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Review Article

The Impact of the Integration of Basic Medical Insurance for Urban and Rural Residents on the Well-being of Middle-aged and Elderly People

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Abstract: Health insurance, as a key social security measure, impacts residents' well-being. This paper uses data from the China Health and Retirement Longitudinal Study (CHARLS) from 2015 to 2020 and employs the Difference-in-Differences (DID) method to empirically analyze the potential impact of the integration of basic medical insurance for urban and rural residents on the happiness of middle-aged and elderly people. It is found that the integration of basic medical insurance for urban and rural residents can significantly increase the life satisfaction of middle-aged and elderly people. The study passes the robustness test. Further heterogeneity analysis shows that, in terms of health status, the policy had a significant happiness-enhancing effect on middle-aged and elderly people with poor self-assessed health status in 2018, but by 2020, this enhancing effect was mainly reflected in the group with better health status. In terms of income level, the happiness enhancement of both low-income and high-income groups was more significant in 2018, while by 2020, the low-income group's well-being enhancement effect was more prominent. This study provides a theoretical basis for the policy design of 'targeted health insurance'.

Keywords: Well-being; Basic Medical Insurance for Urban and Rural residents; System Integration; Difference-in-Differences.

I. INTRODUCTION

Against the backdrop of accelerating aging and health inequality in China, the well-being of the middle-aged and elderly population has become a core indicator of the effectiveness of social security. By 2023, China's population aged 60 and above will reach 297 million, accounting for 21.1% of the total population 1. However, the problem of unequal distribution of healthcare resources between urban and rural areas remains severe: the number of health technicians per 1,000 population in rural areas is only 45% of that in urban areas 3. The policy of integrating basic medical insurance for urban and rural residents, implemented in 2016, has been seen as a key reform to crack the fragmentation of healthcare resources and to enhance the well-being of the middle-aged and the elderly. However, after eight years of implementation, has the policy truly realized the policy objective of "promoting equity in well-being through system integration"? This question urgently needs to be answered by empirical research.

Although established studies have confirmed the positive impact of health insurance on well-being, there are two major limitations: first, they mostly focus on short-term effects and ignore the dynamic changes in policy effects. One study found that the promotional effect of health insurance on the well-being of rural residents decayed after three years, suggesting the need for long-term assessment; second, most previous studies have explored the perspective of the elderly and residents, while this study complements this research perspective by taking the perspective of the middle-aged and the elderly.

Based on the 2015-2020 CHARLS data, this study evaluates the policy effectiveness of health insurance integration from the perspectives of "long-term effect" and "multidimensional heterogeneity". At the theoretical level, we combine the theory of equalization of basic public services with the theory of hierarchy of needs to construct an analytical framework from "system integration to security needs satisfaction to happiness enhancement," which reveals the mechanism by which the health insurance policy reduces the economic risk of medical care and enhances the sense of security of the middle-aged and elderly. At the empirical level, using the Difference-in-Differences (DID) and heterogeneity analysis, it is found that there are significant differences in the effect of the policy on the happiness of middle-aged and elderly people with different health conditions and income levels: in 2018, the happiness of those with poorer health conditions and the low- and high-income groups will increase significantly; in 2020, the happiness of those with better health conditions and the low-income groups will increase even more prominently. This indicates that the impact of health insurance integration on different groups changes dynamically over time, providing important insights for optimizing the targeting of health insurance policies.

II. LITERATURE REVIEW

Research on aspects of well-being. Happiness is a multidimensional concept that usually refers to an individual's satisfaction with his or her current life, which involves feelings of pleasure, a state of good psychological functioning, and the realization of self-achievement [3-5]. In psychology, Diener and other scholars (1999) defined well-being as an individual's evaluation of life and the corresponding emotional experience, emphasizing the importance of positive emotions, negative emotions, and life satisfaction [6]. Ryff and Singer argued that well-being focuses on an individual's self-actualization and the meaning of life, and they suggested six dimensions: self-acceptance, positive relationships with others, autonomy, environmental mastery, life purpose, and personal growth [7]. From the sociological perspective, happiness has shifted from focusing on individual emotional and growth experiences to emphasizing social attributes such as social support and fairness [8]. Economics, on the other hand, focuses on the role of factors such as income and socio-economic status on well-being. Easterlin's (2012) study suggests that life satisfaction can be used as a proxy indicator of well-being [9], providing a new perspective on how economic factors affect an individual's well-being. The exploration of domestic happiness in the existing literature continues to expand; for example, Xing Zhanjun (2005) developed the Subjective Happiness Scale for Urban Residents in China, which provides a tool for the study of happiness in older age groups [10]. Xu Xiaobo and other scholars (2017) proposed that the study of happiness goes from subjective happiness to psychological happiness to spiritual happiness, showing a gradual deepening process [11].

