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Effect of Outpatient Pooling Scheme on the Medical Costs of Patients with Chronic Diseases

--Based on Multi-period DID Modeling

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Abstract: The establishment of a sound mechanism for covering outpatient medical bills under the basic medical insurance for urban employees is one of the major livelihood projects to deepen the reform of China's medical security system. This study utilizes the China Health and Retirement Longitudinal Study (CHARLS), combines the interview data from four periods from 2011 to 2018, empirically analyzes the impact of the outpatient pooling scheme on the total outpatient costs and personal burden of patients with chronic diseases by using a multi-period double-difference model and further validates it by using the double-difference propensity score matching method (PSM-DID). The results show that the implementation of the outpatient pooling scheme is conducive to reducing the healthcare burden of chronically ill patients. Although the outpatient co-ordination did not have a significant impact on the reduction of outpatient costs for patients with chronic diseases, it significantly reduced the self-treatment costs of patients with chronic diseases. Further research found that the policy had a greater impact on chronic disease patients with poorer health. Combined with the results of the study, this paper suggests gradually eliminating the differences in basic policy treatment between regions, guaranteeing the level of outpatient treatment for insured patients in different places, and promoting better utilization of the outpatient co-ordination policy effect.

Keywords: outpatient pooling scheme, chronically ill patients, outpatient costs, multi-period double-difference modeling.

1. Introduction

With changes in living environment and lifestyle, population aging and rapid urbanization, chronic diseases have become the primary threat to the health of China's residents[1]. As chronic diseases are characterized by long duration, numerous complications and basic incurability, patients usually need to rely on frequent outpatient services to control and treat their diseases, which brings a heavy burden to patients, families and society. The total prevalence rate of chronic diseases in China was 34.3% in 2018, resulting in a disease burden that accounts for 70% of the total disease burden.

The exploration of the outpatient pooling scheme has gone through three stages, namely, "practical exploration, gradual development and full implementation". As the traditional model of integrated

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social pooling with individual accounts lacks risk sharing, and it is difficult to bring into play the redistributive effect of social medical insurance between different groups. At the beginning of the 21st century, some conditional regions in China, such as Beijing, Shanghai, Ningbo and other areas, carried out the exploration of outpatient pooling scheme for the basic medical insurance for urban employees one after the other. In 2009, Chinese government issued a paper about improving medical insurance for urban residents, proposing that "on the basis of focusing on guaranteeing the medical expenditures of insured residents for hospitalization and outpatient major illnesses, outpatient medical expenses for minor illnesses will gradually be included in the scope of payment by the fund", after that the work of outpatient coordination for urban and rural residents was gradually carried out throughout the country. In 2018, Chinese government lunched a notice about Basic Medical Insurance for Urban and Rural Residents, mentioned that “China will establish a general support mechanism for covering outpatient medical bills under the employee basic medical insurance and broaden the use of funds in individual accounts, to ease people's medical burden”. In 2021, the State Council issued the guiding opinions on establishing and improving a general support mechanism for covering outpatient medical bills under the basic medical insurance for urban employees, which provides unified guidance on the implementation of outpatient pooling scheme and requires that the state will enhance the general support for covering outpatient medical bills. A mechanism for the overall planning of covering general outpatient bills under the medical insurance for employees shall be established and improved. On the basis of ensuring the medical insurance for hypertension, diabetes, and other outpatient chronic diseases and special diseases (hereinafter collectively referred to as outpatient chronic and special diseases) for which the general public patients bear a heavy burden, gradual steps shall be taken towards reimbursing the general outpatient bills for frequently occurring and common diseases through unified accounts. Thus making the outpatient pooling scheme a reality throughout the country.

Against this background, whether chronically ill patients, as a social group with an urgent need for outpatient services, will be provided with further medical protection under the outpatient pooling scheme, thereby changing their choice of outpatient services and improving their health, is crucial to the assessment of the effect of this policy.

