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Original Paper

Influencing Factors of the Long-term Care Needs of Disabled Elderly People in Urban and Rural Areas in China

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Abstract

As the population ages, the long-term care needs of elderly people with disabilities are becoming increasingly urgent. This study examines urban-rural differences in long-term care needs and their key determinants among older adults in China. Using data from the 2020 China Health and Retirement Longitudinal Study, we analyzed a sample of 8,533 individuals aged 60 and above with disabilities. A generalized ordered logistic regression model was applied to both the full sample and urban-rural subsamples. Results show that individuals aged 80 and above and those with four or more chronic diseases have significantly higher care needs, while better self-assessed health is associated with lower demand. Rural elderly individuals exhibit greater long-term care needs than their urban counterparts, especially those aged 80 and above, whose needs are 1.23 times higher. Chronic disease has a stronger effect on care needs in rural areas, and the protective effects of education and social participation are weaker. These findings highlight the importance of age, health status, and chronic disease burden in shaping long-term care demand and underscore significant urban-rural disparities. It is recommended that long-term care insurance be integrated into basic medical systems, prioritizing coverage for severely disabled rural populations and gradually expanding to include those with mild to moderate disabilities.

Keywords

Urban-Rural Disparities, Disabled Elderly People, Long-term Care Insurance

1. Introduction

In recent years, the global population has been undergoing a marked process of ageing, resulting in a persistent increase in the demand for long-term care. It is imperative that the determinants of this demand are understood if effective long-term care insurance systems are to be designed. A plethora of studies

have investigated the factors that influence long-term care needs and participation. At the individual level, the following factors have been identified as significant predictors: age, activities of daily living (ADL) and instrumental activities of daily living (IADL), cognitive function, and self-assessed health. For instance, a systematic review of 35 international studies found that age, education level, family structure, income, health insurance, and ADL status significantly affect older adults' willingness to participate in long-term care [1]. A further review focusing on nursing home residents found that physiological indicators such as dyspnea and oxygen therapy were associated with shorter institutional stays [2]. Social and familial factors have also been identified as playing a crucial role. Key influences on the phenomenon under investigation include family structure, living arrangements, and social support. A study conducted in Germany [3] found that older men and those living with spouses or relatives expressed a preference for family care. In contrast, individuals with prior caregiving experience were more likely to opt for home-based care. The demand for this product is further influenced by economic and institutional factors. In China, research has demonstrated that per capita GDP, the availability of community-based services, the proportion of older adults, and health status significantly affect urban elderly care demand [4]. In OECD countries, long-term care insurance policies tend to promote family-based care, while cash subsidies, although increasing flexibility, may perpetuate reliance on market-based services and migrant labor [5]. Furthermore, recent research has emphasized the importance of care service quality and individual characteristics. A German study reported that education, place of residence, and health status influence preferences for institutional care, while personality traits and birthplace are also significant in the context of overseas care choices [3]. A research study of the middle and upper Yangtze River region of China discovered that psychosocial variables, including self-image and perceived satisfaction with care needs, were found to have a significant influence on LTCI preferences [6].

Despite the growing body of literature on the subject, relatively little is known about how long-term care needs differ between urban and rural elderly populations, especially among individuals with varying degrees of disability. In China, where healthcare resources and ageing pressures vary significantly between regions, this discrepancy has tangible consequences. This study uses data from the 2020CHARLS to examine the long-term care requirements of elderly individuals with disabilities, with a particular focus on investigating urban-rural disparities. This study is to ascertain the key influencing factors, guide the rational allocation of long-term care resources, and provide evidence-based policy recommendations for expanding LTCI coverage to meet the diverse needs of older adults across regions and disability levels.

2. Methods

2.1 Data

This study uses data from the China Health and Retirement Longitudinal Study (CHARLS) 2020 for empirical research [7]. The survey was conducted by the China Social Science Survey Center at Peking University, with a baseline survey conducted in 2011 covering 28 provinces nationwide. It has been

updated to 2020. The database collects sample information on respondents' health status, family circumstances, and social support, among other aspects, which meets the sample information requirements of this study. This study uses the 2020 cross-sectional data as the research sample [8], excluding cases with missing core variables. A total of 8,533 elderly individuals aged 60 and above with disabilities were included, including 3,229 urban cases and 5,304 rural cases, accounting for 37.84% and 62.16%, respectively.