Research on the aspect of factors influencing the sense of well-being. With the prosperity of society and the development of the economy, the factors affecting the happiness of middle-aged and elderly people have become more diverse and complex. Academics have conducted extensive research on this issue, mainly focusing on the influence of factors such as education, health, marital status, income, gender, and consumption on happiness [12-17]. In addition to these traditional factors, the influence of social factors such as social trust, social participation, and government image on well-being has been increasingly emphasized. For example, Li Shu and Yan Mo (2022) pointed out that the government's public services and economic policies are important ways to enhance residents' happiness, and government behavior has a significant effect on individual happiness [18]. Social factors such as social support (Yao Ruosong *et al.*, 2018), social trust (Wang Lei, 2019), and a sense of social fairness (Wang Ping, Chen Jie, 2022) have been found to enhance individual happiness [19-21].

A study on the impact of basic health insurance on well-being. Basic medical insurance, as a key part of the social medical security system, has a profound impact on the well-being of the elderly. On the one hand, numerous studies have shown that there is a positive correlation between basic medical insurance and the well-being of the elderly. Studies by Shouwei Qi *et al*., (2010) and Shijie Feng *et al*., (2014), which utilized survey data at the national level, found a significant positive correlation between basic medical insurance participation and the well-being of the elderly [22]. [23]. On the other hand, some studies show the limitations of the effect of basic health insurance on well-being. Chu Lei *et al*., (2020) pointed out that there may be group differences, such as urban-rural differences, in the impact of basic health insurance on happiness [24]. Wang Zhengwen *et al*., (2022) suggest that the basic medical insurance system still faces some challenges in the implementation process, which limits the potential of medical insurance in enhancing residents' sense of well-being [25]. Throughout the domestic and international literature on basic health insurance on well-being, although many researchers have used rich data resources to conduct in-depth discussions on the link between the health insurance system and well-being, there are still several shortcomings: First, most studies have neglected the long-term effects of the basic health insurance policy, often focusing on assessing the immediate effects in the short term after the health insurance intervention, while an in-depth understanding of the long-term welfare of the insured is relatively lacking. Second, most previous studies have focused on the impact of basic health insurance on the well-being of the elderly group, lacking consideration of the impact on the well-being of groups at different age stages.

III. Theoretical Foundations and Empirical Modeling

(i) Rationale

Based on the theory of equalization of basic public services, the integration of basic medical insurance for urban and rural residents significantly improves the sense of well-being of the middle-aged and elderly. The theory of equalization of basic public services advocates that the government should ensure that all citizens, regardless of geography, economic status, or other factors, have fair access to basic public services. Liu Jiang (2012) elaborates on this, arguing that the equalization of basic public services means that the government needs to provide members of society with public products or services that can meet their basic survival and development needs. These services should be subject to different standards at different stages, but the ultimate goal is to achieve roughly equal provision [26]. In the context of the integration of basic medical insurance for urban and rural residents, this theory implies that through the integration of medical insurance, the government is committed to eliminating the differences in the distribution of medical resources between urban and rural areas and realizing the equalization of basic medical services. It helps to ensure that the middle-aged and the elderly receive the necessary health protection and reduces financial and psychological pressure, thus enhancing their sense of security and satisfaction. Therefore, the theory of equalization of basic public services provides a framework for analyzing how the integration of health insurance can improve the quality of life and well-being of middle-aged and elderly people by facilitating the equitable distribution of healthcare resources.

Based on Maslow's hierarchy of needs, the integration of basic medical insurance for urban and rural residents has differential impacts on the well-being of middle-aged and elderly people with varying health statuses and income levels. Maslow's hierarchy of needs is a foundational concept in psychology, proposed by Abraham Maslow, which categorizes human needs into five ascending levels: physiological needs, safety needs, social needs, esteem needs, and self-actualization needs 28. Within this framework, health serves as the foundation for fulfilling physiological and safety needs, directly affecting an individual's ability to maintain basic living standards and a sense of security. Without good health, it is challenging for individuals to pursue higher-level needs. Income, on the other hand, is closely related to meeting safety needs and the subsequent social, esteem, and self-actualization needs, as it provides the economic resources necessary to satisfy these needs. By considering health and income as key variables in our study, we can gain a more comprehensive understanding of how the integration of basic medical insurance for urban and rural residents affects the well-being of middle-aged and elderly individuals.

Based on the above analysis, the following hypotheses are proposed:

H1: The integration of basic medical insurance for urban and rural residents has significantly improved the well-being of the middle-aged and elderly groups.

H2: The integration of basic medical insurance for urban and rural residents has a differential effect on the well-being of middle-aged and elderly people with different health statuses and different incomes.

