, and access to health insurance and pension. Moreover, the demand factors in the

study were self-reported whether health problems affect work or life. All the above variable information can be found in the questionnaire.

**Social environment variables (independent variables).** Individuals are social actors and reside in social environments that contain different levels of support and resources. Many studies have shown that the social environment can affect the use of health services,<sup>20,21</sup> such as social class,<sup>23</sup> social capital,<sup>24</sup> social support,<sup>21</sup> and so on. Therefore, some variables related to the social environment in the CGSS questionnaire were also selected as independent variables. The variables included “perceived social trust (the majority of people are worthy of trust),” “perceived social equity” and “perceived social class (which level do you think you are in the social class?).”

Moreover, China performs a regional division based on the local economic level. The whole country can be divided into 4 regions with different economic levels by the National Bureau of Statistics of China, including the east region (the most prosperous region), central region (middle economic level), west region (the least developed region), and north-east region (middle economic level, focus on heavy industry development). Thus, we also included this variable in the study as a social-economic factor.

### Common Method Bias Check

In this study, the CGSS questionnaire contains some self-report scales to measure the social environment and satisfaction with health services. In addition to this, the CGSS data was a cross-section data collected over a specific timeframe (in 2013). Therefore, common method bias might exist in this study, producing a systematic covariation above the true relationship between the scale items.<sup>27</sup>

Harman’s single-factor test is a simple and widespread statistical method that detects common method bias.<sup>28</sup> All the scale items are introduced into an exploratory factor analysis to determine the number of factors that are necessary to account for the variance in the variables. If common method bias exists, only 1 component will account for more than 50% of the covariance between the items and the criterion constructs.<sup>29,30</sup> Our result was 33.46%, smaller than 40%. Therefore, we can think that common method bias does not exist in this study.

### Statistical Analysis

The satisfaction was described, and the Chi-square test was used to examine the statistical difference between sociodemographic characteristics. The Cochran-Armitage trend test was used to investigate trends in satisfaction across the variables. The multicollinearity between the multivariate was tested. All values of variance inflation factor (VIF) were less than 10 which showed no multicollinearity existed in the

data set. Then, a multivariable logistic regression model was implied to evaluate the associations between satisfaction and sociodemographic factors. Odds Ratio (OR) and its 95% confidence interval (95%CI) were calculated.

All statistical tests were 2-sided, and  $P$ -values of  $<.05$  were considered as statistically significant. Data were statistically analyzed using R software 3.6.3 (2020-02-29) (R Core Team 2020).

## Results

A total of 5283 subjects were enrolled in this study, including 5149 answered the “satisfaction with health management service,” and 5269 answered the “satisfaction with public health service.” The total satisfaction was 56.74% for “health management service” and 54.48% for “public health service.”

### Descriptive Analysis

For both satisfaction with “health management service” and “public health service” (Table 2), the higher satisfaction was observed in individuals: (a) over 70 years (64.49% and 55.63%), (b) married (57.26% and 55.30%), (c) with elementary school education level or below (64.77% and 56.37%), (d) having medical insurance (not include commercial medical insurance) (57.29% and 55.32%), (e) having pension (not include commercial pension) (58.47% and 57.18%), (f) who had the highest social trust (68.61% and 66.31%), (g) who thought the society was fair (71.81% and 74.84%), and (h) from the western region (65.17% and 63.83%). All the above Chi-square test  $P$ -values were less than .05. Moreover, the results of the Cochran-Armitage trend test showed that satisfaction had an upward trend with the increase of age, perceived social trust, and perceived social equity, but with a decrease of education level (all trend  $P < .05$ ).

In addition to the above, for “satisfaction with health management service,” the higher satisfaction was also found in persons with rural hukou (61.39%,  $P < .001$ ) and low personal annual income ( $<10000$ RMB) (61.99%,  $P < .001$ ). However, as income increased, the satisfaction decreases (trend  $P < .001$ ).

As for “satisfaction with public health service,” the individuals with above-average perceived household income, who never had health problems affecting work or life, and who thought they were in the upper social class reported a higher satisfaction (62.59%, 59.12%, and 62.13%, respectively). The satisfaction also showed trend changes in terms of these 3 characteristics (all  $P < .05$ ).

