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Long-term Effects of National Health Insurance on Improving Health Status and Reducing Financial Burden: Evidence from China

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INTRODUCTION

- The New Cooperative Medical System (NCMS) is a health insurance system which was built for China's rural residents. The primary goals of this program are to alleviate medical impoverishment and improve health.
- The implementation of the NCMS can be divided into two stages, a pilot stage, and a full implementation stage. The pilot stage was from 2003 to 2007. The full implementation stage began in 2008. Insurance coverage rates and reimbursement levels of the two stages are substantially different.

SUMMARY STATISTICS, 2004-2011

Indicator	2004	2005	2006	2007	2008	2009	2010	2011
Counties in the NCMS	333	678	1451	2451	2729	2716	2678	2637
Enrollees (100 million people)	0.80	1.79	4.10	7.26	8.15	8.33	8.36	8.32
Enrollment rate (percent)	75.2	75.7	80.7	86.2	91.5	94.0	96.0	97.5
Per capita premiums (RMB)*	64.1	52.4	63.9	68.5	105.2	124.3	165.7	246.2
Payout (100 million RMB)*	33.6	76.9	191.1	403.4	679.7	1011.6	1256.7	1710.2

Source: National Bureau of Statistics in China, 2018. *Per capita premiums and payout are inflated to 2011.

- Numerous studies reported the effects of the expanded insurance coverage at the pilot stage.
- My research estimates the 6-12 year effects of the NCMS on improving health status and reducing financial burden. The time span covers both the pilot stage and the full implementation stage.

DATA

- The data used are from the China Health and Nutrition Survey.
- My research uses one wave of data before the program and five waves of data after the program, which are 2000, 2004, 2006, 2009, 2011, and 2015.

DEPENDENT VARIABLE LIST

Dependent variable	Description
Been sick or injured during the past four weeks	1 if the individual was sick or injured during the past four weeks, 0 otherwise
The severity of the illness or injury	1 if the sickness or injury is somewhat severe or quite severe, 0 if not severe
Went to formal medical provider or not	1 if the individual saw local health worker or doctors in last four weeks, 0 if took self-care or did not pay any attention
Went to city or higher level hospital	1 if the individual went to city or higher level hospital during the past four weeks, 0 otherwise
Inpatient visit	1 if the individual had an inpatient visit, 0 otherwise
Out of pocket	Spend on the illness or injury when an individual went to see a formal medical provider during the past four weeks
Heart disease	1 if doctor diagnosed heart disease during the past four weeks, 0 otherwise
Respiratory disease	1 if doctor diagnosed respiratory disease during the past four weeks, 0 otherwise
Digestive disease	1 if doctor diagnosed digestive disease during the past four weeks, 0 otherwise
Muscular or rheumatological disease	1 if doctor diagnosed muscular or rheumatological disease during the past four weeks, 0 otherwise

RESULTS

	Individual fixed-effects estimates (1)	Probit with the Mundlak device (dy/dx) (2)
Panel A: Health status		
Been sick or injured during the past four weeks	-0.0128 (0.0105)	-0.0084 (0.0072)
Observations	32,672	32,049
The severity of the illness or injury	0.0523 (0.0697)	0.0353 (0.0340)
Observations	3,540	3,486
Panel B: Health-seeking behaviors		
Went to formal medical provider or not	0.0471 (0.0638)	0.0129 (0.0316)
Observations	3540	3102
Went to city or higher level hospital	-0.0251 (0.0240)	-0.0219 (0.0259)
Observations	3540	1808
Inpatient visit	-0.00734 (0.0258)	0.0255 (0.0219)
Observations	3,540	2,457
Panel C: Medical expenditure		
Out-of-pocket	-1.021** (437.2)	
Observations	2,193	
Panel D: Diagnosed Diseases		
Heart disease	-0.0009 (0.0020)	-0.0038 (0.0027)
Observations	32,672	15,548
Respiratory disease	0.0091* (0.0054)	0.0113** (0.0047)
Observations	32,672	26,500
Digestive disease	-0.0028 (0.0038)	-0.0035 (0.0032)
Observations	32,672	21,243
Muscular/rheumatological disease	0.0042 (0.0032)	0.0034 (0.0036)
Observations	32,672	14,353

Notes: To overcome serial correlation, I use the cluster-robust standard errors. The cluster-robust standard errors are in the parentheses, *** p<0.01, ** p<0.05, * p<0.1. The observation number for been sick or injured during the past four weeks is based on the whole sample. The observation numbers for other dependent variables are based on the subsample of those got sick during the past four weeks. In the probit model, when some county-by-year interaction dummy variables equal 1, the dependent variables equal 0. In these situations, the dummy variables will have an infinite coefficient. Stata eliminates observations that lead to this problem. In the linear model, observations will not cause these problems. Therefore, the numbers of observations in the probit model are smaller than those in the FE model.

METHOD

Individual FE Estimation

$$Y_{ict} = \beta_1 + \beta_2 NCMS_{ict} + \beta_3 X_{ict} + \gamma_t + \lambda_i + \delta_{ct} + \epsilon_{ict}$$

- Where Y_{ict} is the outcome; $NCMS_{ict}$ is an indicator of whether an individual i was enrolled in the NCMS at time t ; X_{ict} is a vector of individual observable characteristics including age, gender, education, marital status, and household income; γ_t is time FE; λ_i is individual FE; δ_{ct} is a full set of county-by-year interactions which is included to account for any effects of county-specific time trends; and ϵ_{ict} is an error term.

Probit Model with the Mundlak Device Estimation

$$Y_{ict} = \beta_1 + \beta_2 NCMS_{ict} + \beta_3 X_{ict} + \xi \bar{X}_i + \gamma_t + \delta_{ct} + \epsilon_{ict}$$

- Where \bar{X}_i is the average of the vector X_{it} , $t = 1, \dots, T$. An advantage of this specification is a direct test for correlation with time-invariant errors by testing the coefficient ξ in the Mundlak device.

CONCLUSIONS

- The result of this research shows that the NCMS has a significant effect on relieving the financial burden, as measured by out-of-pocket spending among patients.
- There is no evidence that the NCMS improves health or changes health seeking-behaviors, the negative effect of the NCMS on medical expenditures is not at the expense of the frequency and quality of medical services.
- The result of the scheme for reducing the financial burden is entirely due to the improvement of the reimbursement level.

