FACTORS ASSOCIATED WITH CHILD HEALTH IN URBAN AREAS OF BANGLADESH

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Abstract

The paper examined the factors associated with infant mortality in urban area and health seeking behavior of the urban children. This study used data from the Bangladesh Urban and Health Survey 2006. Both descriptive and logistic regression analyses were used to assess the infant mortality differential of slum and non-slum areas. The rich-poor gap in infant mortality is significant. The prevalence of acute respiratory infection among the slum and non-slum children within two weeks preceding the survey was 14.3 percent and 10.8 percent respectively. In slum communities, children were 27 percent less likely to be taken to health facilities for treatment than non-slum communities. Wealth, migration status and the mother's education are identified as important correlates of infant mortality**.** There are large differences in infant mortality rates between slum and non-slum urban areas. It will be difficult to achieve Millennium Development Goals if the government ignored the health care need of the urban poor.

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Introduction

Bangladesh is one of the few developing countries that has been experiencing rapid urbanization. According to the 2001 census about one in four persons live in urban areas (BBS 2003). The projection suggests that by 2035 about half of the Bangladesh population will be urban, which will have impacts on the requirements for provision of basic needs, including the health care services. At present about 40% of the urban population is poor and lives in slum areas (UNDP 1998, Ravallion 2001). The growth of urbanization is due to landlessness; natural calamities such as river bank erosion, flood, and cyclone, and more recently, the impact of climate change on coastal districts (Afsar 2003, Islam 2005). Rapid urbanization accompanied by rural urban migration is one challenge that must be addressed in improving child health and reducing childhood mortality. Although infant and child mortality is lower in urban areas than rural ones, it is significantly higher among the urban poor and in particular among the slum population (Ravallion 2001, NIPORT 2005, NIPORT 2009).

The urban poor in Bangladesh face more health risks than the rural poor. This may be attributed to the fact that, unlike rural areas, in urban areas there is no structured health care facilities for the poor. Studies from other countries reveal that infant mortality is higher in the less developed urban areas than in those that are more developed (Bicego and Ahmad 1996). Health conditions for the urban poor are sometimes even worse than they are for the rural poor. The urban poor consist of mainly the migrants who live in deplorable

socioeconomic conditions and face economic insecurity. Thus, they are vulnerable to health risks, especially their children. As a result, in large cities of developing countries, child mortality is highest among children whose mothers recently migrated from rural areas and who live in slums (Brockerhoff 1995). The extent of childhood illness in these areas is closely related to poverty levels, quality of health care, clean water supplies, and sanitation.

The last two decades have seen a rise in advocacy—a call for attention to the newborn infant along with her mother and siblings—and an incremental growth in the evidence for potential interventions (NNF 2004). Reducing neonatal mortality is both an ethical obligation and a prerequisite to achieving the Millennium Development Goal 4 (MDG 4), the target of which is a reduction in child mortality by two-thirds between 1990 and 2015. A report from United Nations Children Fund (UNICEF) found only a quarter of the countries is on track to reach this target. The study seeks to contribute to the growing evidence of how far developing countries in general, are progressing in reducing the persistent high infant mortality rates (UNICEF 2008). Though the MDGs have been set and are typically assessed at the national level, we argue that focus on urban areas of Bangladesh provides a useful starting point for identifying factors that can help countries to achieve the child mortality target. Despite the amount of work on child morbidity and mortality in developing countries, very few have focused on urban areas. There have not been many studies on infant and child mortality in urban Bangladesh because of the paucity of data. The 2006 Urban Health Survey (UHS) has provided new opportunities to assess the correlates of infant and child mortality in urban areas of Bangladesh, particularly for the urban poor (NIPORT 2008).

In the light of above, the main aim of this paper is to investigate the disparities in infant mortality in urban areas by using a wealth index. Another aim is to identify the

determinants of health seeking behavior and infant mortality of urban slum and non-slum population.

Materials and Methods

Bangladesh Urban and Health Survey (UHS) 2006 data were used for the study. The survey was based on a multi-stage sampling scheme under which the primary sampling units were explicitly crafted to reflect some meaningful notion of urban community or neighborhood. The survey design covers eight statistical domains across which indicator values relating to health were compared. Before data collection ethical clearance had been taken from Bangladesh Medical Research Council (BMRC).