2. Literature Review

Outpatient co-ordination is a form of outpatient protection through the unified mobilization and use of medical insurance funds to provide disease cost protection in the form of mutual aid and risk sharing[2]. Currently, the academic research on the effect of outpatient coordination policy is mainly carried out from the perspectives of participants' medical service utilization, patients' medical burden, and health insurance fund allocation[3], and the scope of the research is also continuously refined with the passage of time. Scholar Zhu Fengmei used zero-inflated Poisson regression and two-stage least squares model to examine the impact of outpatient coordination on healthcare utilization and costs, and found that the policy helps to improve healthcare utilization, but it needs to be reasonably designed in order to avoid overuse and fund wastage[4], and scholars such as Cao Qinghua and others have pointed out that the outpatient coordination of urban workers' healthcare insurance helps to reduce the out-of-pocket medical costs of the insured employees, and improves the outpatient service utilization rate while significantly reducing the inpatient service utilization rate[5]. Scholars Du Wenwen and other scholars further examined the impact of different reimbursement rates on patients' medical behavior, health output and medical costs, pointing out that moderately increasing the outpatient treatment for patients with chronic diseases can prompt patients to have more reasonable medical behavior and better health output, and achieve the control of medical costs and effective use of the health insurance coordination fund[6]. Scholars Tian Hu[7] and He Wen[8] also reached similar conclusions.

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Although a number of scholars have pointed out the positive effects of the implementation of the outpatient coordination system, some scholars have pointed out that the outpatient coordination has not had a significant impact on the reduction of outpatient and inpatient costs of the insured, and that compared with the general population, patients with chronic illnesses, especially those who suffer from multiple illnesses, are less sensitive to outpatient treatment, and thus the enhancement of outpatient coverage will not affect the use of their medical services[9][10]. Other scholars have argued that the medical costs of outpatient illnesses are usually too low to impose an undue financial burden on patients, and therefore "outpatient coverage" is a pan-welfare system, which is contrary to the law of large numbers and the principle of mutual aid in insurance[11].

Although the academic community has accumulated rich discussions on the implementation effect of outpatient coordination, chronic disease groups, as one of the most frequent and urgent users of outpatient services, are rarely discussed by scholars as an independent research object. In addition, due to the longer duration and treatment cycle of chronic diseases, compared with acute and common diseases, their medical consumption has its unique characteristics[12], such as the type of medical treatment tends to be outpatien[13], the delayed nature of medical treatment and more inclined to self-treatment, etc.[14], which makes it more valuable for research. Based on this, this paper empirically analyzes the impact of outpatient pooling scheme on chronic disease patients using a multi-period double-difference model based on relevant data from the China Health and Retirement Longitudinal Study(CHARLS), and explores whether the reform of the outpatient coordination system can produce the expected policy effects such as reducing the burden of medical costs on the insured, with the aim of providing a certain marginal contribution to the establishment of a sound and comprehensive health care system for the chronically ill. It is hoped to provide certain marginal contribution and provide reference basis for the establishment of a sound outpatient co-payment protection mechanism.

3. Materials and methods

3.1. Data sources and variable design

The data for this study come from the China Health and Retirement Longitudinal Study (CHARLS)[1], which is hosted by the National Development Research Institute of Peking University and implemented by the China Social Science Research Center, collecting high-quality microdata representing households and individuals of middle-aged and elderly people in China aged 45 years and above. It covers a wide range of information from socioeconomic status to individual health status. In this paper, the interview data from the four periods from 2011 to 2018 were combined and processed to select people aged 45 and above as the analyzed sample, and exclude those who did not suffer from chronic diseases, as well as meaningless and defective items, finally obtaining a valid sample of 41,172.

3.1.1. Explanatory variable

In this paper, the patient's total expenditure on outpatient costs in the previous month and the proportion of expenditure on out-of-pocket visits to total outpatient expenditures were selected as the explanatory variables. In this case, logarithmic treatment was applied to the total expenditure on outpatient costs in the previous month.

[1] China Health and Elderly Tracking Survey (https://charls.pku.edu.cn/index.htm)

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3.1.2. Explanatory variable

The explanatory variable is whether outpatient pooling scheme is carried out. For the collection of explanatory variables, this paper has been improved on the basis of the research of Cao Qinghua and other scholars. On the basis of the 31 cities that have carried out out outpatient co-ordination of urban workers' medical insurance and the time of implementation of the system, this paper further collects the data from the official websites and governmental documents, and organizes the time of implementation of outpatient co-ordination policy of the 125 cities involved in the sample, which is specifically shown in Table 1, and assigns a dummy variable according to the time of implementation of the policy compared with the time of the questionnaire statistics. If the implementation time of the policy is earlier than the time of the questionnaire survey, the variables of the current year and the following years will be assigned as 1, and if the provincial coordination is not realized, the variables will be assigned as 0.

