Catastrophic costs of Tuberculosis care in a population with internal migrants in China

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Abstract

Background Although a free diagnosis and baseline treatment package was offered for tuberculosis (TB), hidden costs incurred by patients and their households could worsen their socio-economic and health status, particularly for migrants. We estimated the prevalence of catastrophic cost of TB patients and its associated factors in an urban population with internal migrants in China.

Methods A cross-sectional survey was conducted to enroll culture-confirmed pulmonary TB patients in Songjiang district, Shanghai, between December 1, 2014, and December 31, 2015. Consenting participants completed a questionnaire, which collected direct and indirect costs before and after the diagnosis of TB. The catastrophic cost was defined as the annual expenses of TB care that exceeds 20% of total household income. We used logistic regression to identify factors associated with catastrophic costs.

Results Overall, 248 drug-susceptible TB patients were enrolled, with 70% (174 of 248) of them being internal migrants. Migrant patients were significantly younger compared to resident patients. The total costs were 25,824 ($3,689) and 13,816 ($1,974) Chinese Yuan (RMB) for resident and internal migrant patients, respectively. The direct medical cost comprised about 70% of the total costs among both migrant and resident patients. Overall, 55% (132 of 248) of patients experienced high expenses (> 10% of total household income), and 22% (55 of 248) experienced defined catastrophic costs. However, the reimbursement for TB care only reduced the prevalence of catastrophic costs to 20% (49 of 248). More than half of the internal migrants had no available health insurance (52%, 90 of 174). Hospitalizations, no available insurance, and older age contributed significantly to the occurrence of catastrophic costs.

Conclusions. The catastrophic cost of TB service cannot be overlooked, despite the free policy. Migrants have difficulties benefiting from health insurance in urban cities. Interventions, including expanded medical financial assistance, are needed to secure universal TB care.

Introduction

Tuberculosis (TB) is often recognized as a disease of poverty and is known to disproportionately affect the economically disadvantaged population.[1] One of the three goals of End TB strategies by 2020 includes reducing the catastrophic costs to TB-affected families.[1-2] This goal is a challenge as more than 50% of TB patients have experienced financial difficulties due to the direct and indirect costs caused by TB care [3], particularly in countries with a high-TB burden such as China and India. China bears the third-largest TB epidemic burden worldwide, with about one million new infections annually.[4] Currently, the increase in internal rural-to-urban migrants is one of the major challenges for TB control in China. Most of the internal migrants are men who leave the rural countryside to join the wage economy in towns and cities all over China. There are an estimated 240 to 260 million internal migrants in urban areas of China by 2030.[5] However, the household registration (*Hukou)* system legally ties the internal migrants and their family members to their rural homes and bars them from receiving most public benefits. As a

result, internal migrants are not entitled to subsidized housing or education, have poor access to social security, health insurance, and medical benefits, often share crowded living conditions due to low socio-economic status, and are thus more vulnerable to communicable disease including TB.[6-9]

Patient costs incurred during TB diagnosis and treatment, as well as seeking and receiving health care, could cause barriers to access and adherence that can affect treatment outcomes and increase the risk of transmission of disease.[10] Therefore, patient costs could hamper TB control, particularly for vulnerable populations such as immigrants (internal and international migrants). In China, people with TB-related symptoms can have free sputum smear tests and a primary treatment package if TB is confirmed. This is the so-called “free diagnosis and treatment” policy for TB in China. However, there are many out-of-pocket health care costs associated with TB diagnosis and treatment.[10-13] In the recent past, internal migrants could not share the free TB policy in urban centers, and they were not allowed to use their health insurance in cities, only in the town or location where they were born. Although some urban cities like Shanghai have expanded the health care services to offer free TB diagnosis and treatment to include internal migrants in urban areas since 2004, there are still medical charges for TB diagnosis and treatment.[13] Meanwhile, out-of-pocket payments for transportation, accommodation, and food to get access to TB diagnosis and treatment could also have a significant impact on the household economic burden of TB patients.[14] Here, we hypothesized that internal migrants incurred a higher economic burden during the TB care in urban centers, partially due to the barriers to accessing the health system and insurance benefits. We conducted a cross-sectional study to estimate the economic burden of adequate TB diagnosis and treatment and to identify related risk factors among both internal migrants and residents in an urban area in China.

