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The medical insurance system's weakness to provide economic protection for vulnerable citizens in China: A five-year longitudinal study

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ABSTRACT

Objectives: Little is known about the magnitude of catastrophic health expenditure (CHE) attributable to critical disease, especially in the middle-aged and elderly population. This research aimed to exploring the key aspects of how the health insurance fails to protect the middle-aged and elderly against CHE in the past five years. And propose corresponding measures to improve.

Methods: Data were obtained from the 2011 to 2015 China Health and Retirement Longitudinal Study. The method was adapted from WHO to calculate the catastrophic health expenditure (CHE) and impoverishment by medical expense (IME), and use Generalized Linear Mixed Models (GLMMs) to comprehensively analyze the risk factors that cause middle-aged and elderly people to fall into CHE.

Results: The incidence of CHE of China's middle-aged and elderly population has been rose in the five years from 2011 (10.5 %) to 2013 (17.5 %) to 2015 (19.7 %). The CHE of richest families was almost 6 times from 2011 to 2015. Urban Employee Medical Insurance Scheme, the incidence of CHE was up 10 percentage from 2011 to 2015. According to the GLMMs, families have inpatient cares as the most important factor to CHE. The incidence of CHE increased by 2.25 times compared with those who did not use inpatient services.

Conclusions: The health system needs to control the irrational growth of health expenses and reduce residents' overuse of health services. Government should take supplementary measures to comprehensively strengthen the advantages of health insurance. Raise residents' awareness of health care, enhance citizens' physical fitness, and avoid unnecessary waste of health resources.

1. Introduction

Little is known about the magnitude of the catastrophic health expenditure (CHE) attributable to critical disease worldwide. According to World Bank (2017), 800 million people spend at least 10 percent of their household budget on health expenses and for about 100 million of

those individuals, these costs are sufficiently high to push them into extreme poverty—forcing them to survive on just \$1.90 or less a day. Therefore, protecting families from the impact of CHE has become a primary policy objective for every country. The World Bank have set the ambitious goal that “by 2030, no one should fall into poverty because of out-of-pocket health care expenses” (Kim, 2015).

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Establishing a universal coverage health insurance system has become a significant way for countries to protect families against CHE (Shrime et al., 2015). China's health insurance system has grown remarkably in recent years (Hongmei & Jiang, 2017) (see in the Appendix). The Urban Employee Basic Medical Insurance (UEMI), New Rural Cooperative Medical Scheme (NCMS), and Urban Resident Medical Insurance (URMI) constitute China's basic medical protection network, covering more than 1.3 billion people (about 95 % of the population) in 2018 (The Lancet, 2018). A basic health insurance system that covers the vast majority of the population has made health services more accessible for middle-aged and elderly people; however, this benefit may be offset by the rapid increase in medical expenses. The increase in the elderly population poses another challenge to the health insurance system because their generally poorer health than younger citizens results in higher health-related expenses.

China's medical resources and service capabilities have improved significantly, with total health expenditure increasing from 11 billion yuan in 1978 to 5.159 trillion yuan in 2017, an average annual increase of 17.1 % (National Bureau of Statistics of China, 2018a). However, for those who use medical services, the burden of out-of-pocket (OOP) payments is still heavy. For example, OOP payments increased by over six times from 2000 (271 billion yuan) to 2018 (1.7 trillion yuan) (National Bureau of Statistics of China, 2018b), although the growth rate has recently slowed. Nonetheless, China's OOP payments are more than double those of Canadian residents and triple those of French residents (Global Burden of Disease Health Financing Collaborator Network, 2019). Therefore, this basic medical network does not adequately protect residents from the risk of CHE.

Moreover, China's population structure has changed in recent years. Although aging is sweeping the globe, China's population is aging much faster than other countries and it accelerated in 2015 (Gong et al., 2016; National Bureau of Statistics of China, 2015). The United Nations predicts that China's elderly population will double by 2050, reaching approximately 491 million (Population Division of Department of Economic and Social Affairs of United Nations, 2015). As a result, China is facing a major health threat, as the incidence of disease and the cost of medical care will rise as the population ages. (Ye et al., 2019). This increasing demand for medical services by the middle-aged and elderly populations will affect China's development in the coming decades markedly. Indeed, the prevalence of chronic diseases in rural residents over the age of 65 is as high as 65.6 % (Center for Health Statistics and Information, 2019) and nearly half of Chinese people aged 35–75 years have hypertension (Lu et al., 2017).

