

Rural-Urban Migration, Poverty and Child Survival in Urban Bangladesh

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ABSTRACT

Despite recent decline, infant and child mortality in Bangladesh is still one of the highest among the developing countries with strong urban-rural differentials. Nearly one in ten children in Bangladesh dies before reaching age five. This paper analyses the levels and trends of childhood mortality in urban Bangladesh, and examines whether children's survival chances are poorer among the urban poor and rural-urban migrants. The data for the study comes from the 1999-2000 Bangladesh Demographic and Health Survey. The results indicate that, although the indices of infant and child mortality are consistently better in urban areas, the urban-rural differentials in childhood mortality are diminishing in recent years. The study identifies two distinct child mortality regimes in urban Bangladesh, one for urban natives and one for rural-urban migrants. Mortality before age five is 1.6 times higher among children born to urban migrants compared to the children born to lifelong urban natives (102 and 62 per 1,000 live births, respectively). The migrant-native mortality differentials fairly correspond with the differences in socio-economic status. Like childhood mortality rates, rural-urban migrants are seemed to be moderately disadvantaged by economic status than their urban native counterparts. Within the urban areas, the child survival status is even worse among the migrant poor than the average urban poor, especially the recent migrants. This poorest-richest differential in childhood mortality is higher in urban areas than that in rural areas. The study demonstrates that housing condition and access to safe drinking water and hygienic toilet facilities are the most critical determinants of child survival in urban areas, even after controlling for migration status. The study underscores the importance of mother's education, especially beyond secondary levels, to child survival in urban areas. Mothers parity, household size, mother's autonomy (measured by household headship), household economic status, mothers age at the time of birth, and preceding birth interval have significant differential effects on child survival in urban areas irrespective of their migration status.

The underlying efforts to improve child health in urban Bangladesh, thus, is that of urban poor, particularly the urban migrants, who are growing more rapidly than the rural poor due to heavy rural-urban migration. Urban planners should be concerned about the rapidly expanding cities and the concentration of perhaps disaffected migrants in urban areas. The study results highlight the need to target migrant groups and urban poor within urban areas in the provision of health care services. Further research is needed to understand the health care needs of migrants in urban areas in order to develop the appropriate health policy and planning. The available evidence suggests that more effective public actions than in the past will be necessary to accelerate the progress in attaining the MGDs with respect to child mortality and maternal health.

INTRODUCTION

Despite recent decline, infant and child mortality in Bangladesh is still one of the highest among the developing countries with strong urban-rural differentials. Nearly one in ten children in Bangladesh dies before reaching age five. According to the 1999-2000 Bangladesh Demographic and Health Survey, infant and under-five mortality in Bangladesh are 66 and 94 per 1000 live births respectively (Mitra *et al.*, 2001).

Child survival status has been consistently better in urban Bangladesh than that of rural areas. This differential in child survival is primarily due to limited access to proper health services by rural residents compared to urban residents and to better sanitary conditions in the urban centres (Brockerhoof, 1990; Farha and Preston, 1982). The child survival advantage associated with urban residence in contemporary developing countries is documented in a large body of demographic literature (Behm and Vallin, 1982; Davis, 1973; Hobcraft *et al.*, 1984). Many rural residents who move to the city do so with expectations of higher earnings and an improved life cycle. Intuitively, the search for an improvement in economic status of migrants is also expected to translate into improved health and well being of the family members including children. However, in recent years, there has been growing recognition that this urban advantage is misleading and inappropriate as a guide for national health strategies, insofar as it obscures enormous differences in health status and survival chances among and within urban areas of most developing countries (WHO, 1991; Harpham *et al.*, 1991, Brockerhoff, 1995). Using Demographic and Health Survey data from 17 countries, a recent study demonstrates that the child survival prospects of rural-urban migrants are higher than those in their rural origin and lower than those of urban non-migrants (Brockerhoff, 1995). A similar pattern has been found when examining the use of health services among migrant and non-migrant groups (Tam, 1994; Zulkifli *et al.*, 1994; Bender *et al.*, 1993).

According to a recent study on the urban poor in Bangladesh, urban poor have the worse health situation than the nation as a whole (Khan, 1997). The study cites two estimates of infant mortality among the urban poor (from two different sources) as 152 per thousand and 180 per thousand respectively, which are much above the rural and national level estimates. Compared to the general population, urban infants in slum communities are extremely vulnerable to disease and death.

Studies have demonstrated enormous disparities in child survival chances between poor and wealthier neighborhoods within the same city, and detailed a variety of threats to child health and survival (Harpham and Stephens, 1988). Urban areas are growing rapidly, and the poor of the world are increasingly urban (United Nations Population Division, 2001). This provides both opportunities and new challenges for economic development. The urban health crisis have assumed greater urgency because of projections that the urban poor in developing countries will increase from 35 per cent of urban families in 1975 to more than seventy per cent by the turn of the century (WHO, 1991; Harpham and Stephens, 1991).

In recent years most of the cities in Bangladesh experiencing rapid, but unplanned urbanization. While the annual population growth rate is 1.5 per cent at national level, it is more than 5 per cent in most of the big cities, and it is expected that more than 50 per cent of the population in Bangladesh will live in urban areas by the year 2025 (World Bank, 1999). Rural to urban migration has been a major explanation for the dramatic increase in the urban population. The most remarkable characteristic of this urbanization is the mushrooming growth of slums and squatters with the increased migration of rural poor in search of employment and income (Afsar, 2000). Although, the implications of rural-urban migration for socio-economic development are of long-standing interest to social scientist, very little work has looked at the effect of migration on the health and survival of the most vulnerable members of migrants' families – infants and children in Bangladesh.

