

# Does health insurance matters to the use of health service for elderly in urban China? A nationwide cross-sectional study

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## Research article

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## Abstract

**Background** China's rapidly aging population is raising many challenges for the delivery and financing of health care. The Urban Residents Basic Medical Insurance (URBMI) has provided financial protection for the urban elderly population not covered by other health insurance schemes since 2007. We conducted a national level assessment to measure on the perceived health needs of this population as well as their use of health services.

**Methods** Data on individuals over the age of 60 were extracted from two National Health Service Surveys conducted in 2008 and 2013. Multivariate regression models were used to estimate associations of socioeconomic factors and perceived health needs with the use of health services while controlling for demographic characteristics and year of survey. **Findings** Perceived health needs increased significantly between 2008 and 2013, regardless of insurance enrollment, age group or income level. In 2013, over 75% of individuals reported having at least one Non-communicable disease (NCD). Outpatient services decreased for those without insurance but increased for those with insurance. Middle- and high-income groups with insurance experienced a faster growth in outpatient visits and hospital admissions than the low-income group. Proportion of forgone hospital admissions, and proportion of forgone hospital admissions due to financial difficulties decreased. Yet there were still over 20% elderly forgone necessary hospital admissions, among which more than 40% were caused by financial barriers in 2013. Multivariate regression models found an increase of outpatient visits and hospital admissions from 2008 to 2013 when controlling for socioeconomic and health need factors.

**Conclusion** Perceived health needs among the elderly increased at an alarming rate, and results showed a high prevalence of NCDs. Use of overall services increased and forgone necessary admissions decreased after the implementation of URBMI, indicating the improvement of access to health services. However, high-income groups had the highest increase in service use calling for further attention to issues related to equity. The service benefit packages offered by health insurance schemes should provide more support to the care of NCD patients.

## Background

Providing financial protection for vulnerable populations, particularly those from informal economic systems, is a major challenge to achieving universal health coverage (UHC) globally [1]. The Urban Employees' Basic Medical Insurance (UEBMI) (established in 1999) and the New Cooperative Medical Schemes (NCMS) (established in 2003) have successfully provided insurance coverage for employees (including retirees) in urban regions and all residents in rural areas, respectively. The Urban Residents' Basic Medical Insurance (URBMI) was piloted in 79 cities in 2007 and fully scaled-up across the country in 2009 and was intended to close "the last mile" gap in UHC in China [2].

Adapting similar policies to NCMS, URBMI targeted the elderly, unemployed and children (including students) not covered by other health insurance schemes in urban areas [3]. URBMI is financed through individual premiums and government subsidies. Premium levels vary by city and in general decrease from eastern to western China [4]. The benefit package initially covered inpatient services and very limited outpatient services, but later increased coverage for outpatient services [5].

However, URBMI's unique features create several challenges. First, one of the target populations of URBMI, the elderly, have higher medical needs than the overall population [6]. With the rapid aging population in China, individuals aged 60 years or over will make up 19.5% of the population by 2025 [7]. Secondly, different benefit packages between insurance schemes cause equity issues. [8]. Third, the recent integration of URBMI and NCMS was aimed to reduce urban-rural disparity yet its impact on use of health services remains under-reported [9].

Limited evidence about the impact of URBMI makes addressing these challenges difficult. Chen, G. et al found URBMI had significantly increased the use of both inpatient and outpatient treatment but its impact on reducing forgone hospitalization was insignificant [10] while Li, X. and colleagues found that URBMI's impact on service utilization is not sufficient [11]. Evidence on the impact of URBMI on different income groups is also contradicted [12,13]. Few studies have compared the difference between URBMI enrollees and uninsured members of the population in terms of health needs and service use.

This paper aims to assess the changes in the perceived health needs and use of health services among the elderly in urban China at the national level. Perceived health needs pertain to individuals' personal perceptions about their health, and their belief that they need to seek health care whether or not they actually need it. Additionally, we explore the impact of URBMI and other factors associated with service utilization, with special attention given to different socio-economic and demographic groups.