(ii) Modeling

In this study, the double-difference model was firstly used as the main empirical analysis tool to assess the impact of the integration of the basic medical insurance system for urban and rural residents implemented in 2016 on the well-being of middle-aged and elderly people. The specific model is as follows:

$$Y_{it} = \beta_0 + \beta_1 T_{it} + \beta_2 P_{2018t} + \beta_3 (T_{it} \times P_{2018t}) + \sum_{j=1}^{k} \gamma_j Control_{ijt} + \epsilon_{i2018t} \quad \text{..... (1)}$$

$$Y_{it} = \beta_4 + \beta_5 T_{it} + \beta_6 P_{2020t} + \beta_7 (T_{it} \times P_{2020t}) + \sum_{j=1}^{k} \gamma_j control_{ijt} + \epsilon_{i2020t} \quad \text{..... (2)}$$

Where: Y_{it} is an indicator of individual i's well-being at time t; T_{it} is a dummy variable for middle-aged and elderly people across the country in time period t. $T_{it} = 1$ represents the experimental group, which denotes individuals affected by system integration, i.e., those whose type of participation changed from the New Cooperative Medical Scheme or the urban residents' health insurance to the basic health insurance for urban and rural residents, and $T_{it} = 0$ denotes the control group, which denotes those individuals not affected by system integration, i.e., those whose type of participation is always the New Cooperative Medical Scheme or the urban residents' health insurance; and P_{2018t} and P_{2020t} are time dummy variables for 2018 and 2020, respectively. $T_{it} \times P_{2018t}$ and $T_{it} \times P_{2020t}$ are interaction terms indicating the effect of the policy implementation on the well-being of middle-aged and elderly people across the country in 2018 and 2020, respectively; β_3 and β_7 are DID estimators indicating the estimated value of the policy effect in 2018 and 2020, respectively; $Control_{ijt}$ is the other control variable; and ϵ_{i2018t} and ϵ_{i2020t} are error terms.

In order to reduce the sample selection bias, this paper introduces propensity score matching on the basis of the DID model for calibration and robustness testing, thus ensuring that the results of the study are not disturbed by the effect of sample selectivity.

IV. Empirical analysis

(i) Selection of variables

This study empirically analyzes data based on the China Health and Retirement Longitudinal Study (CHARLS), which was initiated by the National Development Research Institute of Peking University in 2011 and covers 28 provinces, municipalities, and autonomous regions across China. In this study, three periods of data from 2015, 2018, and 2020 were selected for empirical analysis, key variables were screened, and the datasets were precisely merged through ID matching. Focusing on people aged 45 and above, we screened 29,366 valid samples for analysis. Specific variables are selected and processed as follows.

The selected explanatory variable is the happiness of middle-aged and elderly people, which is measured using self-assessed life satisfaction, as suggested by Zhao Fengjun (2016) and Zheng Chao (2020) [28, 29]. We used self-assessed life satisfaction as an indicator to measure the level of well-being of middle-aged and elderly people. Life satisfaction, as a subjective evaluation indicator, not only considers the actual living conditions of an individual but also integrates the individual's subjective feelings and expectations about life. This indicator is based on the question in the CHARLS questionnaire, "Overall, are you satisfied with your life?" and is quantitatively scored on a scale of 1 to 5, where 5 means "extremely satisfied" and 1 means "not at all satisfied." Higher scores indicate greater life satisfaction and vice versa.

Referring to the practice of scholars such as Chen Rui (2023) [30], whether middle-aged and elderly people participate in the basic medical insurance for urban and rural residents is the core explanatory variable, according to the questionnaire "whether you yourself are currently enrolled in the following medical insurance" to determine whether the individual is enrolled in urban and rural residents' health care integration at the time of the survey, and if the respondent answers Yes, it is assigned a value of 1; otherwise, it is assigned a value of 0. The specific form of the explanatory variable is the interaction term of the policy dummy variable and the time dummy variable.

According to the needs of the study, the control variables selected include age, gender, literacy, marital status, area of residence, total annual household income (in logarithms), and health status. The indicator of total annual household income was selected to be expressed as the sum of consumption. The selection and definition of the variables are shown in Table 1.

Table 1: Variable Settings and Descriptions

Variable Type	Variable Name	Variable Symbol	Variable Definition
Explanatory variable	sense of well-being	Happiness	Extremely satisfied = 5, Very satisfied = 4, Quite satisfied = 3 Not very satisfied = 2, Not at all satisfied = 1
Core explanatory variables	double difference	DID	Cross-multipliers of policy dummy variables with time dummy variables
Control variable	(a person's) age	Age	Year of visit minus ID birth year
	distinguishing between the sexes	Male	Male = 1, Female = 0
	Literacy	Literate	Literate = 1, illiterate = 0
	marital status	Married	Married = 1, unmarried = 0
	living area	Urban	Urban = 1, rural = 0
	Annual household income (logarithmic)	Lnincome	The sum of annual expenditures of respondents and their household members on clothing, travel, education and training, medical care, health care, and beauty care, after taking logarithmic values.
	health status	Health	Bad, very bad = 1, fair = 2, good, very good = 3