Methods

Study site and population

We designed and conducted a cross-sectional survey in TB patients in Songjiang, Shanghai, from December 1, 2014, to December 31, 2015. Songjiang is one of 15 districts in Shanghai and had a rapid increase in the proportion of internal migrants among its population since the nationwide economic reforms. In 2015, 1.1 million (60%) of the total population in the Songjiang district was internal migrants.[15] Community physicians routinely screened and referred TB suspects to the local designated TB hospital for diagnosis. The study includes culture-confirmed TB patients age no less than 15 years old who currently reside in Songjiang district and who provided written informed consent to participate in the study. Prisoners and mentally ill/cognitively impaired and institutionalized TB patients were excluded from this study due to unavailable cost estimates and ethical concerns.

Diagnosis and treatment of TB

Beginning in 2004, the Shanghai Centers for Disease Control and Prevention (CDC) implemented a new policy extending free TB treatment to all migrants. During the period of our study, all individuals with

suspected TB had three sputum samples collected (spot, early morning, and night) and tested for the presence of *Mycobacterium tuberculosis* (*M. tuberculosis*) by microscopic exam and culture. We used sputum induction for individuals who were unable to produce sputum spontaneously. From each individual with culture-positive TB, a single pre-treatment sputum specimen was submitted to the Shanghai Municipal CDC TB reference laboratory for rifampin (RIF) and isoniazid (INH) drug susceptibility testing (DST) by the proportion method on Löwenstein-Jensen medium. Multidrug-resistant TB (MDR-TB) patients were excluded in this study, as the costs for MDR-TB were much higher than drug-susceptible TB, and the rate of MDR-TB in Songjiang is relatively low.[16] In the study district, once being confirmed as pulmonary TB, patients were asked to sign an agreement with the local CDC that they could get reimbursement for first-line anti-TB drugs and certain times of TB related testing once they complete the treatment period.

Data collection

We collected data on costs using a standardized questionnaire, modified from the Poverty sub-working group of the Stop-TB Partnership, titled “Tool to Estimate TB Patient’s Costs.” [17] We recruited and enrolled patients who had a confirmed diagnosis of TB during the study period. To ensure the accuracy of the medical fees, an addition to an interview questionnaire, we also collected patient’s medical receipts from their activities to seek TB diagnosis and treatment. Standardized questionnaires also collected additional demographic information and routine data on diagnostic delays, complications, sputum smear test results, and the type of TB diagnosed.

Measurements and definitions

Direct costs were the out-of-pocket payments for TB care and costs incurred in the pathway to care, to access the services. Direct costs included medical fees, transportation, food, and accommodation costs during the TB care. Indirect costs accrued from patients’ lost income due to illness and the time needed to receive a diagnosis, treatment, and care. Guardian costs were the costs incurred by family members looking after or caring for the patient during the patients’ treatment. Household costs were the sum of a patient’s direct, indirect, and guardian costs. The affordability of costs was measured as the proportion of annual household costs compared to their annual household income level. We defined catastrophic expenditure if the patient-reported health expenditures were exceeding 20% of the annual household income according to the WHO recommendation.[18] A diagnostic delay was defined as the time interval (days) from the onset of symptoms to the date of diagnosis. A treatment delay was defined as the time interval (days) from the onset of symptoms to the initiation of treatment.

Statistical analysis

We summarized the demographic characteristics and costs for all participants. TB related costs were described by the mean and interquartile range (IQR). We compared groups using the chi-square test for categorical variables (including a linear trend test of the odds) and the Wilcoxon nonparametric rank-sum test for continuous variables. We used multivariates logistic regression analyses to evaluate potential risk

factors associated with catastrophic cost among internal migrants and residents. All of the analysis was performed using Stata/SE version 13.1 (StataCorp, College Station, TX, USA).

Results

Study population

From December 1, 2014, to December 31, 2015, we continually enrolled 252 culture-confirmed pulmonary TB patients diagnosed in the Songjiang district, Shanghai. Of the 252 cases enrolled, four (1.6%) were excluded: three patients had an infection with non-tuberculosis mycobacteria (NTM), and one other case died of respiratory failure during the anti-TB treatment. Among the remaining 248 participants whose data were included for analyses, 29.8% (74 of 248) were residents, and 70.2% (174 of 248) were internal migrants. The characteristics of the study population were detailed in Table 1.