The increasing importance of rural-urban migration in Bangladesh leads to a great number of people who are exposed to new environments and, potentially, to new influences on health and mortality. An understanding of the mortality risks associated with rural-urban migration has the potential to influence health policy and the provision of health services through an appreciation of the differential health needs of rural-urban migrants relative to lifelong non-migrants groups. This study analyses the levels and trends of childhood mortality in rural and urban Bangladesh, and examines whether children's survival chances are poorer among the urban poor and rural-urban migrants. The central questions to be addressed include: Are children of migrants from rural areas experience higher child mortality than rural or urban non-migrants? If so, what individual or household characteristics accounts for this? The study also examines the progress towards the Millennium Development Goals (MDGs) of reducing child mortality and improving maternal health in Bangladesh.

RURAL-URBAN MIGRATION IN BANGLADESH

Bangladesh is predominantly rural country. In 1951, only 4.3 per cent of the population was urbanized. During 1961-1991, while the country's population doubled from 55 million to 111 million, the urban population grew almost 9 times, from 2.6 million to 22 million. According to the 2001 population census in Bangladesh, the urban population makes up 23 per cent of the country's population of 130 million within a small area of 147, 570 square kilometers (BBS, 2003). As a result, about 30 million people are living currently in urban areas. According to United Nations (UN) population projections (1998), the size of the urban population in Bangladesh will exceed 50 million by the year 2025.

The urbanization process gain momentum in Bangladesh after its independence in 1971. Between 1990 and 2000, the urban population in Bangladesh experienced an annual average growth rate of 5.6 percent, which is highest rate among the South Asian countries (Bangladesh Bureau of Statistics (BBS), 2003). Urban growth in Bangladesh is predominantly an outcome of rural-urban migration which is estimated to contribute between three-fifths to two-thirds of urban growth (United Nations, 1993a: 2-16) and about three-quarters to four-fifths of urban poor represent migrant groups in the mega

city of Dhaka (Centre for Urban Studies (CUS), 1990; Majumdar *et al.*, 1989). In the urbanization process of Bangladesh, Dhaka the capital city of Bangladesh plays the most dominant role. It alone contains one-third of the urban population of Bangladesh (United Nations, 1993b: 25) with an estimated population of around 10 million and thus entering into the club of the top ten mega cities of the world.

In a recent study Afsar (2000) has observed positive relationship between economic development and urbanization. The study notes that rural-urban migration in Bangladesh involves those from both the low and high socio-economic strata. For the poor in rural areas, urban-ward migration is predominantly a poverty elevation strategy, whereas for the rich, such migration is a strategy of better education, health and economic development (Afsar, 2000). The propensity to migrate to an urban area is highest among the educated people in rural areas, with the availability of employment in the major urban areas, particularly Dhaka and other major cities, providing the main attraction for migration. However, with regards to the social impacts of migration, it was found that migration *per se* does not change one's attitudes. The nature of migration (long and short) and educational attainment are associated with attitudinal change.

DATA AND METHOD

The data for the study comes from the 1999-2000 Bangladesh Demographic and Health Survey (BDHS). The BDHS covers a nationally representative sample of 10,544 ever-married women of age 10-49 years, of whom 3,150 (30%) were residing in urban areas. The BDHS defined city, town and municipality (other urban) as urban areas. In addition to current place of residence (categorized as city, town, other urban, village), the survey collects basic information on childhood residence, number of years the respondents spent in the current place of residence (coded in single years, always and visitors), and type of residence prior to the most recent migration. Using these information it is possible to identify four migration streams: those who had moved from rural to rural areas, urban to urban, rural to urban and urban to rural. In this study, a migrant is defined as a person who has changed place of residence across an administrative boundary. Visitors were excluded from the analysis. A woman who reported childhood and previous residences as rural and current residence as urban, is classified as rural to urban migrant. The non-migrant groups of respondents are classified as rural native and urban native based upon their reported duration at the current residence as "always".

To reduce the influence of recall bias on the reporting of children's age at death, the analysis is restricted to children born in the 5 years prior to the survey. Hence, the analysis refers to births during the period 1995-1999. The unit of analysis is the child, not the mother. Therefore, a sample of children was created from the female respondent data set. The analysis henceforth refers to information on the children, where mothers' and household attributes have been attached to each record of the child.

The Cox proportional hazard model is used to estimate the relation between migration and other explanatory variables (such as socio-economic and demographic characteristics of mothers) and infant and child survival in order to allow for the censoring. The

underlying logic, advantages and limitations of the proportional-hazard model developed by Cox (1972) have been illustrated in a number of studies (Menken et al., 1981; Trussell & Hammerslough, 1983).

In the absence of income or consumption data collected by the household surveys, household ownership of assets (wardrobe, radio, TV, etc.), which serve as a proxy for household wealth, as well as household construction, and water and sanitation are used as the basis for constructing a wealth index for the study. The wealth index was constructed with coding for each asset set equal to one if the household had the asset, and equal to zero if not. Principal component analysis (PCA), which searches for the linear combination of the assets for the maximum possible variance in the data, was conducted and the first principal component was retained (Filmer and Pritchett, 1999; Wagstaff, 2002).

