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Heterogeneous Effects of Socioeconomic Status on Health Outcomes among Middle-Aged and Older Adults: Evidence from Five Waves of CHARLS

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Abstract

This paper uses data from five waves of the China Health and Retirement Longitudinal Study (CHARLS) (N = 37,710) to measure the health of middle-aged and older adults from the four dimensions of Activities of Daily Living (ADL), self-rated health, mental health, and the number of chronic diseases. It uses principal component analysis to construct a comprehensive socioeconomic status (SES) index, and uses negative binomial regression model, generalized ordered logit and linear regression model to test the impact of SES on health and its urban-rural and gender heterogeneity. The study found that SES has a significant positive protective effect on health. High-SES groups have stronger Activities of Daily Living (ADL), better mental health, and better self-rated health, but it is positively related to the number of chronic diseases, mainly reflecting the higher detection rate of high-SES groups; There are significant urban-rural and gender differences in this effect, which has a greater impact on rural and female groups, especially in the mental health dimension. The conclusion of the robustness test is established. This article provides vertical evidence for understanding the health inequality of middle-aged and older adults in China, and then puts forward suggestions in terms of improving rural health security, formulating gender differentiation strategies, and improving screening fairness to promote healthy aging.

Keywords

socioeconomic status, health of middle-aged and older adults, health inequality, urban–rural disparities, gender differences

1. Introduction

Health is the basic condition for economic and social development. At present, the aging of China continues to deepen, and the population aged 60 and above has increased from 264 million in 2020 to 323 million in 2025, accounting for 23.0%. The “Healthy China 2030” Planning Outline and related implementation guidelines both place health as a strategic priority, emphasizing the gradual reduction of health disparities among populations and promoting healthy aging and sustainable development.

Socioeconomic status (SES) reflects individuals' access to multidimensional resources, including income, education, and occupation [1]. Studies have confirmed that there is a stable positive correlation between SES and the health of middle-aged and older adults [2]. From the perspective of human capital, the health capital

theory regards health as a capital stock that can be depreciated with age, and individuals can maintain health through resource investment [3]; Social stratification theory emphasizes that SES determines the ability of individuals to access "flexible resources" to respond to health threats. SES may not only directly affect health, but also indirectly play a role through health behavior, access to medical services and other pathways [4].

Although existing studies have provided important references for understanding the relationship between socioeconomic status and health, there is still room for further exploration in data application and moderating effect testing. Based on this, based on the theory of health capital and social stratification theory, this study uses CHARLS multi-period tracking data to empirically analyze the relationship between SES and the health of middle-aged and older adults, aiming to provide empirical supplements for understanding health inequality in the Chinese context and provide a reference basis for the formulation of differentiated health promotion policies.

2. Literature Review

2.1 Literature Review

The relationship between socioeconomic status and health has been confirmed by a large number of studies. Health capital theory regards health as a capital stock that can be depreciated with age, and individuals can maintain and improve it through health investment [1, 3]. The theory of social stratification emphasizes that the unequal distribution of resources leads to health inequality and has a cumulative effect [4].

In terms of income, higher income is conducive to access to quality medical care and a healthy lifestyle, which is positively related to self-assessment of health, and low-income groups are at higher risk of chronic diseases and restricted daily activities [5]. As a core indicator of socioeconomic status, education not only affects the acquisition of health knowledge, but also reflects the development of health behavior. People with higher education are more inclined to active health management [6, 1]. SES can also indirectly affect health by improving sleep and promoting exercise [7, 2]. But the relationship between the two is not always linear. Chinese older adults with higher socioeconomic status are longer in terms of "disability life expectancy" [8, 3]. Sometimes it is also associated with a higher risk of dyslipidemia, indicating that the influence mechanism is shaped by cultural background and disease spectrum changes [4, 9]. In general, the positive health effects of socioeconomic status remain the mainstream conclusion, but their relationship is situationally dependent and needs to be examined in different social environments.

The dual structure of urban and rural areas is one of the basic characteristics of Chinese society. This structural difference deeply affects the intensity of the relationship between socioeconomic status and health. Urban seniors usually have better health status [5, 10]. In rural areas, medical care and security resources are relatively weak, and the impact of socioeconomic status on health is more significant in groups with low socioeconomic status [6, 5]. Urban infrastructure and security systems buffer the negative effects of low socioeconomic status, and the decisive role of rural individual resource endowment on health is more prominent [7, 11]. The promotion of equal resources has a greater effect on improving the health of the rural elderly [12]. In summary, the differences in the distribution of urban and rural resources can regulate the impact of socioeconomic status on health to a certain extent.

With the gradual coverage of rural revitalization and medical insurance and old-age care system, the gap between urban and rural security has narrowed [8, 13]. From the perspective of social stratification, the dual structure of urban and rural areas is an institutional stratification mechanism, and the institutional arrangement shapes the rules of resource allocation. The study found that the health inequality of the elderly in urban and rural areas exists objectively, and the use of the Internet plays a partial intermediary role in it [9, 14]. It shows that the impact mechanism of urban and rural differences on health in the digital era is further complicated. Existing research generally supports the judgment that socioeconomic status has a stronger effect on the health of middle-aged and older adults in rural areas, but its intensity is adjusted with changes in the policy environment.

As an important dimension of social stratification, gender also regulates the relationship between socioeconomic status and the health of middle-aged and older adults. Studies show that socioeconomic status has a more significant impact on women's health than men, especially in terms of mental health and self-rated

health [10, 15]. However, the direction of the moderating effect may vary depending on the health indicators [16].

Domestic studies have found that Chinese women are at a disadvantage at all ages because their health returns from education and income are lower than those of men [11, 17]. In addition, the impact of education level, endowment insurance and medical insurance on the health of men and women shows different patterns [12, 1]. It is worth noting that the gender gap in old age may narrow, which may be related to selective survival - individuals with poorer health die early, resulting in a weakening of the health differences between different sexes in the elderly group [13, 18]. These findings show that women are more sensitive to the health effects of economic resources due to the division of labor and the unequal status of the labor market [14, 19].

2.2 Literature Evaluation

Through the combing of existing literature, the positive relationship between socioeconomic status and the health of middle-aged and older adults has been widely verified. Secondly, urban-rural and gender differences, as an important social structural factor, have attracted the attention of the academic community. Most studies support that this effect is more prominent in rural areas and female groups.

However, there is still room for deepening the existing research. First, in terms of data application, most studies are limited by cross-section or short-term span, and it is difficult to capture long-term dynamics and separate age, period and cohort effects [17, 20]. Second, in terms of moderating effect, most scholars focus on single-dimensional analysis and rarely include the two in the same analytical framework for systematic comparison. Third, in terms of content design, the measurement standards of socioeconomic status and health are different for different studies. Differences in indicator measurement and model setting may lead to heterogeneity of conclusions, and a more unified and stable analytical framework is needed for comprehensive testing.

