Rural-Urban Migration on Adults' Health: Slums of Dhaka North, Dhaka South and Gazipur City Corporations

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Abstract

Although rural-urban migration occurs almost in every society but a little research has been done to measure the effects of such migration on health. Using database of the Health and Demographic Surveillance System of selected slums of Dhaka (North and South) and Gazipur City Corporations, 1,017 respondents of age 18 years or more were selected randomly for this study (505 for male and 512 for female). The respondents were interviewed during August-September 2016 to collect data on perceived physical and mental health statuses using 36-items Short Form. The eight scale scores were computed with these data and grouped in to two categories: physical health and mental health scores.

The study reported that after controlling for selected socio-demographic variables, both physical and mental health statuses were better for non-migrants than those of short- and long- duration migrants; these two health statuses were also consistently better for migrants of short-duration than migrants of long-duration. The study also documented better physical and mental health statuses for male than female, better health for educated than illiterate, and better health for rickshaw puller/laborer than the 'other' occupation category.

As physical and mental health statuses get worse for people living long in the slum, it has implication on health care cost (caring and medical); such health care cost is likely to increase in future as people grow old in the slum and more people in-migrating.

Introduction

Globally, slightly more people live in urban than rural area (UN 2014). By 2030, the world's urban population will increase by more than two billion, while the rural population will decline by about 20 million (UN 2003). It has been projected that the population of Bangladesh will increase by 64.6 million to roughly 218 million by 2030; three-fourths of that growth will occur in urban areas. By the middle of this century, Bangladesh will be more urban than rural; more than a third of urban residents will dwell in slum settlements (UN 2014).

Urbanization occurs through three interacting processes: a) natural increase, b) rural-to-urban migration, and c) area reclassification. However, high growth of urban population in Bangladesh occurs mainly through migration of the rural poor. There is evidence that international migrants are 'positively selected', that is of prime-aged, more educated, and in a better psychological and physical health than non-migrants (Palloni & Arias 2004; Palloni & Ewbank 2004). The 'healthy migrant hypothesis' predicts that migrants are typically a healthier subset of the population, compared to the average health status of their peers at origin and destination (Lu, 2008; Palloni & Morenoff 2001). These selection factors impede the attribution of post-migration differences in health status– when compared with non-migrant counterparts– to the effects of migration.

Although a substantial body of literature was assessed to identify the health outcomes among immigrants of the developed world, much less attention has been paid to internal migration in the developing countries. With rapid urbanization, rural-urban migration is occurring in many developing countries even at larger scales than international migration (IMO 2005). In fact, rural-urban migration affects migrants' economic burdens and opportunities, new environmental risks and benefits, leads to changes in the cultural and social context, and provides access to resources of origin (Nauman et al., 2007). So, the migration process and its consequences can have impacts on migrants' health and well-being both positively and negatively.

The objective of the study is to assess the effects of rural-urban migration on physical and mental health of adult migrants, comparing migrants of different durations to those of non-migrants. The study also assesses the effects of such rural-urban migration on physical and mental health by comparing migrants of different durations (short vs long).

Materials and Methods

Study population

The data for this study were collected from the selected slums of Dhaka North, Dhaka South and Gazipur City Corporations, where icddr,b has been operating the Health and Demographic Surveillance System with financial support from the Government of Bangladesh/donors. In the baseline population and socioeconomic census of 2015-16, 121,912 people were counted living in 31,577 slum households. In Dhaka North City Corporation, 10,297 households were included from Korail slum and 6,278 households from Mirpur slum. In Dhaka South City Corporation, 2,082 households were included from Dhalpur slum and 2,398 households from Shayampur slum. In case of Gazipur City Corporation, 3,190 households were included from Tongi slum and 7,332 households from Ershad Nagar slum.

These slums were mainly built on government lands (91%), and about 60% occupants were tenants. Eighty-two per cent households possessed one bedroom with mean dwelling area of 119 sq ft. About 95% households used pipe water for drinking, 30% households had sanitary latrine flush to sewerage/septic tank, while slightly over 50% households used gas from gas line for cooking; sharing of water sources, latrine and cooking places were very common in these slums. Use of electricity as a source of light was universal. Among aged 8 years or more, 73.5% males were involved in income generating activities compared to 39.6% among females. Most households had electric fan (96%), and mobile phone (85%). Sixty per cent households had television and *khat*.