LEVELS AND TRENDS OF INFANT AND CHILD MORTALITY IN URBAN BANGLADESH

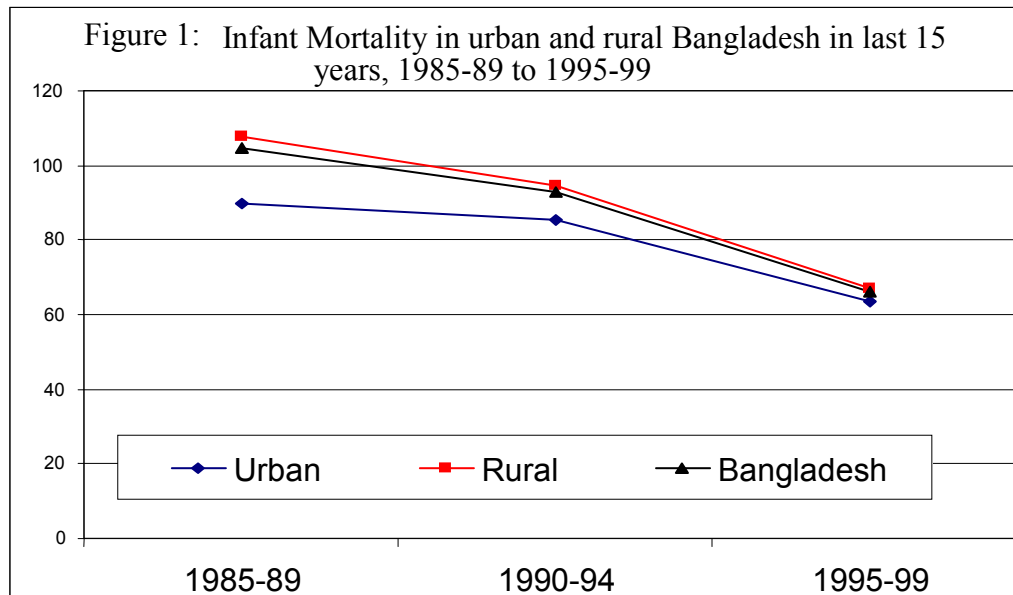
Table 1 presents the estimates of infant and under-five mortality by urban-rural place of residence for the three five-year periods preceding the survey. The mortality indicators have been calculated using life table approach which provides probability of dying at different age per 1000 live births. Under-five mortality for the recent five-year period (which roughly corresponds to the years 1995-1999) is 94 per 1000 births. This means that nearly one in ten children born in Bangladesh dies before reaching the fifth birthday. About 70 per cent of the deaths under age five occur in the first year of life; the infant mortality rate is 66 deaths per 1000 live births. The infant and child mortality show declining trend over the period 1985-1989 to 1995-1999.

Table 1: Levels and trends in infant and child mortality by place of residence in Bangladesh, 1985-1989 to 1995-1999

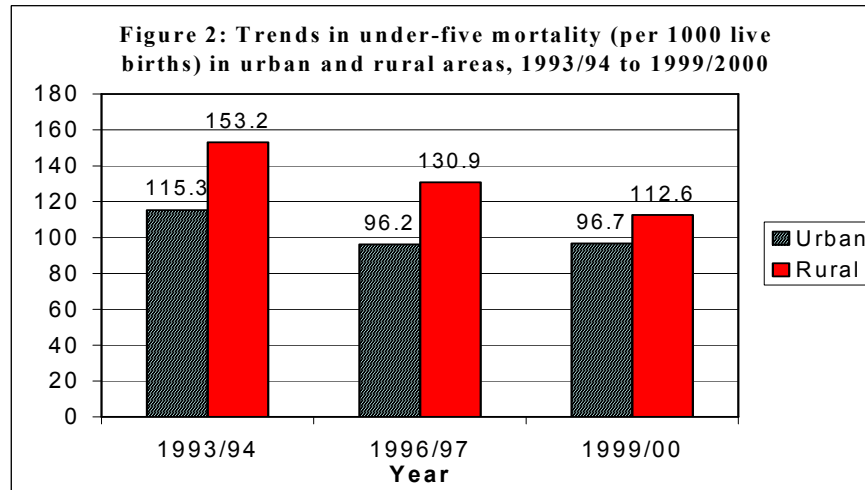
Reference period	Urban		Rural		All	
	IMR	U5	IMR	U5	IMR	U5
1995-1999	63.3	81.6	66.9	96.6	66.3	94.0
1990-1994	85.3	111.5	94.4	128.6	92.8	125.7
1985-1989	89.9	118.6	107.7	158.8	104.6	151.5
% decline over the period	30	31	38	39	37	38

The survey data demonstrate consistently higher child survival in urban area. However, the urban-rural differentials in child survival appears to have diminished in recent years. For example, the infant mortality rate (IMR) is only marginally better in urban Bangladesh than in rural areas in 1995-1999 (63 Vs 67 deaths per 1,000 live birth respectively), a differential that was substantially less than earlier figures in 1985-1989 (90 Vs. 108 deaths per 1,000 live birth respectively) (Figure 1). Although the mortality is declining in both urban and rural areas, the decline is much slower in urban areas than in

rural areas. Over the last 15 years, the infant mortality declined by 30 per cent in urban area compared to 38 per cent in rural area (Table 1).