Finally, this study is based on the five-phase tracking data of CHARLS, integrates the theory of health capital and the theory of social stratification, and uses multi-phase panel data regression to systematically test the dual adjustment effect of urban and rural areas and gender.

3. Theoretical Framework and Hypotheses Development

3.1 Theoretical Foundations

This research takes the theory of health capital and the theory of social stratification as the common interpretation framework. The theory of health capital was proposed by Grossman in 1972 [1]. He regarded health as a capital stock that can be depreciated with age. Individuals can slow down the depreciation through health investments such as medical services and a healthy diet, so as to achieve health capital accumulation to obtain health output and economic returns [3, 21, 15, 22, 16]. The theory reveals that SES affects health stock through differences in investment capacity: those with higher education have stronger health production efficiency, and those with higher income have more abundant investment resources [3]. This mechanism is especially important in middle-aged and elderly age - the health depreciation rate increases significantly with age, and the difference in investment capacity granted by SES directly determines the health differentiation between groups.

The theory of social stratification further explains how such differences arise systematically between groups. The “Fundamental Cause Theory of Health” proposed by Link and Phelan points out that SES determines the ability of individuals to acquire “flexible resources” such as knowledge, money, power and social connections to cope with changing health threats. Therefore, health inequality is deeply rooted in the social hierarchy [4, 17, 23]. The two theories complement each other. The former focuses on individual health investment behavior, while the latter is good at revealing the differences in health effects in different social situations. According to the theory of social stratification, individuals' own resource endowment in resource-scared fields is almost the only source of health investment, and the protective effect of SES is amplified; Public resources in resource-sufficient fields partially offset the advantage of personal resources [18, 24, 19, 26]. This logic also provides an analytical basis for understanding the heterogeneity effect of urban and rural areas and gender dimensions.

3.2 Hypotheses Development

Both the theory of health capital and the theory of social stratification point out that socioeconomic status has a positive impact on health, but the former focuses on the differences in individual health investment capacity, while the latter is better at explaining the changes in the strength and weakness of the effect in different social situations. Accordingly, the main effect hypothesis of this study is derived from the two theories, and the adjustment effect hypothesis is mainly based on the theory of social stratification.

Health capital theory points out that individuals with high SES have stronger health investment capacity and productivity, and can more effectively slow the depreciation of health capital and accumulate health capital through high-quality medical care, a healthy diet and exercise [20, 3]. The theory of social stratification emphasizes that SES determines the ability of individuals to access “flexible resources” [4], enabling them to prevent and respond to health threats more effectively. Based on this, this study puts forward the following assumptions:

H_1: The higher the socioeconomic status of middle-aged and older adults, the better their health.

Under the dual structure of urban and rural areas, the accessibility of medical resources, health information dissemination channels and infrastructure are relatively weak, and the buffering effect of external public resources on individual health is limited. According to the theory of social stratification, the endowment of individual resources plays a decisive role in health in resource-scarce environments - people with high SES can still obtain necessary services, while those with low SES fall into health disadvantages, and the SES effect is “amplified”; and the relatively perfect security system in cities partially offsets the negative impact of low SES. Accordingly, it is proposed that:

H_2: Compared with urban middle-aged and older adults, socioeconomic status has a more significant impact on the health status of rural middle-aged and older adults.

Traditional gender roles are expected to put women at a disadvantage in access to health resources; women have a lower average income, an earlier retirement age, limited disposable resources in old age, and more dependent on SES. Studies have shown that women’s health returns from education and income are lower than men's [17, 21]. Its health disadvantages run through the whole life course. Accordingly, it is proposed that:

H_3: Among the middle-aged and elderly, the socioeconomic status has a more significant impact on the health of middle-aged and elderly women.

3.3 Theoretical Framework

See Figure 1.

4. 4 Research Design

4.1 4.1 Data Source

The data in this article comes from the China Health and Elderly Care Tracking Survey (CHARLS). The project is hosted by the National Development Research Institute of Peking University. It is aimed at the middle-aged and older adults aged 45 and above. Multi-stage stratified probability sampling is adopted. The sample is representative in the country and provides a data basis for interdisciplinary research on aging problems [27]~[29]. This study selected the five survey data of 2011, 2013, 2015, 2018 and 2020. After screening and eliminating abnormal and missing values, 37,710 effective tracking samples were finally obtained, and Stata 18.0 software was used for data analysis.