2.2 Research Methods and Variable Explanations

Research Methods. This study aims to analyze the factors influencing the long-term care needs of elderly individuals with varying degrees of disability and the urban-rural differences therein, employing a Generalized Ordered Logit Regression model for empirical analysis. The research adopts a two-step regression strategy: The model under discussion is a general regression model based on a national sample and urban-rural sample. These models are used to systematically identify key influencing factors and conduct a comparative analysis. $p< 0.05$ is typically considered to be statistically significant. The overall model is defined as follows:

$$\log\left[\frac{P(Y>j)}{P(Y\leq j)}\right]=\alpha_j+\beta_j X \qquad (j=1,2)$$

Variable Explanations. The study used long-term care needs as the dependent variable and selected gender, marital status, urban/rural residence, age, number of chronic diseases, educational attainment, social participation, and self-assessed health as independent variables based on relevant literature and research needs [9–15]. The explanations are shown in Table 1. This study uses the Katz Index [16] to classify dependency levels based on ADL (Activities of Daily Living) assessments, and quantifies cognitive ability using the HCAP (Health and Retirement Study Cognitive Assessment Protocol, HRS-CAP) classification method referenced in the CHARLS database [17]. The dependent variable is extracted from the “D. Health Status and Function” module of the CHARLS questionnaire. The level of care needs is determined by combining cognitive function and ADL scores: Mild needs refer to individuals who are independent in daily living but have moderate to severe cognitive impairment, or those with mild dependency and intact to moderate cognition. Moderate needs include those with mild dependency and severe cognitive impairment, or moderate dependency regardless of cognitive status. Severe needs apply to those with moderate dependency and severe cognitive impairment, or severe dependency regardless of cognitive function.

Table 1. Variable Names and Assignments

Variable	Assignment
Long-term Care Needs	0=Mild Demand, 1=Moderate Demand, 2=Heavy Demand
Gender	0=Female, 1=Male
Marriage	0=Other (Divorced, Unmarried, Widowed), 1=Married

Areas	0=Urban, 1=Rural
Age	0=60-69, 1=70-79, 2=80+
Chronic Disease	0=0, 1=1, 2=2, 3=3, 4=4 or More Types
Education	0=Elementary School and Below, 1=Junior High School, 2= High School and Above
Social Participation	0=No, 1=Yes
Self-assessed Health	0=Very Poor, 1=Poor, 2=Fair, 3=Good, 4=Very Good

3. Results

As shown in Table 2, this study included a total of 8,533 participants, including 4,033 males (47.26%) and 4,500 females (52.74%). 4,801 aged 60–69 years (56.26%), 2,979 aged 70–79 years (34.91%), and 753 aged 80 years and above (8.82%). Among them, 3,229 (37.84%) resided in urban areas and 5,304 (62.16%) in rural areas. Among the 8,533 samples included, 7,683 (90.04%) had mild long-term care needs, 702 (8.23%) had moderate needs, and 148 (1.73%) had severe needs.

Table 2. Basic Characteristics of the Sample (N=8533)

Basic Characteristics	Number (%)	Basic Characteristics	Number (%)	Basic Characteristics	Number (%)
LTC Need		**Marriage**		**Self-assessed Health**	
Mild Demand	7683 (90.04)	Married	6674 (78.21)	Very Poor	679 (7.96)
Moderate Demand	702 (8.23)	Other	1859 (21.79)	Poor	1871 (21.93)
Heavy Demand	148 (1.73)	**Education**		Fair	4233 (49.61)
Gender		Elementary School and Below	6397 (74.97)	Good	935 (10.96)
Female	4500 (52.74)	Junior High School	1365 (16.00)	Very Good	815 (9.55)
Male	4033 (47.26)	High School and Above	771 (9.04)	**Chronic Disease**	
Age		**Social Participation**		0	1 158(13.75)
60-69	4801 (56.26)	No	4696 (55.03)	1	1733 (20.31)

