

THE URBAN RESIDENT BASIC MEDICAL INSURANCE: A LANDMARK REFORM TOWARDS UNIVERSAL COVERAGE IN CHINA

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SUMMARY

As the latest government effort to reform China's health care system, Urban Resident Basic Medical Insurance (URBMI) was piloted in seventy-nine cities during the summer of 2007, following State Council Policy Document 2007 No. 20's guidelines. This study presents the first economic analysis of URBMI, following a national household survey in nine representative Chinese cities. The survey aimed to answer three questions: Who is covered by the plan? Who gains from the plan? Who is most satisfied with the plan? We have found that there is a U-shaped relationship between URBMI participation rate and income. That is, the extremely rich or poor are the most likely to participate. Those with any inpatient treatment last year or with any chronic disease are also more likely to enroll in URBMI, indicating adverse selection into participation. We have also found that in reducing financial barriers to care, URBMI most significantly benefits the poor and those with previous inpatient care. Finally, those participants in the bottom 20% of family incomes are happier with URBMI than are their more affluent counterparts. Copyright © 2009 John Wiley & Sons, Ltd.

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1. INTRODUCTION

China's health care system is confronted with new challenges as the country transitions towards a more open economy. The challenges are threefold: (1) unaffordable access to medical care for low- and middle-income families (Liu, 2004); (2) poverty due to steep medical expenditures (Liu *et al.*, 2003); and (3) unequal health insurance coverage between urban and rural areas, as well as between the poor and affluent social classes (Zhao, 2006). In response to these challenges, and in following 'Harmonious Society,' the current guiding principle of the communist party, China's health care system is undergoing a major reform through Urban Resident Basic Medical Insurance (URBMI).

Prior to 2007, there were two primary insurance programs: Urban Employee Basic Medical Insurance (UEBMI) for the urban employed, and New Cooperative Medical Scheme (NCMS) for the rural population. The third population cohort, some 420 million urban residents without formal employment, was completely left out of the state health care safety net. Following the guidelines outlined in State Council Policy Document 2007 No. 20 (State Council Document No. 20, 2007), a large-scale pilot of URBMI was initially launched in seventy-nine cities. In his State Report to the 2008 People's Congress, Chinese Premier Wen Jiabao reiterated the policy's goals: to implement a pilot

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model in 50% of cities nationwide by the end of 2008, and to ultimately extend insurance coverage to 100% of cities by 2010. Under direction of the State Council, the three programs of UEBMI, URBMI, and NCMS will eventually serve as a universal safety net in helping finance health care for all of China.

The newly implemented URBMI is a crucial step in closing the insurance policy coverage gap, especially with the continuous increase in UEBMI coverage – extended to over 180 million urban enrollees in 2007 – and vast NCMS coverage, which insures over 720 million enrollees (China National Bureau of Statistics, 2007). As such, it is critical to understand the pilot's full effects on the targeted population and to gauge its success.

To serve this goal, in 2007, commissioned by the State government, the Peking University Guanghua School of Management conducted the URBMI survey. Utilizing data from this survey, our study conducts a more in-depth assessment of the pilot program. In particular, we focus our research on three questions that are of important to policy makers and scholars alike. First, who are the most likely to enroll in the URBMI program? Understanding whether there is adverse selection in terms of wealth and health has significant implications in program sustainability. Second, who benefits the most from URBMI? It is important to understand whether or not URBMI succeeds in addressing one of the major challenges facing China's health care system, its lack of affordability for the poor. Finally, who are most satisfied with URBMI? Although participation in URBMI is voluntary, the ultimate goal is to provide universal coverage to all urban residents who are not already covered by UEBMI. It is necessary, therefore, to understand satisfaction in URBMI if further outreach programs are to be successful.

2. URBMI POLICY SETTINGS

2.1. Enrollment

As written in State Council Policy Document 2007 No. 20, URBMI coverage should be provided for 'primary and secondary school students who are not covered by the urban employee medical insurance system (including students in professional senior high schools, vocational middle schools, and technical schools), young children, and other unemployed urban residents'. Enrollment in URBMI is on a voluntary basis at the household level, which is a compromise given the high administrative costs associated with mandatory enrollment and adverse selection evident in voluntary enrollment.

Though eligibility and basis for enrollment are decided, reaching out to the informal economy to enroll remains an issue. So far, the local government administrative system has played a major role in encouraging local residents to enroll in URBMI. The administrative system is well structured from the provincial level down to the community level, of which the two primary outreach channels are the community administrative offices and the community health centers. While differing in their primary functions, both serve as local centers of information dissemination.

2.2. Financing

According to State Council policy, URBMI premium should generally be higher than those of the NCMS, but lower than those of the UEBMI. Government contributions vary depending on the region's economic status and each individual's economic situation. However, it is required by the central government that the total annual government subsidy for each URBMI participant should not be less than 40 RMB per enrollee. In the poorer central and western provinces, this figure is reduced to a minimum of 20 RMB per enrollee per year. An enrollee with financial difficulties or a severe disability is to receive an additional subsidy of 60 RMB per year, 30 RMB of which is financed by the central government (State Council Document No. 20, 2007).