Internal migrant TB patients were significantly younger than resident cases (median age, 32 years versus 52 years; p<0.01), had a higher annual household income (median 90 000 versus 70 000 Chinese Yuan [RMB], p=0.01). However, migrants with TB had a significantly smaller living space per capita compared to residents (12 [IQR, 8-20] *vs.* 34 [IQR, 24-60] square meters, p<0.01). Due to restrictions on medical insurance among internal migrants, half (52%, 90 of 174) of the migrant cases paid all of the medical costs out-of-pocket by themselves. In contrast, most (95%, 70 of 74, p<0.01) residents had health system insurance that covered the related medical expenditures. Also, internal migrants had a significantly lower rate of hospitalizations than that of resident patients during both the periods before and after the diagnosis of TB (24%, 42 of 174 versus 58%, 43 of 74, p<0.01).

Most of the TB patients during the study period were either cured (34%, 85 of 248) or completed the treatment (64%, 158 of 248), and such proportions were similar between internal migrant and resident TB patients. Patients went to the hospital for an average of three times before being diagnosed with TB and went to the hospital 14 more times during TB treatment. Patients delayed an average of 10 [IQR 3-22] days to seek medical care after well-defined TB symptoms occurred, and the hospital delayed an additional 13 [IQR 6-20] days to make the diagnosis.

Direct costs and indirect costs of TB services

The direct costs and lost income are summarized in Figure 1. In general, residents paid almost twice as much as internal migrants for direct costs and lost income (25 824 and 13 816 Chinese Yuan [RMB], respectively). The majority of the total expenses (> 65%) were direct medical costs. The proportion of total costs that were direct medical costs was similar among residents and internal migrants (67.6% vs. 69.0%). Non-medical items, including transportation, extra food supplies, accommodation, and guardian care, accounted for a higher proportion of total costs among residents compared to internal migrants (8.1% [95%CI 7.8%-8.5%] vs. 6.2% [95%CI 5.8%-6.6%], p<0.01). The other quarter of total costs to TB

patients were from indirect income loss. The proportion of indirect costs among the total costs did not differ significantly between residents and internal migrants (24.3% vs. 24.8%, p=0.30).

Costs incurred among different treatment stages.

The costs accrued before getting a TB diagnosis were one-third of the total expenses, and the proportion of costs accrued before getting a TB diagnosis was slightly higher among residents compared to internal migrants (35.4% [95%CI 34.8-36.0%] vs. 31.9% [95%CI, 31.1-32.6%], p<0.01). Lost income increased, and medical costs decreased slightly after diagnosis; however, the costs of medicine after diagnosis rose from 28.1% to 44.7% of the total expenses among residents and from 31.7% to 47.2% among internal migrants.

Catastrophic costs and risk factors

Overall, 55 (22%, 55 of 248) TB patients have experienced household catastrophic costs during the entire illness, and more than half of them had experienced high TB care-related expenses (≥ 10% of total household income). After adjusting for the migration status in the multivariate model, TB patients who experienced hospitalization (adjusted OR [aOR], 10.08, 95%CI [4.96-23.41]), having no available health insurance (aOR, 2.69, 95%CI [1.68-6.72]), and being older than 45 years (aOR, 2.50, 95%CI [1.20-5.21]) were independently associated with the occurrence of catastrophic costs (Table 2). The benefits of reimbursement for TB diagnosis and treatment had less impact on the prevalence of the catastrophic cost by reducing it from 22% to 20% (49 of 248, p=0.50). Besides, TB patients who experienced hospitalization and were older than 45 years remained significant for catastrophic costs after this specific reimbursements, except the health insurance (Table 2).

Migrant TB patients had higher income levels and were less likely to be hospitalized than residents who were TB patients. The proportions of household's catastrophic costs were significantly different between households of residents versus household of internal migrants (p<0.01; Table 2). However, after adjustment for hospitalization, the health insurance, and age groups, there was no significant difference in the prevalence of catastrophic costs between migrants and residents (adjusted OR, 0.64, 95%CI [0.25-1.61]). The average proportion of the total costs that were covered by insurance payments was 18.8% (95%CI 14.0%-23.7%) among internal migrants compared to 54.0% (95%CI 48.5%-59.4%) of residents.