70-79	2979 (34.91)	Yes	3837 (44.97)	2	1780 (20.86)
80+	753 (8.82)	**Areas**		3	1447 (16.96)
		Urban	3229 (37.84)	4 or More Types	2415 (28.30)
		Rural	5304 (62.16)		

As demonstrated in Tables 3 and 4, a comparison of the long-term care needs of elderly individuals residing in urban and rural areas reveals that among samples with four or more chronic conditions, the proportion of moderate care needs in rural areas was 15.23%, and the proportion of severe care needs was 3%. The proportion of individuals in rural areas reporting a need for moderate care was 70%, which is higher than the urban proportion of 10.45%. Similarly, the proportion of individuals in rural areas reporting a need for severe care was 7.04%, which is also higher than the urban proportion of 10.95%. A notable disparity in demand distribution was observed among married individuals residing in urban areas, while no statistically significant differences were identified in rural areas. In urban samples, the proportions of moderate (7.65%) and severe (2.10%) demand among those not participating in social activities were higher than among participants and statistically significant. However, this indicator did not reach statistical significance in rural areas.

Table 3. Long-term Care Needs of City (n=3229)

		Mild Demand	**Moderate Demand**	**Heavy Demand**	χ^2
Gender	Female	1 574(90.72)	134(7.72)	27(1.56)	9.05**
	Male	1 397(93.51)	77(5.15)	20(1.34)	
Marriage	Married	2 331(93.13)	140(5.59)	32(1.28)	19.01***
	Other	640(88.15)	71(9.78)	15(2.07)	
Age	60–69	1 694(93.90)	91(5.04)	19(1.05)	28.59***
	70–79	989(90.15)	92(8.39)	16(1.46)	
	80+	288(87.80)	28(8.54)	12(3.66)	
Chronic Disease	0	398(96.14)	12(2.90)	4(0.97)	55.76***
	1	577(94.44)	29(4.75)	5(0.82)	
	2	626(93.71)	39(5.84)	3(0.45)	
	3	538(92.92)	31(5.35)	10(1.73)	
	4 or More Types	832(86.94)	100(10.45)	25(2.61)	
Education	Elementary School	1 848(90.46)	163(7.98)	32(1.57)	19.73***

	and Below				
	Junior High School	657(94.53)	29(4.17)	9(1.29)	
	High School and Above	466(94.91)	19(3.87)	6(1.22)	
Social Participation	No	1 462(90.25)	124(7.65)	34(2.10)	16.58***
	Yes	1 509(93.78)	87(5.41)	13(0.81)	
Self-assessed Health	Very Poor	146(69.52)	41(19.52)	23(10.95)	304.82***
	Poor	492(84.10)	77(13.16)	16(2.74)	
	Fair	1 624(95.08)	80(4.63)	5(0.29)	
	Good	375(97.66)	7(1.82)	2(0.52)	
	Very Good	316(97.83)	6(1.86)	1(0.31)	

Table 4. Long-term Care Needs of Rural (n=5304)

		Mild Demand	**Moderate Demand**	**Heavy Demand**	χ^2
Gender	Female	2 426(87.74)	288(10.42)	51(1.84)	9.27**
	Male	2 286(90.04)	203(8.00)	50(1.97)	
Marriage	Married	1 001(88.35)	103(9.09)	29(2.56)	3.33
	Other	3 711(88.97)	388(9.30)	72(1.73)	
Age	60–69	2 702(90.16)	253(8.44)	42(1.40)	21.51***
	70–79	1 648(87.57)	192(10.20)	42(2.23)	
	80+	362(85.18)	46(10.82)	17(4.00)	
Chronic Disease	0	721(96.91)	20(2.69)	3(0.40)	162.63***
	1	1 041(92.78)	69(6.15)	12(1.07)	
	2	1 007(90.56)	90(8.09)	15(1.35)	
	3	761(87.67)	90(10.37)	17(1.96)	
	4 or More Types	1 182(81.07)	222(15.23)	54(3.70)	
Education	Elementary School and Below	3 841(88.22)	422(9.69)	91(2.09)	14.03**
	Junior High School	606(90.45)	55(8.21)	9(1.34)	
	High School and Above	265(94.64)	14(5.00)	1(0.36)	
Social Participation	No	2 714(88.23)	297(9.66)	65(2.11)	3.24
	Yes	1 998(89.68)	194(8.71)	36(1.62)	
Self-assessed Health	Very Poor	323(68.87)	113(24.09)	33(7.04)	371.82***
	Poor	1 049(81.57)	198(15.40)	39(3.03)	
	Fair	2 339(93.34)	143(5.71)	24(0.96)	