Further evidence of diminishing urban-rural differential in childhood mortality comes from a comparison of the data from the last three successive Demographic and Health Surveys (DHSs) in Bangladesh conducted between 1993/94 and 1999/2000 (Figure 2). The results indicates that the urban-rural differentials in childhood mortality has narrowed down in recent years, and in urban areas childhood mortality remained almost unchanged since 1996. This may be partly due to change in the definition of urban area in the 1999-2000 BDHS which, unlike the 1996-97 BDHS, considered other urban domains as urban area. But, the rapid growth of urban population due to rural to urban migration in Bangladesh may be an explanation for such demographic change in urban areas. For the rate and pattern of rural to urban migration or urbanization are not always synonymous with development. They may be particularly disadvantaged in terms of health as they live in enclaves or “urban villages” where traditional rural behaviours persist, experience economic and psychological problems of adjustment, and lack political representation (Abu-Lughod, 1961; McGee, 1967, Brockerhoff, 1995). This we have examined in the next section by analyzing the child survival status by migration status and urban native.



ARE THE URBAN MIGRANTS DISADVANTAGED?

Table 2 presents infant (under one-year of age), child (age between first and fifth birth day) and under-five mortality rates during the 1995-1999 period for children as well as selected indicators of child health care utilization of urban and rural natives and rural-urban migrants. A sharp differentials in childhood mortality and child health care utilization has emerged between migrants and non-migrants. Urban migrants appeared to be greatly disadvantaged in terms of child survival. Mortality before age five is 1.6 times higher among children of urban migrants compared to the children of urban natives (102 and 62 per 1,000 live births, respectively). Even the long-time migrants (living in urban areas for ten years or more) who have lived in the urban areas on the average 16 years and are supposed to adapt urban environment, experienced higher childhood mortality than for life long urban residents.

Table 2: Estimated index of childhood mortality and health care utilization of urban and rural natives (i.e. lifelong residents) and rural-urban migrants, 1995-1999

Indices	Rural to urban migrant			Native	
	<10 yrs	10+ yrs	All	Urban	Rural
Infant mortality rate	86.1	72.2	81.7	50.6	75.6
Child mortality rate	26.3	17.3	22.6	14.5	43.8
Under-five mortality rate	110.2	88.2	102.4	62.3	116.2
Under-five mortality before migration	-	-	116.9	-	-
Under-five mortality after migration	-	-	98.5	-	-
Utilization of health care					
Delivery in Health Facility	20.3	16.3	19.1	33.2	4.0
ANC from Doctor (%)	43.9	39.4	42.5	61.7	16.7
Doctor assisted delivery (%)	17.9	11.9	16.1	28.5	3.7
Child vaccination (%)					
% received BCG	94.4	95.1	94.5	95.3	89.4
% received DPT3+	80.6	75.6	79.4	85.1	69.2
% received Polio3+	79.0	73.2	77.6	80.4	68.5
% received Measles	78.2	70.7	76.4	86.5	67.5

The disadvantaged condition of the urban migrants also evident from the relatively poor rate of utilization of health care among the children of urban migrant compared with urban natives. For example, mother of the 42 per cent of the children of migrant received antenatal care (ANC) compared to 62 per cent of the children of urban native. Similarly, the vaccination coverage for different types of vaccine is lower among the children of rural-urban migrants than urban natives. Thus there are two distinct child mortality regimes operating in urban Bangladesh, one for natives and one for migrants. Possible reasons for urban child mortality differences among native and migrant at the individual level are explored later.

It also seems, however, that rural-urban migration promotes child survival. Children born to migrants after they settled in the city experience a under-five mortality of 98 per 1,000, compared with 117 per 1,00 for children born before migration. This may reflect, in part, declining trend of child mortality in Bangladesh as a whole over the period. The results also suggest that rural to urban migration improves child survival and health status. This has been confirmed by the lower rate of childhood mortality among migrant children than the children of rural natives. For example, under-five mortality is 102 per 1000 live birth among migrant children compared to 116 per 1000 births among rural natives. This difference is probably due in part to positive migrant selection, since the mortality rate of migrant children is substantially lower than that of the children of rural natives. Infant and Child mortality also declines substantially with duration of residence in the city. For example, under-five mortality declines from 110 per 1,000 births for the recent migrants (within last ten years) to 88 per 1,000 births for the long-time migrants (more than ten years).

Table 3: Percentage of urban and rural native and rural-urban migrant women ages 15-49 who lack basic household amenities and sufficient food, 1999-2000

Basic Household Amenities	Rural-urban migrant			Native	
	<10 yrs.	10+ yrs.	All	Urban	Rural
Reside in dwellings without electricity, flush toilet or piped drinking water	16.8	23.2	19.7	15.6	76.6
Reside in natural or rudimentary housing ¹	32.1	36.6	34.1	28.3	67.2
Own no major consumer durables ²	20.9	17.8	19.5	13.2	39.1
Have always food deficit	42.3	53.7	47.4	42.5	61.9

1. Constructed wholly or in part of earthen materials, 2. Do not own either wardrobe, TV, radio, watch

The migrant-native mortality differentials shown in Table 2 fairly correspond with the differences in socio-economic status shown in Table 3. Like childhood mortality rates, rural-urban migrants are seems to be moderately disadvantaged by economic status than their urban native counterparts. For example, rural-urban migrant women are more likely than life time urban residents to live in dwelling that lack basic amenities such as electricity, piped drinking water, or a flush toilet and are constructed of nondurable, natural materials. This clearly reflects migrants' inferior economic status than the urban natives. Similarly, higher percentages of migrants than urban native do not own a major

consumer durable items or sufficient food for whole year indicating low income level of the migrants than life long urban natives.