Table 1: Cities that have launched outpatient pooling scheme for urban workers' health insurance and when the policy was implemented

city	timing	city	timing	city	timing	city	timing	city	timing
Shanghai	2001	Shangrao	2023	Linfen	2023	Linyi	2022	Guilin	2020
Lincang	2022	Lishui	2011	Lijiang	2023	Jiujiang	2022	Yulin	2022
Bozhou	2023	Foshan	2010	Jilin	2023	Baoding	2021	Hanzhong	2020
Baoshan	2023	Xinyang	2022	Lu'an	2022	Lanzhou	2023	Jiangmen	2010
Hinggan league	2022	Neijiang	2022	Zhoukou	2022	Beijing,	2001	Cangzhou	2021
Nanchong	2022	Nanning	2022	Nanchang	2020	Taizhou (Zhejiang)	2010	Zhuang: Hozciz	2014
Dalian	2014	Tianjin	2010	Weihai	2022	Loudi	2022	Taizhou (Jiangsu)	2009
Ningde	2022	Ningbo	2022	Anqing	2022	Anyang	2022	Ji'nan	2014
Dingxi	2023	Yibin	2023	Yichun	2023	Baoji	2023	Huainan	2020
Suzhou	2010	Suqian	2023	Yueyang	2019	Chaohu	2023	Shenzhen	2010
Guangzhou	2009	Zhangye	2020	Xuzhou	2020	Dezhou	2021	Qingyuan	2010
Chengde	2021	Kunming,	2022	Zhaotong	2022	Pingliang	2023	Weinan	2022
Chaoyang	2023	Benxi	2022	Huzhou	2009	Binzhou	2015	Zhangzhou	2009
Weifang	2014	Chaozhou	2021	Puyang	2022	Jiaozuo	2020	Yulin	2022
Yangzhou	2023	Yiyang	2022	Yancheng	2011	Meishan	2016	Changde	2020
Fuzhou	2009	Mianyang	2022	Liaocheng	2023	Suzhou	2010	Maoming	2010
Jingmen	2014	Putian	2021	Xiangfan	2022	Ziyang	2023	Ganzhou	2020

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Table 1: (continued).

Chifeng	2022	Yuncheng	2023	Guang'an	2020	Shaoyang	2022	Zhengzhou	2022
Chongqing	2024	Chengdu	2023	Jinzhou	2022	Changsha	2022	Fuyang	2023
Yangquan	2023	Xinzhou	2021	Qingdao	2010	Anshan	2011	Ji’xi	2023
Ji'an	2023	Jiamusi	2013	Harbin	2023	Hulunbuir	2022	Guilin	2020
Shijiazhuang Hebei	2012	Jingdezhen	2023	Pingdingshan	2021	Lianyungang	2010	Haidong	2011
Hohhot	2011	Liangshan Yi autonomous prefecture	2023	Qiandongnan Miao and Dong autonomous prefecture	2022	Qiannan Buyi and Miao autonomous prefecture	2022	Qiqihar	2023
Aksu	2022	Enshi Tujia and Miao autonomous	2020	Xilin Gol league	2022	Kandze, Tibetan autonomous prefecture	2022	Chuxiong Yi autonomous prefecture	2018
Huanggang	2023	Jiaxing	2021	Siping	2023	Luoyang	2022		

3.1.3. Control variable

In this study, gender, age, hukou, education, work status, marital status, family size, monthly after-tax income, self-rated health status, whether they smoke, whether they drink alcohol, whether they are covered by private health insurance, and whether they are covered by other insurance were included in the model as control variables. The meanings and assigned values of all variables are shown in Table 2.