Several studies have focused on the health status of the middle-aged and elderly populations. However, to the best of our knowledge, research has paid little attention to the calculation of the disease-related economic burden on these populations in China, especially longitudinal follow-up studies over the past five years. Therefore, whether the health insurance system truly addresses the high demand for health services by the middle-aged and elderly populations and protects those populations from falling into poverty due to CHE are worthy of further exploration. To bridge this gap, this study analyzes the high demand of health services by the middle-aged and elderly populations over a recent five-year period to determine the factors that make these populations susceptible to CHE.

2. Material and methods

2.1. Data source and sampling method

The data are obtained from the 2011–2015 China Health and Retirement Longitudinal Study (CHARLS) database. The CHARLS uses probability sampling proportional to population size (so-called PPS sampling) to guarantee unbiased and representative samples. The CHARLS National Baseline Survey was launched in 2011, covering 150 county-level units and 450 village-level units. These samples are tracked

every two to three years. The CHARLS database determines the number of sampling households according to a strict sampling method and examines the samples to determine household status. If household status is normal, the interviewer will return to visit according to the ID of each household. If the head of the household dies or the household is unreachable, a new sample is included according to the sampling method. We use the personal ID and household ID provided by the CHARLS database to merge the database over five years (2011–2015). After cleaning the data (eliminating abnormal and incomplete data), 8,579 households in 2011, 8,120 households in 2013, and 9,795 households in 2015.

2.2. Calculating CHE and impoverishment from medical expenses (IME)

We use the method recommended by the World Health Organization to calculate CHE (0 = not occurring/1 = occurring) and conduct the statistical analysis using SAS 9.4 for Windows. CHE is defined as an OOP health payment for health care equaling or exceeding 40 % of a household's capacity to pay (CTP). IME is defined as consumption expenditure equal to or higher than a household's subsistence expenditure but lower than its subsistence expenditure net of OOP health payments.

Four expenditure indicators are included in the calculation process. First, OOP health expenditure represents the payments made by households for health services without third-party compensation. Second, household consumption expenditure comprises both monetary and in-kind payments for all goods and services as well as the monetary value of the consumption of homemade products. Third, household subsistence expenditure is calculated using food expenditure as a share of total household consumption expenditure. The weighted average food expenditure of a household, whose food expenditure as a share of household consumption expenditure ranges between the 45th and 55th percentiles of the sample, is considered to be the poverty line. The subsistence expenditure of each household is calculated as the poverty line multiplied by the standard household size. Finally, a household's CTP is defined as the non-subsistence spending of a household as a share of total household consumption expenditure (Xu et al., 2003).

2.3. Generalized linear mixed models (GLMMs)

The GLMM, an extension of the generalized linear model and mixed linear model, can process hierarchical data, making it suitable for the CHARLS database, which provides city, county, and resident-level data over time. Including random effects in the model addresses the problems of correlations, excessive dispersion, and heterogeneity among the data. The GLMM is also insensitive to missing data, which reduces the bias in the study's outcomes caused by data missing from the CHARLS database.

According to the literature, as our standard for determining the fixed effect is the main risk factor that can influence CHE, the random effect is the confounding factor (Wen-jiao et al., 2011; Adelman et al., 2015). Hence, according to the applicability of the model, the factors (X) that affect CHE (Y) are fixed over time (i.e., the fixed effects). Therefore, urban-rural typology, gender, marital status, educational level, health insurance, disability, chronic disease, inpatient care, family economic level, and family size serve as the fixed effects. We select the year (2011–2015) as a random variable to control for the annual fixed effects (dummies) to capture unobservable time-varying characteristics such as improvements in health care technology for the elderly, government policies, and economic improvements. For the control variables used in this study, see Supplementary Table 1.

3. Results

Table 1 shows that the prevalence rate increased from 8.8 % in 2011 to 11.3 % in 2013 and 14.2 % in 2015. However, the outpatient rate did not follow that trend. Compared with the rate in 2013 (20.6 %), it

Table 1
Health care needs and service utilization of households.

Variable	2011 (%)	2013 (%)	2015 (%)
Prevalence rate	8.8	11.3	14.2**
Outpatient rate	18.6	20.6	17.9**
Inpatient rate	8.6	11.8	12.0**

**p < 0.001; *p < 0.05.

declined by approximately 3% by 2015. By contrast, the inpatient rate of 2015 was higher than that in 2011 by almost 4%.