Good	526(95.46)	22(3.99)	3(0.54)
Very Good	475(96.54)	15(3.05)	2(0.41)

Based on Table 5, the regression findings indicate that gender did not attain statistical significance in either the total sample or the urban and rural subsamples. This suggests that its impact on long-term care needs is negligible. The marital status of the subjects demonstrated a significant negative correlation, exclusively within the urban sample. This indicated that married older adults exhibited a reduced probability of experiencing long-term care needs. Self-reported enhancements in health status and an augmentation in the prevalence of chronic diseases have been demonstrated to manifest highly consistent and significant effects on care requirements, with the former being shown to markedly reduce risk and the latter to substantially increase risk.

In the overall sample, no statistically significant correlation was identified between gender and marital status, and demand for long-term care insurance. A comparison of the demand for long-term care between the 60–69 age group and the 70–79 age group reveals a significant increase in demand in the latter, with an even more pronounced increase in demand in the 80 and above age group. The correlation between the prevalence of chronic diseases and the demand for long-term care insurance is positive. In comparison with individuals possessing an education level equivalent to or below that of elementary school, those who have attained a high school diploma or higher exhibited a substantially diminished demand for long-term care services. Furthermore, engagement in social activities was found to markedly decrease this demand. In the context of self-assessed health, a positive correlation was identified between elevated health status and a significantly diminished demand for long-term care. In the urban subsample, married individuals exhibited a significantly lower demand for long-term care compared to unmarried individuals. The demand for long-term care was found to be significantly higher among older adults aged 70–79 and those aged 80 and above compared to those aged 60–69. The impact of chronic diseases on the demand for long-term care among urban older adults was not found to be statistically significant. Individuals with a middle school education exhibited a substantially lower demand compared to those with an elementary school education or below, and social participation significantly reduced their demand. The impact of self-assessed health on the demand for long-term care among urban elderly individuals is a significant negative one. In contrast, within the rural sub-sample, no statistically significant associations were identified between demand for long-term care and gender, marital status, social participation, or secondary school education. A statistically significant discrepancy has been observed in demand between the 80+ age group and the 60-69 age group. The number of chronic diseases is positively correlated with the demand. The demand among those with a high school education or higher is significantly lower than that among those with an elementary school education or below. The better the self-assessed health, the lower the demand for long-term care. The correlation between the prevalence of chronic diseases and demand is a subject that merits further investigation. The demand for this occupation is found to be significantly lower among those with a high school education or higher, in comparison to those with an

elementary school education or below. It has been demonstrated that a high level of self-assessed health corresponds to a reduced demand for long-term care.