Table 2: Control variables and their descriptions

variable name	Description of variables
gender	Refers to the gender of the respondent, 1=male, 2=female
age	Refers to the age of the respondent
rhukou	Refers to the type of respondent's hukou, 1=Agricultural hukou, 2=Non-agricultural hukou, 3=Unified residential hukou, 4=No hukou
education	Refers to the respondent's highest level of education, 1=uneducated (illiterate), 2=did not finish elementary school but can read and write, 3=private schooling, 4=primary school graduation, 5=junior high school graduation, 6=high school graduation, 7=secondary school graduation (including secondary teacher training and vocational high school), 8=junior college graduation, 9=bachelor's degree graduation, 10=masters' degree graduation/doctoral degree graduation

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Table 2: (continued).

rwork	Indicates whether the respondent is currently working, 1=yes, 0=no
marital	Refers to the marital status of the respondent, 1=married, 3=partnered and unmarried, 4=separated, 5=divorced, 7=widowed, 8=never married
hhhres	Refers to the number of persons living in the respondent's household
ritearn	Refers to the monthly after-tax income of the respondent
rshlta	Refers to the respondent's self-assessed health status, 1=very good, 2=good, 3=fair, 4=bad, 5=very bad
smoke	Indicates whether the respondent has ever smoked cigarettes, 1=yes, 0=no
drunk	Indicates whether the respondent has ever consumed alcohol, 1=yes, 0=no
rhipriv	Indicates whether the respondent is covered by commercial health insurance, 1=yes, 0=no
rhiothp	Indicates whether respondent is covered by other health insurance, 1=yes, 0=no

3.2. Model Design

Difference-in-differences (DID) model is an econometric method for estimating causal effects, which simulates an experimental research design by comparing the changes in the experimental and control groups before and after the intervention, so as to estimate the average effect of the intervention. The core of the method lies in the use of panel data, and the elimination of potential interfering factors through double differencing, so as to achieve a more accurate identification of the effect of the intervention. Since the time of implementation of outpatient pooling scheme varies from place to place, this paper applies a multi-time DID model to assess its impact on the total monthly outpatient expenditures of chronically ill patients and the percentage of out-of-pocket expenses of individuals, so as to estimate the long-term effect of the policy more accurately. The basic regression model is constructed as follows:

$$Y_{it} = \gamma E_{it} + \beta X_{it} + \lambda_i + \theta_t + \epsilon_{it} \quad (1)$$

In this model, Y_{it}represents policy outcomes (monthly outpatient expenditures, monthly out-of-pocket expenditures on medical care as a proportion of total outpatient expenditures) for individuals in city i in year t;E_{it} represents whether city i implemented outpatient care in year t, with 1 for yes and 0 for no;X_{it} represents the set of control variables, including gender, age, household, education, work status, etc; λ_i represents urban fixed effects; θ_t represents time fixed effects and $\epsilon_{it}$is Error term.

4. Empirical Analysis

4.1. Descriptive Statistics of Variables

As can be seen from Table 3, the mean age of the interviewed chronic disease population was 61.338, with an overall skew towards the older age group, and a relatively balanced male to female ratio, with slightly more males than females. Given that the majority of the interviewees were elderly and suffered from chronic diseases, their self-assessed health level was generally between fair and poor, with little individual difference, and thus they had a greater demand for outpatient medical care each

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month. Among all respondents, the average monthly after-tax income was 3,854 yuan, with significant income disparity. Among them, only a small number of respondents were covered by private health insurance or other types of insurance. In addition, the average value of respondents' participation in outpatient pooling scheme is 0.191, which reflects the relatively limited coverage of outpatient pooling scheme until 2021, as the government has not yet issued a unified policy document to promote and guide the implementation of outpatient pooling schemefor health insurance, indirectly leading to a higher proportion of out-of-pocket expenses for patients during outpatient visits, with an average value of 44.6%.

Table 3: Results of descriptive statistics

Variable meaning	Variable symbol	Number of samples	Standard deviation	Mean
Whether or not outpatient coordination is in place	D	41172	0.392	0.191
Total monthly outpatient costs	lnrtotdoc1m	41172	2.454	1.212
Monthly out-of-pocket expenses for outpatient services as a percentage of total expenses	A	41172	1.456	0.446
(a person's) age	age	41172	9.486	61.338
distinguishing between the sexes	gender	41172	0.495	1.573
marital status	marital	41172	2.077	1.947
Self-assessed health status	rshlta	41172	0.927	3.146
education attainment	education	41172	1.942	3.306
population (counted as number of households for census or taxation)	rhukou	41172	0.472	1.247
Are you a smoker?	smoke	41172	0.416	0.223
Whether or not alcohol is consumed	drunk	41172	0.494	0.421
working condition	rwork	41172	0.490	0.601
Whether covered by private health insurance	rhipriv	41172	0.156	0.025
Are covered by other types of insurance	rhiothp	41172	0.108	0.012
Household size	hhhres	41172	1.648	3.187
Monthly after-tax income	ritearn	41172	17346.05	3854.386