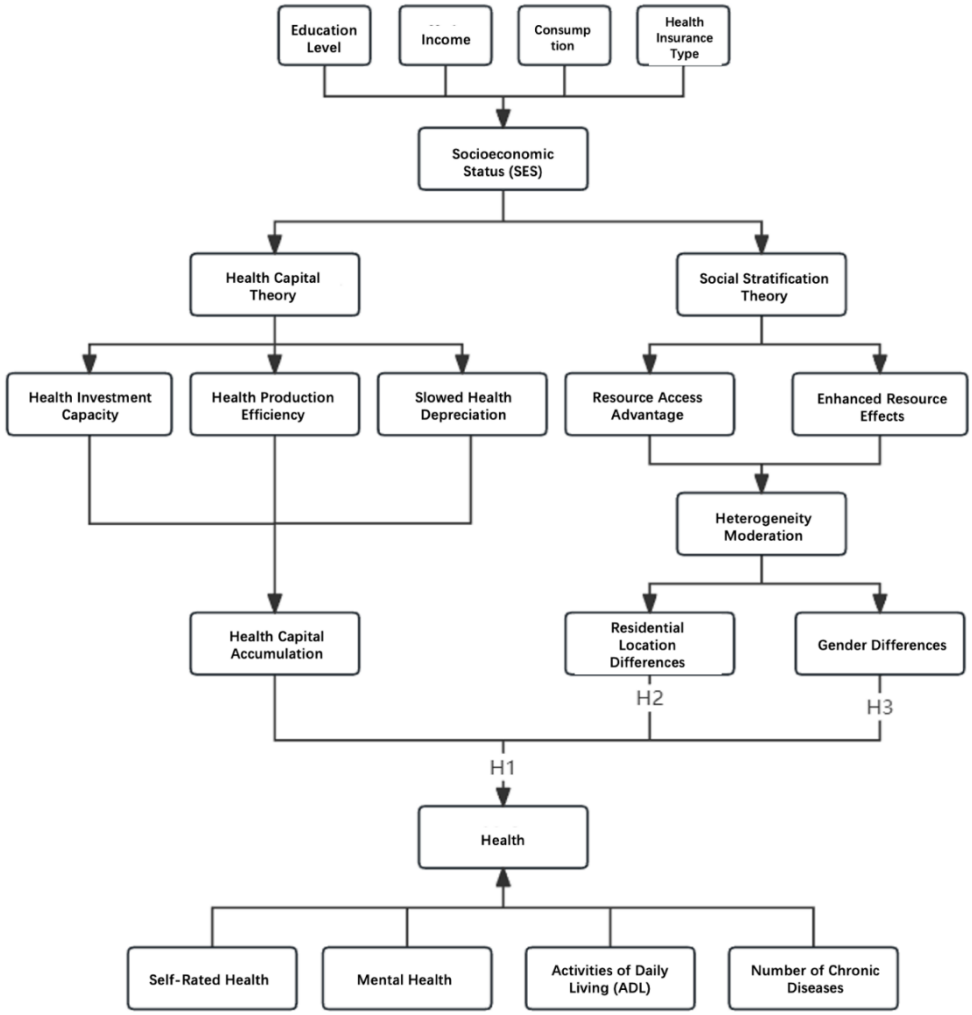
4.2 Variable Design

4.2.1 Dependent Variable

The explained variable in this article is the health status of middle-aged and older adults. Referring to existing studies, it is comprehensively measured from the four dimensions of Activities of Daily Living (ADL), self-rated health, mental health and the number of chronic diseases [30]~[32]. The Activities of Daily Living (ADL) of life is combined by ADL (6 items) and IADL (5 items). Each “difficult” is counted as 1 point, and

the total score is 0-11 points. The higher the score, the worse the ability, and the standardized processing is carried out during analysis. Self-assessment of health adopts a five-level score (1 = very bad to 5 = very good), and the higher the score, the better the self-assessment. The CES-D10 depression scale (0-30 points) is used for mental health. The higher the score, the worse the psychological condition. The number of chronic diseases summarizes the number of 14 common diseases such as hypertension and diabetes, ranging from 0 to 14, and the greater the number, the heavier the burden.

Figure 1: Theoretical Framework



4.2.2 Independent Variable

The key independent variable of this article is socioeconomic status. Referring to the practice of existing studies, this paper adopts Principal Component Analysis to integrate multiple related variables into a comprehensive indicator to more comprehensively measure the socioeconomic status of middle-aged and older adults [2], [32]. Integrate the four variables of family per capita income, family per capita consumption, education level (1 = lower than junior high school to 4 = higher education) and medical insurance type (0 = no insurance to 3 = public expense/commercial medical insurance) into comprehensive indicators. In terms of variable processing, because the original data of family per capita income and family per capita consumption have obvious right-biased distribution characteristics, this paper takes the natural logarithm of the two to improve their normality and facilitate subsequent analysis. Standardize the four variables before analysis.

The results of the KMO test and Bartlett's test for sphericity are shown in Table 1. The KMO measure of sampling adequacy is 0.685, falling within the 0.6 to 0.7 range; this indicates a moderate degree of correlation among the variables, making the data suitable for principal component analysis. The χ^2 value for Bartlett's test of sphericity was 19,852.784 ($p < 0.001$), leading to the rejection of the null hypothesis that the variables are independent and further confirming the suitability of factor analysis.

Table 1: Results of Factor Analysis

Test Type	Statistical Indicator	Result
Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy	KMO Value	0.685
Bartlett's Test of Sphericity	Approximate Chi-square	19852.784
	Degrees of Freedom (df)	6
	Significance (p-value)	0.000

As shown in Table 2, the characteristic values of the first three main components are greater than 0.6, and the cumulative variance interpretation rate reaches 85.58%, indicating that these three main components can better summarize the information contained in the original four variables. Therefore, this article selects the first three main components for follow-up analysis.

Table 2: Statistical Results of Principal Component Analysis (PCA)

Principal Component	Eigenvalue	Variance Explained (%)	Cumulative Variance Explained (%)
Principal Component 1	1.90994	47.75	47.75
Principal Component 2	0.84497	21.12	68.87
Principal Component 3	0.66813	16.7	85.58
Principal Component 4	0.57695	14.42	100

Table 3 reports the load matrix of each variable on the main component. Based on the above load matrix, this paper uses the variance interpretation rate weighting method to calculate the comprehensive score of socioeconomic status. The method takes the variance interpretation rate of each principal component as the weight for weighted average, which can make full use of the information contained in the three main components. The calculation formula is as follows:

$$SES = (47.75 \times Comp1 + 21.12 \times Comp2 + 16.70 \times Comp3)/85.58 \quad (4\text{-}1)$$

Table 3: Component Loading Matrix

Variable	Principal Component 1	Principal Component 2	Principal Component 3
Logarithm of Household Per Capita Income	0.5417	-0.3192	-0.2259
Logarithm of Household Per Capita Consumption	0.4819	-0.6091	0.3917
Education Level	0.4573	0.6452	0.599
Health Insurance Type	0.515	0.3328	-0.6609

In order to facilitate model estimation and coefficient interpretation, the calculated comprehensive score is standardized, so that the final SES indicator obeys the standard normal distribution with a mean of 0 and a standard deviation of 1. The higher the standardized SES score, the higher the socioeconomic status of the individual. The value range of SES in the sample is -2.716 to 5.155, covering a complete continuous spectrum from lower socioeconomic status to higher socioeconomic status.

4.2.3 Control Variables

In order to reduce the bias of missing variables, this article refers to existing studies to select control variables from the three dimensions of individual characteristics, health behavior and marital status. Individual characteristics include age, gender, marital status, and residential location; healthy behaviors include drinking, smoking and sleep time; social participation is measured by participating in social activities at least once a month.

4.3 Model Specification

The explained variables in this paper cover count variables (total difficulties in Activities of Daily Living (ADL), the number of chronic diseases), ordinal variables (self-rated health status) and continuous variables (mental health). According to the data characteristics of different dependent variables, the negative binomial regression model, the generalized ordered logit model and the linear regression model are used for estimation respectively.

(1) Activities of Daily Living (ADL) and the number model of chronic diseases. The total number of difficulties in Activities of Daily Living (ADL) (ADL_IADL_total) and the number of chronic diseases (chronic_num) are both non-negative count variables. It has been verified that the variance of both variables

is greater than the mean value (ADL variance/mearance = 3.90, chronic disease variance/meriance = 1.61), and there is an excessive dispersion phenomenon. The negative binomial regression model is more suitable than Poisson regression. The model settings are as follows:

$$\ln\left(E(y_i|\boldsymbol{X}_i)\right) = \alpha + \beta_1 SES_i + \beta_2 Age_i + \gamma \boldsymbol{Controls}_i + \varepsilon_i \quad (4\text{-}2)$$

Here, y_i represents the total number of difficulties in activities of daily living or the number of chronic diseases, and SES_i represents the composite indicator of socioeconomic status; Age_i represents age; $\boldsymbol{Controls}_i$ represents a vector of control variables. Regression results are reported as incidence rate ratios (IRRs); an IRR < 1 indicates a negative association between SES and the dependent variable.