For 30% cases, the household heads migrated within 10 years, 24% household heads migrated between 10-19 years, and 35% household heads migrated 20 or years more ago; 8.6% household heads did not migrate, born in Dhaka or Gazipur. The majority of household heads migrated to the slum for work (62.4%), while 20% household heads migrated to join family.

Sample

Using the database of the urban HDSS of selected slums of Dhaka North, Dhaka South and Gazipur City Corporations, 1,017 respondents aged 18 years or more were selected randomly (505 males and 512 females) for the study.

Questionnaires

Two types of questionnaires were used: a) background characteristics including migration history, and b) measure of perceived physical and mental health statuses. Background data were age, sex, marital status, education, occupation, and history of migration, while for perceived health status (physical and mental), we used Short Form- 36 (SF-36) derived from the Medical Outcomes Study (Stewart, 1992).

The SF-36 was designed for using in clinical practice and research, health policy evaluations, and for monitoring the health of general population sub-groups. The SF-36 includes one multi-item scale that assesses eight health concepts (Table 1): 1) limitations in physical activities because of health problems; 2) limitations in social activities because of physical or emotional problems; 3) limitations in usual role activities because of physical health problems; 4) bodily pain; 5) general mental health (psychological distress and well-being); 6) limitations in usual role activities because of emotional problems; 7) energy and fatigue; and 8) general health perceptions. These provide a concise method for individuals to express their views about health outcomes that are important to them (Ware et al. 1993; Ware & Gandek 1994).

Score: Physical and Mental Health

We followed two-step scoring rules that were used by the RAND 36-item health survey 1.0 (SF- 36, www.rand.org). First, numeric values were recorded so that a high score indicates a better health state. Then items in the same scale were averaged to create 8-scale scores. Analyses of 8 different composite scales showed that reliability of these health measures were high except for mental health (Table 2).

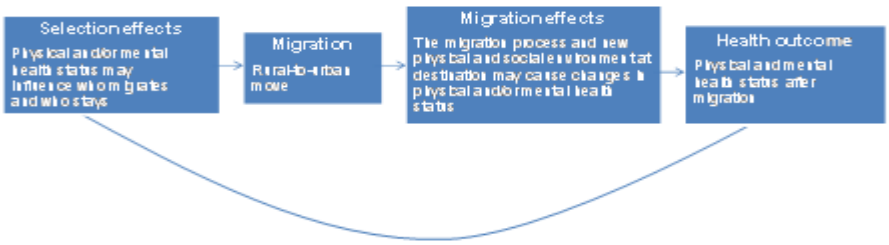
These 8- scale scores were grouped into two categories: a) mean physical health component consists of five scales (physical functioning, role of physical health, bodily pain, general health perceptions, and energy/fatigue), and b) mean mental health components consists of three scales (social functioning, role of emotional health, and mental health).

Conceptual Model

The conceptual model illustrates a two-stage relationship between health and migration. Firstly, individual health status of the population at origin may influence those who migrate and who stay. These are the selection effects of health on migration. Secondly, during migration process, the new physical, social and environment conditions at destination may cause changes to the migrants' physical and mental health statuses. This stage represents the effects of migration on health.

In Figure 1, the curved line connects the first and last boxes indicating correlations between a priori health status and post-migration health outcomes.

Conceptual Model: The relationship between health and migration



The conceptual model illustrates two stage relationship between health and migration

Statistical Analyses

Both bivariate and multivariate analyses were applied to measure the effects of migration on physical and mental health. These two health measures were compared between migrants of different durations to non-migrants, as well as migrants' of different durations.

In bivariate situation, mean scores of physical and mental health were compared for migrants to non-migrants, as well as between migrant's of different durations and tested for significance.

In multivariate analyses, multiple linear regression models assessed the effects of migration on physical and mental health. The two dependent variables were continuous: a) mean physical health scores, and b) mean mental health scores. The control variables used in the analyses were: age, sex, marital status, education and occupation; except for age, all other explanatory variables in the multivariate analyses were treated as dummies.