### Logistic Regression Analysis

Table 2 displays multivariable logistic regression results of sociodemographic characteristics associated with high health service satisfaction.

**Table 2.** Multivariable Logistic Regression Models of Predictors for High Satisfaction Levels in Health Service among CGSS (2013) Respondents.

	Health management (N = 5149)			Public health service (N = 5269)		
	High satisfaction	OR	P <sup>1</sup>	High satisfaction	OR	P <sup>1</sup>
Sex						
Male	56.19% (1462)	Reference		54.52% (1454)	Reference	
Female	57.32% (1460)	1.005 (0.881-1.147)	.942	54.46% (1417)	0.984 (0.864-1.121)	.807
Age						
≤30	48.62% (406)	Reference		49.23% (415)	Reference	
31-50	56.30% (1131)	1.253 (1.016-1.544)	.035*	54.14% (1112)	1.125 (0.913-1.386)	.270
51-69	58.55% (1000)	1.199 (0.953-1.509)	.121	57.03% (998)	1.249 (0.994-1.569)	.056
≥70	64.49% (385)	1.475 (1.106-1.968)	.008**	55.63% (346)	1.107 (0.836-1.466)	.477
Marriage						
Married	57.26% (2252)	Reference		55.30% (2231)	Reference	
Others <sup>2</sup>	54.82% (660)	0.957 (0.811-1.130)	.603	51.68% (632)	0.937 (0.796-1.104)	.436
Education level						
Elementary school level or below	64.77% (1151)	Reference		56.37% (1031)	Reference	
Junior/senior middle school or technical secondary school	54.21% (1366)	0.772 (0.656-0.909)	.002**	54.54% (1405)	0.935 (0.797-1.098)	.415
Undergraduate or above	47.59% (405)	0.639 (0.498-0.820)	<0.001***	50.41% (435)	0.779 (0.609-0.998)	.048*
Hukou						
Rural resident	61.39% (1735)	Reference		55.32% (1607)	Reference	
Non-rural resident	51.12% (1184)	0.762 (0.653-0.888)	0.001**	53.59% (1263)	0.942 (0.809-1.098)	.447
Personal annual income (RMB)						
Low (<10,000)	61.99% (972)	Reference		55.07% (890)	Reference	
Median (10,000-29,999)	56.14% (900)	0.898 (0.759-1.062)	0.207	56.21% (914)	1.001 (0.849-1.180)	.993
High (≥30,000)	52.61% (767)	0.832 (0.680-1.019)	0.075	53.50% (795)	0.856 (0.702-1.045)	.127
Perceived household income						
Below average	55.65% (951)	Reference		49.63% (873)	Reference	
Average	57.68% (1742)	1.126 (0.970-1.308)	0.118	56.28% (1738)	1.247 (1.077-1.443)	.003**
Above average	54.14% (216)	1.084 (0.827-1.420)	0.561	62.59% (251)	1.701 (1.292-2.240)	<.001***
Whether health problems affect work or life						
Always	59.48% (69)	Reference		49.58% (59)	Reference	
Often	60.88% (277)	1.199 (0.745-1.929)	0.456	50.00% (233)	1.074 (0.673-1.714)	.764
Sometimes	57.40% (450)	1.178 (0.744-1.864)	0.486	49.88% (401)	1.057 (0.673-1.661)	.810
Rarely	55.18% (1038)	1.107 (0.708-1.731)	0.654	53.30% (1026)	1.222 (0.787-1.898)	.372
Never	57.11% (1088)	1.282 (0.818-2.008)	0.279	59.12% (1151)	1.583 (1.017-2.465)	.042*
Access to medical insurance <sup>3</sup> (not include commercial medical insurance)						
No	52.55% (278)	Reference		47.39% (254)	Reference	
Yes	57.29% (2630)	0.958 (0.763-1.203)	0.712	55.32% (2601)	1.057 (0.843-1.324)	.632

(continued)