As long as they follow the central government's general guidelines, local governments have autonomy in developing and implementing URBMI according to their specific needs (State Council Document No. 20, 2007). Local health insurance bureaus are responsible for determining financing levels. According to the URBMI survey, the average premium of the pilot sites in 2007, comprising individual contributions and subsidies from central and local governments, reached 236 RMB for adults and 97 RMB for minors (State Council Evaluation Group for the URBMI Pilot Program, 2008). On average, the central and local governments are subsidizing 36% of the financing cost for adults, indicating that the majority of URBMI financing comes from individual premium contributions.

2.3. Insurance benefits

As one of its founding goals, URBMI seeks to eliminate impoverishment due to steep medical expenditures by focusing on inpatient and outpatient services for chronic or fatal diseases, such as diabetes or heart disease (See Table I). The reimbursements paid out for these outpatient services are much more generous than they are for general outpatient services. On average, the URBMI policy covers 45% of related inpatient service medical costs, which amounts to a payment of 1436 RMB per inpatient stay (State Council Evaluation Group for the URBMI Pilot Program, 2008).

3. DATA AND RESULTS

3.1. The household survey

In 2007, commissioned by the State government, the Peking University Guanghua School of Management conducted the URBMI survey. Starting with the baseline survey in December 2007, the plan scheduled three waves for 2008, 2009, and 2010, respectively.

The URBMI Survey includes information on the population demographics, health status, health expenditures, health insurance coverage, satisfaction rate, economic status, the financial burden of medical care, and the utilization of health services. Using a cluster analysis technique, we have selected from the 79 pilot cities a representative sample based on per capita GDP, total population, population density, average number of hospital beds, average financing cost of URBMI, average financing cost of UEBMI social pooling account in year 2006, and average number of physicians. Based on the aforementioned criteria, there are nine cities included in the final URBMI survey: Baotou City, Inner-Mongolia SAR; Changde City, Hunan Province; Chengdu City, Sichuan Province; Jilin City, Jilin Province; Shaoxing City, Zhejiang Province; Xiamen City, Fujian Province; Xining City, Qinghai Province; Urumqi City, Xinjiang SAR; and Zibo City, Shandong Province.

3.2. Policy setting in nine surveyed cities

Since local governments develop and implement URBMI policy based on how much they can subsidize the needs of the population and which health care services can be provided, the URBMI plans differ substantially across cities. Table I lists the different URBMI plans in terms of starting day, eligibility requirements, financing, and benefit packages in each of the nine surveyed cities. Column 3 of Table I displays starting date of URBMI in each city, ranging from October 2006 in Chengdu city to October 2007 in the cities of Baotou, Changde, and Zibo. Column 5 of Table I indicates whether or not the URBMI plan in each city covers its migrant workers. The majority of cities do not cover migrant workers or their children with the exception of Urumqi and Xiamen, both of which cover migrant workers' children going to school in each respective city. The migrant workers themselves, however, are not included in the coverage.

The health care problem for migrant workers in China has become an important issue for the Chinese government. Generally, migrant workers come from rural areas and have rural registry, and