Hospitalization and health insurance among migrants and residents

Hospitalization rates were significantly higher among resident patients (58%, 43 of 74) compared to migrant patients (24%, 42 of 174, p<0.01), and such a difference mainly existed in a patient group of individuals less than 45 years old (p<0.01, Figure 2). Migrant patients had a significant trend association between hospitalization and age (p<0.01), while resident TB patients had a high average rate without the trend association (p=0.59, Figure 2). In total, patients without health insurance were less likely to be hospitalized than those with health insurance (24%, 23 of 94 vs. 40%, 62 of 154, p=0.01) (Figure 2). Since only 5% of the resident patients lacked health insurance, we stratified this analysis by migration status; however, we observed no significant factors for the prevalence of hospitalization in either resident or

migrant patients subgroups. In a multivariable logistic regression model, TB patients who were a migrant (aORs of 0.29 [95%CI 0.14-0.56]) and age between 25-34 years old (0.28 [95%CI 0.12-0.67]) were less likely to be hospitalized.

We also stratified the hospitalization by pre-diagnosis and post-diagnosis: 79% (67 of 85) patients had hospitalization before the diagnosis of TB, and 13% (11 of 85) of them had hospitalization during both periods. Among migrants, more TB patients (83%, 35 of 42) had a pre-diagnosis hospitalization compared to local residents (60%, 32 of 53, p=0.01).

Discussion

Despite the “free TB care” policy, TB patients among both internal migrants and residents incurred high costs due to TB care and a high rate of catastrophic costs in the Songjiang district, Shanghai, China. Internal migrants, who were mainly from rural areas, accounted for the majority of the urban TB disease burden. They were less likely to benefit from health insurance during their medical care in urban cities and were less likely to be hospitalized, but were more likely to experience catastrophic costs compared to resident patients.

We defined total catastrophic costs due to TB as the sum of total costs to patients that exceeded 20% of the annual household income. However, there is no universal standard for this definition, and a range of thresholds (5-25%) of total household incomes was used in other studies.[19-21] A prospective study in Peru analyzed the relationship between prognosis and treatment costs in patients with MDR-TB and defined clinically relevant catastrophic costs with a 20% threshold.[22] Studies from China used more than 10% of annual income or more than 40% of non-food income or capacity to pay as the cutoff to define the catastrophic costs and reported a high rate from 60-90% in the rural regions.[21] The rate of catastrophic costs also exceeds 50% in our study in an urban setting where the majority of the population was migrants from rural China. Catastrophic costs can lead to reduced access to health care and completion of TB treatment, as well as poverty reinstatement due to illness. We showed that more than half of the TB patients in the Songjiang district in Shanghai had catastrophic expenditures, regardless of their household status (i.e., being an internal migrant or a resident). This finding indicates that the proportion of catastrophic expenditures due to TB disease is still high, and the current health and social security system needs more efforts toward the goal of zero catastrophic expenditure for TB disease in 2020.[1]

Of note, the internal migrant TB patients had a slightly higher average income compared to that among residents. It’s mainly because the majority of the migrant patients were young individual workers (e.g., service workers and labor workers). In contrast, most of the resident patients were older adults who lacked decently paid work or were retired. Despite their relatively high income, half of the TB patients among migrants had catastrophic costs, and they were more likely to incur catastrophic costs compared

to residents after adjusting for hospitalization and household income. It has been widely reported that internal migrants faced many barriers to seeking TB care. Although we did not observe significant differences in the delays in diagnosis and treatment outcomes between internal migrants and residents, we cannot ignore the high economic burden caused by TB care.

Another notable finding is that more than half of the migrants with TB had to pay their medical costs by themselves because they cannot access urban health insurance, mainly because of the household registration system in China. In contrast, most (>92%) of the resident patients had health insurance. Shanghai and many other cities with large increasing populations of internal migrants (e.g., Beijing, Shenzhen, and Hangzhou) expanded the free TB treatment policy to migrants around 2004-2006. In the Songjiang district, TB patients who finished the treatment period could get the reimbursement that was financially supported by the local central government. However, such reimbursement only covered the first TB related diagnosed testing and the first-line anti-TB drugs and had little impact on reducing the rate of catastrophic costs for both migrants and residents. Besides, the reimbursement system requires migrants to provide a residential permit to qualify for this reimbursement, and the permit became mandatory beginning in 2018.