**Table 2. (continued)**

	Health management (N=5149)			Public health service (N=5269)		
	High satisfaction	OR	P <sup>1</sup>	High satisfaction	OR	P <sup>1</sup>
Access to commercial medical insurance						
No	56.71% (2528)	Reference		54.15% (2473)	Reference	
Yes	52.22% (235)	0.965 (0.724-1.286)	0.807	54.97% (249)	1.081 (0.810-1.443)	.597
Access to pension <sup>4</sup> (not include commercial pension)						
No	53.14% (845)	Reference		48.95% (794)	Reference	
Yes	58.47% (2020)	1.310 (1.125-1.525)	0.001**	57.18% (2024)	1.278 (1.101-1.485)	.001**
Access to commercial pension						
No	56.45% (2576)	Reference		54.05% (2524)	Reference	
Yes	53.80% (177)	1.107 (0.808-1.516)	0.527	55.99% (187)	0.960 (0.700-1.317)	.801
Perceived social trust (the majority of people are worthy of trust)						
Level 1 (strongly disagree)	46.46% (118)	Reference		42.02% (108)	Reference	
Level 2 (disagree)	51.20% (621)	1.230 (0.903-1.676)	0.190	48.74% (602)	1.284 (0.941-1.751)	.115
Level 3 (neutrality)	58.95% (461)	1.552 (1.116-2.159)	0.009**	52.00% (416)	1.455 (1.047-2.023)	.026*
Level 4 (agree)	58.42% (1533)	1.371 (1.016-1.851)	0.039*	57.85% (1559)	1.572 (1.163-2.124)	.003**
Level 5 (strongly agree)	68.61% (188)	2.186 (1.459-3.275)	<0.001***	66.31% (185)	2.244 (1.505-3.345)	<.001***
Perceived social equity						
Level 1 (totally unfair)	43.21% (159)	Reference		43.88% (165)	Reference	
Level 2 (unfair)	47.66% (714)	1.117 (0.859-1.451)	0.409	47.57% (725)	1.068 (0.824-1.385)	.619
Level 3 (neutrality)	57.40% (698)	1.412 (1.076-1.853)	0.013**	51.20% (641)	1.086 (0.829-1.422)	.549
Level 4 (fair)	64.80% (1239)	1.841 (1.413-2.398)	<0.001***	62.58% (1224)	1.595 (1.227-2.074)	<.001***
Level 5 (totally fair)	71.81% (107)	1.932 (1.232-3.030)	0.004**	74.84% (116)	2.120 (1.349-3.334)	<.001***
Perceived social class (Which level do you think you are in the social class?)						
Bottom	55.45% (829)	Reference		49.67% (759)	Reference	
Middle	56.97% (1848)	1.019 (0.875-1.188)	0.806	55.82% (1855)	1.130 (0.973-1.313)	.111
Upper	59.85% (237)	1.243 (0.947-1.632)	0.117	62.13% (251)	1.462 (1.114-1.919)	.006**
Regional division based on economic level						
East region	55.55% (1056)	Reference		55.06% (1067)	Reference	
Central region	52.22% (660)	0.771 (0.648-0.917)	0.003**	49.46% (644)	0.824 (0.695-0.977)	.026*
West region	65.17% (829)	1.330 (1.116-1.585)	0.001**	63.83% (840)	1.450 (1.220-1.722)	<.001***
North-east region	52.95% (377)	0.906 (0.741-1.106)	0.331	44.88% (320)	0.725 (0.594-0.885)	.002**

<sup>1</sup>P for logistic regression.\*P<.05. \*\*P<.01. \*\*\*P<.001.

<sup>2</sup>Include unmarried, cohabitation, separated and not divorced, divorce, and widowed.

<sup>3</sup>Include urban medical insurance, new cooperative medical insurance, and public medical insurance.

<sup>4</sup>Include rural pension, urban residents' pension.

In the model assessing “satisfaction with health management service,” individuals who aged 31 to 50 or over 70 years had higher satisfaction than those aged 30 years old and below (31-50 years OR (95%CI):1.253 (1.016-1.544);  $\geq 70$  years OR (95%CI): 1.475 (1.106-1.968)). Higher education levels had lower odds of reporting high satisfaction compared to an elementary school level or below. Non-rural residents showed lower satisfaction than rural residents (OR (95%CI): 0.762 (0.653-0.888)). Compared to the reference group, those who had a pension (not include commercial pension), who believed that society was more trustworthy and fairer, were all markedly associated with higher odds of reporting high satisfaction. Moreover, compared to the east region, the individuals from the central region had lower odds of reporting high satisfaction (OR (95%CI): 0.771 (0.648-0.917)). In comparison, those from the west region had higher odds (OR (95%CI): 1.330 (1.116-1.585)).