Table 2 shows that outpatient expenses increased from 2011 to 2013 (1.8 times). However, in 2015, inpatient expenses increased by 2.4 times compared with 2013. A household's CTP also increased over the period, as the CTP in 2015 was 1.2 times that in 2011. However, the economic burden of medical expenses (OOP/CTP) increased from 7.1 % in 2011 to 17.4 % in 2015. The CHE rate increased from 10.5 % in 2011 to 19.7 % in 2015, and the overall incidence of IME increased from 4.3 % in 2011 to 7.1 % in 2013 and slightly decreased to 7% by 2015.

As shown in Table 3, the incidence of households experiencing CHE caused by chronic disease, disability, or inpatient care increased significantly. For households with chronic diseases in 2011, the rate of CHE was 12.4 %, which rose to 19.9 % in 2013 and nearly doubled by 2015 (24 %). The same tendency was true for households with disabilities, where the incidence of CHE in 2015 was 26.7 % compared with just 13.7 % in 2011. The incidence of CHE in families using inpatient services was 13.7 % in 2011. This increased 2.7 times by 2013, but decreased by 8.3 percentage points by 2015 (29.6 %).

The incidence of CHE increased to varying degrees by wealth quintile. For the wealthiest quintile, the incidence of CHE grew by 14.3 % over the five years compared with 4.4 % in the poorest quintile. Nonetheless, this stronger increase for wealthier households did not raise them above the average level. For households with UEMI and NCMS, the incidence of CHE increased by 10 % from 2011 to 2015. However, for URMI, there was a slight decline in 2015, from 17.2 % to 16.3 %, and the increase was half that of UEMI and NCMS. Compared with other insurance schemes, NCMS coverage is thus relatively insufficient.

Table 4 shows that in 2015, the incidence of IME in households with disabilities doubled from 2011. In households with chronic diseases, IME was 4.9 % in 2011, but this increased to 8.8 % in 2015. For households with inpatient care, the incidence of IME increased by 9 % from 2011 to 2013 but decreased from 13.5 % to 10.1 % by 2015.

The poorest families did not suffer from IME in the three survey years, while other families showed varying degrees of increases, even the richest families. In 2011, the richest families did not suffer from IME; yet, by 2015, their incidence rate was 2.4 %. The incidence of IME rose under all three insurance schemes. Although URMI and UEMI had an IME incidence rate similar to no insurance status in 2011, the incidence of no insurance had doubled to 8 % by 2015; URMI and UEMI increased at a lower rate (both 4.7 %).

As shown in Table 5, the most influential factor for households falling into CHE is inpatient care. Households with inpatient care have a 2.25 times higher rate of CHE than people that do not. Compared with the richest families, the incidence of CHE for the poorest families

Table 2
Health care expenses, CHE and IME of households.

Variable	2011	2013	2015
Inpatient expenses (yuan)	220.5	197.3	474.8**
Outpatient expenses (yuan)	32.5	57.3	110.5**
OOP (yuan)	115.4	327.5	353**
CTP (yuan)	1635.9	2029	2029.7**
OOP/CTP (%)	7.1	16.1	17.4**
CHE	10.5	17.5	19.7**
IME	4.3	7.1	7**

**p < 0.001; *p < 0.05.

increased by 1.83 times and 1.74 times for sub-poverty families. Families with one member had 1.75 times higher incidence rate of CHE than those with three members. The incidence increased in households with chronic diseases and disabilities by 1.51 and 1.27 times, respectively. In addition, compared with urban residents, rural residents were 1.24 times more sensitive to CHE. However, households participating in UEMI had a decreased incidence of CHE (0.86). Finally, compared with being illiterate, being literate shielded households from CHE. Overall, from the random effects, CHE grew annually.

4. Discussion

The incidence of CHE in China's middle-aged and elderly populations rose from 10.5 % in 2011 to 19.7 % in 2015, well above the national average rate (13 %) (Li et al., 2012) as well as much higher than in other countries (Liliana & Lara, 2016; Kumar et al., 2018; Brinda et al., 2015; Ghiasvand et al., 2015). Our analysis found that the factors causing middle-aged and elderly people to face CHE during this period included the utilization of health services, economic factors, and inadequate health insurance protection.

