

# Treatment seeking for symptoms suggestive of TB: comparison between migrants and permanent urban residents in Chongqing, China

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## Summary

**OBJECTIVES** To understand the health-seeking behaviour of rural-to-urban migrants with chronic cough in Chongqing city, and compare this with the permanent urban population taking into account the socioeconomic factors influencing delays in access to healthcare in urban China.

**METHODS** Patient survey in 23 health facilities from different levels of two urban districts in Chongqing: 1005 tuberculosis (TB) suspects (229 rural-to-urban migrants and 776 permanent urban residents) were interviewed about socioeconomic status and service-seeking behaviours.

**RESULTS** Migrants (67.7%) delayed treatment by more than 2 weeks, as did 54.0% of urban residents ( $P < 0.01$ ). The reasons given by migrants for the delay in seeking care were lack of money and lack of perceived need for care. Female TB suspects, people without health insurance, those without sufficient knowledge of TB, without full-time employment and people with low incomes also experienced longer patient delay ( $P < 0.01$ ).

**CONCLUSIONS** To be more effective, TB control efforts need to be better accessible to the economically and socially vulnerable.

**keywords** tuberculosis, healthcare, migrants, china

## Introduction

China has the second highest burden of tuberculosis (TB) in the world, registering 17% of global cases (WHO 2004). There are approximately 1.4 million new TB cases annually, of which 650 000 are smear-positive (Li *et al.* 2005; Liu *et al.* 2005). Since the economic reforms of the early 1980s, health disparities between urban and rural areas have been exacerbated. The greatest number of illnesses from TB are concentrated in rural areas, where the active TB prevalence rate is 397 per 100 000 compared with 198 per 100 000 in urban areas, and the mortality rate is nearly three times as high (National Technical Steering Group of the Epidemiological Sampling Survey, China (2005)).

Rural-to-urban migration, the low case detection rate, development of multi-drug resistance and poor quality of TB-related healthcare are the four main problems affecting TB control in China (Shenglan & Bertel 2005). Population migration from regions of high TB prevalence is one of the major contributors to the growth of TB in low-incidence areas (Sukhan *et al.* 2005; Shenglan & Bertel 2005; MacPherson & Gushulak 2006). It may also contribute to the low case detection rate and development of multi-drug

resistance. In 2005, there were an estimated 160 million internal migrants in China, of whom 70% were farmers (Li *et al.* 2006). TB incidence among the rural-to-urban migrant population increased 160% between 1993 and 1996 (Liu 1997). In Shanghai, while the incidence of pulmonary TB was relatively stable among residents in recent years, the number of active TB patients among rural-to-urban migrants increased by 9.4% every year (Mei 2002).

In moving from the rural to the urban context, migrants are more vulnerable to TB because of relatively poor living and working conditions, lack of family support and the fragmentation of their social support network (Wang *et al.* 2007). Rural-to-urban migrants perceive and experience prejudice from society and the health system (Zhan *et al.* 2002; Wong *et al.* 2007), which may affect their seeking health behaviour. Migrants are likely to earn less than their urban resident counterparts and are less likely to be covered by health insurance, meaning that they are liable to face high out-of-pocket costs for healthcare.

The majority of TB cases in China are detected through passive case finding; that is, people with TB-related symptoms are identified when they seek care at a general health facility and referred to a local TB dispensary for a

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sputum smear test (CDC 2002). Although Chinese government policy states that TB treatment is to be provided free to smear positive TB patients through designated TB dispensaries (Centers for Disease Control 2002), the costs of obtaining a diagnosis are far higher than the expenditure on treatment. As a result, vulnerable groups with TB symptoms may delay seeking care for financial reasons until symptoms become severe.

Many difficulties facing rural-to-urban migrants suggest that case detection may be lower among this group than permanent urban residents, but there have been no comparisons of access to TB diagnosis between these groups published to date. This study aimed to fill this knowledge gap by understanding the health-seeking behaviour (and the socioeconomic factors influencing it) of rural-to-urban migrants with chronic cough in Chongqing city, when compared with permanent urban residents.