Regarding “satisfaction with public health service,” undergraduate individuals or above had significantly lower odds (OR (95%CI): 0.779 (0.609-0.998)) than those with elementary school level or below to satisfied with service. Results also found that individuals whose self-perceived household income were average and above had higher odds of satisfaction in comparison to those below average (OR (95%CI): 1.247 (1.077-1.443) and 1.701 (1.292-2.240), respectively). Those having a pension (not include commercial) had higher odds of satisfaction (OR (95%CI):1.278 (1.101-1.485) as compared to those without a pension. Additionally, having a higher degree of trust in the society, believing that the society was fair, and believing that they were in an upper class were also predictive of higher satisfaction than the reference groups. Finally, compared to the east region, the individuals from the central region or the north-east region had lower odds of reporting high satisfaction (OR (95%CI): 0.824 (0.695-0.977) and 0.725 (0.594-0.885), respectively), while those from the west region had higher odds (OR (95%CI): 1.450 (1.220-1.722)).

## Discussion

In this study, Chinese health service satisfaction was 55%, of which 48.93% for those under 30 years old and 58.14% for those over 50 years old. Compared with foreign countries, China’s satisfaction level was close but still lower. For example, the satisfaction with the Spanish national health service was 57.1%.<sup>31</sup> In Ethiopia, the satisfaction was 60.7% among adolescents aged 15 to 17 years.<sup>32</sup> As for the elderly aged 65 years or above, the satisfaction was 71% in Turkey.<sup>33</sup> Therefore, through comparison, the Chinese population’s satisfaction with health services needs to be improved.

Moreover, results also revealed that the satisfaction with “public health service” was lower than with “health management service.” It may be related to the development history of China’s public health services. In 2003, the “Severe Acute Respiratory Syndrome” (abbreviated as “SARS”) broke out

globally, originating in Guangdong Province, China. Before 2003 (the year of the SARS outbreak), China’s public health services experienced a period of deviation with more attention to treatment but little to prevention. It was not until after SARS that public health was gradually taken seriously. But there are still many challenges, including service quality, poor integration among service items, and so on.<sup>4</sup> In other words, China’s public health services must be improved.

Consistent with published researches,<sup>34,35</sup> we found that age was positively associated with satisfaction. The older population expressed higher satisfaction. An alternative explanation would be that the elderly were treated in a “more respectful and responsive manner” by staff who were, after all, much younger than them. Another explanation was that the elderly might have lower expectations concerning their health care than the younger people, and they were less inclined to question what they were told.<sup>36</sup>

Moreover, in China, associations between health service satisfaction and education level were inconsistent among different studies. Some studies found higher satisfaction among the population with lower education level.<sup>15</sup> Some studies reported the opposite results,<sup>37</sup> while others had discovered no significant relationship.<sup>38</sup> In this study, people with lower education levels were found to be more satisfied with health services. It may be because people with lower educational levels had better medication adherence.<sup>15</sup> Conversely, people with higher education were more inclined to ask questions about what was being told, and their medication adherence was not good. Meanwhile, people with higher education levels are expected to be given preferential treatment.<sup>39</sup> However, these possible inferences and inconsistent associations need to be tested in future studies.

Having a pension is an enabling factor that would increase an individual ability to access health services. Studies had reported that outpatient health services were more likely to be used among those with pension income.<sup>40</sup> In other words, people with a pension were more satisfied with the accessibility and usability of health services than those without a pension. However, although China had initially established a universal non-contributory pension, the pension system was not complete. Its benefit level was low, and the benefit level varied from region to region. These factors have caused the so-called universal coverage to be weak and incomplete.<sup>41</sup> Promoting pension reform and increasing its coverage is necessary for the future development of health services.