Table 5. Results of Regression for LTC Demand

		Total			Urban			Rural		
		Coef	**SE**	**P**	**Coef**	**SE**	**P**	**Coef**	**SE**	**P**
α_1		-1.632***	0.222	0.000	-0.672	0.351	0.055	-1.902***	0.268	0.000
β_2	**Male**	-0.064	0.081	0.425	-0.074	0.149	0.620	-0.059	0.097	0.541
	Married	-0.055	0.092	0.549	-0.331*	0158	0.036	0.097	0.115	0.399
	70–79	0.171*	0.082	0.037	0.313*	0.150	0.036	0.111	0.099	0.261
	80+	0.465***	0.129	0.000	0.627**	0.216	0.004	0.403*	0.163	0.013
	1 Chronic Type	0.442*	0.193	0.022	-0.009	0.321	0.978	0.659**	0.245	0.007
	2 Chronic Types	0.532**	0.190	0.005	0.016	0.313	0.959	0.787***	0.241	0.001
	3 Chronic Types	0.647***	0.192	0.001	-0.032	0.318	0.921	0.975***	0.243	0.000
	4 and More Chronic Types	0.950***	0.182	0.000	0.309	0.295	0.296	1.264***	0.232	0.000
	Junior High School	-0.219	0.118	0.065	-0.429*	0.194	0.027	-0.071	0.150	0.636
	High School and Above	-0.567***	0.176	0.001	-0.427	0.231	0.065	-0.748**	0.281	0.008
	Social	-0.160*	0.078	0.039	-0.326*	0.140	0.020	-0.074	0.093	0.426
	Poor Self-Assessed Health	-0.719***	0.103	0.000	-0.848***	0.190	0.000	-0.676***	0.124	0.000
	Fair Self-Assessed Health	-1.730***	0.109	0.000	-1.995***	0.196	0.000	-1.625***	0.132	0.000
	Good Self-Assessed Health	-2.118***	0.199	0.000	-2.705***	0.383	0.000	-1.870***	0.234	0.000
	Very Good Self-Assessed Health	-2.307***	0.230	0.000	-2.822***	0.425	0.000	-2.101***	0.274	0.000
α_2		-3.545***	0.239	0.000	-2.296***	0.371	0.000	-3.923***	0.286	0.000
β_2	**Male**	-0.064	0.081	0.425	-0.074	0.149	0.620	-0.059	0.097	0.541
	Married	-0.055	0.092	0.549	-0.331*	0158	0.036	0.097	0.115	0.399
	70–79	0.171*	0.082	0.037	0.313*	0.150	0.036	0.111	0.099	0.261
	80+	1.016***	0.220	0.000	0.627**	0.216	0.004	0.931***	0.281	0.001
	1 Chronic Type	0.442*	0.193	0.022	-0.009	0.321	0.978	0.659**	0.245	0.007
	2 Chronic Types	0.532**	0.190	0.005	0.016	0.313	0.959	0.787***	0.241	0.001
	3 Chronic Types	0.647***	0.192	0.001	-0.032	0.318	0.921	0.975***	0.243	0.000
	4 and More Chronic Types	0.950***	0.182	0.000	0.309	0.295	0.296	1.264***	0.232	0.000
	Junior High School	-0.219	0.118	0.065	-0.429*	0.194	0.027	-0.071	0.150	0.636
	High School and Above	-0.567***	0.176	0.001	-0.427	0.231	0.065	-0.748**	0.281	0.008
	Social	-0.160*	0.078	0.039	-0.326*	0.140	0.020	-0.074	0.093	0.426
	Poor Self-Assessment	-0.719***	0.103	0.000	-0.848***	0.190	0.000	-0.676***	0.124	0.000

Health									
Fair Self-Assessed Health	-2.127***	0.220	0.000	-3.264***	0.492	0.000	-1.625***	0.132	0.000
Good Self-Assessed Health	-2.118***	0.199	0.000	-2.705***	0.383	0.000	-1.870***	0.234	0.000
Very Good Self-Assessed Health	-2.307***	0.230	0.000	-2.822***	0.425	0.000	-2.101***	0.274	0.000

4. Discussion

Based on Table 5, age, chronic disease, education, and social participation are pivotal factors influencing the necessity for long-term care. These factors demonstrate considerable heterogeneity between urban and rural populations.

Existing research indicates that the impact of age on long-term care needs yields two distinct outcomes. A study based on a Markov [18] model shows that the probability of individuals aged 80 and above transitioning from independent living to moderate or severe dependency significantly increases. Furthermore, extant research posits that as individuals age, they are more likely to require care [15,19]. German and Japan also considers age a key factor in long-term care insurance assessments [20–22]. However, some research indicates no significant association between age and long-term care needs [23, 24]. The results of this study indicate that, compared to the 60–69 age group, the demand for long-term care among those aged 80 and above increased by nearly 176%. Further analysis by urban and rural areas revealed that the impact of age on the demand for long-term care was more significant in rural areas, particularly in terms of the intensity of the transition to higher levels of care. Among the elderly population aged 80 and above with disabilities, rural elderly individuals have a 1.23 times higher demand for long-term care compared to urban elderly individuals. This differs from previous studies, which indicated that urban elderly individuals have a stronger willingness to purchase long-term care insurance. Regardless of whether they are urban or rural, age is an important factor influencing the demand for long-term care. As age increases, the demand for long-term care also rises, and this effect is more pronounced among elderly individuals with disabilities, especially in rural areas. As such, age is a significant factor influencing long-term care needs, with demand increasing with age. This trend is particularly pronounced among elderly individuals with disabilities, especially those in rural areas. Related studies also indicate that as the elderly age, their physical functions decline due to the combined effects of physiological factors and natural laws, and their level of disability gradually worsens. Since China's long-term care insurance is based on urban employee medical insurance, and among the 49 cities that have implemented long-term care insurance, only 23.5% include moderate disability in their coverage, while rural areas are largely without such systems, there is an even greater need for institutional safeguards.