## Methods

### Study sites

Chongqing municipality is generally perceived as the commercial capital of southwest China. It is the most populous of the four municipalities in China, with a total population of over 30 million. Chongqing city has six districts with more than three million urban residents and it is a key destination for a large number of migrants. The study sites were selected from these six urban districts, according to the following considerations: a high proportion of rural-to-urban migrant population, representation of relatively developed and less developed areas of Chongqing city, willingness to participate in the study and capacity for implementing the study. Two districts were selected as study sites: Yuzhong district (YZ) in central Chongqing and Jiulongpo district (JLP) in suburban Chongqing. The main characteristics of the study population in the two districts are shown in Table 1.

Yuzhong district is in the economically developed centre of Chongqing city, and it has better indicators of health and healthcare service development than JLP. At the end of 2002, there were 496 health facilities in YZ district: 14

municipal level hospitals (tertiary hospitals), 56 district general hospitals (secondary hospitals), 426 private clinics and community healthcare centres (primary hospitals) and a TB dispensary under the district Center for Disease Control. JLP is a less-developed area of the city, and has a high rural-to-urban migrant population. There is no municipal level hospital, but there are 40 secondary and 431 primary hospitals. The Chongqing municipal TB control centre is located in the district.

### Study designs and data collection

Twenty-three health facilities (12 in YZ and 11 in JLP) in the two districts were purposively selected to include tertiary, secondary and primary types of health facilities (Table 2).

All adult patients (over 15 years old) with a history of cough for more than 3 weeks who visited the outpatient department of the health facilities were recruited as study subjects. Two study arms in each district were organized for the purpose of comparison: rural-to-urban migrants and permanent residents. To reflect the proportion of the rural-to-urban migrants among the whole population in Chongqing's urban areas, one quarter of the study subjects were rural-to-urban migrants and three quarters were permanent residents. The sample size for comparison of delay in diagnosis between the two groups was estimated as 783 cases, of which 209 were rural-to-urban migrants and 574 were permanent residents.

Information on the recruited coughing patients' health-care-seeking experiences (from the onset of the current episode of cough) was collected through patient interview surveys, using standard questionnaires. Subjects recruited in secondary and primary hospitals were interviewed by nurses who had received 2-day training. Subjects recruited in tertiary hospitals were interviewed by the researchers and post-graduate students from Chongqing Medical University's (CQMU) School of Public Health. The survey questionnaire covered general demographic and socioeconomic information of the subjects and their care-seeking experiences from the onset of the current episode of cough to the time of interview.

**Table 1** Characteristics of study sites in Chongqing, during 2002

Items	YZ	JLP
Population	5 96 312	6 50 579
No. of migrants	2 59 062	2 52 191
Income per capital (Yuan)	13 426	5822
No. of health facilities	496	381
Geographic location	Central	Sub-urban

**Table 2** Distribution of study health facilities in Chongqing

Facility level	YZ	JLP	Total
Municipal level	3	0	3
District level	3	7	10
Community level (private clinics and community health centres)	6	4	10
Total	12	11	23

### Main variables and definitions

For this study, self-reported average annual income per person was used to divide the study population into three income groups (less than twice the poverty line, two to three times poverty line and more than three times poverty line). The poverty line was defined as 198 yuan per person per month in 2004 by the Chongqing Municipal Bureau of Civil Affairs.

The study subjects for this survey were adult suspected TB cases, defined as patients over 15 years old, who suffered from either chronic cough or cough with sputum or haemoptysis, or sputum with blood for 3 weeks or more prior to interview. Rural-to-urban migrants were people registered in the rural areas who had been working and living in a city or town for more than 3 years. Permanent urban residents were people registered in the six urban districts of Chongqing (i.e. Yuzhong, Jiangbei, Nanan, Shapingba, Jiulongpo and Dadukou). Delay in seeking care was defined as more than 2 weeks elapsing between the onset of symptoms and the first contact with a healthcare provider.

### Data analysis

The questionnaire data were double entered, using Epi Data 6.0. After validation, the data were converted into SAS format and analysed using SAS 8.0. Mean, median and proportion were used in a descriptive analysis of the quantitative data with Student's *t*-test and chi-squared test. Univariate analysis and multivariable logistic regression were used to explore factors influencing delays in seeking care.

### Quality assurance

A 2-day training workshop with a practice component was given to enumerators in each district. The research team carefully checked completed questionnaires every week during the whole study period, to correct any logical mistakes found, and double-checked with interviewers and interviewees to ensure a high quality of data collected. Ten percent of subjects were re-interviewed for quality control by the research team from School of Public Health, CQMU. About 95% of the results of the double interviews were very similar, demonstrating that the quality of the data collected was good.