Table I. Policy setting in nine cities

City/province	Region	Starting date	Eligibility ^a			Financing/per person per year				Benefit package							
			General	Migrant workers	Central Government	Provincial Government	City Government	District / County Government	Individual	Deductible	Reimbursement rate	Ceiling	Regular outpatient services	Chronic or fatal disease	Accident	Emergency room use	Free annual checkup
Baotou City/Inner-Mongolia SAR	Western	2007-10-1	(1) Male residents over 60 years old and female residents over 55; (2) Those severely disabled aged from 16 to 60; (3) Residents under 18 and not attending school; (4) Primary and middle school students	No	20 RMB	10 RMB	20 RMB	20 RMB	(1) Adults: 170 RMB; (2) Students and inpatients: 400, and 100 RMB for tertiary, secondary, and primary medical institutes outside the city; (3) Residents under 18 and not attending school: 50 RMB. (4) Primary and middle school students	(1) 700 RMB for medical institutes outside the city; (2) 600, 500, and 400, and 100 RMB for tertiary, secondary, and primary, attending and community medical institutes inside the city, respectively	45-70%, according to the level of the medical institutes and expenditures	30000 RMB	No	No	Students: outpatient services due to accident	Students: reimbursements for emergency room visits	No
Changde City/Hunan Province	Central	2007-10-1	(1) Unemployed urban residents aged from 18 to 60; (2) Urban residents over 60 and not covered by UEBMI; (3) Residents under 18 and not attending school; (4) Primary and middle school students	No	In total 40 RMB from all levels of government ^b				(1) Adults: 160 RMB; (2) Students and inpatients: 400, and 100 RMB for tertiary, secondary, and primary medical institutes respectively	40-65%, according to the level of the medical institutes and expenditures	(1) 30000 RMB; (2) Students and residents under 18 and not attending school: 50000 RMB	No	No	Adults: outpatient services reimbursement for more than 6 chronic or fatal diseases; (2) Students and residents under 18 and not attending school: outpatient services due to accident	Students: reimbursements for emergency room visits	No	
Chengde City/Sichuan Province	Western	2006-10-1	(1) Unemployed urban residents: males 18 to 59, females 18 to 49; (2) Urban residents not covered by UEBMI: males over 60, females over 50; (3) Residents under 18 and not attending school; (4) Kindergarten, primary school, and middle school students	No	20 RMB	7 RMB	18 RMB	(1) Adults: 275 RMB; (2) Primary and middle school students, and pre-school children: 35 RMB	(1) Adults: 2708, 1805, and 564 RMB for tertiary, secondary, and primary medical institutes, respectively; (2) Students and residents under 18 and not attending school: 40 RMB	(1) Adults: 30-65%, according to the level of the medical institutes; (2) Students and residents under 18 and not attending school: 50000 RMB	(1) Adults: 2708, 1805, and 564 RMB for tertiary, secondary, and primary, attending and not attending patient medical expenditures	No	(1) Adults: outpatient services reimbursement for more than 9 chronic or fatal diseases; (2) Students and residents under 18 and not attending school: outpatient services reimbursement for more than 11 chronic or fatal diseases, (hemophilia and phlebotomuria plus the aforementioned diseases covered for adults)	Adults: outpatient services reimbursement for more than 9 chronic or fatal diseases; (2) Students and residents under 18 and not attending school: outpatient services reimbursement for more than 11 chronic or fatal diseases, (hemophilia and phlebotomuria plus the aforementioned diseases covered for adults)	Yes	No	
Jilin City/Jilin Province	Central	2007-4-13	(1) Unemployed urban workers not covered by UEBMI; (2) Urban residents under 18 and not attending school; (3) Primary and middle school students	No	20 RMB	12 RMB	5 RMB	3 RMB	(1) Adults: 900, 600, and 300 RMB for primary, secondary, and county-level medical institutes; (2) Students and inpatients: 45000 RMB; (3) Residents under 18 and not attending school: 30 RMB	(1) Adults: 900, 600, and 300 RMB for primary, secondary, and county-level medical institutes; (2) Students and inpatients: 45000 RMB; (3) Residents under 18 and not attending school: 30 RMB	(1) Adults: 900, 600, and 300 RMB for primary, secondary, and county-level medical institutes; (2) Students and inpatients: 45000 RMB; (3) Residents under 18 and not attending school: 30 RMB	Adults: outpatient services reimbursement for more than 3 chronic or fatal diseases from 2006; (2) Students and residents under 18 and not attending school: 60000 RMB	Adults: outpatient services reimbursement for more than 3 chronic or fatal diseases from 2006; (2) Students and residents under 18 and not attending school: 60000 RMB	Students and children in the kindergarten: outpatient services due to accident	Students and children in the kindergarten: outpatient services due to room visits	No	

Table I. Continued

City/province	Region	Starting date	Eligibility ^a			Financing per person per year				Benefit package				
			General	Migrant workers	Central Government	Provincial Government	City Government	District / County Government	Individual	Deductible	Reimbursement rate	Ceiling	Regular outpatient services	Chronic or fatal disease
Zibo City/Shandong Province	Eastern	2007-10-1	(1) Males over 60 and females over 55 with local hukou for more than 2 years; 2 years; (2) Unemployed urban residents not covered by UEBMI; (3) Residents under 18 and not attending school	No	(1) Males over 60 and females over 55 with local hukou for more than 2 years: 100 RMB; (2) Unemployed urban residents not covered by UEBMI: 60 RMB; (3) Residents under 18 and not attending school: 40 RMB	Over 55 with local hukou for more than 2 years: 120 RMB; 120 many medical institutes, respectively	50-60%, according to the level of the medical institutes	30,000 RMB	Yes	Outpatient services reimbursement for 9 chronic or fatal diseases ^d	No	Yes if receiving inpatient services after emergency treatment	No	

^aIf not noted, people covered by UREMI must be unemployed urban residents with local urban hukou and not covered by UEBMI and NCMS.

^bThe policy does not mention the extent to which each level of government is responsible, respectively.

^cFinancing for college students amounts up to 80 RMB per capita from governments. Which level of government is responsible for financing depends on the colleges' administrative affiliation.

^dTheroma, renal failure, organ transplant, aplastic anemia, schizophrenia, brain disease, complete paralysis.

^eOutpatient services, radiotherapy and chemotherapy for thieroma, outpatient services and dialysis for chronic renal failure, anti-rejection treatment after renal transplantation, chronic leukemia, aplastic anemia, Parkinson's disease, lupus erythematosus, hepatocirrhosis, schizophrenia, etc.

^fRadiotherapy and chemotherapy for thieroma, outpatient services and dialysis for uraemia, anti-rejection treatment after renal transplantation.

^gOutpatient services, radiotherapy and chemotherapy for thieroma, outpatient services and dialysis for chronic renal failure, anti-rejection treatment after organ transplantation, nonfunction of organs, fees during recovery stage of cerebrovascular disease, hypertension stage 3, diabetes, chronic aplastic anemia, systemic lupus erythematosus, psychopathy.

^hType II diabetes, hypertension stage 2, pulmonary heart disease, coronary heart disease, anodyne, radiotherapy and chemotherapy for thieroma, dialysis for chronic renal failure, anti-rejection treatment after organ transplantation.

ⁱChronic bronchitis, cor pulmonale, post hypertension stage 2, coronary atherosclerosis and heart disease, complications or sequela after cerebrovascular accident, malignancy, diabetes and complications or sequela after diabetes, chronic nephritis, dropsical nephritis, chronic renal failure, serious systemic lupus erythematosus, chronic active hepatitis, hepatocirrhosis, epilepsy.