## Methods

### Data collection

This study used sub-samples from two National Health Service Surveys (NHSS) conducted in 2008 and 2013. NHSS is a nationally representative cross-sectional household survey conducted every 5 years by the Center for Health Statistics and Information of National Health Commission (the former China National Health and Family Planning Commission before 2018). A multi-stage randomized sampling method was applied across the country, trained interviewers conducted face-to-face interviews with all available adult member of the household and then completed structured questionnaires. Information on demographic and socio-economic status, health insurance enrollment, health needs, health service access and utilization, medical expenditures, and household expenditures were collected. Detailed methodology on these surveys can be found elsewhere [1].

To assess the impact of URBMI, we aimed to include populations that were eligible for URBMI (but may or may not be enrolled). Considering URBMI was only piloted in 2007, we extracted data on individuals aged 60 years or over from URBMI pilot cities who were either enrolled in URBMI or who had no insurance from the 2008 Survey. For the 2013 Survey, we extracted information from individuals aged 60 years or over from all urban cities who had URBMI or who had no insurance.

## Indicators

Our major indicators for perceived health needs were self-reported illness or injury in the past 2 weeks and self-reported diagnosis of non-communicable diseases (NCDs). Use of health services was measured by collecting information such as outpatient visits in the past 2 weeks, hospital admissions within the past year, proportion of forgone necessary hospital admissions, and proportion of forgone necessary hospital admissions due to financial difficulties. Forgone necessary hospital admission is defined as a hospital admission indicated by a doctor but declined or not followed through on by the patient.

Age, gender, marital status, highest education level, and EuroQol five dimensions questionnaire (EQ-5D, an instrument comprising five modalities of health including mobility, self-care, daily activities, pain/discomfort, and anxiety/depression) were collected at the individual level. Household size, annual household income and source of income were collected at the household level. Income level was adjusted for Consumer Price Index (CPI) using 2008 as reference level and the adjustment ratio for 2013 was 117.5%.

## Analysis

Indicators were analyzed by age groups (60–69 years, 70–79 years, 80 years or over) and income levels (low, middle, and high).

We used multivariate regression models to estimate associations of socioeconomic factors (age and income groups) and perceived health needs with the use of health services while controlling for demographic characteristics (sex, household size, marriage status, and education) and year of survey (using 2008 as base).

Statistical significance was examined using Chi square tests and t tests.

To further examine factors associated with service use, four multivariate logistic regression models were used. Model 1 and 2 used records from elderly populations with URBMI and Model 3 & 4 used records from the whole elderly population.

## Results

### Demographic characteristics

Two thousand one hundred and three individuals from URBMI pilot sites were eligible for analysis from the 2008 survey. The 2013 survey included 7,543 individuals. The number increased between the two surveys due to the scale up of URBMI during the time period between the surveys.

The demographic landscape changed between 2008 and 2013 in the elderly population studied. The proportion of men ( $p < 0.05$  for URBMI), aged 60 to 69 ( $p < 0.05$  for URBMI), married ( $p < 0.05$  for both uninsured and URBMI), with secondary or higher education levels ( $p < 0.05$  for both uninsured and URBMI), EQ5D, annual income per capita ( $p < 0.05$  for both uninsured and URBMI) and relying on their own income rather than support from children ( $p < 0.05$  for both uninsured and URBMI) increased from 2008 to 2013 (Table 1).

Unsurprisingly, we found differences between the insured and uninsured groups. Women comprised over 60% of study population, and the proportion of men without insurance was higher than men enrolled in URBMI, but the difference was not significant ( $P > 0.05$ ). The insured group had a significantly higher proportion of those aged 60 to 69 ( $p < 0.05$ ) and higher proportion of married elderly ( $p > 0.05$ ) compared to the uninsured group. The insured group had higher annual income per capita than the uninsured group in 2008 ( $p < 0.05$ ) but in 2013 we found the

opposite trend ( $p < 0.05$ ). Those with insurance were more likely to have their own income rather than rely on support from children ( $p < 0.05$ ) (Table 1).

## Perceived health needs

Perceived health needs increased significantly between 2008 and 2013, regardless of insurance enrollment, age group or income level ( $p < 0.05$  for all indicators among uninsured and URBMI). About 40% of the elderly population in urban areas reported illness or injury in 2008, and this number increased to over 64% in 2013. Over 75% elderly reported having an NCD in 2013 (Table 2).