(2) Self-rated health status model. Self-rated health status (srh) is an ordered classification variable with values 1-5. The results of the parallel line test show that there are significant differences in the coefficients of some variables at different points ($p<0.05$), so the generalized ordered logit model (gologit2) is used for estimation, which allows the difference in the coefficients of the variables on different cumulative probabilities. The model settings are as follows:

$$\log\left(\frac{P(srh_i \le j \mid \boldsymbol{X}_i)}{1 - P(srh_i \le j \mid \boldsymbol{X}_i)}\right) = \alpha_j + \beta_{1j} SES_i + \beta_{2j} Age_i + \gamma_j \boldsymbol{Controls}_i + \varepsilon \quad (4\text{-}3)$$

Here, srh_i represents the self-rated health level, where a higher value indicates better health status; j is the cut-off point for cumulative probability (j =1 corresponds to the comparison between health levels ≤1 and >1, and so on); α_j is the intercept term corresponding to the j-th split point; β_{1j}, β_{2j} and γ_j are the coefficients to be estimated for the respective explanatory variables at the split points; the meanings of the remaining symbols are the same as before. When $\beta_{1j} > 0$, it indicates that a higher SES is associated with a greater probability of an individual being in a higher health category.

(3) Mental health model. After standardized treatment, the mental health score (cesd10) is approximately subject to the normal distribution, and the linear regression model is used to estimate by the heteroskedasticity-robust standard errors. The model settings are as follows:

$$cesd10_i = \alpha + \beta_1 SES_i + \beta_2 Age_i + \gamma \boldsymbol{Controls}_i + \varepsilon_i \quad (4\text{-}4)$$

Among them, $cesd10_i$ is the standardized mental health score, where a higher value indicates poorer mental health; The meanings of the symbols remain the same as previously defined. The coefficient β_1 represents the change in the standardized mental health score for each one-unit increase in SES and can be directly interpreted as the effect size.

5. Empirical Results

5.1 Descriptive Statistics

As shown in the descriptive statistical results of each variable in Table 4, from the core variables, the average value of the comprehensive socioeconomic status indicator (SES) constructed by our research institute is -0.004 after standardized processing, the standard deviation is 0.994, and the value range is -2.716 to 5.155. The value range covers the complete spectrum from low to high, and the overall distribution is close to the standard normal.

In terms of health indicators, the average value of the total difficulty of Activities of Daily Living (ADL) is 0.771, with a variance of 3.004, which is excessively dispersed; More than 70% of the respondents did not have any difficulties, indicating that the overall body function of the sample was in good condition. The average self-rated health status value is 3.023, and the overall subjective evaluation is positive; The average value of mental health CES-D10 is 8.364, which varies greatly from person to person. The average value of chronic diseases is 2.001, and more than a quarter suffer from 3 or more chronic diseases, reflecting the prevalence of chronic disease comorbidity in middle-aged and elderly groups. The distribution characteristics of the control variables are in line with the basic structure of the middle-aged and elderly population in China. The average age of the sample is 61.69 years old, 47.9% are male, 61.7% of rural residents, and 13.3% without spouses; drinkers and smokers account for 34.7% and 27.1% respectively, with an average sleep of 6.34

hours/night, 47 .4% participate in social activities at least once a month. The above sample characteristics provide a descriptive reference for the basic structure of the middle-aged and elderly population in China.

Table 4: Descriptive Statistics of Variables for the Full Sample

Variable Type		Variable	Definition	Minimum	Maximum	Mean (Standard Deviation)
Independent Variable		Socioeconomic Status (SES)	A composite index constructed from four variables: household per capita income, household per capita consumption, education level, and health insurance type. The index is standardized based on principal component analysis.	-2.716	5.155	-0.004 (0.994)
Dependent Variable		Activities of Daily Living (ADL)	Total number of difficulties in ADL and IADL (0–11 items)	0	11	0.771 (1.733)
		Self-Rated Health	1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = very good	1	5	3.023 (0.978)
		Mental Health	CES-D10 score (0–30; higher scores indicate poorer mental health)	0	30	8.364 (6.276)
		Number of Chronic Diseases	Number of diagnosed chronic diseases among 14 types (0–14 types)	0	14	2.001 (1.793)
Control Variables	Individual Characteristics	Age	Respondent's age (years)	45	101	61.687 (9.306)
		Gender	0 = female, 1 = male	0	1	0.479 (0.500)
		Marital Status	0 = married, 1 = unmarried	0	1	0.133 (0.339)
		Residential Location	0 = urban, 1 = rural	0	1	0.617 (0.486)
	Health Behaviors	Alcohol Consumption	0 = no, 1 = yes	0	1	0.347 (0.476)
		Smoking	0 = no, 1 = yes	0	1	0.271 (0.444)
		Sleep Duration	Sleep duration per night (hours)	3	12	6.337 (1.727)
	Social Participation	Social Participation	0 = no, 1 = yes (at least once per month)	0	1	0.474 (0.499)

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

5.2 Baseline Regression Results

Table 5: Results of Baseline Regression Analysis

Variable	(1) ADL	(2) Mental Health	(3) Number of Chronic Diseases
Socioeconomic Status (SES)	-0.273***	-0.817***	0.043***
	(0.018)	(0.03)	(0.005)
Age	0.046***	0.006*	0.018***
	(0.001)	(0.003)	(0.001)
Gender	-0.155***	-1.361***	0.009
	(0.031)	(0.077)	(0.011)
Marital Status	0.151***	1.462***	-0.024*
	(0.033)	(0.102)	(0.014)
Residential Location	0.217***	1.203***	-0.023**

Variable	(1) ADL	(2) Mental Health	(3) Number of Chronic Diseases
	(0.028)	(0.068)	(0.010)
Alcohol Consumption	-0.323***	-0.606***	-0.117***
	(0.030)	(0.070)	(0.011)
Smoking	-0.131***	0.333***	-0.096***
	(0.034)	(0.079)	(0.012)
Social Participation	-0.346***	-0.718***	0.023**
	(0.025)	(0.062)	(0.009)
Sleep Duration	-0.114***	-0.803***	-0.067***
	(0.007)	(0.019)	(0.003)
Constant	-2.395***	13.247***	0.049
	(0.098)	(0.254)	(0.038)
lnalpha	1.234***	-	-1.380***
	(0.017)	-	(0.023)
Observations	37710	37710	37710

Standard errors in parentheses.
** p<0.10, ** p<0.05, *** p<0.01*

The results of Table 5 show that for every additional standard deviation in SES, the expected ADL difficulty score decreases by about 24% (IRR=0.761, p<0.01); The mental health score decreased by 0.817 (p<0.01); the number of chronic diseases increased by 0.043 (p<0.01), which may reflect the higher medical accessibility and health screening awareness of high-SES groups, and the detection rate is higher than the higher risk of actual disease. This explanation is supported in existing literature [9].