^jMalignancy, uraemia, organ transplant, diabetes, hypertension stage 3, rheumatoid disease, pulmonary heart disease (right ventricular failure occurred), convalescence of cerebral hemorrhage, chronic viral hepatitis, etc.

thus should be covered by the rural NCMS policy. However, since migrant workers live and work in the cities, it is impractical for them to return to their hometowns for medical visits. A few NCMS plans do actually reimburse medical bills from urban hospitals, though reimbursement for these expenditures is usually a long, cumbersome, and unpleasant procedure, as it is often unclear which particular hospitals are covered by the NCMS policy, thus creating confusion (Guo *et al.*, 2007). It is therefore not too surprising that the majority of migrant workers choose not to participate in NCMS (Guo *et al.*, 2007). With an estimated 140 million migrant workers in the cities, this lack of enrollment in proper medical insurance has been a serious issue (Hu, 2008a). The Chinese government plans to eventually integrate the current three public medical insurance policies into a single universal national public health insurance policy (Hu, 2008b). It is hopeful that such a policy will solve this migrant worker health insurance problem and bring about universal coverage once and for all.

Table I also shows the different financing strategies of URBMI. As is apparent from the table, the majority of URBMI financing comes from individual premium contributions. For working age adults, the individual premium contributions per person per year range from 110 RMB in Xining City to 300 RMB in Shaoxing City. The remainder comes from the central government subsidies and local governments (provincial, city, county and district/county governments). The total amount of government financing ranges from 40 RMB to 100 RMB, with the exception of Xiamen city, where annual government subsidies can be as high as 460 RMB per person per year. Contemporaneously the local governments subsidize more than the central government. However, this pattern might change as the Chinese central government has promised to spend 850 billion RMB in health care over the next three years and have promised to take a major role in financing public health insurances in the near future (Wen, 2009).

Next to the columns describing financing in Table I are the benefit packages for inpatient services, outpatient services, emergency room usage, and free annual checkups. As is apparent in Table I, in the richer coastal cities such as Xiamen, residents enjoy a more generous insurance policy. We also notice that as one goes from primary hospitals to tertiary hospitals in the three-tier hospital hierarchy, deductibles increase and the reimbursement rates decrease. That is, the higher the level of the medical institution in which an individual receives treatment, the more the individuals need to pay out of pocket. Another point to note from Table I is that reimbursement rates increase overall with medical expenditures. Looking at the benefits for outpatient services now, we see that URBMI in most cities only covers outpatient services due to accidents or chronic/fatal diseases, with the exception of Xiamen, Xining and Zibo city, which cover general outpatient services.

Preventive care services on the other hand are not covered by URBMI. As an exception, residents in Xiamen city enjoy a free general check up if they did not receive a reimbursement in the previous year. Some Chinese residents, especially those less educated, do not truly understand that the point of insurance is to insure oneself against adverse health shocks. Consequently, a resident who does not claim any reimbursements for a given year may occasionally feel that their premium is a waste, and thus drop the insurance program. In order to increase satisfaction, providing extra benefits, such as a free annual checkup, for insurance participants who have not been reimbursed for a given year may be beneficial to widen program coverage and to increase program satisfaction.

3.3. Summary statistics

Table II organizes the summary statistics of key variables by health insurance status. Column 1 is the summary statistic for all individuals. Column 2 is the summary statistic for those people who are eligible for URBMI but did not participate. Columns 3–5 show summary statistics for those people who are participating in the URBMI, UEBMI, and NCMS programs, respectively. Statistics of people who had health insurance outside of URBMI, UEBMI, and NCMS are not included in our analysis.