This study also indicated that people with more positive social environmental factors were more satisfied with hygiene satisfaction, which was consistent with the published study.<sup>42</sup> It is easy to understand: individuals who believed that most people in society were trustworthy also had higher trust in health service providers. When the individuals felt that society was fairer, they would also think that the provision and distribution of health services were more equitable and satisfying. Individuals with higher self-perceived social classes tended to have better economic income.



Better economic factors would increase their use of health services and favored the affluent.<sup>43</sup>

The regional economic level was also associated with health service satisfaction. The higher the economic level, the higher the satisfaction with health services. But the western region was an exception. Compared with the eastern region, the western region had higher satisfaction, although its economic level was low. This is mainly due to the country's "Great Western Development Strategy." This government program had extensively promoted the development of health services in the western region. Therefore, in addition to the regional economic level, government policy was also 1-factor affecting health service satisfaction.

Moreover, several limitations should be noted in our study. Firstly, the study is limited by the cross-sectional design, so causation cannot be inferred. Secondly, the survey is based on a self-reported questionnaire, which is associated with potential recall bias. Many variables, such as the social environment factors (ie, perceived social trust, perceived social equity, and perceived social class), were subjective. These were prone to participant response bias. Thirdly, although we find some factors influencing health service satisfaction, the mediating mechanisms in the relationship between these factors and satisfaction were not clear.

## Conclusions

In conclusion, the analysis in this study finds that approximately 55% of satisfaction with health services in China, including "Health management service" and "Public health service." Moreover, these findings also highlight the relative importance of age, education level, pension, social environment factors (such as perceived social trust, perceived social equity, and social class), regional economic level, and government policy in satisfaction with health service. To sum it up, our research has some practical value and theoretical implications.

These findings may be helpful for the health policy practice of China in some ways. Firstly, our research analyzed the overall level of Chinese residents' satisfaction with health management service and public health service. Also, our study showed the importance of social class, social attitudes, and economic regions for people's satisfaction with health services. These research findings will provide specific policy implications for Chinese health policymakers. People with different backgrounds have different satisfaction levels, so the specific situations and needs of different groups should be considered; simultaneously, attention should be paid to further improving the overall quality of health services in China. Actionable measures to increase satisfaction should be proposed by the Chinese government, such as expanding pension insurance coverage, developing local economies, increasing investment in health services, creating an excellent social environment, promoting and ensuring social

equality, and enhancing people's trust in health services. In more detail, for example, in response to the COVID-19 pandemic, China should further improve health equity.<sup>44</sup> Although financial protection was acquired by every patient who is confirmed to have COVID-19 (the out-of-pocket medical expenses would be subsidized by the government), it is still worth improving to provide every suspected patient with the same opportunity to seek medical treatment, especially for the elderly who could not use social media to seek help in the early stages of the outbreak.

Also, our research seeks to enrich relevant theoretical research on health service satisfaction. For the analytical perspectives and methods, this article analyzed the general Chinese population's satisfaction with health services and its influencing factors based on China's background. In particular, using factor analysis, we divided Chinese people's satisfaction with health service into health management service and public health service. Further, our research extended the current literature by analyzing and comparing 2 types of variables, Andersen's behavioral model related variables and social environment variables. These results supplemented and enriched the research on the factors affecting health service satisfaction. However, due to our research's related limitations, further studies on health service satisfaction mechanisms are warranted.

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## Ethics Approval and Consent to Participate

After ethical approval, the Chinese General Social Survey (CGSS) launched in 2003, is the earliest national representative continuous survey project run by academic institution in China mainland. We used the public data of CGSS, no additional ethics approval was needed.