The 2006 Urban Health Survey consisted of a total of 29,181 live births. The present analysis included 3,130 slum dweller births and 1,961 non-slum dweller births over the five years preceding the survey, across seven domains of city corporations. For the district municipalities, there were 635 births and 34 infant deaths, which were excluded from this analysis. Total infant deaths occurring in slum and nom slum population were 192 and 70, respectively. The reason for considering births and deaths across the five years preceding the survey is that children born in the recent past are relatively more reliable and accurate than those born in the distant past. Recall errors will occur less often for children who were born most recently. The survey also provides a history of illness (diarrhea, fever, cough, rapid breathing, difficult breathing and chest-in-drawings) and treatment received for each under five children in the sample households in the two weeks preceding the survey. In this study, "migrant" is defined as a respondent whose place of birth was different from the current place of residence. An index of economic status (wealth index) for each household was constructed using principal component analysis. Principal component analysis involves a mathematical

procedure that transforms a number of possible correlated variables called principal components (Gwatkin *et al.* 2000). Despite the growing number of studies attesting evidence of poorer health among people with less education and income, lower status jobs, and poorer housing (Sastry 2004, Wagstaff and Watanabe 2000), there is still debate about the meaning of health inequalities.

Analysis of the effects of socio-economic and demographic factors on infant mortality was based on the estimation of regression model. The model examined the effects of maternal and other socio-demographic characteristics on the likelihood of the infant being dead. In the analysis of the model, death measured as dichotomous variable was coded 1 if the infant died prior to the date of interview and 0 otherwise. Logistic regression model was used for the analysis to examine the wealth effect on the infant mortality. The coefficient in the analysis represented an increase or decrease in the logarithmic odds of an occurrence of an event associated with a unit or category change in an independent variable. In the regression model, dependent variable is defined as Y_i=1 if an event occurred (i.e. child died, received treatment during illness) and Y_i=0 if the event did not occur (i.e. child is alive, did not seek treatment for illness). The logistic regression model is

$$Ln\ [p_i/(1-p_i)] = \beta_0 + \Sigma \beta_i X_i$$

Where, $P\ (Y_i=1) = p_i$ *and* $P\ (Y_i=0) = 1-p_i$; X_i= Independent variables such as maternal and child characteristics, β_0= Intercept term of the regression model, β_i=Regression co-efficient of the respective variables, representing the effect or association for individual characteristics. The control variables used in the study include urban domain and maternal education, which are known to have some effects on child health that are independent of the effects of other measures of socioeconomic status. The other control variables used in this

study include: the mother's age at birth of the index child, number of children ever born, child sex, wealth quintiles and migration status.

Results

Socio-economic Background of the Respondents

Table 1 provides the selected socioeconomic and demographic characteristics of the respondents. The analysis shows that mean age of the mothers was 26.5±5.9 years. One in ten mothers was below 20 years but about two thirds of the mothers (60.2 percent) were between aged 20-29 years. With respect to level of education of mothers, the information shows that a little over 40% had no education among the slum mothers, while roughly one in five had six years of education or more. One in four mothers was working and more than half of the respondents were migrants. The wealth index of slum dwellers reveals an enormous inequality between the poorest and the richest as nearly half of the mothers were from the poorest quintile.

Infant Mortality

Infant mortality is 61 per thousand births in slums as opposed to 35 per thousand births in non-slums, indicating that infant mortality is about 72% higher among the children of slums than that of non-slums (Table 2). Male children had a higher mortality rate than females during the neonatal period. These differences are statistically significant. Similar differentials exist by the mother's socio-economic and demographic characteristics, as shown in Table 3. Children of mothers who are working experienced higher infant mortality rates (77 per thousand) than the children of mothers who do not work (45 per thousand). Children from the poorest families have much higher infant mortality rates than children of the richest families (61 per thousand opposed to 14 per thousand). The information also shows that children from

migrant families experienced higher infant mortality than the children from the non-migrant families.

Logistic regression analysis explains that infant mortality increases with maternal age at birth, especially when the mother is aged 30 years and above (Table 4). The infant mortality was higher among male children than female children. The migrant children were 1.32 times more likely to die than non-migrant children. The odd ratio shows that there was significant variation in infant mortality among slum and non-slum children. The children of slum areas had almost 1.42 times higher chance of dying during infancy as compared to the children of non-slum areas. Similarly, children of mothers with no formal education were 1.32 times more likely to die before their first birth day than children of mothers with at least a secondary education. Children of the poorest mothers were 3.11 times more likely to die during the first year of life than the children of richest mothers. The number of children ever born to a mother was positively associated with infant death. Mothers with four or more children were 2.63 times more likely to have their infant die than the mother who has only one child.