Table II. Summary statistics by health insurance status

	ALL	Uninsured	URBMI	UEBMI	NCMS
<i>Panel 1, health</i>					
Self-reported health (5 = Excellent; 4 = Good; 3 = Fair; 2 = Poor; 1 = Very Poor)	2.45	2.50	2.53	2.48*	2.31*
Self-reported health status = = Excellent	0.15	0.14	0.13	0.14	0.20*
Self-reported health status = = Good	0.39	0.38	0.39	0.38	0.42*
Self-reported health status = = Fair	0.34	0.35*	0.32	0.37*	0.29*
Self-reported health status = = Poor	0.10	0.10*	0.13	0.10*	0.08*
Self-reported health status = = Very Poor	0.02	0.03	0.02	0.02*	0.02*
Inpatient treatment last year	0.06	0.04*	0.06	0.07*	0.05
Pneumonose	0.02	0.02	0.02	0.02	0.01
Diabetes	0.03	0.02*	0.03	0.04*	0.01*
Cardiovascular	0.07	0.06*	0.08	0.07	0.03*
Hypertension	0.09	0.05*	0.08	0.13*	0.06*
Any chronic disease	0.28	0.22*	0.26	0.34*	0.20*
<i>Panel 2, other controls</i>					
Family income (Yuan, 2007)	2980.43	1967.16*	2474.73	3484.97*	2825.05*
Lowest 20%	0.20	0.35	0.34	0.10*	0.20*
Second 20%	0.20	0.25*	0.22	0.18*	0.21
Middle 20%	0.20	0.18*	0.15	0.22*	0.24*
Fourth 20%	0.20	0.13	0.14	0.24*	0.21*
Top 20%	0.20	0.08*	0.14	0.26*	0.15
Male	0.49	0.45*	0.42	0.53*	0.44
Family size	3.36	3.58*	3.34	3.15*	3.97*
<i>Marital status</i>					
Married	0.69	0.59*	0.45	0.86*	0.70*
Single	0.24	0.33*	0.45	0.07*	0.25*
Divorced	0.02	0.03*	0.02	0.02	0.00*
Widow	0.05	0.06*	0.07	0.05*	0.05*
<i>Education status</i>					
Primary or below (completed year of education)	0.24	0.30*	0.33	0.18*	0.40*
Junior High School Graduate (completed year of education)	0.25	0.28*	0.18	0.28*	0.30*
Senior High School Graduate (completed year of education)	0.24	0.23*	0.15	0.30*	0.15
College Degree or Above (completed year of education)	0.15	0.06*	0.03	0.23*	0.03
Student	0.13	0.12*	0.31	0.00*	0.12*
<i>Occupation status</i>					
Formal sector employment	0.20	0.00	0.00	0.38*	0.08*
Temporary employee	0.09	0.16*	0.09	0.07*	0.15*
Hourly worker	0.00	0.01*	0.00	0.00	0.01*
Self-employed	0.08	0.12*	0.06	0.05*	0.20*
Retired	0.24	0.08	0.09	0.41*	0.04*
Unemployed	0.19	0.38*	0.33	0.08*	0.31*
Not in labor force	0.17	0.22*	0.41	0.00*	0.18*
Other jobs	0.02	0.03	0.03	0.01*	0.05*
<i>Race</i>					
Han	0.94	0.93*	0.89	0.97*	0.96*
Hui	0.03	0.04*	0.09	0.02*	0.03*
Others	0.02	0.03*	0.03	0.02*	0.01*
<i>Age</i>					
0–5	0.04	0.09	0.09	0.00*	0.05*
6–11	0.05	0.04*	0.13	0.00*	0.04*
12–14	0.03	0.02*	0.07	0.00*	0.03*
15–17	0.03	0.02*	0.08	0.00*	0.03*
18–60	0.65	0.69*	0.43	0.74*	0.72*
> 61	0.20	0.13*	0.20	0.26*	0.13*
<i>City</i>					
Changde	0.17	0.35*	0.12	0.11	0.14*
Chengdu	0.14	0.12*	0.09	0.19*	0.06*
Jilin	0.13	0.18*	0.21	0.08	0.01*
Shaoxing	0.12	0.05*	0.12	0.15*	0.06*
Xiamen	0.15	0.05*	0.10	0.18*	0.35*
Xining	0.15	0.09*	0.30	0.15*	0.06*

Table II. *Continued*

	ALL	Uninsured	URBMI	UEBMI	NCMS
Zibo	0.15	0.16*	0.06	0.13*	0.32*
# Obs.	24,665	4,434	4,265	11,124	1,990

Note 1: Asterisks (*) denote that the differences between URBMI group and other groups are significant at 5% level. *Note 2:* The income stratification is based on the whole population not only based on the URBMI sample.

The survey results include information on whether an individual's self-reported overall health status is excellent, very good, good, fair, or poor. The first row of Panel 1 shows the mean for the self-reported health variable. Possible values are: 5 – very satisfied, 4 – satisfied, 3 – indifferent (neither satisfied nor dissatisfied), 2 – dissatisfied, and 1 – very dissatisfied. Row 2 of Panel 1 shows that 13% of people who are insured by URBMI report excellent health. This is 1% lower than those who are uninsured at 14%. However, the differences are not statistically significant. As also shown in Panel 1 of Table II, people enrolled in NCMS show better self-reported health than people in other insurance categories.

The dummy variable 'Inpatient Treatment Last Year' represents an individual's use of any inpatient services in the past year (1 – yes, 0 – no). Since URBMI focuses on reimbursing inpatient services, it is unsurprising to see that people who have had inpatient treatment in the past year are more likely to participate. Among those who participate in URBMI, 6% had used any inpatient services in the last year, while only 4% of the uninsured population had; there is evidence of adverse selection into participating when considering inpatient services usage. In the final row of Panel 1, it is shown that 26% of people who are enrolled in URBMI have at least one chronic disease, while only 22% of the uninsured group reported as having any such disease. This phenomenon shows again that the less healthy are more likely to seek URBMI support. Comparing with URBMI participants, a larger proportion of UEBMI participants use inpatient services in the past year or have at least one chronic disease, which indicates severer adverse selection problem in UEBMI. On the other hand, NCMS participants use less inpatient services and suffer from chronic diseases less often, compared with people who participate URBMI.

In the second panel of Table II, mean statistics for a number of control variables used in our regression models are shown. Those enrolled in UEBMI are the more financially stable families, with a mean family income of 3485 RMB per month. They are followed by those enrolled in the NCMS program, with a mean family income of 2825 RMB per month. Since those participating in NCMS are migrant workers, and those enrolled in URBMI are unemployed, are students, or are senior citizens, it is no surprise that the mean monthly family income of URBMI participants is less than that of the NCMS participants. The poorest group is the uninsured, which suggests that the impoverished are the most prone to being uninsured, likely because they cannot afford to pay the URBMI premium. Finally, the remainder of Table II shows that, compared with the uninsured, URBMI participants are more likely to not in the labor force, and to be younger than 18 or older than 60. URBMI participants are also disproportionately more likely to be students. In practice, schools enroll their students as a group in the URBMI program at appropriate times such as at the beginning of a semester. The students and their parents, however, decide whether or not the student should be enrolled.