Insured groups, women, those aged 70–79, and the high-income group tended to have higher rates of self-reported illness or injury in the past 2 weeks, and higher prevalence of self-reported NCDs. In 2008, about 59.5% of the study population without insurance reported having NCDs while over 67% with insurance reported NCDs ( $p < 0.05$ ) which indicated the adverse selection of insurance. With the roll out of URBMI in 2013, self-reported NCD prevalence was similar for those with or without insurance ( $p > 0.05$ ) (Table 2).

## Use and forgone health services

Compared to health needs (Table 2), there was a noticeable gap between perceived health needs and actual use of services. In addition, the use of outpatient services decreased among the elderly without insurance ( $p > 0.05$ ) but increased for those with insurance between 2008 and 2013 ( $p > 0.05$ ). Both insured and uninsured groups saw an increase in hospital admissions during the same period but the change was not significant ( $p > 0.05$  for both URBMI and uninsured) (Table 3).

The insured group had a higher hospital admission rate than the uninsured group in 2008 ( $p > 0.05$ ) and 2013 ( $p < 0.05$ ). The insured group had a higher outpatient visit rate than the uninsured in 2013 ( $p > 0.05$ ) but not in 2008 ( $p > 0.05$ ). Women tended to use more outpatient services than men but there was no obvious pattern observed for hospital admission. Age groups aged 60–69 and 70–79 had higher outpatient service use than those aged 80 and over, but those aged 70–79 and 80 over had higher rates of hospital admission. In 2008, middle- and high- income groups with insurance experienced a faster increase in outpatient visits and hospital admissions than the low-income group. No such trend was observed among different income groups without insurance (Table 3).

The proportion of forgone necessary admissions, and proportion of forgone necessary admissions due to financial difficulties reduced greatly between 2008 and 2013. Yet in 2013, there were over 20% forgone necessary admissions, among which more than 40% were caused by financial barriers (Table 4).

The study population covered by URBMI had lower proportion of forgone necessary admissions than those without insurance. Proportion of forgone necessary admissions due to financial difficulties was also lower among the URBMI group. Men had a higher reduction in proportion of forgone necessary admissions between 2008 and 2013 than women. Age groups aged 60–69 and 70–79 were more likely to have forgone necessary admissions than those aged over 80. The Low-income group had the highest proportion of forgone necessary admissions in 2008 but also had the most reduced proportion between 2008 and 2013. There was a reduction in the proportion of forgone necessary admissions due to financial difficulties among all income groups between 2008 and 2013. Yet the low-income group still had the highest proportion of forgone necessary admissions due to financial difficulties compared to the other income groups (Table 4).

## Factors associated with service use

Outpatient visits and hospital admissions significantly increased from 2008 to 2013 (M1–4, Table 5). Compared to the uninsured group, those with URBMI were more likely to have outpatient visits and hospital admissions (OR: 1.23 and 1.57, respectively, M3 & 4, Table 5). Gender was not found to significantly influence service use (M1–4, Table 5). Compared to the age group aged 60–69, those aged 70–79 were more likely to have outpatient visits and hospital admissions, while no significant evidence was found for those aged 80 and over (M1–4, Table 5). Income level was a significant influential factor for use of services. The high-income group was more likely to use outpatient and inpatient services than the low-income group (M1–4, Table 5). Meanwhile, the middle-income group only had a significantly higher possible use of outpatient services when compared to the low-income group (M1–4, Table 5). Perceived need was found to be a determinant for use of services among the study population who reported difficulty in taking care of themselves, they were also more likely to use outpatient services and have hospital admissions than those who had no difficulty with self-care (M1–4, Table 5). Those with higher EQ–5D scores were less likely to use services. Size of household and marital status did not have a significant impact on service use (M1–4, Table 5). Among the insured group, higher education was negatively associated with hospital admission (M2, Table 5) but this impact was not significant among

the rest of population when we controlled for insurance status (M3&4, Table 5). When controlling for insurance status, those living on their own income were less likely to use outpatient services than those living on other sources of income (M3, Table 5).