Results

Descriptive Results

Table 3 shows the distribution of migrants (%) and non-migrants by socio-demographic characteristics. Out of 1,017 respondents, 49.5% were male and 50.5% were female. Among the respondents, 37.7% were long- duration migrants followed by 25.5% medium- duration, 23.8% short- duration, while 12.8% were non-migrants.

The distribution of short- duration migrants and non-migrants differed significantly ($p<0.05$) for age, sex, marital status and education but not for occupation; former category was older, had more female, had more married and had less education. The distribution of long- duration migrants and non-migrants differed significantly ($p<0.05$) for age, marital status, and education but not for sex and occupation; former category was older, had more married, and had less education.

Table 4 shows the physical and mental health scores (mean) of migrants and non-migrants. The table shows that when short- duration migrants (col. a) were compared to non-migrants (col. d), both physical health (63.1 vs 72.5) and mental health (64.4 vs 71.1) scores were significantly better ($p<0.01$) for non-migrants than short- duration migrants. The table also shows that when long-duration migrants (col. c) were compared to non-migrants (col. d), both physical health (52.1 vs 72.5) and mental health (57.9 vs 71.1) scores were also significantly better ($p<0.01$) for non-migrants than long- duration migrants.

Table 5 shows the physical and mental health score (mean) of migrants and non-migrants disaggregated by the age of respondents. For each migrant category and those non-migrants, physical health scores got worse as the age increased, except for non-migrants of the high age group, where the score was almost similar to that of the middle-age group. For mental health score, a similar pattern was observed as the age increased, except for non-migrants of the high-age group, where the score was better than of the middle-age group.

For those aged in between 18-29 years, significantly better physical health and mental health scores were observed for non-migrants compared to short-duration and long- duration migrants. For age 30-49 years, slightly better (ns) physical health scores for short- duration migrants than non-migrants were documented, while significantly better physical health scores for long- duration migrants than non-migrants were observed. For mental health, slightly better (ns) health scores were observed for non-migrants compared to short- duration and long- duration migrants. For those aged 50 years or more, slightly better (ns) physical health and mental health scores were observed for non-migrants compared to short- duration and long- duration migrants.

Table 6 shows the physical and mental health score (mean) of migrants and non-migrants disaggregated by the sex of respondent. For each migrant category and those non-migrants, both physical and mental health scores were better for male than female.

For male, significantly better physical health and mental health scores were observed for non-migrants compared to short- duration and long- duration migrants. For female, slightly better (ns) physical and mental health problems were observed for non-migrants compared to short- duration migrants, but significantly better physical health and mental health problems were observed for non-migrants than long- duration migrants.

Table 7 shows the physical and mental health scores (mean) of migrants and non-migrants disaggregated by the marital status of respondents. For each migrant category both physical and mental health scores were usually better for currently married than not currently married but for non-migrants, both physical and mental health scores were better for not currently married than currently married.

Among currently married, both physical and mental health scores were significantly better for non-migrants compared to short- and long- duration migrants. Among not currently married, a similar pattern, both physical and mental health scores were also significantly better for non-migrants compared to short- duration and long- duration migrants.

Table 8 shows the physical and mental health score (mean) of migrants and non-migrants disaggregated by the education of respondents. For each migrant category and those non-migrants, both physical and mental health scores were better for more educated group than less educated group, except for non-migrants of higher education group.

In case of lower education group, both physical and mental health scores were significantly better for non-migrants compared to short- duration and long-duration migrants. For higher education group, a similar pattern, i.e., significantly better physical and mental health scores were observed for non-migrants compared to long- duration migrants; however, comparing non-migrants to short- duration migrants, these differences were not significant.

Table 9 shows the physical and mental health scores (mean) of migrants and non-migrants disaggregated by the occupation of respondents. For each migrant category and those non-migrants, both physical and mental health scores were worse for ‘other’ occupation group compared to service holder/business man and rickshaw puller/laborer.

For service holder/business man, significantly better physical health scores were observed for non-migrants compared to short- duration and long-duration migrants. For mental health scores, the pattern was similar to physical

health, but significant only for non-migrants compared to long- duration migrants. For rickshaw puller/laborer, significantly better physical health and mental health scores were observed for non-migrants compared to short-duration and long- duration migrants. For ‘others’ occupation group, significantly better physical health and mental health scores were also observed for non-migrants compared to short- duration and long- duration migrants.