### Ethical considerations

This study obtained the approval of the WHO Scientific Committee for Research in Human Subjects (SCRIHS), the

Research Ethics Committee at the Liverpool School of Tropical Medicine and the University Presidents Committee at Chongqing Medical University. All data were collected with prior informed consent of participants. Training of the research team stressed confidentiality and privacy. Data were collected in the most neutral and private surroundings that could be found in the study areas.

### Results

#### Socioeconomic and demographic characteristics

All study subjects were over 15 years old and met the criteria for selection as 'TB suspects'. The sample consisted of 1005 patients, of whom 776 (77.2%) were permanent residents and 229 rural-to-urban migrants (22.8%); 19.1% of migrants either had sputum with blood or haemoptysis, or both, compared to 12.1% of permanent residents ( $P < 0.05$ ).

About 70% of migrants were aged 15–44 years, but only 22% of permanent residents were in this age group. More than half of the residents were over 60 years old. About 80% of the migrants were engaged in full or part-time employment, compared to only 30% of the residents, largely because a high proportion of the permanent residents were retirees, 'laid off' or unemployed (Table 3).

More than 60% of migrants were living on less than two times poverty line, while less than half of the permanent residents were. Overall, migrants had lower educational levels than their urban resident counterparts. Since the main health insurance schemes in China are largely employment-based, 94.3% of migrants were not covered by any health insurance. This was two times higher than the proportion of permanent residents without insurance.

#### Delay in seeking healthcare

The median time taken to seek care among all patients was 20 days: 23 days for migrants and 18 days for permanent residents; 67.7% of migrants delayed seeking care, whereas 54% of permanent residents did ( $P < 0.01$ ; Table 4).

The survey found that 23.1% of migrants sought care within 1 week, while 36% of permanent residents did so (Table 5). But 40.2% of migrants waited more than 4 weeks before seeking care, while only 27.9% of permanent residents had such a long delay ( $P < 0.01$ ).

The survey asked patients why they did not seek healthcare before their first visit (Table 6). Nearly 40% of respondents from both the groups said they were not concerned about their symptoms. 38.6% of migrants delayed for financial reasons. This was higher than the

**Table 3** Patients' socioeconomic and demographic characteristics

Indicators	Type	Migrant % (N)	Resident % (N)	$\chi^2$	P-values
Age	15–44 years	69.4 (159)	22.9 (178)	188.4	<0.0001
	45–59 years	21.0 (48)	26.3 (204)		
	≥60 years	9.6 (22)	50.8 (394)		
Sex	Male	56.3 (129)	53.5 (415)	0.6	0.45
	Female	43.7 (100)	46.5 (361)		
Marriage	Unmarried	14.9 (34)	5.3 (41)	40.4	<0.0001
	Married	82.1 (188)	80.9 (628)		
	Divorced	1.3 (3)	2.6 (20)		
	Widowed	1.8 (4)	11.2 (87)		
Education	Primary school and below	44.3 (101)	37.1 (288)	14.3	0.0008
	Middle school	49.1 (112)	46.7 (362)		
	College and above	6.6 (15)	16.2 (126)		
Occupation	Manual	52.0 (117)	47.7 (370)	29.4	<0.0001
	Semi manual	33.3 (75)	21.0 (163)		
	Headwork	14.7 (33)	31.3 (243)		
Employment	Full/part time employed and students	80.4 (184)	32.2 (250)	203.0	<0.0001
	Retired	2.6 (6)	52.6 (408)		
	Unemployed/laid off	17.0 (39)	15.2 (118)		
Annual income per person	≤2 PL	63.3 (145)	46.5 (361)	20.3	<0.0001
	2–3 PL	17.9 (41)	24.0 (186)		
	>3 PL	18.8 (43)	29.5 (229)		
Health insurance	No	94.3 (216)	31.8 (247)	277.9	<0.0001
	Yes	5.7 (13)	68.2 (529)		

**Table 4** Rate of delay by migrants and permanent residents

	Migrants % (N)	Residents % (N)	Total % (N)
Non-delay	32.3 (74)	46.1 (357)	42.9 (431)
Delay	67.7 (155)	54.0 (419)	57.1 (574)
Total	100 (229)	100 (776)	100 (1005)

percentage among permanent residents (32.2%;  $P < 0.05$ ). More than 20% of migrants did not take any actions between the onset of symptoms and seeking healthcare, while only 12.4% of permanent residents sought no alternative care during this period ( $P < 0.01$ ).