4.2. Benchmark Regression

Table 4 reports the impact of the implementation of the outpatient pooling scheme on outpatient medical costs and their burden for patients with chronic diseases. Columns 1-2 and 3-4 report the results of the multi-time DID modeling with total monthly outpatient costs as the dependent variable and the proportion of monthly out-of-pocket medical expenditures to total outpatient expenditures as the dependent variable, respectively. The results show that the coefficient of whether or not outpatient pooling scheme is practiced is significantly positive when total monthly outpatient expenses is used

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as the dependent variable, while the coefficient of whether or not outpatient pooling scheme is practiced is significantly negative when the ratio of monthly out-of-pocket expenses to total outpatient expenses is used as the dependent variable, indicating that the the policy releases more outpatient demand, and that the total monthly outpatient expenses of the interviewees have increased compared with those in the past but the proportion of individual outpatient out-of-pocket expenses has declined. Patients with chronic diseases are effectively protected under the outpatient pooling scheme.

The above results show that appropriate compensation for outpatient medical care is conducive to the formation of reasonable medical behavior among patients with chronic diseases, which protects the right to medical care of special groups. To put it in another way, with the rationality of patients' medical behavior and the improvement of their health status, some of the costs that might have been incurred in hospitalization are transferred to outpatient clinics, thus forming a substitution of outpatient clinic costs for inpatient hospitalization costs[15], leading to a rise in the total amount of outpatient clinic costs. This trend is both a reflection of the active triage of patients after the improvement of the compensation mechanism for public health services and the realization of the allocation of medical service resources, as well as a reflection of the health benefits of the outpatient co-ordination policy, which is in line with the orientation of Value-Based healthcare. Along with the increase in the number of outpatient visits, patients have strengthened their concern and understanding of their own diseases, and doctors can also better disease management, health guidance and other educational activities, which is conducive to preventing complications and controlling disease progression, responding to China's promotion of "prevention-oriented"strategy for the Healthy China initiative

Other control variables are also worthy of attention. Compared with inpatient services, the demand for outpatient services is more elastic and susceptible to a variety of factors. According to Prospect Theory, when patients face the decision of choosing an outpatient institution, they will first judge the expected value of the upcoming behavior according to their own health status, and then combine their own experience and cognition of the existing conditions, and finally make the corresponding decision of outpatient service[16]. Among the many factors, age, education and self-assessed health status significantly affect the total monthly outpatient costs, the higher the cultural level of chronic disease patients, the stronger their health awareness, and the higher the demand for outpatient services; the significant negative effect of age on the total monthly outpatient costs means that as the age of the patient increases, the higher the probability of suffering from a serious illness, the relative decrease in outpatient demand, and the higher demand for inpatient services. Gender and work status also have an impact on total monthly outpatient costs, with women having a higher demand for outpatient services than men, and the coefficient for work status is significantly negative due to the higher probability of chronic diseases among retired elderly people.

The decline in monthly out-of-pocket spending as a percentage of total outpatient expenditures was similarly influenced by a variety of factors. Unlike the regression results of total monthly outpatient expenses, gender has no significant effect on the proportion of out-of-pocket expenses, while marital status is significantly positive, reflecting the fact that being married may have a positive impact on the psychological state of the patient, with a certain positive supportive effect emotionally and economically, whereas due to the lack of a family's role in guaranteeing the health of the family, chronic patients who live alone, divorced, or widowed have a greater need for social co-payment of health care insurance, and are more concerned about the application of social welfare is implemented.