Hospitalization during the TB treatment accounted for more than 60% of the health care expenditures. Residents were about four times more likely to be hospitalized than migrants. Hospitalization before the diagnosis of TB was much higher than after the diagnosis. Most of the health insurance that the migrants have cannot be used in the urban health system, which could lead to significant differences in the hospitalization rate among TB patients who were migrants versus residents. Meanwhile, migrants do tend to avoid hospitalization, regardless of whether they can use their health insurance or not in an urban city, because of the expected high expenditures for hospitalization. The relatively lower frequency of hospitalization among migrant TB patients could also be partially due to the much younger population of migrants. It is also reasonable to infer that the type of health insurance that migrants had could impact their healthcare-seeking behavior.[23]

Despite the so-called free TB policy in China, it only covers the first time diagnosis and first-line anti-tuberculosis drugs, the effectiveness of the implementation also variates in different areas, and many costs are still not covered.[14] For example, in Shanghai, all expenses need to be paid in advance, and some of the costs can only be reimbursed after the completion of anti-TB treatment. From the patient management perspective, this necessary arrangement offers a financial incentive for TB patients to complete therapy and to improve the provider’s treatment completion rate. But various types of certificates are required for internal migrants to obtain the TB reimbursement, including the residence permit, which also creates barriers. In contrast, some implementation studies refer to the use of transportation subsidies (50-100 RMB or 7-14 USD) and monthly living allowances (100-200 RMB or 14-28 USD) for migrant patients to increase treatment compliance.[24] However, the amount of subsidies is relatively low for the overall medical expenses, and it is difficult to alleviate the medical burden of

patients. In summary, a higher rate and broader coverage of reimbursement for TB patients could effectively protect TB patients from catastrophic costs.[24]

This study has some limitations. First, the study restricted to those who seek care in local dispensaries and specific TB hospitals, and not all of the migrant patients seek TB care in Shanghai after the diagnosis or during the treatment of TB. Many individuals with TB symptoms may not even seek care due to social welfare and financial barriers. Therefore, we probably underestimated the overall incidence of catastrophic costs among migrants with TB. Second, the measures of annual household income and expenditures on food and health care relied on self-reported information, which could be affected by recall biases.

Conclusions

In summary, even in an urban area with relatively abundant health resources in China, a policy of free TB care for patients has not been enough to reduce the economic burdens, and the high costs occurred in both internal migrant and resident patients. The low rates of adequate health insurance coverage for migrant TB patients in urban settings highlight a need for available, practical financial assistance for this vulnerable group, as well as crucial medical reform to reach a universal insurance coverage for TB disease in China.

Declarations

Ethical Approval and Consent to participate

The study protocol was reviewed and approved by the Ethnical Committee of Institutes of Biomedical Sciences, Fudan University (2014-116) and University of California, Davis (781914-1). Informed consent was sought from the eligible study participants prior to enrollment in the study.

Consent for publication

Not applicable.

Availability of supporting data

The data supporting the conclusions of this article are included within the article.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

CY and KD contributed to the conception, design and management of the study. QJ, CY, LL, HB and KD contributed to the questionnaire design. CY, L L, and QJ contributed the demographic and epidemiological data collection. CY, QJ, LL, XJ and JH contributed to the epidemiological investigations. CY and QJ did the costs, epidemiological, and statistical analyses and drafted the manuscript. CY, QG, HB and KD prepared and reviewed the manuscript. All authors have reviewed the approved the final report.

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Authors' information

Not applicable.