#### Socioeconomic factors affecting delay

Female patients were more likely to delay in seeking care than their male counterparts (OR: 2.14; 95% CI: 1.66–2.77) (Table 7). This was a very statistically significant

difference. Patients aged 15–44 years were more likely to delay care-seeking than those over 45 years. Singles were also more likely to delay care-seeking than married people (OR: 1.96; 95% CI: 1.40–2.75).

Education was an influential factor. The more education patients had received, the more likely they were to delay care-seeking. Those who were full or part-time employed were more likely to delay in seeking care than those who were retired, unemployed or 'laid off' ( $P > 0.05$ ). People without health insurance were more likely to delay than those with insurance (OR = 2.31; 95% CI: 1.78–2.98). Income levels were also found to affect delays in care-seeking, with the highest income group more likely to delay than the lowest income group ( $P < 0.05$ ). Furthermore, people who self-treated and had little knowledge of TB were more likely to delay seeking formal healthcare; 58% of respondents did not recognize chronic cough as a sign of TB; among migrants the rate was 68%.

	<1 week	1~2 weeks	2~4 weeks	>4 weeks
Migrants % (N)	23.1 (53)	9.2 (21)	27.5 (63)	40.2 (92)
Residents % (N)	36.0 (279)	10.1 (78)	26.2 (203)	27.9 (216)
Total % (N)	33.0 (332)	9.9 (99)	26.5 (266)	30.6 (308)

**Table 5** Time to a health facility from onset of symptoms by migrants and residents

**Table 6** Self-reported reasons for delay

Reasons	Migrants % (N)	Residents % (N)	Total % (N)
Don't care	38.6 (59)	39.1 (164)	39.0 (223)
No time	21.6 (33)	20.1 (84)	20.5 (117)
No money	38.6 (59)	32.2 (135)	33.9 (194)
Others	0.4 (2)	8.6 (36)	6.6 (38)

Two migrant cases who did not report any reasons.

The results from multi-variable logistical regression analysis (Table 8) show that women, patients who were fully employed, those not covered by health insurance, those with high incomes, those seeking self-treatment and those with low TB-related knowledge were more likely to delay care-seeking ( $P < 0.01$ ).

**Table 7** Univariable analysis of socioeconomic factors affecting delay

Type	Non-delay	Delay	OR/95% CI
Sex			
Male	51.3 (279)	48.7 (265)	1.00
Female	33.0 (152)	67.0 (309)	2.14 (1.66–2.77)
Age			
15–44 years	31.8 (102)	68.2 (219)	1.00
45–59 years	34.9 (80)	65.1 (149)	0.87 (0.61–1.24)
≥60 years	54.7 (249)	45.3 (206)	0.39 (0.29–0.52)
Marriage			
With spouse	45.8 (374)	54.2 (442)	1.00
Without spouse	30.2 (57)	69.8 (132)	1.96 (1.40–2.75)
Education			
Primary school and lower	50.0 (195)	50.0 (195)	1.00
Middle school	38.2 (181)	61.8 (293)	1.62 (1.23–2.12)
College and higher	39.0 (55)	61.0 (86)	1.56 (1.06–2.32)
Occupation			
Manual	43.8 (284)	56.2 (364)	1.00
Semi manual	35.1 (27)	64.9 (50)	1.45 (0.88–2.37)
Headwork	42.9 (120)	57.1 (160)	1.04 (0.78–1.38)
Employment			
Full/part time employed	32.9 (140)	67.1 (285)	1.00
Retired	58.2 (241)	41.8 (173)	0.35 (0.27–0.47)
Unemployed/laid off	30.1 (50)	69.9 (116)	1.14 (0.77–1.68)
Health insurance			
Yes	52.3 (278)	47.7 (253)	1.00
No	32.3 (153)	67.7 (321)	2.31 (1.78–2.98)
Avg. per capita income			
≤4680 yuan	46.1 (233)	53.9 (273)	1.00
4680–7020 yuan	44.1 (100)	55.9 (127)	1.08 (0.79–1.49)
≥7020 yuan	36.0 (98)	64.0 (174)	1.52 (1.12–2.05)
Self-treatment			
No	63.8 (90)	36.2 (51)	1.00
Yes	39.5 (341)	60.5 (523)	2.71 (1.87–3.92)
TB-related knowledge			
Low	26.4 (52)	73.6 (145)	1.00
Middle	42.2 (136)	57.8 (186)	0.49 (0.33–0.72)
High	50.0 (243)	50.0 (243)	0.36 (0.25–0.52)

## Discussion and conclusion

### Delays in care-seeking and diagnosis of TB

This study shows that more migrants than residents delayed seeking TB-related care and that a greater proportion of migrants than residents delayed for more than 4 weeks. Before seeking professional care, the migrant patients were more likely to take no action, while the urban resident patients were more likely to seek self-treatment (such as buying drugs from pharmacies).