Multivariate Results

Table 10 shows the effect of rural-urban migration on physical and mental health, after controlling for selected socio-demographic characteristics. The results show that physical and mental health scores were better for non-migrants than those of short- and long- duration migrants, while both physical and mental health of short- duration migrants were consistently better compared to long- duration migrations.

The results also show that both physical and mental health statuses deteriorated as the age increased. The study also observed better physical and mental health for male than female, better physical and mental health for educated than illiterate, and better physical and mental health for rickshaw puller/laborer than the ‘other’ occupation group.

Discussion

Studies measuring the effects of migration on health suffer due to selectivity issue, as migrants are not random. Measure of pre-migration health status allows one to determine the extent to which a priori health problem influences those who subsequently migrated and who stayed at origin. The 'healthy migrant hypothesis' suggests that migrants are physically healthier before they move compared to those who stay at origin. To overcome the issue of selectivity, a longitudinal study design is required that would compare health condition of pre-migrants (origin) and post-migrants (destination) with adequate control variables.

Our study did not have pre-migration health measures, but compared the migrants at destination of different durations to non-migrants. Our results show that both physical and mental health statuses of non-migrants' were better than physical and mental health of short- and long- duration migrants. These findings contradict with the previous findings those dealt immigrants of the developed countries (Lu 2008; Palloni & Arias 2004), and those dealt rural-urban migration in the developing countries (Nauman et al. 2015), where pre-migration health was better for migrants those who stayed at origin as well as better health of migrants than non-migrants at destination. This could be due to the fact that the migrants' socioeconomic context of our study were quite different from the previous studies, i.e., a particular type of people those who migrate to urban slum from rural area to find work/to join family.

Our study also consistently documented that both physical and mental health statuses were better for short- duration migrants than long- duration migrants. This indicates that as people who stay longer in the slums, their health gets worse. This could be due to the nature of the work they do, their housing condition, water-sanitation and socio-cultural context where they were exposed.

As physical and mental health statuses get worse for people living long in the slum, it has implication on health care cost (caring and medical); such health care cost is likely to increase in future as people grow old in the slum and more people in-migrating.

Table 1: Item groupings and abbreviated item content for the SF 36 survey

Health scale	Item	Abbreviated Item content
Physical functioning (PF)	PF1	Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports
	PF2	Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf
	PF3	Lifting or carrying groceries
	PF4	Climbing several flights of stairs
	PF5	Bending, kneeling, or stooping
	PF6	Walking more than a mile
	PF7	Walking one block
	PF8	Bathing or dressing yourself
Role of physical (RF)	RF1	Cut down on the amount of time you spent on work or other activities
	RF2	Accomplished less than you would like
	RF3	Were limited in the kind of work or other activities
	RF4	Had difficulty performing the work or other activities (for example, it took extra effort)
Bodily pain (BP)	BF1	Intensity of bodily pain
	BF2	Extent pain interfered with normal work
General health perceptions (GH)	GH1	Is your health: excellent, very good, good, fair, poor
	GH2	My health is excellent
	GH3	I am as healthy as anybody I know
	GH4	I seem to get sick a little easier than other people
	GH5	I expect my health to get worse
Energy/fatigue (EF)	EF1	Fill full of life
	EF2	Have a lot of energy
	EF3	Feel worn out
	EF4	Feel tired
Social functioning (SF)	SF1	Extent of physical health or emotional problems interfered with your normal social activities
	SF2	Frequency of physical health or emotional problems interfered with your social activities
Role of emotional (RE)	RE1	Cut down on the amount of time you spent on work or other activities
	RE2	Accomplished less than you would like
	RE3	Didn't do work or other activities as carefully as usual
Mental health (MH)	MH1	Did you feel full of life
	MH2	Have you been a very nervous person
	MH3	Have you felt calm and peaceful
	MH4	Did you have a lot of energy
	MH5	Have you felt downhearted and blue
	MH6	Did you feel worn out
Reported change	TRAN	Rating of health now compared to one year ago