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Tables

Table 1. Demographic, socio-economic and clinical characteristics of Tuberculosis patients among residents and migrants

Variable	Total		Residents		Migrants		p value
	N=248		N=74		N=174		
Age, yrs [median (IQR)]	34	(26-49)	52	(34-62)	32	(25-40)	<0.01
Gender [n (%)]							0.40
Male	167	(67.3)	47	(63.5)	120	(69.0)	
Female	81	(32.7)	27	(36.5)	54	(31.0)	
Education level [n (%)]							0.01
Primary	46	(18.5)	19	(25.7)	27	(15.5)	
Middle	88	(35.5)	20	(27.0)	68	(39.1)	
High	82	(33.1)	20	(27.0)	62	(35.6)	
College	32	(12.9)	15	(20.3)	17	(9.8)	
Living area per capita, m^2 [median (IQR)]	16	(9-30)	34	(24-60)	12	(8-20)	<0.01
Mean Income, thousand Yuan [median (IQR)]							
Monthly income	3.5	(2.0-4.5)	2.9	(1.3-3.0)	3.8	(2.5-4.9)	<0.01
Annual household income	80	(54-120)	70	(50-100)	90	(60-120)	0.01
Annual household income per capita	24	(16-33)	20	(15-32)	25	(17-36)	0.06
Medical insurance status [n (%)]							<0.01
Yes	154	(62.1)	70	(94.6)	84	(48.3)	
No-feasible (self-pay)	94	(37.9)	4	(5.4)	90	(51.7)	
Debts [n (%)]							0.96
Yes	17	(6.9)	5	(6.8)	12	(6.9)	
No	231	(93.1)	69	(93.2)	162	(93.1)	
TB history [n (%)]							0.03
Yes	17	(6.9)	9	(12.2)	8	(4.6)	
No	231	(93.1)	65	(87.8)	166	(95.4)	
Number of patient visits [median (IQR)]							
Pre-diagnosis	3	(2-4)	3	(2-4)	3	(2-4)	0.17
Post-diagnosis	14	(11-17)	15	(12-19)	13	(11-16)	0.01
Treatment outcomes [n (%)]							0.80
Cured	85	(34.3)	26	(35.1)	59	(33.9)	
Completed	158	(63.7)	46	(62.2)	112	(64.4)	
Others	5	(2.0)	2	(2.7)	3	(1.7)	
Sputum smear microscope testing [n (%)]							0.82
Positive	88	(35.5)	27	(36.5)	61	(35.1)	
Negative	157	(63.3)	45	(60.8)	112	(64.4)	
Default	3	(1.2)	2	(2.7)	1	(0.6)	
Hospitalization [n (%)]							<0.01
None	163	(65.7)	31	(41.9)	132	(75.9)	
Pre-diagnosis	56	(22.6)	26	(35.1)	30	(17.2)	
Post-diagnosis	18	(7.3)	11	(14.9)	7	(4.0)	
Both	11	(4.4)	6	(8.1)	5	(2.9)	
Diagnosis delay, days [median (IQR)]							
Patient delay (days from symptom to seeking care)	10	(3-22)	10	(3-26)	10	(2-20)	0.17
Hospital delay (days from seeking care to diagnosis)	13	(6-20)	15	(7-22)	11	(6-19)	0.07