We analyzed these reasons and found that the incidence gap between poor and rich families is shrinking, as even rich families are gradually becoming unable to avoid falling into the vortex of CHE. This means that even rich families are in danger of falling into poverty after paying for health services. We showed that in 2011, the incidence of CHE in poor and rich families was 17.5 % and 2.9 %, respectively; however, by 2015, the rates had risen to 21.9 % and 17.2 %. The CHE of the richest families increased almost six times in this period.

The growth rate of CHE in rich families is significantly higher than that in poor families. This finding concurs with research showing evidence that the higher the socioeconomic status of a household, the higher is its direct use of health services as well as that high-income people also suffer from financial disasters (Koch et al., 2017). Our findings also showed that the prevalence rate of rich families is lower than that of poor families, but they had higher health care utilization than poor families from 2011 to 2015. The utilization rate of inpatient services among richest families was 2.5 times higher than poorest families in 2011.

Rich families may use more health services than poor families because they are more confident in their economic status. However, the rapid increase in health expenses has made some families unable to resist economic risks and they have fallen victim to CHE. Our results are consistent with those of previous studies that have found that middle-aged and elderly people in wealthy European countries encounter CHE due to health service use. The cumulative frequency of CHE in France is as high as 40 % with a threshold of 35 %–40 % (Jelena et al., 2016).

Regardless of the type of health insurance, the incidence of CHE and IME increased over the five-year period, meaning that participating in health insurance cannot completely prevent falling into CHE. Participation in health insurance schemes was associated with a higher risk of facing CHE in 2015. For the group of middle-aged and elderly people who have high demand for health services, insurance coverage with medical expense control may increase the disease-related economic burden to some extent. Even for UEMI, which has the most efficient economic protection, the incidence of CHE showed a year-on-year increase and IME doubled from 2011 to 2015.

The expansion of insurance coverage only reduces the threshold for residents to use health services. However, the depth (benefit coverage) and height (reimbursement) of compensation are insufficient and the advantages of universal health insurance coverage (breadth) have been offset by the high expenditure from high health care service utilization; moreover, the basic medical insurance system does not accurately target the most vulnerable people (Wang et al., 2016). Similarly, research has shown that participating in basic medical insurance schemes increases the incidence of household CHE by 31.8 % (Wang & Xu, 2019).

The coverage of the basic health insurance system in China has

Table 3
Catastrophic health expenditure (CHE) in the different households in the three years.

Variable	2011 (%)	SD	2013 (%)	SD	2015 (%)	SD	
Households with chronic diseases	12.4**	0.33	19.9**	0.40	24**	0.43	
Households with disabilities	13.7**	0.34	21.9**	0.41	26.7**	0.44	
Households with inpatient care	13.7*	0.34	37.9**	0.49	29.6**	0.46	
Family economic level	The poorest	17.5**	0.38	24.7**	0.43	21.9**	0.41
	Sub-poverty	15.5	0.36	21	0.41	23.2	0.42
	Intermediate	10.8	0.31	14.2	0.35	19.5	0.40
	Sub-rich	6.3	0.24	12.8	0.33	17	0.38
	The richest	2.9	0.17	14.8	/0.36	17.2	0.38
Health insurance status	UEMI	7**	0.26	11**	0.31	17.3**	0.38
	URMI	11.4	0.32	17.2	0.38	16.3	0.37
	MIX	12.1	0.33	8.3	0.28	18.7	0.39
	NCMS	11.2	0.31	19.2	0.39	21.7	0.41
	NO	9.7	0.30	15.2	0.36	15.5	0.39

**p < 0.001; *p < 0.05.

Table 4
Impoverishment from medical expenses (IME) in the different households in the three years.

Variable	2011 (%)	SD	2013 (%)	SD	2015 (%)	SD	
Households with chronic diseases	4.9**	0.22	7.9**	0.27	8.8**	0.28	
Households with disabilities	4.9	0.21	7.4	0.26	10.1**	0.30	
Households with inpatient care	4.7	0.21	13.5**	0.34	10.1**	0.30	
Family economic level	The poorest	/	/	/	/	/	
	Sub-poverty	15.9**	0.37	26.9**	0.44	22**	0.41
	Intermediate	4.3	0.20	5	0.22	7.1	0.26
	Sub-rich	1.3	0.11	2.2	0.15	3.4	0.18
	The richest	/	/	1.7	0.13	2.4	0.15
Health insurance status	UEMI	2.4**	0.15	2**	0.14	4.7**	0.21
	URMI	3.5	0.18	7.2	0.26	4.7	0.24
	MIX	2.4	0.15	/	/	6	0.28
	NCMS	4.9	0.21	8.3	0.28	8.4	0.27
	None	3.1	0.17	5.3	0.22	8.0	0.22

**p < 0.001; *p < 0.05.

Table 5
Results of the GLMMs.