In terms of self-rated health status (as shown in Table 6), SES has a significant positive impact on the four cumulative probability comparisons, and the improvement effect on groups with poorer health is more prominent. In summary, H1 has been verified, but it should be noted that there are differences in the performance of this positive effect on different health indicators.

Table 6: Regression Results of the Generalized Ordered Logit Model

Variable	(1) Very Poor	(2) Poor	(3) Fair	(4) Good
Socioeconomic Status (SES)	0.225***	0.240***	0.183***	0.081***
	(0.031)	(0.016)	(0.013)	(0.018)
Age	-0.010***	-0.017***	-0.012***	-0.014***
	(0.003)	(0.001)	(0.001)	(0.002)
Gender	-0.104**	-0.053*	0.063**	0.076*
	(0.051)	(0.029)	(0.031)	(0.041)
Marital Status	0.206***	-0.059	0.120***	0.031
	(0.062)	(0.036)	(0.039)	(0.056)
Residential Location	0.216***	0.309***	0.126***	-0.096**
	(0.053)	(0.028)	(0.028)	(0.038)
Alcohol Consumption	0.507***	0.567***	0.289***	0.297***
	(0.057)	(0.030)	(0.029)	(0.04)
Smoking	0.036	0.036	0.036	0.036
	(0.026)	(0.026)	(0.026)	(0.026)
Social Participation	0.265***	0.217***	0.071***	-0.015
	(0.047)	(0.025)	(0.025)	(0.035)
Sleep Duration	0.169***	0.169***	0.169***	0.169***
	(0.006)	(0.006)	(0.006)	(0.006)
Constant	2.381***	1.038***	1.691***	2.514***
	(0.168)	(0.096)	(0.098)	(0.131)

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

5.3 Heterogeneity Analysis

5.3.1 Urban–Rural Heterogeneity Analysis

Table 7: Heterogeneous Effects of Health Outcomes by Urban–Rural Stratification

Variable	Urban			Rural		
	Activities of Daily Living (ADL)	Mental Health	Number of Chronic Diseases	Activities of Daily Living (ADL)	Mental Health	Number of Chronic Diseases
Socioeconomic Status (SES)	-0.267***	-0.763***	0.029***	-0.286***	-0.888***	0.077***
	(0.022)	(0.036)	(0.006)	(0.028)	(0.057)	(0.009)
Age	0.050***	-0.007	0.020***	0.044***	0.014***	0.017***
	(0.002)	(0.005)	(0.001)	(0.002)	(0.005)	(0.001)
Gender	-0.004	-1.040***	0.016	-0.240***	-1.563***	-0.001
	(0.055)	(0.116)	(0.017)	(0.036)	(0.103)	(0.015)
Marital Status	0.168***	1.311***	-0.056***	0.153***	1.586***	0.002
	(0.058)	(0.154)	(0.022)	(0.040)	(0.135)	(0.018)
Alcohol Consumption	-0.383***	-0.711***	-0.141***	-0.281***	-0.549***	-0.101***
	(0.056)	(0.106)	(0.017)	(0.035)	(0.092)	(0.014)
Smoking	-0.071	0.540***	-0.067***	-0.152***	0.238**	-0.114***
	(0.060)	(0.123)	(0.020)	(0.040)	(0.102)	(0.016)
Social Participation	-0.482***	-0.930***	0.017	-0.271***	-0.588***	0.027**
	(0.045)	(0.096)	(0.015)	(0.029)	(0.080)	(0.012)
Sleep Duration	-0.123***	-0.839***	-0.080***	-0.109***	-0.785***	-0.060***
	(0.014)	(0.031)	(0.005)	(0.008)	(0.024)	(0.003)
_cons	-2.583***	14.254***	0.035	-2.082***	13.867***	0.042
	(0.176)	(0.392)	(0.059)	(0.111)	(0.322)	(0.047)
lnalpha	1.435***		-1.427***	1.133***		-1.356***
	(0.030)		(0.038)	(0.020)		(0.030)
N	14450.000	14450.000	14450.000	23260.000	23260.000	23260.000
Pseudo R^2	0.041	0.033			0.021	0.016
Adjusted R^2			0.120	0.100		

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

As shown in Table 7, on the whole, the impact of socioeconomic status on the health of middle-aged and older adults in rural areas is generally greater than in urban areas. Specifically, the SES coefficient for mental health in rural areas (-0.888) is about 16% larger in absolute value than that in urban areas (-0.763); the positive correlation of chronic diseases in rural areas (0.077) is also stronger than urban areas (0.029). In terms of self-rated health status, as shown in Table 8, the rural SES coefficient is stable and significant (0.155~0.266) at each segmentation point, while the urban area decreases from 0.277 to not significant, indicating that rural areas show a more inclusive promotion effect. In summary, compared with urban middle-aged and older adults, the socioeconomic status has a more significant impact on the health status of rural middle-aged and older adults. The study assumes that H2 has been effectively verified.

Table 8: Urban–Rural Heterogeneity Analysis of Self-Rated Health

Variable	Very Poor		Poor		Fair		Good	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Socioeconomic Status (SES)	0.277***	0.155***	0.215***	0.266***	0.164***	0.236***	0.018	0.223***
	(0.043)	(0.044)	(0.021)	(0.025)	(0.015)	(0.022)	(0.021)	(0.027)
Age	-0.014***	-0.011***	-0.014***	-0.018***	-0.014***	-0.009***	-0.014***	-0.011***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Gender	-0.204**	0.005	-0.122**	0.005	0.063	0.005	0.049	0.005
	(0.091)	(0.032)	(0.051)	(0.032)	(0.048)	(0.032)	(0.065)	(0.032)
Marital Status	-0.116	-0.239***	-0.091	-0.041	0.150**	0.096*	0.013	0.022
	(0.108)	(0.076)	(0.060)	(0.045)	(0.059)	(0.051)	(0.084)	(0.074)
Alcohol Consumption	0.517***	0.473***	0.655***	0.510***	0.350***	0.273***	0.343***	0.302***
	(0.102)	(0.065)	(0.054)	(0.035)	(0.046)	(0.036)	(0.063)	(0.048)
Smoking	-0.022	0.068**	-0.022	0.068**	-0.022	0.068**	-0.022	0.068**
	(0.043)	(0.033)	(0.043)	(0.033)	(0.043)	(0.033)	(0.043)	(0.033)
Social Participation	0.264***	0.266***	0.326***	0.163***	0.087**	0.059*	-0.018	-0.008
	(0.083)	(0.056)	(0.043)	(0.030)	(0.040)	(0.033)	(0.056)	(0.045)
Sleep Duration	0.203***	0.153***	0.203***	0.153***	0.203***	0.153***	0.203***	0.153***
	(0.011)	(0.007)	(0.011)	(0.007)	(0.011)	(0.007)	(0.011)	(0.007)
_cons	2.498***	2.258***	0.642***	0.902***	-1.773***	-1.827***	-2.703***	-2.641***
	(0.146)	(0.197)	(0.134)	(0.114)	(0.135)	(0.124)	(0.140)	(0.163)
N	14450	23260	14450	23260	14450	23260	14450	23260
r2_p	0.031	0.022	0.031	0.022	0.031	0.022	0.031	0.022