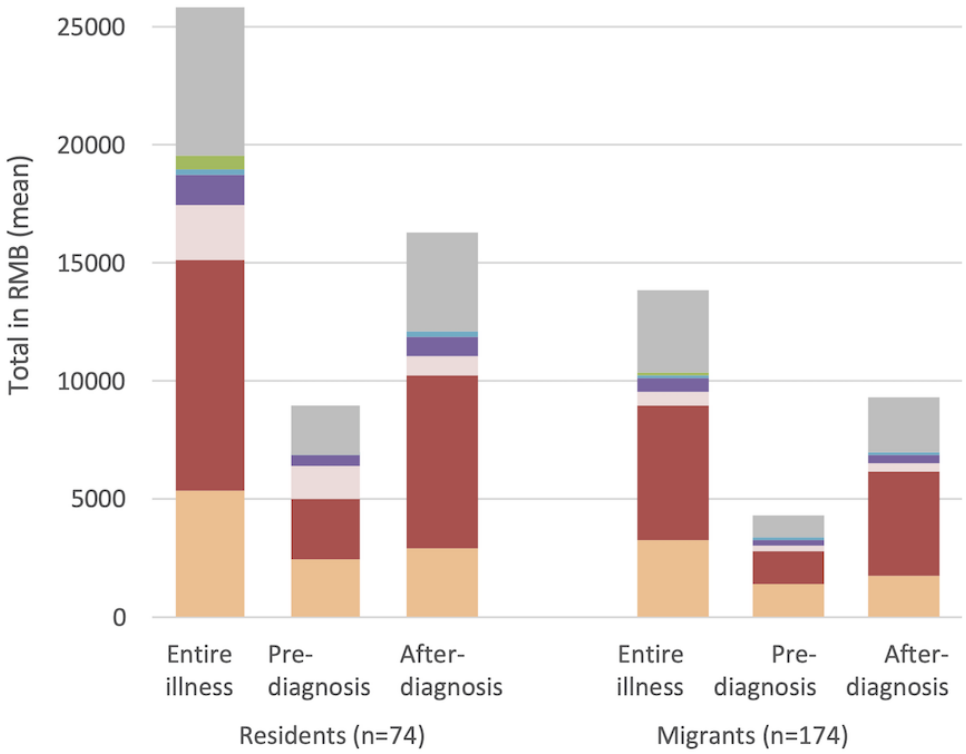
* IQR =Interquartile range

Table 2. Risk Factors associated with catastrophic cost before (CC1) and after (CC2) the TB specific reimbursement.

	Univariable analysis, CC1		Multivariable logistic regression, CC1		Multivariable logistic regression, CC2	
	OR (95%CI)	p value	Adjusted OR (95%CI)	p value	Adjusted OR (95%CI)	p value
Migrants	0.41 (0.21-0.77)	<0.01	0.64 (0.25-1.61)	0.34	0.81 (0.31-2.13)	0.68
Sex, females	1.00 (0.53-1.90)	0.99				
Age, years	1.04 (1.02-1.06)	<0.01				
More than 45 years old	3.87 (2.02-7.43)	<0.01	2.50 (1.20-5.21)	0.01	2.52 (1.17-5.47)	0.01
Primary education and lower	3.24(1.60-6.58)	<0.01				
Living area per capital, m^2	1.01 (1.00-1.02)	0.01				
Unemployment	2.17 (0.86-5.49)	0.10				
No feasible health insurance	1.12 (0.60-2.07)	0.36	2.69 (1.08-6.72)	0.03	2.33 (0.89-6.14)	0.08
Previous TB episode	2.67 (0.96-7.45)	0.06				
Patient delay; days	1.01 (0.99-1.02)	0.07				
Hospital delay; days	1.00 (0.99-1.01)	0.76				
Smear positive	1.17 (0.62-2.21)	0.63				
Hospitalization	11.27 (5.55-22.89)	<0.01	10.78 (4.96-23.41)	<0.01	14.92 (6.30-35.28)	<0.01
Pre-diagnosis	8.65 (3.98-18.79)	<0.01				
Post-diagnosis	12.83 (4.42-37.15)	<0.01				

Note, CC1 represents catastrophic costs without reimbursement from local CDC, and CC2 represents catastrophic expenditures after reimbursement from local CDC; OR=odds ratio.

Figures



		Residents (n=74)			Migrants (n=174)		
Non-medical costs	Lost income	6275 (24)	2037 (23)	4238 (26)	3421 (25)	1035 (24)	2387 (26)
	Guardian in hospitalization	550 (2)	-	-	106 (1)	-	-
	Guardian in care-seeking	318 (1)	79 (1)	239 (1)	159 (1)	49 (1)	109 (1)
	Non-medical costs	1233 (5)	464 (5)	769 (5)	594 (4)	216 (5)	378 (4)
	SUB-TOTAL	**2101 (8)**	**543 (6)**	**1008 (6)**	**859 (6)**	**265 (6)**	**487 (5)**
Medical costs	Other medical costs	2305 (9)	1410 (16)	895 (5)	520 (4)	265 (6)	255 (3)
	Medicines	9809 (38)	2517 (28)	7292 (45)	5793 (42)	1384 (32)	4409 (47)
	Examinations	5334 (21)	2440 (27)	2894 (18)	3223 (23)	1419 (32)	1804 (19)
	SUB-TOTAL	**17448 (68)**	**6367 (71)**	**11081 (68)**	**9536 (69)**	**3068 (70)**	**6468 (69)**
	TOTAL COSTS	**25824 (100)**	**8947 (100)**	**16327 (100)**	**13816 (100)**	**4368 (100)**	**9342 (100)**

Figure 1

Lost income, direct non-medical costs, direct medical costs, and total expenses by treatment stage in mean RMB, stratified by resident status.