Morbidity Pattern and Health Seeking Behaviour

The prevalence of acute respiratory infection (that is, having a cough with rapid or difficult breathing, or chest in-drawings) among the children within two weeks preceding the survey in slum and non-slum areas were 14.3 percent and 10.8 percent respectively (Table 2). The analysis shows that the percentage of ARI among slum children was significantly higher than non-slum children. Children suffering from fever were also higher in slum areas as against non-slum areas. Morbidity and health seeking behavior differed significantly by wealth index. There is also significant difference in receiving treatment between slum and non-slum

children by wealth index. Health seeking behavior of mothers during pregnancy by slum and non-slum also varied significantly (88% in the non-slum compared to 70% in the slum). Health seeking behavior is also varied by wealth index, socio-economic characteristics of the mothers by slum and non-slum. The results of the chi-square tests for the bivariate analysis of care seeking practice and socioeconomic status revealed significant differences between the categories.

The regression analysis revealed that, after adjusting for other variables, maternal socioeconomic position, migration status and residence in slums all had a large and significant impact on the health seeking behaviour of illness for the children. The migrant mothers were 1.31 times more likely to have sought treatment during illness for their children than non-migrant mothers. The odd ratio (OR) for seeking care for the slum children compared to the non-slum was 0.75 (95% CI=0.60-0.95). Moreover, the likelihood of seeking care for poorest children was 45 percent less compared to the richest children.

Discussion and Conclusion

The main objective of the paper was to compare the disparities in infant mortality and health seeking behaviour in urban areas. The findings confirmed that, when compared by the wealth index, inequalities in childhood morbidity and mortality do exist (Supon *et al.* 2010, Doorslaer *et al.* 2006). The analysis also confirmed that the infant mortality rate is higher among slum children than non-slum children; moreover, disparities in mortality are also present when compared between migrant and nonimmigrant characteristics. The findings also show that there is a significant gap in health seeking behavior between the slum and non-slum populations.

The logistic regression analysis showed mortality differentials by wealth index. It also shows that socio-economic factors of the mother, such as education and work status, as well as demographic characteristics, such as age at birth, and slum and non-slum characteristics, are all important correlates of infant mortality. The relationship between mothers' education and mortality of the children is probably due to a higher exposure to health seeking knowledge and better accessibility to the health care facilities.

The evidence presented here pertaining to child health has important implications for social and health policy at the urban and national levels. Policies which aim to improve access to public and private health services and to reduce economic disparities may help improve children's health status and wellbeing. Due to existing socioeconomic situation in Bangladesh, the urban slum children are more vulnerable to deaths than the urban non-slum children. Since the urban population has been increasing rapidly and 40% of its population is poor and live in slums, the findings have important implications in the achievement MDG 4. The urban infant and child mortality gap between slum and no-slum areas should be prioritized for intervention in order to improve child survival among slum dweller of cities.

Table 1. Distribution of socioeconomic and demographic characteristics of mothers.

Variables		Slum		Non-slum		Total	
		n	%	n	%	n	%
Mother's age (year)	<20	399	12.7	100	5.1	499	9.8
	20-24	1106	35.3	599	30.6	1705	33.5
	25-29	809	25.8	550	28.1	1359	26.7
	≥30	817	26.1	710	36.2	1527	30.0
Mean±SD		25.9±6.0		26.8±5.8		26.5±5.9	
Mother's education	No education	1261	40.3	392	20.0	1653	32.5
	1-5 years	1158	37.0	424	21.6	1582	31.1
	≥6 years	711	22.7	1145	58.4	1856	36.4
Currently working	Yes	792	25.3	309	15.9	1101	21.6
	No	2338	74.7	1651	84.1	3989	78.4
Migration status	Migrant	1753	56.0	1196	61.0	2949	57.9
	Non-migrant	1377	44.0	765	39.0	2142	42.1
Wealth quintile	Poorest	1402	44.8	214	10.9	1616	31.7
	Second	891	28.5	299	15.2	1190	23.4
	Middle	488	15.6	413	21.1	901	17.7
	Fourth	291	9.3	457	23.3	748	14.7
	Richest	59	1.9	578	29.5	637	12.5
Total		3130	100.0	1961	100.0	5091	100.0

Table 2. Prevalence of mortality and morbidity of under-five children.