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Table 4: Benchmark regression results

	Total monthly outpatient costs	Total monthly outpatient costs	Percentage of monthly outpatient self-sayment expenses	Percentage of monthly outpatient self-payment expenses
D	0.197**	0.187**	-0.912***	-0.915***
	(0.090)	(0.088)	(0.057)	(0.057)
age		-0.007***		-0.002**
		(0.002)		(0.001)
gender		0.071**		0.021
		(0 .033)		(0.012)
marital		-0.004		0.005**
		(0.006)		(0.002)
rshlta		0 .475***		0.046***
		(0.013)		(0.005)
education		0. 049***		0.006**
		(0.008)		(0.003)
rhukou		0.031		-0.001
		(0.031)		(0.003)
smoke		-0.295***		-0.003
		(0.032)		(0.012)
drunk		0.019		0.028**
		(0.029)		(0.010)
rwork		-0.145**		-0.007
		(0.029)		(0.010)
rhipriv		0.057		0.017
		(0.077)		(0.020)
rhiothp		0 .244		-0.056
		(0.121)		(0.043)
hhhres		0.005		0.004
		(0.008)		(0.003)
ritearn		-3.93e		-9.08e
		(4.96e)		(1.35e)
urban fixed effect	containment	containment	containment	containment
time fixed effect	containment	containment	containment	containment
observed value	41172	41172	41172	41172

Note: Cluster-adjusted standard errors at the individual level are in parentheses; ** and *** indicate 5% and 1% significance levels, respectively.

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4.3. Tests based on the PSM-DID method

In order to overcome the systematic differences in the change trends of cities with and without outpatient pooling scheme and to reduce the estimation bias of the double-difference method, this paper further utilizes the PSM-DID method to conduct a robustness test[17]. On the basis of controlling variables such as gender, age, marital status, and education level, a logit model of whether outpatient pooling scheme is implemented in a region is established, and nearest-neighbor 1:5 no-return sampling is adopted to match patients, and then the main regression in Table 4 is repeated with the matched samples, in order to test the robustness of the effect of the implementation of the outpatient coordination policy on the total monthly outpatient costs of patients with chronic diseases, as well as the ratio of monthly outpatient outpatient out-of-pocket costs to the total cost of outpatient coordination. whether the impact results are robust.

Table 5 reports the regression results of the PSM-DID methodology. From the table, it can be seen that after utilizing the PSM-DID method, the impact of the implementation of outpatient pooling scheme on the total monthly outpatient costs is still significantly positive, and the impact on the proportion of monthly outpatient outpatient outpatient out-of-pocket costs to the total costs is still significantly negative, which can lead to the conclusion that the implementation of the outpatient pooling scheme can reduce the proportion of outpatient out-of-pocket costs for patients and the burden of patients' medical care.The results of the PSM-DID estimation and the results of the previous double-difference results are not significantly different from the results of the DID method, thus further supporting the empirical conclusion of this paper.

Table 5: PSM-DID results

	Total monthly outpatient costs	Percentage of monthly outpatient self-payment expenses
D	0.184**	-0.914***
	(0.090)	(0.058)
age	-0.007***	-0.002**
	(0 .001)	(0.001)
gender	0.067	0.025*
	(0 .034)	(0.012)
marital	-0.003	0.003
	(0.006)	(0.002)
rshlta	0 .472***	0.044***
	(0.013)	(0.005)
education	0. 046***	0.007**
	(0.008)	(0.003)
rhukou	0.033	-0.003
	(0.031)	(0.013)
somke	-0.302***	-0.002
	(0.033)	(0.012)
drunk	0.024	0.027**
	(0.029)	(0.011)

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Table 5: (continued).

rwork	-0.147**	-0.007
	(0.029)	(0.011)
rhipriv	0.066	0.021
	(0.079)	(0.020)
rhiothp	0 .219	-0.053
	(0.121)	(0.044)
hhhres	0.004	0.004
	(0.008)	(0.003)
ritearn	-2.44e	-6.90e
	(4.84e)	(1.31e)
urban fixed effect	containment	containment
time fixed effect	containment	containment
observed value	39815	39815

Note: Cluster-adjusted standard errors at the individual level are in parentheses; ** and *** indicate 5% and 1% significance levels, respectively.