4. REGRESSION RESULTS

Regression analysis was conducted to further examine the outcomes of URBMI in terms of participation, relieving financial burden, and residents' satisfaction. All models control for a comprehensive set of covariates, including education, age, gender, race, marital status, occupation, household size, and city location. The sample in Table III includes those who are eligible only for

Table III. Regression results

Dependent variable	Participated URBMI (Probit marginal effect)	Relieve financial burden of medical services compared to the situation before enrollment in URBMI (Probit marginal effect)	Satisfaction (5 level scale with 5 = Very Satisfied to 1 = very dissatisfied) (Ordered Probit marginal effect)	Satisfaction (5 level scale with 5 = Very Satisfied to 1 = very dissatisfied) (OLS)
Mean of dependent variable (Reference group: family income = = Bottom 20%)	0.49	0.57	4.00	4.00
Family income = = Second 20%	-0.003 [0.017]	-0.062 [0.033]*	0.013 [0.003]***	-0.299 [0.044]***
Family income = = Middle 20%	-0.026 [0.020]	-0.042 [0.039]	0.005 [0.003]*	-0.109 [0.054]**
Family income = = Fourth 20%	0.023 [0.022]	-0.057 [0.041]	0.008 [0.003]***	-0.179 [0.056]***
Family income = = Top 20%	0.059 [0.024]**	-0.069 [0.045]	0.005 [0.003]	-0.106 [0.063]*
Any inpatient treatment last year	0.109 [0.027]***	0.149 [0.041]***	-0.003 [0.002]*	0.1 [0.067]
Any chronic diseases	0.059 [0.017]***	-0.002 [0.034]	0.002 [0.002]	-0.056 [0.046]
(Reference group: Self-reported health status = = Worst)				
Self-reported health status = = Poor	0.065 [0.039]*	0.088 [0.069]	-0.003 [0.003]	0.129 [0.102]
Self-reported health status = = Fair	0.047 [0.038]	0.16 [0.067]**	-0.009 [0.003]***	0.307 [0.101]***
Self-reported health status = = Good	0.033 [0.040]	0.153 [0.072]**	-0.008 [0.003]**	0.296 [0.105]***
Self-reported health status = = Excellent	0.073 [0.042]*	0.195 [0.067]***	-0.011 [0.002]***	0.494 [0.111]***
Observations	8,699	2,300	3,188	3,188
R-squared	0.22	0.09	0.05	0.10

Note 1: Standard errors in brackets. Note 2: * significant at 10%; ** significant at 5%; *** significant at 1%. Note 3: Other than those indicated in the table, control variables also include: a full set of education dummies, age, gender, a full set of race dummies, marital status, employment status, household size and a full set of city dummies. Note 4: The income stratification is based on the whole population not only based on the URBMI sample.

URBMI. Subjects eligible for, or are already enrolled in UEBMI or NCMS were excluded from this regression analysis. For the first two columns in Table III, since the dependent variables are binary, probit models were adopted and we report marginal effects into the table.¹

4.1. Who joins URBMI?

A large volume of literature has investigated the determinants of health insurance enrollment. Demographic variables, such as age, ethnicity, educational level, and family size are documented to be important factors influencing people's enrollment decisions (Budenstein and Hennelly, 1980; White-Means and Hersch, 2005; Zhang *et al.*, 2004). Besides, socioeconomic factors, such as income, also play an important role in determining health insurance participation, though the size and direction of its effect is still controversial. While Budenstein and Hennelly (1980) and Liu *et al.* (2004) find that the income is positively correlated with possibility of enrollment, Zhou *et al.* (2005) find a U-shaped relationship: the richest and poorest subjects are the most likely to participate. Moreover, health status

¹We have calculated the average of marginal effects across all observations and have also calculated the standard errors using the delta method (Wooldridge (Ch. 15)).

is also an important factor in causing adverse selection in health insurance enrollment (Browne, 1992; Cutler and Zeckhauser, 1998). In the analysis below, we are interested in the effect of income and health status on enrollment decisions. We also control for a comprehensive set of covariates, including education, age, gender, race, marital status, occupation, household size, and city location.

Column 1 of Table III investigates who among the eligible is most likely to join the URBMI program, and examines whether or not adverse selection into participation exists. We run a probit regression, where the dependent variable is one if an individual participates in URBMI, and zero otherwise. From the coefficient estimates of family income dummies, we observe a U-shaped relationship between participation rate and income: the richest and poorest subjects are the most likely to participate in URBMI. This U-shaped relationship between income and enrollment is an interesting result, shedding light on the existence of two driving forces in enrollment: health effect and income effect.