## Discussion

The elderly population had higher perceived needs and increased service use after the implementation of URBMI. Our findings have many policy implications for the health delivery system and health financing. Self-reported illness and prevalence of NCDs among the elderly increased at an alarming rate from 2008 to 2013. Interestingly, the rate was higher than that reported by the 2013 National Health Statistics Yearbook. One explanation for this variation could be that health promotion and education programs, as well as health insurance schemes helped to improve awareness of NCDs in China. However, while it only be a perception that is higher at the moment, the health system needs to urgently to prepare itself to provide services to address the increasing rates of NCDs. For example, Mao et al summarized the health system and its policies around diabetes and found insufficient support has been provided for education, early screening and patient management programs [1]. Evidence showed policy and population-wide interventions such as healthy-lifestyle education is cost-effective in NCD treatment and prevention [2]. With an aging population, it is time for the health system to make NCDs a top priority. More specifically, public health and primary level providers should promote healthy lifestyle education and early screenings for NCDs. Primary level providers also have a crucial role to play in the management and coordination of care for NCD patients.

Use of overall services increased after the implementation of URBMI, which confirms previous findings from Chen, G. et al [12]. We also found the forgone necessary admissions and proportion of forgone necessary admissions due to financial difficulties decreased. The implementation of URBMI was a major contributor to improving access to health services among the elderly Chinese population.

However, several issues emerged from our study. First, elderly people with URBMI had higher self-reported prevalence of NCDs than those without insurance, indicating the existence of adverse selection in the enrollment of URBMI. Adverse selection exists widely among voluntary insurance schemes and endangers the financial sustainability of insurance [3]. This remains an issue of concern even after the integration of URBMI and NCMS, as some provinces provide different benefit packages (and contribution rates) [4].

Second, while health insurance improves access to health services, the rationale behind service use is under-studied. We observed that the insured group had a higher hospital admission rate than the uninsured group but there was only a slight difference between these two groups in outpatient visits. In 2008, the URBMI group had lower outpatient visits than the uninsured group. This coincidentally could be associated with the benefit package of URBMI which provides a relatively high reimbursement for hospital admissions and limited or no reimbursement for outpatient services, this was especially true in 2008 [10]. After controlling for other factors, the regression also showed that those with URBMI were more likely to have outpatient visits and hospital admissions (OR: 1.23 and 1.57, respectively) than those without insurance. Nonetheless hospital admissions usually incur higher expenses than outpatient visits and is the major cause of catastrophic health expenditure. As such it is time to revisit the benefit package policy and examine the evidence showing the cost-effectiveness of various packages, especially those that include services to address the increasing rate of NCDs. Many cities have started to provide higher reimbursements for outpatient visits (or more specifically for outpatient visits for certain NCDs). The impact of these policy initiatives should be studied to inform future policy development and implementation.

Third, though there was some improvement in the rate of forgone necessary hospital admissions, one-fifth of the study population still had forgone necessary hospital admissions, among which more than 40% were caused by financial barriers in 2013. The high-income group was more likely use services than the low-income group. The middle- and high- income groups with insurance had more outpatient visits and hospital admissions than the low-income group. Service use was higher among the high-income group which calls for further attention to equity. Medical Financial Assistance and Insurance Program for Catastrophic Disease should provide more support to low-income groups.

Our study is the first to use the National Household Survey to examine the service use among the elderly population in urban areas. However, the sample sizes for 2008 and 2013 were uneven due to the fact that URBMI was initially only available in a limited number of pilot cities in 2008 before being scaled up across the country in 2013. Additionally, the demographic characteristics of study populations were not homogeneous, however this should not bias our major conclusions.

## Conclusion

Perceived health needs among the elderly increased alarmingly, especially those related to NCDs. The high prevalence of NCDs requires that attention be given to NCDs in the health service delivery system. Use of overall services increased and forgone necessary admissions decreased after the implementation of URBMI, indicating an improvement to health service access. However, service use was higher among those in the high-income group which calls for further attention to issues related to equity. To help address both these issues, the benefit packages of insurance schemes should provide more support for the prevention and treatment of NCDs.

## Abbreviations

CPI- Consumer Price Index

EQ–5D -EuroQol five dimensions questionnaire

OR- odds ratio

NCD- non-communicable disease

NCMS-New Cooperative Medical Scheme

NHSS-National Health Services Survey

UEBMI-Urban Employees' Basic Medical Insurance

UHC- universal health coverage

URBMI-Urban Residents' Basic Medical Insurance

## Declarations

### Ethical approval and consent to participate

The National Health Services Surveys received ethical approval from National Statistics Bureau of China. Considering some of the interviewees were illiteracy (cannot read or write), an oral consent was permitted for this study. All Participants gave oral consent to participate in the study. No individual identifiable information (name, address, phone number, etc.) was collected.