(ii) Descriptive statistics

In the process of conducting the empirical analysis, this study carefully screened and excluded samples that had never participated in urban residents' medical insurance, new rural medical insurance, or urban and rural residents' basic medical insurance. Additionally, samples with missing key information were also excluded. The final number of valid samples was determined to be 29,366 [1], and the relevant descriptive statistics can be found in

[1]According to the setting of the model in this study, the final effective sample size here is the total three-year effective data for 2015, 2018, and 2020, whereas, in the subsequent DID regression analysis, the two sample sizes mentioned correspond to the effective samples for 2015 versus 2018, and 2015 versus 2020, respectively, which are not consistent.

Table 2.

In terms of the explanatory variables, the mean value of happiness is 3.262, which means that most respondents are "relatively satisfied" with their lives, showing that the overall happiness of middle-aged and elderly people in China is good, but the standard deviation is large, which indicates that there are differences in feelings among individuals. In terms of explanatory variables, the proportion of middle-aged and elderly people participating in health insurance integration is about 14.8%, showing a certain degree of popularity. The standard deviation value is 0.355, which shows the distribution of participation status, with a value close to twice the mean, indicating that some middle-aged and elderly people participate in health insurance integration, but a significant portion do not.

In terms of control variables, in terms of personal characteristics, the average age of these middle-aged and elderly people is 61.74 years, about 82.5% are married, and about 26.3% live in urban areas. In terms of educational level, 10.7% of the middle-aged and elderly were illiterate; in terms of economic status, the logarithmic mean of annual household income was 8.701; and the mean of self-assessment of health status was 1.961, reflecting the good self-perceived health status of most middle-aged and elderly people.

Table 2: Descriptive Statistics

Variant	Observed Value	Average Value	(Statistics) Standard Deviation	Minimum Value	Maximum Values
Happiness	29,366	0.148	0.355	0	1
DID	29,366	3.262	0.774	1	5
Age	29,366	61.74	9.893	46	118
Male	29,366	0.481	0.500	0	1
Literate	29,366	0.107	0.309	0	1
Married	29,366	0.825	0.380	0	1
Urban	29,366	0.263	0.440	0	1
Ln_income	29,366	8.701	1.515	0	14.51
Health	29,366	1.961	0.686	1	3

(iii) Benchmark regression analysis

Based on the model constructed in Section 3.2, this part explores the effect of institutional integration on the well-being of middle-aged and elderly people. The results of the related regression analysis are detailed in

Table ***3***.

Table 3: Effects of institutional integration on the well-being of middle-aged and elderly people based on double-differential regression

Variant	Sense of well-being	
	2018	2020
DID	0.0418**	0.0454**
	(0.0164)	(0.0222)
Age	0.00598***	0.00535***
	(0.000543)	(0.000694)
Male	0.0166*	0.0102
	(0.00997)	(0.0128)
Health	0.272***	0.260***
	(0.00770)	(0.00995)
Lnincome	0.00415	0.00476
	(0.00342)	(0.00449)
Urban	-0.00174**	0.00139
	(0.0129)	(0.0159)
Literate	0.0169	0.0630*
	(0.0152)	(0.0378)
Married	0.115***	0.123***
	(0.0150)	(0.0185)
Year	-0.0516***	-0.0332***
	(0.00367)	(0.00355)
Constant	106.2***	69.32***

	(7.387)	(7.142)
Observations	24,149	13,710
R-squared	0.066	0.062

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

From the regression results, hypothesis 1 is preliminarily confirmed that the integration of urban and rural residents' basic medical insurance systems positively affects the well-being of middle-aged and elderly people with the inclusion of control variables. Specifically, in the first DID analysis, the coefficient of the interaction term is 0.042. This means that since the implementation of the policy, the well-being of middle-aged and elderly people has been significantly improved by about 4.2%, and the p-value is at the statistical level of 5%, which strongly supports the positive impact of the integration of the system on well-being. Meanwhile, the second DID analysis shows that the coefficient of the interaction term is 0.045 and the p-value reaches the 10% significance level. This result shows that the positive impact of the policy has not weakened over time and that the policy effect has long-term stability. The conclusions of this study are consistent with the findings of Liu Huixian (2023), who used Probit regression analysis and also concluded that the integration of basic medical insurance for urban and rural residents is beneficial to the maintenance of positive emotions among insured residents [31].

In addition, this paper looks at the effects of other control variables on the subjective well-being of individuals, which are analyzed below:

Age has a significant positive effect on the well-being of middle-aged and older adults, meaning that as they grow older, middle-aged and older adults tend to exhibit higher levels of well-being. Our conclusion is further supported by the study of Wang, Qiu, and Xing, Zhanjun (2008), who found that the 55+ age group scored higher on several well-being-related dimensions, which suggests that with age, middle-aged and older adults experience higher levels of well-being in terms of contentment and abundance, psychological health, and social confidence [32].