Table 2: Reliability analysis of 8 different composite scales

Scale	Description	Cronbach's α	
		Urban HDSS	Matlab HDSS
Physical functioning	Limitations in physical activity because of health problems; 10 items	0.86	0.85
Role-physical	Role limitations due to physical health problems; 4 items	0.89	0.96
Bodily pain	Bodily pain; 2 items	0.74	0.92
General health	General health perceptions; 5 items	0.85	0.78
Vitality	Perceptions of energy and fatigue; 4 items	0.68	0.59
Social functioning	Limitations in social activities; 2 items	0.74	0.73
Role-emotional	Role limitations due to emotional problems; 3 items	0.86	0.94
Mental health	Positive and negative emotional states; 5 items	0.62	0.81

Table 3: Distribution of migrants[+] and non-migrants by socio-demographic characteristics

Scale	Migration status				p-values	
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	axd	cxd
	(n=242)	(n=261)	(n=384)	(n=130)		
Age (yrs)						
18-29	52.5	47.1	10.9	68.5	p<0.05	p<0.05
30-49	32.2	35.8	37.3	26.9		
50+	15.3	17.1	51.8	4.6		
Marital status						
Currently married	87.6	85.8	85.9	71.5	p<0.05	p<0.05
Not currently married	12.4	17.2	14.1	28.5		
Sex						
Male	41.3	45.6	55.5	56.2	p<0.05	ns
Female	58.7	44.4	44.5	43.8		
Education (yrs)						
<5	56.6	63.2	68.5	34.6	p<0.05	p<0.05
5+	43.4	36.8	31.5	65.4		
Occupation						
Service/business	27.7	29.9	27.9	39.2		
Labor/rickshaw puller	23.5	21.8	23.2	14.6	ns	ns
Other	48.8	48.3	48.9	46.2		

Note: Short- duration migrant= migrated within 10 years; Medium- duration migrant= Migrated between10-19 years; Long- duration migrant= Migrated 20 or more years ago; Non-migrant= Born in city (Either Dhaka or Gazipur);
[+]Percent

Table 4: Physical and mental health scores[+] of migrants and non-migrants

Scale	Migration status				p-values	
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	axd	cxd
	(n=242)	(n=261)	(n=384)	(n=130)		
Physical health	63.1±21.4	61.5±22.5	52.1±23.7	72.5±21.7	p<0.01	p<0.01
Mental health	64.4±17.3	63.3±17.9	57.9±19.4	71.1±17.2	p<0.01	p<0.01

Note: [+]Mean

Table 5: Physical and mental health scores[+] of migrants and non-migrants disaggregated by age of respondent

Scale	Migration status					
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	p-values	
					axd	cxd
Age 18-29						
	(n=127)	(n=110)	(n=42)	(n=89)		
Physical health	68.9±19.3	67.2 ±21.1	65.7±20.1	76.5±20.6	p<0.01	p<0.01
Mental health	67.0±16.7	66.7±16.8	67.6±17.8	73.1±15.3	p<0.01	p<0.05
Age 30-49						
	(n=78)	(n=102)	(n=143)	(n=35)		
Physical health	60.1±21.5	62.5±20.2	56.8±22.5	63.4±20.7	ns	p<0.05
Mental health	61.9±18.4	64.0±15.8	60.8±19.1	66.1±19.0	ns	ns
Age 50 or more						
	(n=37)	(n=49)	(n=199)	(n=6)		
Physical health	49.1±20.3	46.5±29.9	45.8±23.3	64.9±27.9	ns	ns
Mental health	60.3±15.7	54.2±21.2	53.8±18.8	70.1±28.3	ns	ns

Note: [+]Mean

Table 6: Physical and mental health scores[+] of migrants and non-migrants disaggregated by sex of respondent

Scale	Migration status					
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	p-values	
					axd	cxd
Male						
	(n=100)	(n=119)	(n=213)	(n=73)		
Physical health	65.5±20.2	66.1±22.5	57.1±22.8	78.6±18.8	p<0.01	p<0.01
Mental health	65.6±15.6	66.8±17.8	60.9±18.8	73.7±16.3	p<0.01	p<0.01
Female						
	(n=142)	(n=142)	(n=171)	(n=57)		
Physical health	61.3±21.9	57.5±21.8	45.9±23.3	64.6±22.7	ns	p<0.01
Mental health	63.4±18.4	60.2±17.4	54.2±19.5	67.8±17.8	ns	p<0.01