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

5.3.2 Gender Heterogeneity Analysis

It can be seen from Table 9 that in terms of Activities of Daily Living (ADL), the coefficient of SES for female samples is -0.297 ($p<0.01$) and for male samples is -0.265 ($p<0.01$), and the absolute value of the female effect is greater. In terms of mental health, the gap is particularly prominent: the coefficient of SES for women is -0.983 ($p<0.01$) and for men is -0.717 ($p<0.01$), and the protective effect of socioeconomic status on women's mental health is about 37% higher than that of men. In terms of the number of chronic diseases, the coefficient of SES is 0.054 ($p<0.01$) for women and 0.036 ($p<0.01$) for men.

Table 9: Gender Heterogeneity Analysis of Health Effects

Variable	Female			Male		
	Activities of Daily Living (ADL)	Mental Health	Number of Chronic Diseases	Activities of Daily Living (ADL)	Mental Health	Number of Chronic Diseases
Socioeconomic Status (SES)	-0.297***	-0.983***	0.054***	-0.265***	-0.717***	0.036***
	(0.024)	(0.050)	(0.007)	(0.024)	(0.038)	(0.006)
Age	0.045***	-0.008	0.018***	0.047***	0.017***	0.017***
	(0.002)	(0.005)	(0.001)	(0.002)	(0.005)	(0.001)
Marital Status	0.087**	1.318***	-0.018	0.280***	1.810***	-0.042*
	(0.040)	(0.134)	(0.017)	(0.057)	(0.158)	(0.024)
Residential Location	0.310***	1.351***	-0.008	0.092**	0.964***	-0.034**
	(0.035)	(0.098)	(0.014)	(0.046)	(0.093)	(0.015)
Alcohol Consumption	-0.160***	-0.108	-0.106***	-0.406***	-0.835***	-0.125***
	(0.043)	(0.121)	(0.017)	(0.040)	(0.086)	(0.014)
Smoking	0.193***	0.907***	0.105***	-0.196***	0.292***	-0.143***
	(0.058)	(0.216)	(0.027)	(0.040)	(0.085)	(0.014)
Social Participation	-0.293***	-0.738***	0.027**	-0.412***	-0.685***	0.016
	(0.030)	(0.089)	(0.012)	(0.041)	(0.084)	(0.014)
Sleep Duration	-0.127***	-0.899***	-0.068***	-0.094***	-0.687***	-0.065***
	(0.009)	(0.026)	(0.004)	(0.012)	(0.027)	(0.004)
_cons	-2.347***	14.538***	0.006	-2.567***	10.700***	0.154***
	(0.121)	(0.372)	(0.051)	(0.168)	(0.366)	(0.059)
lnalpha	1.031***		-1.427***	1.497***		-1.342***
	(0.022)		(0.032)	(0.026)		(0.034)
N	19650.000	19650.000	19650.000	18060.000	18060.000	18060.000
Pseudo R^2	0.036		0.018	0.036		0.019
Adjusted R^2		0.113			0.097	

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Judging from the results of the generalized and ordered logit of self-rated health status (Table 10), the improvement effect of SES on women is greater than or equal to that of men at all four points, and in the high-level comparison of “better vs very good”, the female coefficient (0.115) is still significantly higher than that of men (0.063). It shows that even at a higher health level, SES has a stronger marginal improvement effect on women.

Table 10: Gender Heterogeneity Analysis of Self-Rated Health

Variable	Very Poor		Poor		Fair		Good	
	Female	Male	Female	Male	Female	Male	Female	Male
Socioeconomic Status (SES)	0.241***	0.219***	0.245***	0.239***	0.172***	0.192***	0.115***	0.063***
	(0.043)	(0.041)	(0.024)	(0.022)	(0.020)	(0.016)	(0.027)	(0.021)
Age	-0.008**	-0.010**	-0.014***	-0.019***	-0.004*	-0.019***	-0.007**	-0.021***
	(0.003)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Marital Status	-0.198**	-0.237**	0.001	-0.180***	0.079	0.119**	-0.081	0.122
	(0.080)	(0.103)	(0.047)	(0.059)	(0.051)	(0.060)	(0.077)	(0.082)
Residential Location	-0.271***	-0.138*	-0.332***	-0.274***	-0.139***	-0.115***	-0.115**	-0.070
	(0.070)	(0.081)	(0.038)	(0.042)	(0.040)	(0.039)	(0.057)	(0.054)
Alcohol Consumption	0.415***	0.538***	0.422***	0.625***	0.247***	0.301***	0.240***	0.315***
	(0.099)	(0.071)	(0.050)	(0.037)	(0.048)	(0.036)	(0.068)	(0.050)
Smoking	-0.303**	0.164**	-0.173**	0.114***	-0.074	0.002	0.162	-0.039
	(0.125)	(0.071)	(0.074)	(0.037)	(0.084)	(0.035)	(0.113)	(0.048)
Social Participation	0.308***	0.206***	0.233***	0.192***	0.047	0.090**	-0.063	0.031
	(0.062)	(0.070)	(0.033)	(0.037)	(0.036)	(0.035)	(0.051)	(0.049)
Sleep Duration	0.185***	0.151***	0.185***	0.151***	0.185***	0.151***	0.185***	0.151***
	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)
_cons	2.240***	2.273***	0.785***	1.158***	-2.255***	-1.068***	-3.018***	-1.955***
	(0.223)	(0.265)	(0.133)	(0.150)	(0.141)	(0.147)	(0.187)	(0.188)
N	19650	18060	19650	18060	19650	18060	19650	18060
r2_p	0.025	0.030	0.025	0.030	0.025	0.030	0.025	0.030

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

It can be seen from the above that in the middle-aged and elderly group, the socioeconomic status has a more significant impact on the health of middle-aged and elderly women, assuming that H3 has been verified.

5.4 Robustness Checks

5.4.1 Robustness Check Using an Alternative Measure of the Key Independent Variable

In order to avoid the impact of the weighting method of principal component analysis on the results, this study uses the simple addition method (Comp1+Comp2+Comp3) to reconstruct the socioeconomic status index (SES_simple) and re-estimate all models.