Health status has a significant positive effect on the well-being of middle-aged and elderly people. Good health status not only ensures that middle-aged and elderly people maintain their daily lives but also avoids the pain caused by diseases, thus enhancing well-being. This finding is consistent with the findings of Zheng Zhidan and Zheng Yanhui (2017), who stated that individuals with better health tend to hold a higher evaluation of their life satisfaction [33]. In addition, Zhou Chunping (2012), in his study, also emphasized the positive effect of improving the health of the population on enhancing well-being [34].

Marital status exhibits a significant positive effect on the well-being of middle-aged and older adults. Delving deeper into the underlying mechanisms, we find that marital stability, especially among middle-aged and older adults who have a spouse, tends to reflect a stronger sense of family responsibility and enhanced well-being. In addition, our findings extend further from the findings of previous studies. In her study, Chen Lu (2013) pointed out that marriage significantly contributes to enhancing individuals' happiness [35].

(iv) Robustness tests

First, this study estimated the propensity scores of urban and rural residents' health insurance participation using the logit model. Then, samples with close scores were matched by the 1-to-1 nearest neighbor matching method combined with the caliper matching technique, and the effectiveness of feature control was ensured by checking the balance of the matched samples. In addition, the quality of matching was further verified by comparing the probability density plots of propensity scores before and after matching.

In order to ensure the reliability of the propensity score matching (PSM) results, we made the "conditional independence assumption" that there is no significant difference between the experimental group and the control group in terms of matching variables. As can be seen from

Table 4 andTable 5, the absolute values of standardized deviations for most variables were reduced to less than 10% after matching, indicating good matching. Although the standardized deviations of age and marital status increased, the p-values of all the matched variables exceeded 10%, indicating that the difference in the means of the experimental and control groups on the matched variables was not significant. Therefore, we can confirm that the application of the PSM-DID method is effective.

Table 4: Covariate Balance Test Results (2018)

Variable	Unmatched	Mean			%reduct	t-test		V(T)/V(C)
	Matched	Treated	Control	%bias	|bias|	t	p>|t|	
Age	U	61.846	61.596	2.5		1.22	0.221	0.98

	M	61.846	61.483	3.7	-45.3	1.34	0.180	0.99
Health	U	2.0156	1.93	12.3		6.00	0.000	1.02
	M	2.0156	2.0357	-2.9	76.5	-1.05	0.295	1.00
Lnincome	U	8.7439	8.5665	11.7		5.68	0.000	1.00
	M	8.7439	8.7212	1.5	87.2	0.56	0.579	1.07
Male	U	.47322	.47504	-0.4		-0.18	0.860	.
	M	.47322	.48614	-2.6	-610.5	-0.94	0.348	.
Urban	U	.19711	.16848	7.4		3.68	0.000	.
	M	.19711	.19332	1.0	86.7	0.35	0.728	.
Literate	U	.15572	.12349	9.3		4.69	0.000	.
	M	.15572	.15951	-1.1	88.2	-0.38	0.705	.
Married	U	.83897	.8193	5.2		2.49	0.013	.
	M	.83897	.84542	-1.7	67.2	-0.64	0.521	.

Table 5: Covariate Balance Test Results (2020)

Variable	**Unmatched**	**Mean**			**% reduct**	**t-test**		**V(T)/V(C)**
	Matched	**Treated**	**Control**	**%bias**	**|bias|**	**t**	**p>|t|**	
Age	U	61.618	61.69	-0.7		-0.30	0.765	0.94
	M	61.622	61.44	1.8	-151.1	0.59	0.555	1.01
Health	U	1.9814	1.9619	2.9		1.18	0.237	0.99
	M	1.9814	1.9924	-1.6	43.2	-0.52	0.606	0.99
Lnincome	U	8.7682	8.6709	6.4		2.61	0.009	0.90*
	M	8.7698	8.8111	-2.7	57.5	-0.87	0.387	0.91*
Male	U	.48717	.5096	-4.5		-1.85	0.064	.
	M	.48691	.47684	2.0	55.1	0.63	0.525	.
Urban	U	.34474	.38471	-8.3		-3.40	0.001	.
	M	.34441	.3716	-5.7	32.0	-1.79	0.074	.
Literate	U	.02416	.03574	-6.8		-2.63	0.008	.
	M	.02367	.02467	-0.6	91.3	-0.21	0.836	.
Married	U	.81933	.79092	7.2		2.90	0.004	.
	M	.81974	.83585	-4.1	43.3	-1.34	0.179	.