Effects	Variables	b	stb	P	OR	[95 % Conf Interval]		
Fixed effects	urban-rural typology	Rural vs. urban	0.22	0.06	0.000	1.24	1.10	1.40
	Gender	Female vs. male	0.00	0.04	0.919	1.00	0.93	1.07
	Marital status	Married vs. unmarried	0.03	0.05	0.576	1.03	0.93	1.13
		High school and above vs. illiterate	-0.24	0.06	0.000	0.79	0.70	0.89
	Educational level	Junior high school vs. illiterate	-0.30	0.07	<0.001	0.74	0.65	0.85
		Elementary school vs. illiterate	-0.15	0.05	0.004	0.86	0.77	0.95
		UEMI vs. NCMS	-0.15	0.07	0.027	0.86	0.79	1.11
	Health insurance	URMI vs. NCMS	-0.01	0.08	0.868	0.99	0.89	1.29
		MIX vs. NCMS	0.01	0.19	0.968	1.01	0.74	1.62
		No insurance vs. NCMS	-0.08	0.07	0.201	0.92	0.96	1.24
	Disability	Yes vs. No	0.24	0.04	<0.001	1.27	1.17	1.37
		Chronic disease	Yes vs. No	0.41	0.04	<0.001	1.51	1.40
	Family size	1 member vs. > 3 members	0.56	0.07	<0.001	1.75	1.54	1.99
		2-3 members vs. > 3 members	0.53	0.05	<0.001	1.70	1.55	1.86
		The poorest vs. the richest	0.60	0.06	<0.001	1.83	1.63	2.05
	Family economic level	Sub-poverty vs. the richest	0.55	0.06	<0.001	1.74	1.55	1.95
		Intermediate vs. the richest	0.24	0.06	<0.001	1.27	1.13	1.43
		Sub-rich vs. the richest	-0.01	0.06	0.912	0.99	0.88	1.12
	Inpatient care	Yes vs. no	0.81	0.05	<0.001	2.25	2.05	2.46
		Years						
Random effects	Years	0.44	0.03	<0.001	/	/	/	

continued to expand closer to universal coverage over time (Hao, 2015). Compared with uninsured group, participating in health insurance allows residents to make full use of health services and, therefore, generates higher medical expenses. Some research has found that households with UEMI and URMI are more likely to use outpatient and inpatient services (Li & Zhang, 2013). Moreover, residents are more likely to use tertiary hospitals than primary health care (Winnie et al., 2019). The number of outpatients in tertiary hospitals increased by 12.1 % from 2008 to 2017, while patients in primary health care facilities

increased by 4.4 % annually (Winnie et al., 2019), leading to higher medical expenses.

To sum up, the increased reimbursement rate has been offset by the high expenses caused by high health care demand. Indeed, the insufficient control of health care expenses comprehensively offsets the advantages brought about by participating in health insurance. Faced with such high medical expenses, middle-aged and elderly people are bound to have a rising risk of falling into CHE. Therefore, the health insurance system in China should assist middle-aged and elderly people by

establishing a preventive health care system to provide early-stage treatment to more diseases and reduce the use of unnecessary health services. Moreover, it is necessary to take measures to control the unreasonable growth in costs, such as developing comprehensive community health and sanitation resources, engaging the health management functions of family doctors, implementing appropriate health interventions for different groups, promoting hierarchical diagnosis and treatment, and treating minor illnesses in the community.

Lastly, middle-aged and elderly people have increased demand for and utilization of health care services due to their (cognitive and emotional) vulnerability, which exacerbates the increase in health expenses and makes them more likely to fall into poverty due to illness. This reason has become the leading cause of CHE. For example, the incidence of CHE in households with chronic diseases (4.6 %) is 15 times that of non-chronic disease households (0.3 %) in South Korea (Choi et al., 2015). Indeed, we found that from 2011 to 2015, the prevalence rate of the middle-aged and elderly rose by four percentage points and the medical expenses of inpatients doubled. This shows that the incidence of CHE doubled in five years because of demand by the middle-aged and elderly with chronic diseases/disabilities and the use of inpatient services.