Table 11: Robustness Check Using Alternative Measures of Socioeconomic Status (SES)

Variable	Activities of Daily Living (ADL)	Self-Rated Health				Mental Health	Number of Chronic Diseases
		Very Poor	Poor	Fair	Good		
SES	-0.273***	0.225***	0.240***	0.183***	0.081***	-0.817***	0.043***
	(0.018)	(0.031)	(0.016)	(0.013)	(0.018)	(0.030)	(0.005)
SES_simple	-0.208***	0.177***	0.172***	0.137***	0.008	-0.576***	0.020***
	(0.018)	(0.030)	(0.016)	(0.012)	(0.017)	(0.028)	(0.004)
N	37710	37710	37710	37710	37710	37710	37710

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

As shown in Table 11, the direction and significance level of the regression coefficient of SES_simple are highly consistent with the main analysis. There is no substantial change in the core conclusion after replacing the socioeconomic status index, indicating that the research results are insensitive to the construction method of SES.

5.4.2 Alternative Estimation Models for Self-Rated Health

Because the generalized ordered logit model (gologit2) allows the coefficient to change across equations, although it is more suitable for the data characteristics, the model is more complex. In order to test the robustness of the results, this study adopts the traditional ordered logit model (ologit) to re-estimate the self-rated health model. As shown in Table 12, the coefficient of SES is 0.180 (p<0.01), which is between the four division point coefficients of the main analysis (0.081~0.240). The results of the control variables are basically consistent with those of the main analysis, and the core findings remain robust.

Table 12: Robustness Check Using Alternative Estimation Models for Self-Rated Health

Variable	Self-Rated Health				Self-Rated Health
		Poor	Fair	Good	
Socioeconomic Status (SES)	0.225***	0.240***	0.183***	0.081***	0.180***
	(0.031)	(0.016)	(0.013)	(0.018)	(0.010)
Age	-0.010***	-0.017***	-0.012***	-0.014***	-0.014***
	(0.003)	(0.001)	(0.001)	(0.002)	(0.001)
Gender	-0.104**	-0.053*	0.063**	0.076*	-0.003
	(0.051)	(0.029)	(0.031)	(0.041)	(0.025)
Marital Status	-0.206***	-0.059	0.120***	0.031	0.001
	(0.062)	(0.036)	(0.039)	(0.056)	(0.031)
Residential Location	-0.216***	-0.309***	-0.126***	-0.096**	-0.215***
	(0.053)	(0.028)	(0.028)	(0.038)	(0.022)
Alcohol Consumption	0.507***	0.567***	0.289***	0.297***	0.414***
	(0.057)	(0.030)	(0.029)	(0.040)	(0.023)
Smoking	0.036	0.036	0.036	0.036	0.041
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Social Participation	0.265***	0.217***	0.071***	-0.015	0.140***
	(0.047)	(0.025)	(0.025)	(0.035)	(0.020)
Sleep Duration	0.169***	0.169***	0.169***	0.169***	0.170***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
_cons	2.381***	1.038***	-1.691***	-2.514***	-
	(0.168)	(0.096)	(0.098)	(0.131)	-

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

5.4.3 Excluding Extreme Values

In order to avoid the potential interference of extreme values to the regression results, this study removes the extreme value samples above and below 1% of the socioeconomic status index (a total of 755 observations were excluded) and then re-regressed. As shown in Table 13 and Table 14, after excluding the extreme value, the direction, significance and effect of each model coefficient are highly consistent with the main analysis. The main conclusions of the following results is not extreme value-driven and has good robustness.

Table 13: Robustness Check by Excluding Extreme SES Values

Variable	Baseline Analysis			Excluding Extreme Values of SES		
	Activities of Daily Living (ADL)	Mental Health	Number of Chronic Diseases	Activities of Daily Living (ADL)	Mental Health	Number of Chronic Diseases
Socioeconomic Status (SES)	-0.273***	-0.817***	0.043***	-0.276***	-0.902***	0.043***
	(0.018)	(0.030)	(0.005)	(0.019)	(0.035)	(0.005)
N	37710	37710	37710	36955	36955	36955

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 14: Robustness Check Using 1% Winsorization at Both Tails of SES Indicators (Self-Rated Health Model)

Variable	Baseline Analysis				Excluding Extreme Values			
	Very Poor	Poor	Fair	Good	Very Poor	Poor	Fair	Good
Socioeconomic Status (SES)	0.225***	0.240***	0.183***	0.081***	0.213***	0.254***	0.193***	0.102***
	(0.031)	(0.016)	(0.013)	(0.018)	(0.032)	(0.017)	(0.014)	(0.019)
N	37710				36955			

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

6. Discussion and Recommendations

6.1 Discussion of Findings

Based on five waves of CHARLS data, this paper systematically examines the impact of SES on the health of middle-aged and older adults and urban–rural and gender heterogeneity from four dimensions, forming a consistent study. First of all, SES significantly protects Activities of Daily Living (ADL) functioning, mental health and self-rated health status, which is consistent with the expectations of health capital theory; Its positive correlation with chronic diseases is more likely to reflect the difference in detection rate. Secondly, there is a significant difference between urban and rural areas in the SES effect, and the rural effect is stronger, which verifies the judgment of the social stratification theory that individual advantages are amplified in resource-scarce areas. Thirdly, SES has a higher effect on women's mental health protection than men, reflecting women's weak access to resources and higher dependence on SES under traditional gender roles.

6.2 Recommendations

Based on the above findings, this study puts forward three macro-strategic proposals aimed at promoting health equity.

First, implement resource-oriented health interventions, and focus on strengthening the rural health support system. Given the higher health return of SES in rural areas, policies should focus on improving the basic environment for rural health improvement. It is recommended to give priority to improving the capacity of rural grass-roots medical services and the access to health information. By enhancing the supply of public health resources in rural areas, we should build a basic health security network for low-SES groups, so as to more effectively transform the achievements of economic development into national health and well-being.

Second, build a "gender-responsive" guarantee system and focus on alleviating women's health vulnerabilities. In view of the decisive impact of SES on women's mental health, it is recommended to introduce a gender mainstream perspective in social security policies. Specifically, we can explore to moderately improve the replacement rate of women's pensions, and establish a psychological support and empowerment network for middle-aged and elderly women at the community level, so as to make up for their historical disadvantages in resource acquisition by structural means and break the vicious circle of "low resources-high dependence".

Third, optimize the "multi-dimensional and accurate" health assessment to ensure the fairness and scientificity of health monitoring. Given that there is a deviation in the diagnosis rate of chronic disease indicators, policymakers need to be alert to the policy blind spots that a single health indicator may lead to. We should promote the integration of multi-dimensional indicators such as functional health and subjective well-being into the routine health monitoring system, and encourage low- and middle-income groups to participate in health examination through financial subsidies and other means to narrow the gap in health screening rates and ensure the real reliability of health inequality assessment.