Figure 1 andFigure 2 intuitively show the comparison of the kernel density distribution of the propensity scores of the control group and the experimental group before and after matching. We can see that the probability distribution of the propensity score values of the two groups of samples before matching is relatively discrete, and the matching presents a high degree of overlap. This result effectively controls the influence of confounding factors, reduces sample self-selection bias, and enhances the credibility of the research conclusions.

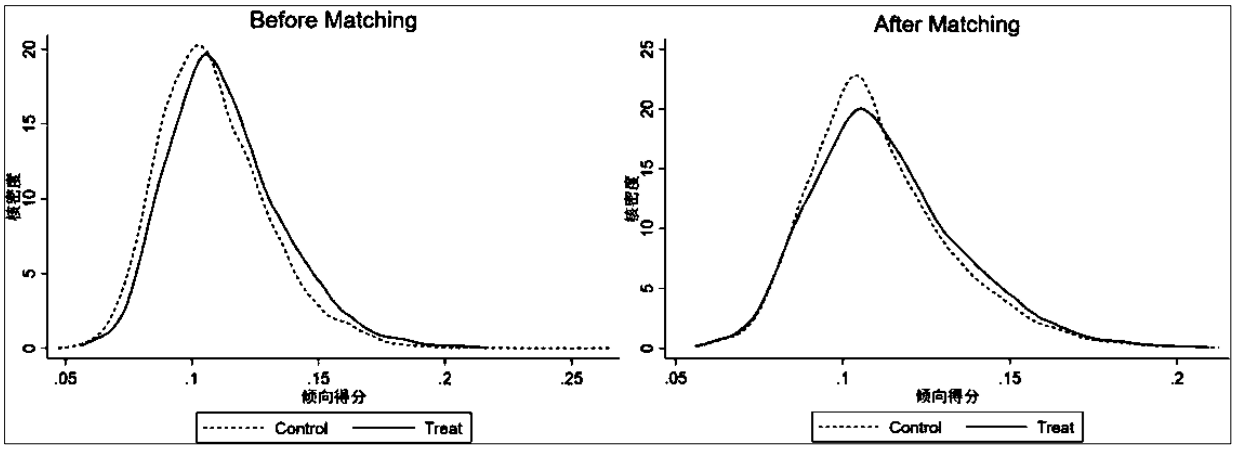

Figure 1: Kernel density map before and after propensity score matching in 2018

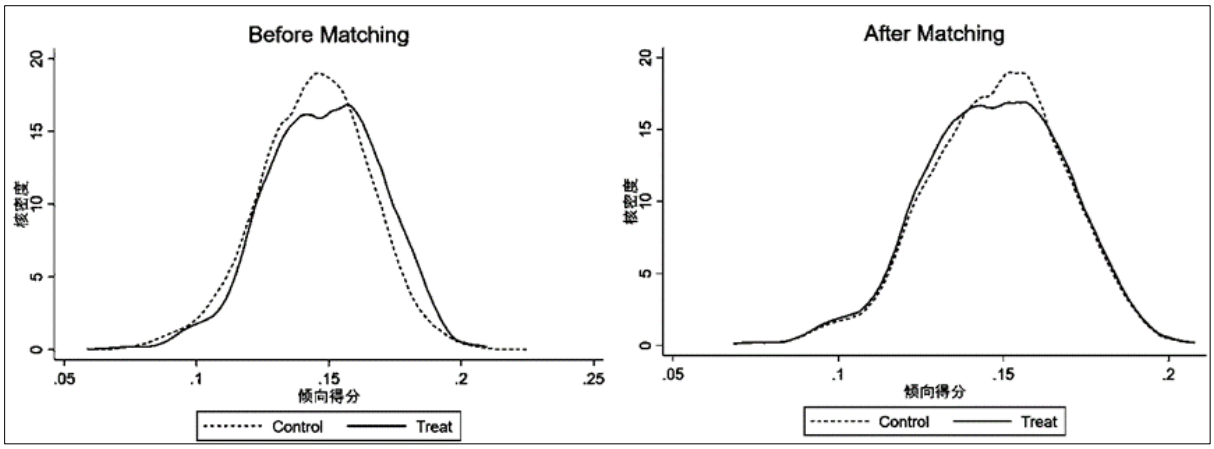

Figure 2: Kernel density map before and after propensity score matching in 2020

In this study, a propensity score matching-double difference model is used for robustness testing, which effectively controls for sample selection bias and endogeneity problems and has been widely used in economics in recent years 37. The regression results are shown in Table 6.

We observe that the coefficients of the interaction terms are 0.0418 for 2018 and 0.448 for 2020, both of which exhibit significance at the 5% level of statistical significance. This not only consolidates the robustness of the findings of the previous study but also further confirms that the integration of the health insurance system indeed enhances the level of well-being of the middle-aged and elderly population. This suggests that the integration of the basic medical insurance system for urban and rural residents not only enhances the well-being of the middle-aged and elderly in the short term but also has a certain degree of long-term stability.