### Declarations

#### Consent to publish

Not Applicable.

### Availability of data and materials

As required by the National Health Commission, the original data of National Health Services Surveys is not available. For questions or inquiries, please contact Centre for Health Statistics and Information of the National Health Commission.

### Competing interests

All authors have contributed to this manuscript and have no conflict interest

### Funding

No funding resources is available for this research

### Authors' Contributors

ST and LX conceptualized and oversaw the study. YZ and WM analyzed the data and drafted the manuscript. LX, ZM, and DD provided comments on the analysis and manuscript. All authors read and approved the final manuscript for submission.

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## Tables

Table 1 Demographic characters

	2008		2013	
	Uninsured	URBMI	Uninsured	URBMI
<b>N (individual)</b>	1288	815	724	6819
<b>Household size</b>	3.1	3.0	2.9	3.1
<b>Sex #</b>				
Men	448(34.8%)	255(31.3%)	279(38.5%)	2429(35.6%)
Women	840(65.2%)	560(68.7%)	445(61.5%)	4390(64.4%)
<b>Age group##</b>	**	**	**	**
60-69	538(41.8%)	356(43.7%)	321(44.3%)	3943(57.8%)
70-79	457(35.5%)	322(39.5%)	233(32.2%)	2015(29.5%)
80+	293(22.7%)	137(16.8%)	170(23.5%)	861(12.6%)
<b>Marital status††##</b>			**	**
Single or widowed	562(43.6%)	319(39.1%)	233(32.2%)	1827(26.8%)
Married	721(56.0%)	490(60.1%)	488(67.4%)	4983(73.1%)
Others	5(0.4%)	6(0.7%)	3(0.4%)	9(0.1%)
<b>Highest education††##</b>	**	**	**	**
None and primary	1009(78.4%)	600(73.7%)	430(59.4%)	4539(66.6%)
Secondary	267(20.7%)	194(23.8%)	231(31.9%)	2147(31.5%)
College and above	11(0.9%)	20(2.5%)	63(8.7%)	133(2.0%)
<b>Per capita annual income (CNY, mean) ††##</b>	6,296**	8,352**	14,151**	12,260**
<b>Per capita annual income (CNY, median)</b>	5,000	7,200	11,064	10,213
<b>EQ-5D</b>	0.867	0.874	0.881	0.889
<b>Difficulty in self-care in the past month</b>	254(19.7%)	150(18.4%)	109(15.1%)	864(12.7%)
<b>Income resource††##</b>	**	**	**	**
Own	608(47.2%)	460(56.4%)	448(61.9%)	4653(68.2%)
Others	680(52.8%)	355(43.6%)	276(38.1%)	2166(31.8%)

\* Significant difference between uninsured and URBMI; \* for P<0.05, \*\* for P<0.01

†Significant difference for uninsured between 2008 and 2013, † for P<0.05, †† for P<0.01

#Significant difference for URBMI between 2008 and 2013, # for P<0.05, ## for P<0.01