Note: [+]Mean

Table 7: Physical and mental health scores[+] of migrants and non-migrants disaggregated for marital status of respondent

Scale	Migration status					
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	p-values	
					axd	cxd
Currently married						
	(n=212)	(n=224)	(n=330)	(n=93)		
Physical health	64.1±20.7	61.4±21.9	52.9±23.4	69.3±21.6	p<0.05	p<0.01
Mental health	65.4±16.9	63.6±17.2	58.6±19.5	69.5±18.1	p<0.05	p<0.01
Not currently married						
	(n=30)	(n=37)	(n=54)	(n=37)		
Physical health	55.5±24.2	61.3±26.3	47.1±24.6	80.5±20.1	p<0.01	p<0.01
Mental health	56.4±18.4	60.9±21.5	54.1±18.4	75.0±14.1	p<0.01	p<0.01

Note: [+]Mean

Table 8: Physical and mental health scores[+] of migrants and non-migrants disaggregated by education of respondent

Scale	Migration status					
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	p-values	
					axd	cxd
Schooling less than 4 years						
	(n=137)	(n=165)	(n=263)	(n=45)		
Physical health	57.3±22.0	58.9±22.3	49.1±23.2	71.1±22.4	p<0.01	p<0.01
Mental health	61.8±17.7	62.1±18.2	55.3±18.8	71.6±17.8	p<0.01	p<0.01
Schooling 5 or more years						
	(n=105)	(n=96)	(n=121)	(n=85)		
Physical health	70.5±17.9	65.7±21.6	58.6±23.5	73.2±22.4	ns	p<0.01
Mental health	67.6±16.2	65.3±17.2	63.6±19.3	70.8±16.9	ns	p<0.01

Note: [+]Mean

Table 9: Physical and mental health scores[+] of migrants and non-migrants disaggregated by occupation of respondent

Scale	Migration status					
	Short-duration (a)	Medium-duration (b)	Long-duration (c)	Non-migrant (d)	p-values	
					axd	cxd
Service/business man						
	(n=67)	(n=78)	(n=107)	(n=51)		
Physical health	68.7±20.9	64.3±22.2	58.2±23.0	75.1±20.9	p<0.05	p<0.01
Mental health	67.4±17.9	65.7±18.7	62.5±19.6	71.9±17.3	ns	p<0.01
Rickshaw puller/laborer						
	(n=57)	(n=57)	(n=89)	(n=19)		
Physical health	63.9±18.4	65.7±20.3	61.5±20.7	81.0±15.0	p<0.01	p<0.01
Mental health	64.5±15.4	66.1±16.5	63.0±17.1	76.1±10.3	p<0.01	p<0.01
Others						
	(n=118)	(n=126)	(n=188)	(n=60)		
Physical health	59.4±22.3	57.7±23.0	44.2±22.7	67.6±23.1	p<0.05	p<0.01
Mental health	62.5±17.7	60.4±17.6	53.0±19.1	68.8±18.6	p<0.05	p<0.01

Note: [+]Mean

Table 10: Effect of rural-urban migration on physical and mental health, controlling For socio-demographic characteristics

Factors	Health measures (scores)	
	Physical health (β)	Mental health (β)
Constant	99.310***	86.620***
Age of respondent (cont)	-0.638***	-0.327***
Migration status		
Short- duration (ref=Non-migrant)	-4.376**	-4.283**
Medium- duration (ref=Non-migrant)	-4.990**	-4.783***
Long- duration (Non-migrant)	-7.283***	-6.462***
Sex of respondent		
Female (ref=Male)	-8.198***	-4.359***
Marital status		
Not currently married (ref=Currently married)	-0.931	-2.412
Education of respondent (yrs of schooling)		
Five or more yrs(ref=Less than five yr)	4.071***	2.695**
Occupation		
Service/business(ref=Rickshaw puller/labor)	-1.228	-0.080
Others(ref=Rickshaw puller/l/labor)	-6.058***	-3.644**

Note: *p<0.10; **p<0<.05; ***p<0.01

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