The former refers to the inferior health status of disadvantaged individuals, who may be more likely to enroll as explained by adverse selection, while the latter refers to the better affordability of insurance among high-income households. While more data are needed to better understand the U-shape, the relationship can be expected to diminish upon an increase in government contributions and outreach efforts, encouraging more of the mid-range population to enroll in the program. From a policy perspective, this finding is important in that it allows more effective interventions to reach the middle-income population for URBMI enrollment. It is essential for the program's survival to reach out to this group, especially because of the middle-income group's composition of those who can afford the insurance, and are also relatively healthy. Encouraging them to participate in the program is expected to increase the sustainability of the program.

Health status is thought to be another crucial factor in causing adverse selection in health insurance enrollment. The positive coefficient estimates from the 'Any Inpatient Treatment in the Past Year' variable and the 'Any Chronic Disease' variable suggest that people who have had any inpatient treatment in the past year are 10.9% more likely to participate in URBMI, while people with any chronic disease are 5.9% more likely to participate. Overall, Column 1 of Table III shows some evidence of adverse selection in terms of low income and poor health. This finding is perhaps not surprising given the voluntary nature of the URBMI program.

As evidenced above, adverse selection is a potential problem for long-run program sustainability. However, we are optimistic that the voluntary nature of the URBMI program will not hurt the sustainability of the URBMI program. Similar to the design of NCMS, URBMI sets the insurance basis at the household level, rather than on an individual basis, in an effort to reduce selection. More stringent enforcement of this requirement in the future can mitigate the selection problem. Additionally, the financially able Chinese central government has committed to take a major role in subsidizing URBMI. For example, the government subsidy for URBMI doubled in 2008 (You and Yu, 2007); with such increasing financial support, the government expects to enroll more of the general population, and with less selection risk. Such efforts may work based on experience with NCMS. In fact, the latest statistics show that well over 90% of the rural population in China has joined NCMS as of 2008 (Information Office for Ministry of Health, 2008). Furthermore, despite its voluntary basis for enrollment, NCMS' financial reserves face a surplus, and are in no immediate danger of bankruptcy (Li, 2006).

4.2. Who benefits from URBMI?

Column 2 of Table III examines whether participation in URBMI relieves the financial burden of visiting a doctor compared with the situation prior to enrollment. Looking at the mean of the independent variable, 57% of the policy beneficiaries report that their financial burden is relieved after enrollment in URBMI. The regression analysis shows that among the URBMI insured group, lower-income participants and those who used inpatient care in the past year are more likely to feel

relief from financial strain with the policy. This suggests that URBMI did reach its goal of relieving people of medical financial burdens, especially the poor, and those with previous inpatient care.

It might be a bit counterintuitive at the first glance that enrollees with better self-reported health statuses may be more likely to have the feeling that URBMI relieves their financial burden. Our thoughts are as follows. First, there may be the possibility that people who had reported better health are healthy residents who seldom need to visit a doctor. In this case, they may have never endured any financial pressure due to medical concerns, and thus were more optimistic about their insurance. Those who reported poor health, on the other hand, may have unpleasant memories of their health situations, in which case they are more pessimistic about what reimbursements can do. Second, for those in poor health, reimbursements from the insurance might cover only a small proportion of their medical expenditure, and thus could not be very helpful in relieving their financial burden. Another possibility deserving attention attributes this observation to the questionnaire, which asked people to evaluate their health status in the month before the survey was conducted. The healthier may have received medical treatment and reimbursement around the time, and thus would report better burden relief.

4.3. Who is happier with URBMI?

Our final analysis is on satisfaction with URBMI. Coefficients in Columns 3 and 4 of Table III show that participants whose family-level income is in the bottom 20% of the income distribution are more satisfied with the URBMI program, as compared with their affluent counterparts. Furthermore, the coefficient estimates demonstrate greater satisfaction with URBMI among those subjects who self reported better health.

5. CONCLUDING REMARKS

While important, research on URBMI is scant, mainly due to the limited time it has been in effect. This study presents the first economic analysis of URBMI utilizing a survey sampled from nine representative cities in China. The major findings can be summarized as follows. First, a U-shaped relationship is found between participation rate and income: the richest and poorest income brackets are most likely to participate in URBMI. Moreover, people with previous use of inpatient services or any chronic disease are also more likely to enroll. Second, positive gains are observed in reducing financial barriers to care in response to URBMI, especially for the poor and those with previous inpatient care experience. Third, we have found that the poor tend to be happier with URBMI than their more affluent counterparts.

It is worth noting several limitations of this paper, where further research is needed in order to better understand policy impacts. Some variables, such as inpatient care, have few observations recorded due to the short observational period for the policy, limiting our ability to analyze the policy effect on such central outcomes. Second, we are not able to calculate out-of-pocket spending as a share of income because of the different months of 2007 in which the URBMI policy was initiated, while the survey asked about out-of-pocket spending for the entire year of 2007. Thus, we cannot distinguish whether the spending occurred before or after the initiation of URBMI program. Third, due to the cross-sectional nature of the baseline survey, it is difficult to infer a causal effect of the insurance policy on the key variables from the associational relationships observed in the current analysis.