Table 6: PSM-DID based robustness test results

Variant	**Sense of well-being**	
	2018	**2020**
DID	0.0418**	0.0448**
	(0.0164)	(0.0220)
Age	0.00606***	0.00536***
	(0.000579)	(0.000704)
Male	0.0166	0.0104
	(0.0107)	(0.0131)
Health	0.272***	0.260***
	(0.00806)	(0.0101)
Lnincome	0.00409	0.00446
	(0.00348)	(0.00451)
Urban	-0.00134	0.00150
	(0.0134)	(0.0162)
Literate	0.0173	0.0613
	(0.0154)	(0.0379)
Married	0.118***	0.123***
	(0.0163)	(0.0189)
Year	-0.155***	-0.166***
	(0.0102)	(0.0174)
Constant	2.318***	2.378***
	(0.0587)	(0.0711)
Observations	24,126	13,703
R-squared	0.066	0.062

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

(v) Heterogeneity test

According to Zhang Yukang (2023), the urban-rural residents' health insurance integration policy has a heterogeneous effect on different self-assessed health status groups 38. Therefore, based on this finding, we analyzed the heterogeneity of groups of middle-aged and elderly people with different health statuses. According to the data from

Table 7, in 2018, the policy exhibited a 10% significant level of impact on middle-aged and elderly people with poor self-assessed health status, while the positive effect of the policy is significant at the 5% level for the group with average self-assessed health status. However, in 2020, according to the results of the model analysis, the well-being-enhancing effect of the policy is only significant in the group with excellent self-assessed health.

This shift may be driven by deepening healthcare policies, increased health awareness, and changing psychological expectations. With the increase in reimbursement rates, the experience of healthcare services for middle-aged and elderly people with better health status has improved. This, coupled with the impact of the epidemic, has deepened their valuing of the health care system, increased their confidence in the health care system, and increased their sense of well-being.

Table 7: Results of Heterogeneity Analysis of Sub-Health Groups

Variant	2018			2020		
	Sense of well-being			Sense of well-being		
	bad team	General group	good group	bad team	General group	good group
DID	0.0767*	0.0450**	-0.00838	0.0215	0.0123	0.143 **
	(0.0409)	(0.0218)	(0.0329)	(0.0615)	(0.0287)	(0.0443)
Age	0.0114 ***	0.00349 ***	0.00588 ***	0.00937 ***	0.00313 ***	0.00732 ***
	(0.00126)	(0.000674)	(0.00119)	(0.00168)	(0.000848)	(0.00143)
Male	0.0567*	-0.00258	0.00946	0.0371	-0.00477	0.0138
	(0.0228)	(0.0127)	(0.0206)	(0.0306)	(0.0161)	(0.0259)
Married	0.145 ***	0.0968 ***	0.111 ***	0.144 ***	0.108 ***	0.127 ***
	(0.0292)	(0.0181)	(0.0313)	(0.0373)	(0.0218)	(0.0374)
Literate	0.0152	0.0168	0.0210	0.0823	0.0774	-0.0272
	(0.0327)	(0.0191)	(0.0327)	(0.0726)	(0.0446)	(0.0806)
Lnincome	0.0143 ***	0.00356	-0.0072 3	0.0146	0.00254	-0.000748
	(0.00791)	(0.00426)	(0.00669)	(0.0109)	(0.00557)	(0.00842)
Urban	0.0646**	-0.0238	-0.00664	0.00605	0.0110	-0.0259
	(0.0325)	(0.0164)	(0.0261)	(0.0399)	(0.0201)	(0.0306)
Year	-0.0619 ***	-0.0518 ***	-0.0365 ***	-0.0319 **	-0.0330 ***	-0.0297 ***
	(0.00814)	(0.00464)	(0.00771)	(0.0102)	(0.00464)	(0.00697)
Constant	126.8 ***	107.4 ***	76.89 ***	66.53 **	69.54 ***	63.05 ***
	(16.40)	(9.358)	(15.53)	(20.51)	(9.327)	(14.03)
Observations	6561	12493	5095	3423	7348	2939

Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001

Income, as a key indicator of socioeconomic status, has a significant impact on the well-being of middle-aged and elderly people. In this study, the sample data of residents' income are arranged in descending order, and the annual household income is divided into the top 20%, the middle 60% and the bottom 20%, so as to define the high-income group, the middle-income group and the low-income group. The specific analysis results of the differences in happiness among middle-aged and elderly people across different income groups are presented in Table 8.