7. Research Limitations

There are several limitations in this study. First, limited by the characteristics of panel data, it is difficult for the model to completely eliminate missing variables and reverse causal interference. Subsequently, it can be instrumental variable method or natural experiments. Second, although the positive relationship between SES and chronic diseases can be explained by the "detection rate hypothesis", this article does not empirically test the mediating pathway of health screening behavior. Subsequently, it can be included in the verification of variables such as physical examination frequency and health literacy. Third, this article focuses on the analysis of static heterogeneity, and the inter-period dynamic trajectory of health is insufficient. In the future, growth curve model and other methods can be used to deeply reveal the shaping mechanism of SES on health depreciation rate and trajectory differentiation.

References

[1] Liu, C. P., & Wang, L. J. (2017). The impact of socioeconomic status on the health status of older adults. Chinese Journal of Population Science, (5), 40–50+127.

[2] Sun, Z. F., & Tan, Z. J. (2022). Healthy China in the aging era: Socioeconomic status and health status of older adults—An empirical analysis based on CGSS 2017 data. Journal of Fujian Agriculture and Forestry University (Philosophy and Social Sciences Edition), 25(6), 68–79.

[3] Grossman, M. (1972). On the concept of health capital and the demand for health. Journal of Political Economy, 80(2), 223–255.

[4] Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. Journal of Health and Social Behavior, 80–94.

[5] Qi, L. S. (2006). Income, income inequality, and health: The effects of urban–rural differences and occupational status. Economic Research Journal, (11), 16–26.

[6] Cheng, L. G., Zhang, Y., & Shen, K. (2015). How does education affect health? Evidence from older adults in China. China Economic Quarterly, 14(1), 305–330.

[7] Xue, X. D., & Ge, K. X. (2017). The impact of socioeconomic status on the health status of older adults in China: Evidence from the Chinese Longitudinal Healthy Longevity Survey. Population and Development, 23*(2), 61–69.

[8] Jiao, K. S. (2018). Inequality in healthy life expectancy among older adults in China. Sociological Studies, 33(1), 116–141+244–245.

[9] Huang, R., & Grol-Prokopczyk, H. (2022). Health and health behaviors in China: Anomalies in the SES-health gradient? SSM—Population Health, 17, 101069.

[10] Du, B. F., & Wang, X. (2013). The evolution, regional differences, and influencing factors of health inequality among older adults. Population Research, 37(5), 81–90.

[11] Zimmer, Z., Kaneda, T., & Spess, L. (2007). An examination of urban versus rural mortality in China using community and individual data. The Journals of Gerontology: Series B, Psychological Sciences and Social Sciences, 62(5), S349–S357.

[12] Su, Y. Y. (2022). The impact of socioeconomic status on multidimensional health among urban and rural older adults. Advances in Applied Mathematics, 11, 5015.

[13] Liu, X. T. (2014). The impact of social medical insurance on the health status of older adults: Evidence from Zhejiang Province. Society, 34(2), 193–214.

[14] Ran, X. X., & Hu, H. W. (2022). Urban–rural differences, digital divide, and health inequality among older adults. Population Journal, 44(3), 46–58.

[15] Read, J. N. G., & Gorman, B. K. (2010). Gender and health inequality. Annual Review of Sociology, 36(1), 371–386.

[16] Matthews, S., Manor, O., & Power, C. (1999). Social inequalities in health: Are there gender differences? Social Science & Medicine, 48(1), 49–60.

[17] Zheng, L., & Zeng, X. H. (2016). Social stratification and gender differences in health inequality: A longitudinal analysis from a life-course perspective. Society, 36(6), 209–237.

[18] Beckett, M. (2000). Converging health inequalities in later life—An artifact of mortality selection? Journal of Health and Social Behavior, 106–119.

[19] Wang, P., & Wu, Y. X. (2019). Socioeconomic status, gender inequality, and gender role attitudes. Sociological Review of China, 7(2), 55–70.

[20] Xue, X. D. (2015). Trends and determinants of health inequality among older adults in China. Population and Development, 21(2), 84–92.

[21] Nocera, S., & Zweifel, P. (1998). The demand for health: An empirical test of the Grossman model using panel data. In Developments in Health Economics and Public Policy (Vol. 6, pp. 35–49).

[22] Bolin, K., & Caputo, M. R. (2020). Consumption and investment demand when health evolves stochastically. Journal of Economic Dynamics and Control, 114, 103893.

[23] Masters, R. K., Link, B. G., & Phelan, J. C. (2015). Trends in education gradients of "preventable" mortality: A test of fundamental cause theory. Social Science & Medicine, 127, 19–28.

[24] Marmot, M. (2002). The influence of income on health: Views of an epidemiologist. Health Affairs, 21(2), 31–46.

[25] Wu, B. Y., Dong, H. L., Yu, Q., et al. (2021). Social stratification analysis of healthy life expectancy among older adults in China. Population and Development, 27(5), 2–11.

[26] Hu, R., & Duan, X. X. (2024). Community characteristics, individual socioeconomic status, and health and health inequality among older adults. Journal of Guizhou University of Finance and Economics, (3), 72–80.

[27] Zhao, Y. H., Chen, X. X., Wang, Y. F., Meng, Q. Q., Bo, H., Chen, C., Chen, Y. F., Gong, J. Q., Jia, Y., Wang, G. W., Wu, X. Y., Yan, L., & Yang, P. (2023). China Health and Retirement Longitudinal Study (CHARLS): Wave 5 (2020) user's manual. National School of Development, Peking University.

[28] Zhao, Y., Hu, Y., Smith, J. P., Strauss, J., & Yang, G. (2014). Cohort profile: The China Health and Retirement Longitudinal Study (CHARLS). International Journal of Epidemiology, 43(1), 61–68.

[29] Zhao, Y., Strauss, J., Yang, G., Giles, J., Hu, P. P., Hu, Y., Lei, X., Liu, M., Park, A., Smith, J. P., & Wang, Y. (2013). China Health and Retirement Longitudinal Study: 2011–2012 national baseline user's guide. National School of Development, Peking University.

[30] Qin, Z. Y. (2017). An empirical study on health differences and influencing factors among urban and rural middle-aged and older residents: Evidence from CHARLS data (Master's thesis, Nanjing University).

[31] Zhou, B. (2020). Socioeconomic status and health disparities among middle-aged and older adults (Master's thesis, Southwestern University of Finance and Economics). https://doi.org/10.27412/d.cnki.gxncu.2020.000828

[32] Han, T. T. (2017). The impact of socioeconomic status on the health of middle-aged and older adults in China (Master's thesis, Shandong University).

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Conflicts of Interest

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