The research findings indicate that the impact of self-assessed health on the demand for long-term care exhibits significant differences between urban and rural areas: individuals with better self-assessed health actually have lower demand for long-term care insurance. Empirical analysis shows that, in the overall sample, the group with self-reported health as “average” saw a 88.1% decrease in long-term care needs;

however, in the rural sample, the decrease narrowed to 80.3%, while in the urban sample, the inhibitory effect on the demand for severe disability care reached as high as 96.2%. In previous studies, most scholars have argued that better self-assessed health indicates that insured individuals have more forward-looking needs and are more likely to purchase long-term care insurance [19, 25–28]. However, this study found that individuals with better self-assessed health have lower demand for long-term care insurance. This suggests that individuals with poorer health are more likely to purchase long-term care insurance, while those with mild to moderate disability often lack awareness of their functional decline, leading to delayed insurance decisions until the severe stage. The urban-rural disparity is further confirmed from the perspective of chronic diseases. Previous studies have shown that the number of chronic diseases is also an important positive predictor of long-term care needs [13, 15, 21–23, 29]. In a study on long-term care insurance in the United States, individuals with a family history of chronic diseases were recommended to purchase long-term care insurance [30]. In this research, its impact was more significant in rural areas. In the rural sample, older adults with four or more chronic diseases faced a higher risk of disability, with their care needs being approximately 1.26 times higher than those of other groups, indicating that multiple coexisting diseases are more likely to increase the care burden in environments with relatively insufficient medical resources. Data shows that among low-risk and medium-risk chronic disease groups, the increase in long-term care needs in rural areas reached 93% and 120%, respectively, far exceeding the -1% and 2% increases in urban areas. This significant gap reflects that rural elderly people face higher care needs at an early stage of disability but struggle to obtain effective protection. China's long-term care insurance system has exhibited issues such as a narrow scope of coverage, inconsistent standards for assessing disability levels, unreasonable rules for benefit disbursement, and a limited range of beneficiaries during its pilot phase. On one hand, rural areas suffer from insufficient grassroots healthcare resources and lagging system coverage; on the other hand, while urban residents have greater opportunities to obtain alternative support through market-based means, there is also a “middle-tier gap” phenomenon, with some mildly to moderately disabled groups struggling to be included in the existing system.

5. Conclusion

This study investigates the key factors influencing the long-term care needs of elderly individuals with disabilities in China, with a particular emphasis on urban-rural disparities. Research findings indicate that age, the number of chronic diseases, and self-assessed health status significantly affect long-term care requirements. These effects are more pronounced in rural areas, primarily due to weaker protective factors such as lower educational attainment and limited social participation, resulting in higher care demands among the rural elderly population. A notable disparity exists between urban and rural populations in terms of care needs. Urban residents generally benefit from greater socio-economic resources and increased opportunities for social engagement, whereas elderly individuals in rural regions—particularly those aged 80 or older or suffering from four or more chronic conditions—exhibit

significantly elevated care needs. This trend highlights a misalignment between the current long-term care insurance framework and the actual health burdens faced by rural elderly populations. Presently, the system predominantly covers individuals with severe disabilities, overlooking those with mild to moderate care requirements. Therefore, it is imperative to expand the coverage of long-term care insurance, particularly in rural areas, by integrating it into the basic public health service system and prioritizing the inclusion of moderately disabled elderly individuals within the scope of protection.

Future policy initiatives should focus on addressing regional disparities in access to long-term care services. Additionally, efforts must be directed toward strengthening early identification mechanisms for high-risk groups, enhancing preventive care measures, and reinforcing community-based support systems. These actions will help ensure equitable access to timely and appropriate long-term care services for all elderly individuals.

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