Indicators	Slum	Non-slum	P-value
Mortality (per 1000 live birth)			
Neonatal mortality rate	43.3	22.7	0.00
Post-neonatal mortality rate	17.9	12.9	0.16
Infant mortality rate	61.2	35.0	0.00
Illness and health seeking behaviour (percent)			
Fever in last 2 weeks	41.1	35.3	0.00
Cough in last 2 weeks	44.4	37.8	0.00
Rapid breathing in last 2 weeks	28.9	24.6	0.06
Difficult breathing in last 2 weeks	24.9	22.0	0.17
Chest in-drawing in last 2 weeks	11.6	8.0	0.02
Acute Respiratory Infection (ARI)	14.3	10.8	0.00
Sought treatment for illness	71.8	79.7	0.00
Diarrhea in last 2 weeks	6.9	5.7	0.14
Antenatal care received	69.9	87.8	0.00

Table 3. Bivariate analysis of health care behaviour and infant mortality.

Variables		Seek treatment for illness	Infant mortality rate
		Percent	Rate/1000
Sex of child	Male	74.7	59.8
	Female	73.9	43.2
		p>0.10	P<0.01
Mother's education	No education	71.4	68.1
	1-5 years	75.3	59.7
	≥6 years	77.0	30.7
		P<0.05	P<0.01
Mother's age at birth	<20 years	72.6	45.1
	20-29 years	75.9	43.0
	≥30 years	73.8	86.7
		p>0.10	P<0.01
Total number of children born	1	75.9	28.9
	2	75.1	43.3
	3	73.0	59.3
	≥4	72.1	84.4
		p>0.10	P<0.01
Mother's currently working	No	75.0	44.9
	Yes	71.2	76.9
		P<0.05	P<0.01
Wealth quintile	Poorest	70.1	61.3
	Richest	81.7	13.9
		P<0.01	P<0.01
Migration status	Migrant	75.7	57.8
	Non-migrant	72.5	42.9
		P<0.10	P<0.02
Domain	Slum	71.8	61.2
	Non-slum	79.7	35.6
		P<0.01	P<0.02
Total		74.3	51.7

Table 4. Adjusted odd ratio for receiving health care and infant mortality according to some selected socioeconomic and demographic characteristics.

Variables		Seek treatment for illness	Infant mortality rate
		Adjusted OR (95% CI)	Adjusted OR (95% CI)
Sex of child			
	Male	1.10 (0.91- 1.31)	1.47 (1.14-1.90)
	Female	1.00	1.00
Mother's education	No education	1.10 (0.83-1.46)	1.32 (1.00-1.95)
	1-5 years	1.26 (0.97-1.64)	1.59 (1.10-2.30)
	≥6 years	1.00	1.00
Mother's age at birth	<20 years	0.79 (0.61-1.02)	1.24 (0.85-1.78)
	20-29 years	1.00	1.00
	≥30 years	0.95 (0.75-1.21)	1.89 (1.40-2.56)
Total number of children born	1	1.00	1.00
	2	0.85 (0.66-1.11)	1.80 (1.16-2.71)
	3	0.69 (0.51-0.95)	2.18 (1.37-3.52)
	≥4	0.70 (0.50-1.05)	2.63 (1.58-4.37)
Mother's currently working	No	1.00	1.00
	Yes	0.98 (0.77-1.26)	1.53 (1.1-2.04)
Wealth quintile	Poorest	0.54 (0.35-0.82)	3.11 (1.44-6.7)
	Richest	1.00	1.00
Migration status	Migrant	1.31 (1.08-1.56)	1.32 (1.01-1.73)
	Non-migrant	1.00	1.00
Domain	Slum	0.73 (0.60-0.95)	1.42 (1.01-1.95)
	Non-slum	1.00	1.00
Constant		1.58	-5.06
-2 Log likelihood		2756.7	1968.9
Model chi-square		52.7	92.3

OR= Odd Ratio; CI=Confidence Interval

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