Table 8: Results of heterogeneity analysis by income group

Variant	2018			2020		
	Sense of well-being			Sense of well-being		
	Low-income group	Middle-income group	High-income group	Low-income group	Middle-income group	High-income group
DID	0.0559*	0.00668	0.0599**	0.102*	0.0233	0.0258
	(0.0314)	(0.0291)	(0.0286)	(0.0490)	(0.0417)	(0.0343)
Age	0.00700 ***	0.00433 ***	0.00707 ***	0.00631 ***	0.00384 ***	0.00694 ***
	(0.000933)	(0.000925)	(0.000985)	(0.00124)	(0.00115)	(0.00119)
Male	0.0309	-0.000419	0.0187	0.0103	0.00796	0.00466
	(0.0171)	(0.0174)	(0.0175)	(0.0225)	(0.0225)	(0.0215)
Married	0.100 ***	0.164 ***	0.0635*	0.0797**	0.200 ***	0.0666*
	(0.0220)	(0.0240)	(0.0280)	(0.0276)	(0.0293)	(0.0333)
Literate	-0.00668	0.0548*	0.000393	0.0107	0.103	0.0887
	(0.0259)	(0.0263)	(0.0258)	(0.0561)	(0.0570)	(0.0708)

Lnincome	0.291 ***	0.258 ***	0.270 ***	0.280 ***	0.249 ***	0.254 ***
	(0.0123)	(0.0127)	(0.0125)	(0.0163)	(0.0168)	(0.0156)
Urban	0.00159	0.00629	0.00565	0.00547	0.0306	0.0293*
	(0.00850)	(0.0317)	(0.0105)	(0.0107)	(0.0413)	(0.0138)
Year	0.0396	-0.0382	-0.000327	0.0361	-0.0322	0.00472
	(0.0257)	(0.0233)	(0.0206)	(0.0294)	(0.0271)	(0.0263)
Constant	-0.0531***	-0.0420 ***	-0.0632 ***	-0.0390 ***	-0.0272 ***	-0.0389 ***
	(0.00610)	(0.006)	(0.00676)	(0.00807)	(0.00647)	(0.00574)
Observations	109.3 ***	87.08 ***	129.8 ***	80.92 ***	56.93 ***	80.44 ***
	(12.28)	(12.59)	(13.62)	(16.25)	(13.02)	(11.56)
Variant	8097	8003	8049	4598	4542	4570

Standard errors in parentheses, * p < 0.05, ** p < 0.01, *** p < 0.001

Specific analyses are as follows: in 2018, the low-income and high-income middle-aged and elderly groups are able to meet their life needs more effectively and enjoy higher-quality healthcare services, thus taking advantage of their physical and mental health, which directly contributes to the improvement of their sense of well-being. However, in 2020, the well-being-enhancing effect of the low-income middle-aged and elderly groups became significant, which may be attributed to the strengthening of policy support during the epidemic, special attention to the health and well-being of the low-income group, and so on. These findings align with existing scholarly research, such as Yan Xiaojing's (2021) study, which found that basic health insurance for urban and rural residents positively impacts the health of all income classes, particularly low-income groups. This is mainly because the increase in the use of medical services is more significant when low-income groups are insured, which is in line with the original purpose of the basic medical insurance system 39.

V. CONCLUSIONS OF THE STUDY AND REVELATIONS

Based on data from the 2015, 2018, and 2020 China Health and Retirement Longitudinal Study (CHARLS), this paper utilizes a double difference model to explore the association between the urban-rural residents' health insurance integration policy and the well-being of middle-aged and elderly people. The study finds that, first, the urban-rural residents' health insurance integration policy has a significant positive effect on the well-being of middle-aged and elderly people. Second, the effects of the urban-rural health insurance integration policy on the life satisfaction of middle-aged and elderly people with different health conditions and income levels are heterogeneous, and the significance results are different in different years.

The above findings show that although China's urban and rural residents' health insurance integration policy has achieved positive results, there is still room for improvement. Based on the above research, this paper puts forward the following suggestions: First, deepen the integration of health insurance, optimize the coordination mechanism of basic health insurance for urban and rural residents, improve the quality of medical services, and achieve the optimal allocation of health insurance resources. Second, for middle-aged and elderly people with different health conditions and income levels, strengthen the policy design of 'precision health insurance', formulate differentiated health insurance supporting measures and assistance policies, and improve the precision and adaptability of health insurance policies. In addition to financial assistance, provide customized medical support, such as the inclusion of special medicines in the medical insurance catalog and other measures. Thirdly, health education and health promotion activities should be carried out to enhance the health awareness and self-care ability of the middle-aged and the elderly. Through education and guidance, we will help middle-aged and elderly people prevent diseases and reduce medical dependency. Fourthly, increasing investment in medical protection for rural areas and low-income middle-aged and elderly people, and narrowing the gap in medical protection between urban and rural areas and between different income groups. This includes upgrading rural medical facilities, allocating additional medical resources, and providing additional medical assistance to low-income groups.

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