Table 2 Perceived health needs

	Self-reported illness or injury in past 2 weeks					Prevalence of self-reported NCDs			
	2008	URBMI	2013	URBMI		2008	URBMI	2013	URBMI
<b>Total ††##</b>	509(39.5%)	355(43.6%)	463(64.0%)	4553(66.8%)	<b>Total ††##</b>	767(59.5%)*	553(67.9%)*	546(75.4%)	5306(77.8%)
<b>Sex ††##</b>					<b>Sex ††##</b>				
Men	140(31.3%)	90(35.3%)	196(70.3%)*	1378(56.5%)*	Men	237(52.9%)	145(56.9%)	226(81.0%)*	1601(65.9%)*
Women	369(43.9%)	265(47.3%)	267(60.0%)*	3180(72.4%)*	Women	530(63.1%)*	408(72.9%)*	320(71.9%)**	3705(84.4%)**
<b>Age group ††##</b>					<b>Age group ††##</b>				
60-69	181(33.6%)	126(35.4%)	160(49.8%)	2413(61.2%)*	60-69	297(55.2%)	194(54.5%)	205(63.9%)	2821(71.5%)
70-79	192(42.0%)	155(48.1%)	178(76.4%)	1529(75.9%)	70-79	300(65.6%)*	256(79.5%)*	208(89.3%)	1795(89.1%)
80+	136(46.4%)	74(54.0%)	125(73.5%)	611(71.0%)	80+	170(58.0%)*	103(75.2%)*	133(78.2%)	690(80.1%)
<b>Income group ††##</b>					<b>Income group ††##</b>				
low	197(36.3%)	69(39.4%)	147(50.2%)	1842(65.2%)**	low	304(56.0%)*	127(72.6%)*	185(63.1%)*	2132(75.4%)*
middle	161(40.3%)	99(36.7%)	73(46.2%)	1508(68.9%)**	middle	250(62.5%)	151(55.9%)	93(58.9%)**	1397(80.1%)**
high	151(44.0%)	187(50.5%)	243(89.0%)	1508(67.1%)**	high	213(62.1%)	275(74.3%)	268(98.2%)**	1777(78.9%)**

\* Significant difference between uninsured and URBMI; \* for P<0.05, \*\* for P<0.01

†Significant difference for uninsured between 2008 and 2013, † for P<0.05, †† for P<0.01

#Significant difference for URBMI between 2008 and 2013, # for P<0.05, ## for P<0.01

Table 3 Use of Health services

	Outpatient visits in the past two weeks					Hospital admission within the past year			
	2008		2013			2008		2013	
	Uninsured	URBMI	Uninsured	URBMI		Uninsured	URBMI	Uninsured	URBMI
<b>Total</b>	388(30.1%)	193(23.7%)	181(25.0%)	1842(27.0%)	<b>Total</b>	127(9.9%)	108(13.3%)	85(11.7%)*	1129(16.6%)*
<b>Sex</b>					<b>Sex</b>				
Men	127(28.3%)	50(19.6%)	89(31.9%)	637(26.2%)	Men††	30(6.7%**)	39(15.3%**)	43(15.4%)	346(14.2%)
Women	261(31.1%)	143(25.5%)	92(20.7%)	1025(27.4%)	Women#	97(11.5%)	69(12.3%)	42(9.4%**)	783(17.8%**)
<b>Age group</b>					<b>Age group</b>				
60-69	143(26.6%)	86(24.2%)	80(24.9%)	966(24.5%)	60-69	40(7.4%)	37(10.4%)	34(10.6%)	524(13.3%)
70-79	139(30.4%)	80(24.8%)	63(27.0%)	646(32.1%)	70-79	49(10.7%)	50(15.5%)	31(13.3%)*	446(22.1%)*
80+	106(36.2%)	27(19.7%)	38(22.4%)	230(26.7%)	80+	38(13.0%)	21(15.3%)	20(11.8%)	159(18.5%)
<b>Income group</b>					<b>Income group</b>				
low	145(26.7%)	46(26.3%)	66(22.5%)	627(22.2%)	low	46(8.5%)	27(15.4%)	26(8.9%)*	447(15.8%)*
middle	126(31.5%)	62(23.0%)	25(15.8%)*	516(29.5%)*	middle	37(9.3%)	30(11.1%)	7(4.4%**)	304(17.4%**)
high	117(34.1%)	85(23.0%)	90(33.0%)	699(31.1%)	high	43(12.5%)	51(13.8%)	52(19.0%)	378(16.8%)

\* Significant difference between uninsured and URBMI; \* for P<0.05, \*\* for P<0.01

†Significant difference for uninsured between 2008 and 2013, † for P<0.05, †† for P<0.01

#Significant difference for URBMI between 2008 and 2013, # for P<0.05, ## for P<0.01