### Socioeconomic factors affecting patient and system-related delays

Delay was associated with a number of other socioeconomic factors. Women were more likely to delay seeking care. Migrant women are likely to earn less (Wang *et al.*

**Table 8** Multi-variable logistical regression analysis of socioeconomic factors affecting delay

Variable	Odds ratio estimates			Chi-square	P-value
	Point estimate	95% Wald confidence limits			
Sex (female <i>vs.</i> male)	1.755	1.33	2.33	15.36	<0.0001
Employment (retired <i>vs.</i> fully employed)	0.426	0.31	0.60	24.99	<0.0001
Health insurance (uncovered <i>vs.</i> covered)	1.584	1.12	2.25	6.67	0.0098
Avg. income per capita ( $\leq 4680$ yuan <i>vs.</i> $4680-7020$ yuan $\geq 7020$ yuan)	1.339	1.12	1.60	10.69	0.0011
Self-treatment (No/Yes)	4.041	2.70	6.05	45.86	<0.0001
TB-related knowledge (low/middle/high)	0.637	0.53	0.77	20.78	<0.0001

2005) and have less power than male migrants to spend household funds. They also have less disposable time due to their double burden of income generating and reproductive work. Women may also place less value on their own health, or their families may prioritize health spending for male members (Xu *et al.* 2004; Yan *et al.* 2007). These gender-related barriers to seeking care have been identified in China and internationally (Cheng *et al.* 2005; Sasaki *et al.* 2000; Enwuru *et al.* 2002; Long *et al.* 2002; Xu *et al.* 2004; Wang *et al.* 2005; Yan *et al.* 2007).

Lack of health insurance and low levels of knowledge about TB were associated with delays in seeking treatment. Many patients are not aware that mild symptoms such as a cough may be indicative of TB disease or that early diagnosis and treatment improves their prospects of recovery. Care-seeking may therefore be delayed until symptoms become more severe and of greater concern to the patient (Lambert & Van der Stuyft 2005). Qualitative findings in this study suggested that rural-to-urban migrants are less likely to be identified and reached by health education on TB. Migrants are particularly unlikely to have health insurance due to their concentration in the informal sector. Therefore, they are likely to wait to see whether symptoms improve to avoid paying high healthcare costs out of pocket unnecessarily (Gao *et al.* 2002; Meng *et al.* 2004).

Full-time employment and higher income levels were associated with delays in seeking care. It is surprising that people with a higher income level were more likely to delay, given that financial difficulties were often cited as a reason for not seeking care, and the common association between low income level and delays in seeking care in China, and internationally (Grange & Zumla 2002; Ministry of Health, China 2002; Nhlema *et al.* 2003; Selvam *et al.* 2007; Zhang *et al.* 2007). We cannot fully explain the apparent contradiction. It may be because people with a full-time job were too busy to seek professional care, particularly when their symptoms were

not perceived as serious. 'Full employment' may therefore act as a barrier to timely formal care-seeking, with self-treatment being sought when symptoms are relatively mild. The influence of income is more difficult to interpret, but it is possible that those earning higher incomes in insecure or daily paid work may have the most to lose from taking time to seek care. These issues require further investigation.

The difficulty of TB control among rural-to-urban migrants has been identified as one of four main problems challenging the effectiveness of TB control in China over the past decade (Shenglan & Bertel 2005). This study provides evidence that migrants are more likely than their permanent resident counterparts to delay in seeking healthcare for symptoms suggestive of TB. Efforts to control TB in urban China therefore need to address these barriers to seeking care faced by migrants. The primary reasons for the delay identified by patients themselves were lack of money and lack of concern about their symptoms. The study also found that women, those in full employment, with higher incomes, without health insurance and with relatively low knowledge about TB are more likely to delay in seeking care.

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