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## Reference

- Chen Z. Launch of the health-care reform plan in China. *Lancet*. 2009;373(9672):1322-1324.
- Li L, Fu H. China's health care system reform: progress and prospects. *Int J Health Plann Manage*. 2017;32(3):240-253. doi:10.1002/hpm.2424.
- Liu GG, Vortherms SA, Hong X. China's health reform update. *Annu Rev Public Health*. 2017;38:431-448. doi:10.1146/annurev-publhealth-031816-044247.
- Wang L, Wang Z, Ma Q, Fang G, Yang J. The development and reform of public health in China from 1949 to 2019. *Global Health*. 2019;15(1):45. doi:10.1186/s12992-019-0486-6.
- Li X, Krumholz HM, Yip W, et al. Quality of primary health care in China: challenges and recommendations. *Lancet*. 2020;395(10239):1802-1812. doi:10.1016/S0140-6736(20)30122-7.
- World Health Organization. *The world health report 2000: health systems: improving performance*. World Health Organization; 2000.
- Hills R, Kitchen S. Development of a model of patient satisfaction with physiotherapy. *Physiother Theory Pract*. 2007;23(5):255-271. doi:10.1080/09593980701249929.
- Eriksen LR. Patient satisfaction with nursing care: concept clarification. *J Nurs Meas*. 1995;3(1):59-76.
- Batbaatar E, Dorjdagva J, Luvsannyam A, Amenta P. Conceptualisation of patient satisfaction: a systematic narrative literature review. *Perspect Public Health*. 2015;135(5):243-250. doi:10.1177/1757913915594196.
- Hussain A, Asif M, Jameel A, Hwang J. Measuring OPD patient satisfaction with different service delivery aspects at public hospitals in Pakistan. *Int J Environ Res Public Health*. 2019;16(13):2340. doi:10.3390/ijerph16132340.
- Asif M, Jameel A, Sahito N, Hwang J, Hussain A, Manzoor F. Can leadership enhance patient satisfaction? Assessing the role of administrative and medical quality. *Int J Environ Res Public Health*. 2019;16(17):3212. doi:10.3390/ijerph16173212.
- Manzoor F, Wei L, Hussain A, Asif M, Shah SIA. Patient satisfaction with health care services; An application of physician's behavior as a moderator. *Int J Environ Res Public Health*. 2019;16(18):3318. doi:10.3390/ijerph16183318.
- Kaur J, Hamajima N, Yamamoto E, et al. Patient satisfaction on the utilization of traditional and complementary medicine services at public hospitals in Malaysia. *Complement Ther Med*. 2019;42:422-428. doi:10.1016/j.ctim.2018.12.013.
- Amorim LP, Senna MIB, Alencar GP, Rodrigues LG, de Paula JS, Ferreira RC. User satisfaction with public oral health services in the Brazilian Unified Health System. *BMC Oral Health*. 2019;19(1):126. doi:10.1186/s12903-019-0803-8.
- Yin T, Yin DL, Xiao F, et al. Socioeconomic status moderates the association between patient satisfaction with community health service and self-management behaviors in patients with type 2 diabetes: a cross-sectional survey in China. *Medicine (Baltimore)*. 2019;98(22):e15849. doi:10.1097/MD.00000000000015849.
- Min R, Li L, Zi C, Fang P, Wang B, Tang C. Evaluation of patient experience in county-level public hospitals in China: a multicentred, cross-sectional study. *BMJ Open*. 2019;9(11):e034225. doi:10.1136/bmjopen-2019-034225.
- Huang J, Zhang T, Wang L, et al. The effect of family doctor-contracted services on noncommunicable disease self-management in Shanghai, China. *Int J Health Plann Manage*. 2019;34(3):935-946. doi:10.1002/hpm.2865.
- Qin S, Ding Y. Why not see a doctor when ill? Evidence from the Chinese elderly. *BMC Health Serv Res*. 2019;19(1):365. doi:10.1186/s12913-019-4212-0.
- Babitsch B, Gohl D, von Lengerke T. Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998-2011. *Psychosoc Med*. 2012;9:Doc11. doi:10.3205/psm000089.
- McCarthy M. Social determinants and inequalities in urban health. *Rev Environ Health*. 2000;15(1-2):97-108. doi:10.1515/rev.2000.15.1-2.97.
- Lee SY, Arozullah AM, Cho YI. Health literacy, social support, and health: a research agenda. *Soc Sci Med*. 2004;58(7):1309-13021. doi:10.1016/S0277-9536(03)00329-0.
- Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Mem Fund Q Health Soc*. 1973;51(1):95-124.
- Borrell C, Rohlfis I, Ferrando J, Pasarin MI, Dominguez-Berjon F, Plasencia A. Social inequalities in perceived health and the use of health services in a southern European urban area. *Int J Health Serv*. 1999;29(4):743-764. doi:10.2190/MVW3-PJ88-LYG4-EWQT.
- Aye M, Champagne F, Contandriopoulos AP. Economic role of solidarity and social capital in accessing modern health care services in the Ivory Coast. *Soc Sci Med*. 2002;55(11):1929-1946. doi:10.1016/s0277-9536(01)00322-7.
- Hou ZY. Can social insurance make us happier?—As mediated by self-identified stratum and moderated by public service performance perception. *J Public Adm*. 2018;11(6):87-111.
- Chan KW, Zhang L. The "hukou" system and rural-urban migration in China: processes and changes. *China Q*. 1999;160:818-55. doi:10.1017/s0305741000001351.
- Rodríguez-Ardura I, Meseguer-Artola A. How to prevent, detect and control common method variance in electronic commerce research. *J Theor Appl Electron Commer Res*. 2020;15(2):i-v.
- Fuller CM, Simmering MJ, Atinc G, Atinc Y, Babin BJ. Common methods variance detection in business research. *J Bus Res*. 2016;69(8):3192-3198.
- Podsakoff N. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J Appl Psychol*. 2003;88(5):879-930. doi:10.1037/0021-9010.88.5.879.
- Podsakoff PM, Organ DW. Self-reports in organizational research: problems and prospects. *J Manage*. 1986;12(4):531-544.
- Valls Martínez MDC, Ramirez-Orellana A. Patient satisfaction in the Spanish national health service: partial least squares structural equation modeling. *Int J Environ Res Public Health*. 2019;16(24):4886. doi:10.3390/ijerph16244886.
- Dagnew T, Tessema F, Hiko D. Health service utilization and reported satisfaction among adolescents in Dejen District, Ethiopia: a cross-sectional study. *Ethiop J Health Sci*. 2015;25(1):17-28. doi:10.4314/ejhs.v25i1.4.
- Caner A, Cilasan SM. Health care services and the elderly: Utilization and satisfaction in the aftermath of the Turkish