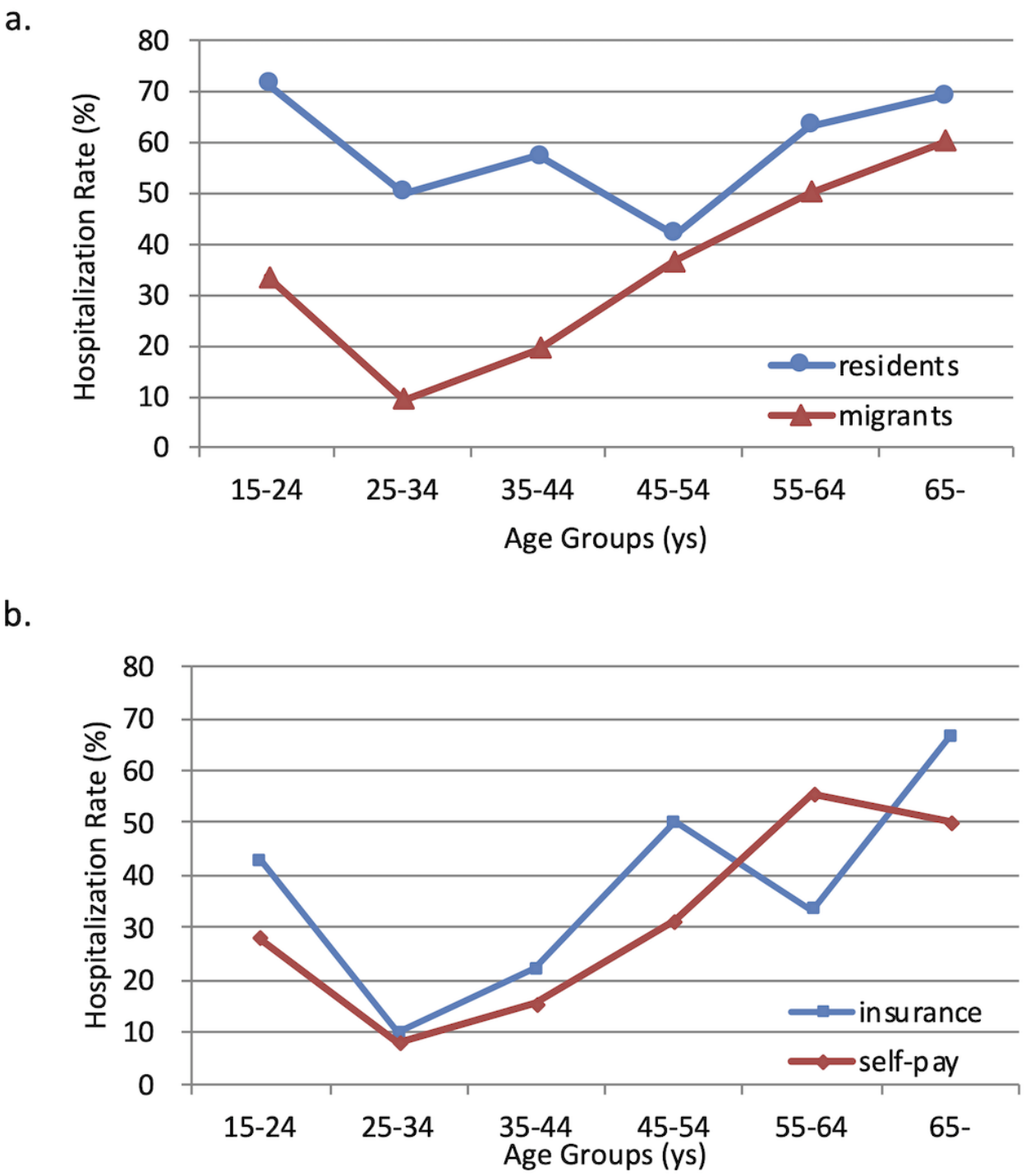


Figure 2

Trends of hospitalization rates with age, stratified by the household status and medical insurance.