EVIDENCE OF MIGRANT SELECTION AND ADAPTATION

Table 4 presents socio-economic and demographic characteristics that are related to migrant selection and adaptation and may account for differential child mortality for migrant and non-migrant subgroups. Since most of the data pertaining to current status also reflect the adaptation of migrants post-migration, we have very little choice of measures of migrant selection. Nevertheless, women age, children ever born at the time of migration, and primary or above level of education (since the most recent rural-to-urban migration usually occurred after the age of 15) may be taken as the measure of migration selection.

Table 4: Percentage of native and rural-urban migrant women aged 15-49 by selected characteristics, 1999-2000

Socio-economic and demographic characteristics	Rural-urban migrant			Native	
	<10 yrs.	10+ yrs.	All	Urban	Rural
Mean age	26.7	35.8	30.8	29.2	30.0
Mean years in urban area	3.6	18.1	10.2	-	-
Mean age at time of migration	23.1	17.7	20.6	-	-
Mean CEB at time of migration	1.51	0.78	1.27	-	-
Mean Age at first marriage	15.7	14.8	15.27	16.27	14.5
% primary or above schooling	69.2	57.5	63.9	73.1	49.4
% husband no schooling	25.6	32.2	28.6	20.6	44.2
% husband's with white collar job	49.1	22.7	42.5	51.9	22.7
% two or more tetanus injection	54.6	54.1	54.4	61.9	44.2
% ever use contraceptive	71.4	79.4	75.0	79.2	64.9
% owns:					
TV	46.6	42.2	44.6	52.0	11.2
Radio	44.4	45.1	44.7	58.1	30.3
Wardrobe	42.5	47.3	44.7	59.3	22.2
Watch	74.6	77.2	75.8	82.7	52.7
% piped water	29.0	22.7	26.1	28.2	0.4
% flush toilet	35.1	30.3	32.9	41.1	4.9
% cement/concrete floor	54.1	45.7	50.3	59.9	6.6
% brick/cement wall	51.7	47.2	49.7	58.2	10.1
Number of cases	918	763	1681	1288	6595

Note: Children ever born (CEB) at the age when < 10- year migrants moved was 2.13 for rural natives and 1.73 for urban natives. CEB at the age when 10+ -year migrants moved was 1.49 for rural and 1.14 for urban natives.

Results presented in Table 4 indicate that recent migrants (with less than ten years residence in urban areas) are relatively younger than the urban or rural natives. But they arrived in the urban area more mature than long-time migrants (at the ages of 22 and 18, respectively). A more advanced age may translate into superior child-care practices; but

on the other hand, a younger age may result in greater exposure to and easier adoption of more modern child care practices associated with lower child mortality. This hypothesis is supported by the findings in Table 2, which indicate that recent migrants are more likely to adopt child-care practices and reproductive health care services than the long term migration.

Fertility selectivity is also partly determined by age at migration and age at first marriage. The mean number of children ever born (CEB) to long-time migrants at the time they left the rural area was low (nearly 1 children), indicating that many of these women experienced first births and teenage births, often associated with a higher risk of child mortality, in the urban areas. Mean CEB of recent migrants (1.51 children) at the time they left the rural area is very close to the mean CEB of urban non-migrants (1.73 children) of the same age at the time (see foot note of Table 4), suggesting that subsequent urban child mortality risk related to fertility could be similar for the two groups. Age at first marriage is higher among migrants than the rural native counterparts, but lower than urban native.

In terms of education, rural-to-urban migrants appear to be those rural women who received at least primary school education; 64 per cent of migrants, compared with 49 per cent of rural nonmigrants, received at least primary level of education. Migrant women are less educated than urban natives. Since maternal education and child mortality is negatively associated (i.e. increased maternal education decreased child mortality), this positive selection on education might contribute to lower mortality among urban migrant than rural nonmigrant children.

Measures of adaptation as presented in Table 4 reveal that even though female rural-to-urban migrants in Bangladesh may improve their standard of living substantially compared with women who remain in rural areas, migrants generally do not attain the standard of living enjoyed by urban natives regardless of duration of stay in the urban areas. For example, a smaller percentage of urban migrants than natives live in households equipped with piped water, flush toilet, and concrete/cement floor, brick/cement wall, own consumer durables; and women have husbands with white-collar job. The virtually identical figures of recent and long-time migrants for these variables, despite the dramatic difference of 15 years between the two groups in mean years of residence, suggest that many persons from the country sides are absorbed into less privileged migrant neighbourhood. The figures also imply that there is not much selective return migration to origin areas of unsuccessful or maladapted migrants; that is, remaining long-time migrants are not just the more successful.

On the whole, the data presented here suggest socioeconomic reasons for leaving the countryside, but they are also a striking contrast to much of the recent literature on urban migrant adaptation (Goldscheider, 1983). They convey a picture of limited socioeconomic advancement by rural-urban migrant families. Nevertheless, this does not preclude the possibility, as hypothesized that urban residence confers survival advantages simply through migrants' closer proximity to the physicians, hospitals, food and other consumer durable items concentrated in urban areas.

EVIDENCE OF URBAN POVERTY AND CHILD SURVIVAL

Figure 3 shows the per cent of women of reproductive age living in absolute poverty by migrant and non-migrant status. Women are called in living in absolute poverty who live in dwellings that lack electricity, piped drinking water, or flush toilet and are constructed wholly or in part of nondurable earthen materials, and who do not own wardrobe, TV or watch, and who also live in households that lack sufficient food for the whole year. According to this composite measure, in urban area, household poverty is more prevalent among the migrants, particularly long-time migrants than life long urban residents. Of course, there would be no dispute that on the whole poverty remains much more common, and probably more extreme, in rural areas than in urban areas in Bangladesh.