- health transformation program. *Gerontol Geriatr Med.* 2019; 5:2333721418822868. doi:10.1177/2333721418822868.
34. Peck BM. Age-related differences in doctor-patient interaction and patient satisfaction. *Curr Gerontol Geriatr Res.* 2011;2011:137492. doi:10.1155/2011/137492.
  35. Cohen G. Age and health status in a patient satisfaction survey. *Soc Sci Med.* 1996;42(7):1085-1093. doi:10.1016/0277-9536(95)00315-0.
  36. Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. *Soc Sci Med.* 1990;30(7):811-818. doi:10.1016/0277-9536(90)90205-7.
  37. Wu J, Zhang S, Chen H, et al. Patient satisfaction with community health service centers as gatekeepers and the influencing factors: a cross-sectional study in Shenzhen, China. *PLoS One.* 2016;11(8):e0161683. doi:10.1371/journal.pone.0161683.
  38. Xiong C, Chen X, Zhao X, Liu C. Patient satisfaction and gender composition of physicians - a cross-sectional study of community health services in Hubei, China. *BMC Health Serv Res.* 2018;18(1):217. doi:10.1186/s12913-018-3011-3.
  39. Adjei KK, Kikuchi K, Owusu-Agyei S, et al. Women's overall satisfaction with health facility delivery services in Ghana: a mixed-methods study. *Trop Med Health.* 2019;47:41. doi:10.1186/s41182-019-0172-7.
  40. Jiang M, Yang G, Fang L, Wan J, Yang Y, Wang Y. Factors associated with healthcare utilization among community-dwelling elderly in Shanghai, China. *PLoS One.* 2018;13(12):e0207646. doi:10.1371/journal.pone.0207646.
  41. Liu T, Sun L. Pension reform in China. *J Aging Soc Policy.* 2016;28(1):15-28. doi:10.1080/08959420.2016.1111725.
  42. Zhao D. Chinese public's trust in health system and its influencing factors. *J Zhejiang Univ.* 2018;5(1):67.
  43. Mahapatro SR. Socioeconomic inequality in healthcare utilization in India: is health insurance a way out? *J Popul Soc Stud.* 2020;28(1):89-102.
  44. Wang Z, Tang K. Combating COVID-19: health equity matters. *Nat Med.* 2020;26:458-458.