Table 4 Forgone necessary hospital admission

	% of forgone necessary hospital admission				% of forgone necessary hospital admissions due to financial difficulties			
	2008		2013		2008		2013	
	Uninsured	URBMI	Uninsured	URBMI	Uninsured	URBMI	Uninsured	URBMI
<b>Total</b>	72(36.2%)	45(29.4%)	31(26.7%)	243(17.7%)	51(86.4%)	35(85.4%)	12(52.2%)	85(43.8%)
<b>Sex</b>								
Men	23(43.4%)	17(30.4%)	20(18.9%)	79(18.6%)	16(84.2%)	12(92.3%)	4(50.0%)	22(33.8%)
Women	49(33.6%)	28(28.9%)	21(33.3%)	164(17.3%)	35(87.5%)	23(82.1%)	8(53.3%)	63(48.8%)
<b>Age group</b>								
60-69	27(40.3%)	15(28.8%)	15(30.6%)	128(19.6%)	22(84.6%)	11(78.6%)	7(63.6%)	48(49.5%)
70-79	34(41.0%)	21(29.6%)	11(26.2%)	88(16.5%)	20(87.0%)	16(84.2%)	3(42.9%)	29(38.2%)
80+	11(22.4%)	9(30.0%)	5(20.0%)	27(14.5%)	9(90.0%)	8(100.0%)	2(40.0%)	8(38.1%)
<b>Income group</b>								
low	36(43.9%)	21(43.8%)	11(29.7%)	116(20.6%)	26(96.3%)	18(94.7%)	6(85.7%)	47(50.5%)
middle	18(32.7%)	16(34.8%)	4(36.4%)	52(14.6%)	14(93.3%)	12(85.7%)	2(66.7%)	21(48.8%)
high	18(29.5%)	8(13.6%)	16(23.5%)	75(16.6%)	11(64.7%)	5(62.5%)	4(30.8%)	17(29.3%)

Table 5 Factors associated with service use

	M1: Outpatient	M2: Inpatient	M3: Outpatient	M4: Inpatient
	N = Insured population		N = All population	
	OR[95%CI]			
Year (2008 as base level)				
2013	1.07[1.02,1.11]*	1.11[1.06,1.17]*	1.05[1.02,1.09]*	1.60[1.31,1.95]*
Insurance (uninsured as base level)				
URBMI	/	/	1.23[1.04,1.46]*	1.57[1.28,1.93]*
Gender (women as base level)				
Men	0.93[0.81,1.06]	0.90[0.78,1.05]	0.95[0.84,1.07]	0.92[0.80,1.05]
Age group (60-69 as base level)				
70-79	1.20[1.05,1.38]*	1.42[1.22,1.66]*	1.22[1.07,1.38]*	1.41[1.22,1.63]*
80+	0.88[0.71,1.09]	0.84[0.66,1.06]	1.00 [0.84,1.21]	0.91[0.74,1.13]
Income group (low as base level)				
middle	1.25[1.07,1.47]*	1.14[0.96,1.36]	1.27[1.10,1.48]*	1.13[0.96,1.33]
high	1.46[1.26,1.71]*	1.30[1.10,1.54]*	1.52[1.32,1.75]*	1.34[1.14,1.57]*
Difficulty in self-care in the past month (no difficulty as base level)				
yes	1.03[0.83,1.27]	1.59[1.28,1.97]*	1.19[1.01,1.41]*	2.15[1.81,2.54]*
EQ-5D	0.25[0.17,0.37]*	0.12[0.08,0.18]*	0.25[0.17,0.37]*	0.26[0.21,0.33]*
Household size (1-2person as base level)				
3-4	1.00[0.84,1.18]	0.94[0.78,1.14]	1.09[0.93,1.27]	1.05[0.88,1.25]
≥5	1.08[0.91,1.29]	1.07[0.89,1.30]	1.07[0.91,1.25]	1.06[0.89,1.27]
Highest education of family (None and primary as base level)				
Secondary	1.09[0.93,1.28]	0.80[0.68,0.95]*	1.03[0.89,1.18]	0.91[0.78,1.06]
College and above	0.98[0.79,1.22]	0.65[0.51,0.82]*	1.07[0.91,1.25]	0.82[0.65,1.02]
Marital status (single or widowed as base level)				
married	1.05[0.89,1.24]	0.95[0.79,1.14]	1.04[0.84,1.21]	0.93[0.78,1.10]
Income source (other as base level, such as from children, friends)				
own	0.87[0.75,1.00]	1.11[0.95,1.31]	0.86[0.75,0.98]*	1.16[1.00,1.35]

\*p<0.05