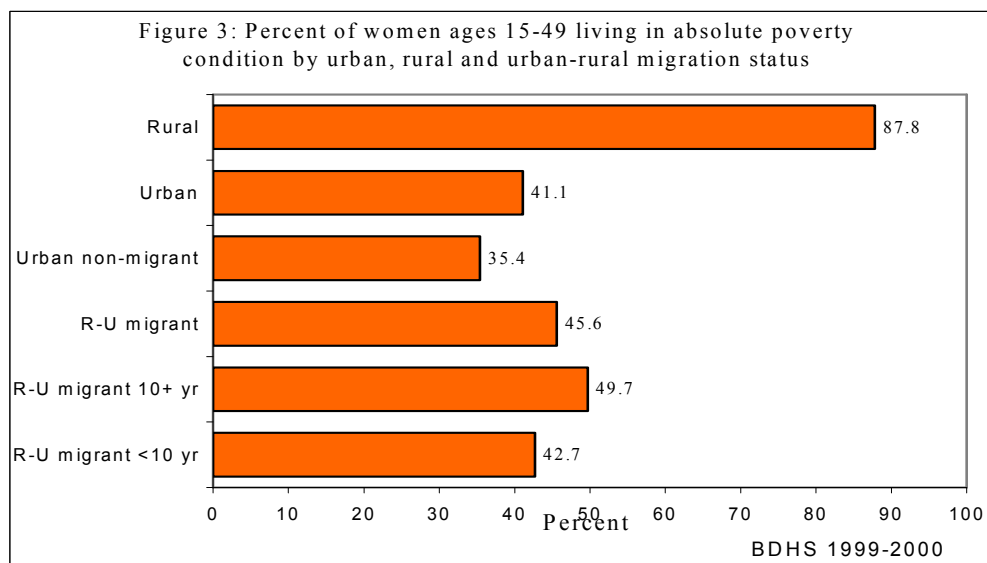


Table 5 presents infant and child mortality rates among poor and non-poor, according to urban and rural residence and urban migrant. The results indicate that, while the urban women who are living in modern houses with all modern facilities (i.e. economically well off or non-poor) have considerably lower infant and child mortality than their rural counterparts, the urban women residing in non-modern housing (i.e. poor) have higher infant and under-five mortality rates than those of rural women. Poor and non-poor childhood mortality differentials are higher in urban area than in rural areas. Table 5 also reveals that, within the urban area, the child survival status is even worse among the migrant poor than the average urban poor, especially the recent migrants. The results confirm that urban poor are more disadvantages in terms of child survival than the urban non-poor as well as rural poor. The results also support the findings of the many previous studies that housing condition such as household construction materials and access to safe drinking water and hygienic toilet facilities are the most critical determinants of child survival in urban areas of developing countries (Mosley et al., 1991; Timaeus and Lush, 1995; DaVanzo, 1988).

Table 5: Estimated infant and under-five mortality rates among poor and non-poor, according to urban and rural residence and urban migrant, 1995-1999

Economic status and mortality indices		Urban migrant			Urban	Rural
		<10 yrs	10+ yrs	All		
Poor	Infant mortality rate	108.5	90.5	102.1	85.7	68.8
	Under-five mortality rate	140.6	109.7	127.7	115.6	100.1
Non-poor	Infant mortality rate	60.6	42.4	55.8	42.9	47.8
	Under-five mortality rate	77.4	53.4	71.1	51.3	61.9

Further evidence of poverty and child survival relationship can be explored by wealth quintiles analysis. Wealth quintiles are expressed in terms of quintiles of individuals in the population (say women in reproductive age), rather than quintiles of individuals at risk (say live births) for any health indicator. Table 6 shows under-five mortality rates by wealth quintiles according to population sub-groups. The results indicate that children from poor families are more likely to die than children from better off families. For example, the under-5 mortality rate of the poorest 20 per cent of the population is more than two times that of the richest 20 per cent in Bangladesh. This poorest-richest differential in childhood mortality is higher in urban areas than that in rural areas. The poorest population in the urban area have similar or higher childhood mortality than that in rural areas. However, the richest have substantially lower mortality in the urban areas than in rural areas. Within the urban areas, rural-urban migrants have higher childhood mortality than the average urban population irrespective of wealth quintiles.

Table 6: Under-five mortality levels by wealth quintiles, according to population subgroups, 1995-1999

Population groups	Wealth Quintile					National average	Poorest/richest
	Poorest	2 nd	3 rd	4 th	Richest		
Bangladesh	119.5	104.4	79.6	82.9	53.6	94.0	2.2
Rural	119.3	102.1	78.3	73.5	66.3	96.6	1.8
Urban	120.2	137.8	96.9	105.4	47.6	81.6	2.5
R-U migrant	128.8	147.7	129.0	119.9	62.8	102.4	2.1

MULTIVARIATE ANALYSIS

To estimate the relations between rural-urban migration and probability of dying of a child up to the age of five, we used multivariate proportional hazard models (Cox, 1972), since our dependent variable is a time dependent stochastic variable (age of the child at death in this case) with censored observations (child is alive at the time of survey). A series of models were fitted to estimate the relative risk of dying a child within age of five, in the five year period preceding the survey. Model I in Table 7 provides overall estimates of the relative risks of death faced by children of urban migrants and non-migrants and rural children, while Model II test whether migrant/nonmigrant and rural

urban differentials in mortality remain significant after controlling for socioeconomic and bio-demographic characteristics of mothers. Table 8 is based on urban births only, who have been the group of greatest interest to urban health planners. Model III in Table 8 proves estimates of the relative risk of childhood mortality among urban migrants and non-migrants, and the Model IV estimates the relative risk of childhood mortality after controlling a set explanatory variables that are expected to have an impact on child mortality.