4.4. Further Discussion

In this paper, the sample is regressed in groups according to self-assessed health outcomes, and the results in Table 6 show that the implementation of outpatient pooling scheme significantly increases the total monthly outpatient visits for individuals with poor self-assessed health, while individuals with excellent and average self-assessed health are not affected by outpatient coverage. This implies that chronically ill individuals in poorer health are more likely to be incentivized by a modest enhancement in chronic disease outpatient coverage, and therefore have higher monthly outpatient costs than before, while there is no significant shift for those with milder conditions.

Table 6: Regression results for total outpatient visits in the next month for self-assessed healthiness subgroups

	Self-assessed health is very good	Self-assessed health is average	Poor self-rated health
D	-.103	0.083	0.509***
	(0.165)	(0.117)	(0.186)
age	0.003	-0.004	-0.017***
	(0.003)	(0.002)	(0.003)
gender	0.010	0.140**	-0.029
	(0.058)	(0.044)	(0.071)
marital	-0.013	-0.005	0.002
	(0.011)	0.008	(0.012)
education	0.008	0.056***	0.087***
	(0.013)	(0.010)	(0.018)

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Table 6: (continued).

rhukou	-0.014	0.057	0.055
	(0.051)	(0.041)	(0.071)
smoke	-0.183**	-0.246***	-0.449***
	(0.053)	(0.041)	(0.074)
drunk	0 .052	0.063	-0.044
	(0.050)	(0.038)	(0.061)
rwork	-0.060	-1.738**8	-0.076
	(0.055)	(0.039)	(0.058)
rhipriv	-0.045	0.060	0.295
	(0.112)	(0.103)	(0.215)
rhiothp	-0.087	0.272	0.302
	(0.192)	(0.157)	(0.262)
hhhres	-0.016	0.008	0.020
	(0.014)	(0.010)	(0.017)
ritearn	-5.11e	3.08e	3.33e
	(3.09e)	(1.44e)	(4.33e)
urban fixed effect	containment	containment	containment
time fixed effect	containment	containment	containment
observed value	7066	21084	13022

Note: Self-rated health is very good: rshlta = 1/2; self-rated health is fair: rshlta = 3; self-rated health is poor: rshlta = 4/5. Cluster-adjusted standard errors at the individual level are shown in parentheses; **, *** denote 5% and 1% significance levels, respectively.

5. Conclusion

Under the outpatient co-ordination protection mechanism, the payment of outpatient costs for insured people will change from risk-sharing and self-balancing under the individual account model to co-ordinated payment and co-payment protection, and the behavior of outpatient medical care will change from self-decision-making and free medical care in the past to guided by the insurer and orderly medical care[18]. This paper empirically analyzes the impact of the outpatient coordination system reform on the total outpatient costs and personal burden of chronic disease patients, using data from the China Health and Retirement Longitudinal Study from 2011 to 2018. It is found that, first, the implementation of the outpatient pooling scheme is conducive to reducing the medical burden of chronic disease patients. Although the outpatient coordination did not have a significant impact on the decrease of outpatient costs of chronic disease patients, it significantly reduced the self-treatment costs of chronic disease patients. Second, the implementation of the policy has a greater impact on chronic disease patients with poorer health. Overall, the outpatient co-ordination policy has exerted positive policy benefits, playing an important role in bringing into play the co-payment role of social

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security, implementing hierarchical diagnosis and treatment, and realizing health care that takes prevention as its precursor.

In organizing the implementation time of the outpatient co-ordination policy, the study found that there are still some differences in the degree of outpatient co-ordination carried out in various regions, with differences in specific modes of payment such as starting payment standards and payment ratios, and that, as population mobility intensifies and the phenomenon of cross-district medical care becomes increasingly common, the existence of differences in medical treatment among regions affects the fairness of the policy of cross-district medical care. Therefore, the gradual elimination of differences in policy and treatment, and the guarantee of outpatient treatment levels for insured patients with chronic diseases in other places, will help to reduce the "fragmentation" of the health insurance system, improve the health insurance management and payment policies for medical treatment in other places, and promote better utilization of the effects of the outpatient coordination policy.

The findings of this paper also have some limitations. First, in terms of the choice of explanatory variables, the total outpatient costs and the proportion of out-of-pocket costs to total costs of chronically ill patients in the month prior to the interview were selected, and the outpatient cost situation in a year was not analyzed over a longer time span. Second, the paper lacks further examination of hospitalization costs and patients' regions, and the relevant details need to be further validated.

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