Fortunately, the survey is a state-funded panel, and will be followed up annually for three years, to accompany the implementation of URBMI. When the follow-up data become available, further research is warranted to assess the full impact of URBMI itself, as well as the potential welfare effect and management cost when merging with UEBMI and NCMS to reach a universal coverage plan for all as proposed by the state reform plan.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

APPENDIX

Data	Number excluded	Number remaining	Used in Table No.
<i>Number of observations: Table II: III Column 1, 2</i>			
URBMI baseline survey 2007		32,989	
Exclude two city which have not start URBMI during the survey	6,059	26,930	
Exclude if insurance status is missing	208	26,722	
Exclude if age is missing	693	26,029	
Exclude if race status is missing	9	26,020	
Exclude if marital status is missing	32	25,988	
Exclude if education status is missing	27	25,961	
Exclude if job status is missing	46	25,915	
Exclude if self-reported health status is missing	6	25,909	
Exclude if hukou is not local and insurance status is URBMI	110	25,799	
Exclude if residence is not city and insurance status is URBMI	79	25,720	
Exclude if formal sector employment and insurance status is URBMI	56	25,664	
Exclude if hukou is not local and uninsured	515	25,149	
Exclude if residence is not city and uninsured	252	24,897	
Exclude if formal sector employment and uninsured	232	24,665	Table II
Keep if uninsured or have URBMI	15,966	8,699	Table III, Column 1
Keep if have URBMI	4,434	4,265	
Keep if attitude towards medical burden relieve is clear	1,965	2,300	Table III, Column 2
<i>Number of observations: Table III, Column 3, 4</i>			
URBMI baseline survey 2007		32,989	
Exclude two city which have not start URBMI during the survey	6,059	26,930	
Exclude if insurance status is missing	208	26,722	
Exclude if age is missing	693	26,029	
Exclude if race status is missing	9	26,020	
Exclude if marital status is missing	32	25,988	
Exclude if education status is missing	27	25,961	
Exclude if job status is missing	46	25,915	
Exclude if self-reported health status is missing	6	25,909	

Exclude if hukou is not local and insurance status is URBMI	110	25,799	
Exclude if residence is not city and insurance status is URBMI	79	25,720	
Exclude if formal sector employment and insurance status is URBMI	56	25,664	
Exclude if hukou is not local and uninsured	515	25,149	
Exclude if residence is not city and uninsured	252	24,897	
Exclude if formal sector employment and uninsured	232	24,665	Table II
Keep if uninsured or have URBMI	15,966	8,699	
Keep if have URBMI	4,434	4,265	
Keep if satisfaction towards URBMI is clear	1,077	3,188	Table III, Column 3, 4

REFERENCES

- Browne MJ. 1992. Evidence of adverse selection in the individual health insurance market. *The Journal of Risk and Insurance* **59**(1): 13–33.
- Budenstein MJ, Hennelly VD. 1980. Deterrents to family enrollment in a prepaid group practice. *Medical Care* **18**(6): 649–656.
- China National Bureau of Statistics. 2007. *2007 Report on National Economy and Social Development of China* (in Chinese).
- Cutler DM, Zeckhauser RJ. 1998. *Adverse Selection in Health Insurance*. Forum for Health Economics & Policy.
- Guo J, Liu X, Zhu X. 2007. Migrant workers are not covered by NCMS. *Outlook Weekly* **47**(2): S12 (in Chinese).
- Hu X. 2008a. Internal migration and health in China. *Lancet* **372**(15): 1717–1719.
- Hu X. 2008b. *Providing Universal Health Care To Chinese People*. National Medical Insurance Forum: China (in Chinese).
- Information Office for Ministry of Health. 2008. *Press Conference, Ministry of Health, China* (in Chinese).
- Li G. 2006. The problem of NCMS surplus. *Ren Da Jian She* **193**(1): 25–26 (in Chinese).
- Liu A, Han Y, Zheng J. 2004. Demand of farmers in Shanxi province for participating in CMS and its affecting factors. *Chinese Rural Health Service Administration* **24**(9): 3–5 (in Chinese).
- Liu Y. 2004. China's public health-care system: facing the challenges. *Bulletin of the World Health Organization* **82**(7): 532–538.
- Liu Y, Rao K, Hsiao WC. 2003. Medical expenditure and rural impoverishment in China. *Journal of Health, Population and Nutrition* **21**(3): 216–222.
- State Council Document No. 20. 2007. *Instructions on Establishing the Urban Employee Essential Medical Scheme*. State Council, China (in Chinese).
- State Council Evaluation Group for the URBMI Pilot Program. 2008. *Report on URBMI Pilot Programs* (in Chinese).
- Wen J. 2009. *Government Work Report* (in Chinese).
- White-Means SI, Hersch J. 2005. Health insurance disparities in traditional and contingent/alternative employment. *International Journal of Health Care Finance and Economics* **5**(4): 351–368.
- You M, Yu G. 2007. *Interview: Increase Government Subsidies for Social Insurance System*. Ministry of Finance, China (in Chinese).
- Zhang L, Wang H, Wang L, Xiao Q. 2004. The influence of social capital on farmer's willingness-to-pay to participate new rural cooperative medical system. *Chinese Health Economics* **23**(10): 15–18 (in Chinese).
- Zhao Z. 2006. Income inequality, unequal health care access, and mortality in China. *Population and Development Review* **32**(3): 461–483.
- Zhou S, Wan C, Hu S, Chen Q, Dai W, Qiu J. 2005. Analysis of Peasants' need on new cooperative medical system in Yu-long county. *Chinese Health Quality Management* **12**(5) (in Chinese).