The results in Model I (Table 7) show higher risk of under-5 mortality among the rural-urban migrants in general, and the recent migrants (less than 10-years ago before survey) in particular, than the lifelong residents of urban areas. Rural-urban migrants experience 1.3-2.2 times higher risk of under-5 mortality than lifelong residents of urban areas. The risk of under-5 mortality among recent migrants is even higher than that of among the children born to rural women. There is a close agreement between the findings of bivariate analysis in Table 2 and the multivariate analysis in Table 7 indicating higher childhood mortality among urban migrants than urban natives. The migrant/non-migrant differential, especially for the recent migrants, remains significant even after controlling for the socio-economic and demographic characteristics. The results, thus, confirm the generally higher child mortality levels of urban migrants than lifelong urban and rural residents.

The results in Model I and II in Table 7 reveal greater odds of under-5 mortality in rural areas in general than in urban areas. Rural natives experience 87 per cent higher risk of under-5 mortality than the urban natives and the result is statistically significant. The relationship remains significant when controlling for the rural/urban residence irrespective of migration status and socioeconomic and demographic characteristics. When rural/urban residence along with other socioeconomic and demographic characteristics were entered in to the Model II, rural areas showed 33 per cent higher risk of under-5 mortality than the children from urban areas. This indicate that the place of residence itself is an important correlate of child survival, and the differences may be explained by differential access and use of maternal and child health care services, which was not examined in this study.

One of the central focus of this study was to examine whether child survival differ significantly among the migrants and non-migrants within urban areas. This has been tested in Model III and IV considering the children born in urban areas only and the results are presented in Table 8. The result indicate that, compared to the children of urban natives, children of both recent and long-term migrants have higher risk of under-5 mortality. However, the difference is significant for the recent migrants, who have 77 per cent higher risk of under-5 mortality than urban natives. After controlling for socioeconomic and bio-demographic characteristics, recent migrants show significant higher risk mortality, but long-term migrants show significant lower mortality compared to urban natives. This result support the gradual convergence of migrant and non-migrant behaviours and living conditions implied by such concepts as migrant assimilation and adaptation in urban areas (Brockerhoof, 1995).

Table 7: Cox proportional hazards models of the relative risks of under-5 mortality (0-59 months) by place of residence and migration status– total sample

Covariates	Relative risk	
	Model I	Model II
Migration status		
Urban native (ref.)	1.00	1.00
Rural native	1.87***	1.63***
Rural-urban migrant		
< 10-years	2.22***	2.10***
10+-years	1.27**	1.07
Other migrant	1.65***	1.42**
Place of residence		
Urban (ref.)		1.00
Rural		1.33**
Sex of child		
Male		1.02
Female (ref.)		1.00
Mother's education		
No education (ref.)		1.00
Primary		1.01
Secondary +		0.84***
Mothers parity		
		0.91**
Mother's relationship to HH head		
Head		0.81***
Other persons		1.11**
Spouse (ref.)		1.00
Mother's work status		
Yes		1.02
No (ref.)		1.00
HH economic status		
Poorest		2.78***
2 nd		2.04***
3 rd		1.53***
4 th		1.51***
Richest (ref.)		1.00
Family size		
0-3		1.08
4-6		1.18**
7+ (ref.)		1.00
Husband's profession		
Prof./Tech./Manag. (ref.)		1.00
Other		1.02
Length of preceding birth interval		
First birth		1.71***
Less than 18		2.36***
18-35		1.66***
36+ (ref.)		1.00
Mother's age at child's birth (years)		
<20		1.52**
20-35 (ref.)		1.00
36+		1.23**

Note: * Significant at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, + $p < 0.10$ two tailed test
ref. = reference category

Results in Table 8 underscore the importance of mother's education, especially beyond secondary levels, to child survival in urban areas. Children to mothers having secondary or above level of education have 40 per cent lower risk of mortality than the children to mother having no education. However, mothers with primary schooling do not experience significantly lower childhood mortality risks than mothers with no schooling. Children to working mother experience greater risk of mortality during childhood than the children to mothers who do not work outside home for cash earning. This is expected because, in Bangladesh for some social, cultural and economic reasons, most of the women from well to do family are less likely to work outside home unless they are highly qualified. Most working mothers come from low socio-economic class and mainly work in non-formal sector such as garment factory, domestic help in others house etc. Father's occupation have also significant effect on child survival. The likelihood of child survival is higher among the children born to mothers whose husbands have white collar job than the children born to mothers with husband having non-white collar job.

The Mother's parity show negative association with risk of under-5 mortality. The risk of under-5 mortality decreases by 3 per cent for increase in each parity. This is partly due to the fact that mother's high parity is related to higher age of mother and thus higher experience and knowledge about child health care.