Further, we found that receiving inpatient care is the most important factor to fall into CHE. The incidence of CHE increased by 2.25 times compared with those who did not use inpatient services regardless of the type of economy and health insurance. Moreover, as age and chronic diseases increase, the use of health care resources continues to rise, leading to high health care expenses; if these families lack financial protection against health risks, high health care expenses may then drive them into poverty (Denton & Spencer, 2010; Mwangi et al., 2015). The incidence of CHE in households containing elderly people (over 60 years) is twice that of households without elderly people (Ye et al., 2014).

In summary, owing to their physical and mental fragility, middle-aged and elderly people are extremely prone to falling into the whirlpool of CHE due to the excessive use of health services. For this vulnerable group, it is of paramount importance to minimize the use of health services and reduce the risk of CHE. Preventive health services are crucial to achieving this goal by stopping the disease process and reducing unnecessary health expenses. Studies have confirmed that strengthening disease prevention can reduce health expenses. Zhao et al. (2013) found that strengthening stroke prevention measures and increasing investment in stroke prevention resources, especially drugs, can help prevent disease, reduce the incidence of stroke, and optimize the cost-effectiveness of health care in China. Similarly, proactive measures and strategies to prevent, identify in an early stage, and treat diabetes reduce the occurrence of complications as well as the use of health services (National Health Commission of the People's Republic of China, 2004).

5. Conclusions

To better protect residents from the economic risks of poor health, controlling the rapid growth in health expenses and reducing citizens' overuse of health services are needed. To improve the protective ability of the Chinese health insurance system, policymakers should give preference to middle-aged and elderly groups; carry out community-level preventive health care and health promotion among citizens; prevent the occurrence and development of infectious and chronic diseases; raise residents' health education; enhance citizens' physical

Appendix A

fitness; and avoid the unnecessary waste of health resources.

The government should also strengthen the advantages of health insurance and form a protective network by combining health insurance and policy measures. In particular, they must control expenditure on outpatient and inpatient services; control the use of antibacterial drugs and unnecessary health examinations; establish a prescription review system; increase punishment measures and severely crackdown on insurance fraud; and increase the sustainability of health insurance funds.

For health insurance, that not only means an increase in the participation rate; it also means the design of benefit packages; protection of vulnerable people and reimbursement of health expenses; more accurate identification and coverage of vulnerable people, especially middle-aged and elderly groups with chronic diseases/disabilities and inpatient care; and implementation of a hierarchical medical system to enable residents to make greater use of primary health care and reduce health expenses.

6. Limitation

Household savings have an important impact on the Chinese population. This leads to an underestimation of households' capacity to pay and it means that the proportion of OOP to CTP obtained is higher than the actual situation, which in turn leads to a higher incidence of CHE. Second, among poor households, their health service needs may be unmet due to lower household savings and income. Inadequate utilization of health services leads to low medical costs, which leads to low or non-occurrence of CHE.

Authors contribution

NSW, YL conducted the conceptualization, writing, review, drafted and revised the manuscript. WG and MYM conducted the data curation and analysis. QHW, DYY and MLJ helped to review the manuscript. LHS, XLF and TS conducted the supervision of original draft. LML, HYY, BGS and HL conducted the formal analysis work. WXT, QX and YNM conducted validation and review of manuscripts. All authors have read and approved the manuscript.

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Declaration of Competing Interest

The authors report no declarations of interest.

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Subject	UEMI	NCMS	URMI
Year of launch	1998	2003	2008
Coverage	All employers and workers in towns and cities	Rural residents	Non-employed urban residents
Source of funding	Contributory (8 % of annual payroll, 6 % from employers, and 2 % from employees)	Government subsidy (80 %) and individual premium (20 %)	Government subsidy (70 %) and individual premium (30 %)
Enrolment (%) (Breadth) ¹	95 %	95 %	95 %
Reimbursement rate (Height) ²	68 % for inpatient reimbursement rate and full coverage for outpatients	44 % for inpatient reimbursement rate and for outpatients in some places	48 % for inpatient reimbursement rate and for outpatients in some places
Benefit coverage (Depth) ³	Both outpatient and inpatient services and more than 2100 drugs	Inpatient services and covers 800–1200 drugs	Inpatient services and covers 2100 drugs

¹: National Bureau of Statistics of China. 2018, The basic insurance coverage rate is over 95 % in 2018.

²: Winnie Chi-Man Yip, et al (2012), Lancet.

³: Wang Q, et al (2016), Soc Sci Med.

Appendix B. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.archger.2020.104227>.

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