The number of members in the household appears to have significant impact on the chances survival of children, although in a positive way. When migration status, maternal characteristics and household factors were controlled, as the size of the household increased the likelihood of survival for under-5 children increased significantly. For example, children born to a family having less than 4 members experience 56 per cent higher risk of mortality than the children born to families with 7 or more members. This finding is contrary to the 'resource dilution' perspective that a large household implies limited resources for children and hence possibly lowers chances of survival (Ssengonzi et al., 2002; Casterline, Cooksey & Ismail 1989; Desai 1992; Lloyd & Gage-Brandon 1993). Given this finding it can be posited that large households may actually lead to more resources available through the contributions of different household members. In addition, the larger the household size, the more likely to have older members who can help the mother with childcare or can take care of the children.

Household headship also have a significant effect on the survival of children. After controlling for migration status, mothers' characteristics, and household factors, children living in households headed by their mothers had the highest chance of survival. Children living in households headed by their mother had a 26 per cent lower chance of survival over children who lived in households headed by persons other than their mother or their mother's spouse. On the other hand, children living in households headed by their mother's spouse had a 22 per cent better chance of surviving compared to those in households headed by other persons. In a society in which women have fewer chances for economic and educational progress, this finding underscores how mothers' resources better translate to child survival when they are the head of the household. Yet, these findings also highlight the relative disadvantage faced by children who live in households headed by persons other than their parents. The foregoing analysis reveals that maternal

and household factors partly explain infant and child survival patterns in urban Bangladesh. This, however, does not imply that the effects of migration on child survival had diminished, but rather were mostly accentuated after controlling for maternal and household factors.

Table 8. Cox proportional hazards models of the relative risks of under-5 mortality (0-59 months) in urban area

Covariates	Relative risk	
	Model III	Model IV
Migration status		
Urban native (ref.)	1.00	1.00
Rural-urban migrant		
< 10-years	1.77***	1.68***
10+-years	1.03	0.91**
Sex of child		
Male		1.18**
Female (ref.)		1.00
Mother's education		
No education (ref.)		1.00
Primary		0.87
Secondary +		0.60***
Mothers parity		
		0.97**
Mother's relationship to HH head		
Head		0.64**
Other persons		1.78**
Spouse (ref.)		1.00
Mother's work status		
Yes		1.25**
No (ref.)		1.00
HH economic status		
Poorest		2.14***
2 nd		1.57***
3 rd		1.45**
4 th		1.32**
Richest (ref.)		1.00
Family size		
0-3		1.56***
4-6		1.32***
7+ (ref.)		1.00
Husban's profession		
Prof./Tech./Manag. (ref.)		0.79***
Other		1.00
Length of preceding birth interval		
First birth		1.70***
Less than 18		2.53***
18-35		1.52***
36+ (ref.)		1.00
Mother's age at child's birth (years)		
<20		1.48**
20-35 (ref.)		1.00
36+		1.13**

Note: * Significant at $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, + $p < 0.10$ two tailed test
ref. = reference category

Household economic status measured by a composite index of household assets and environment shows significant effect on risk of under-5 mortality. Children born to the poorest families have more than two-times higher risk of mortality than the children born to the richest families. The presence of electricity, safe drinking water and hygienic toilet in the dwelling as well as modern housing condition significantly lower the risk of childhood mortality. These are virtually absent among the poorest households, who live mostly in slums or peri-urban households. On the other hand the low risks of childhood mortality associated with ownership of household durable such as television, wardrobe etc. may result from exposure to 'modern' ideas of hygiene, childbearing and use of modern health care, but more likely mean that owner of valuable assets have higher economic status that enable them to acquire durable goods, modern health services and adequate nutrition for their children.

The results show that short birth intervals and very young and old maternal age at birth increase the risk of mortality of child. Children born to adolescent mothers as well as to mother age 36 and above had the greater risk of death than the children born to young mother of age 20-35. The risk of childhood death decreases with the increase of birth interval. For example, the risk of death within five years of birth is 2.5 times higher when there was a birth in the preceding 17 months, compared with the birth that took place after 36 month of the preceding birth. This finding is consistent with the previous studies in Bangladesh and elsewhere (Miller et al, 1992; Hagga, 1989; Hobcraft, 1991; Pebley and Millman, 1986). These findings have important implication for child survival program through promotion of longer birth spacing and prevention of adolescent childbearing in high mortality settings like Bangladesh where large families are still preferred.

PROGRESS TOWARDS MDGS ON CHILD MORTALITY AND MATERNAL HEALTH

The Millennium Development Goals (MDGs) have enjoyed unusually widespread support and acceptance, from both developing and developed countries and from international development agencies, since their introduction in September 2000 at the United Nations Millennium Summit. The appeal of the Goals is understandable, since they provide a view of a much improved world by 2015, where extreme poverty is cut in half, all children are in primary school and infant, child and maternal mortality are greatly reduced. Since the adoption there has been debate over how well the MDGs capture the aspirations of developing countries. The specific targets and indicators associated with the MDGs provide a framework for quantifying many of the desired outcomes and building agreements about the actions for achieving them. The Millennium Development Goals call for reducing under-5 child mortality rates by two thirds and maternal mortality ratios by three-quarters, using 1990 as a benchmark and 2015 as the target date.

The Government of Bangladesh is fully aware of the importance of the MDGs and adopted policies and program to achieve the goals. It may be noted that the MDGs have been set within a time-frame of 25-year period with 1990 as the benchmark. To examine the feasibility of the targets in the light of MDGs, we have made a comparative analysis

between projected targets and the actual pace of achievement during the nineties. The targets are projected by using 2000 as the new benchmark year.

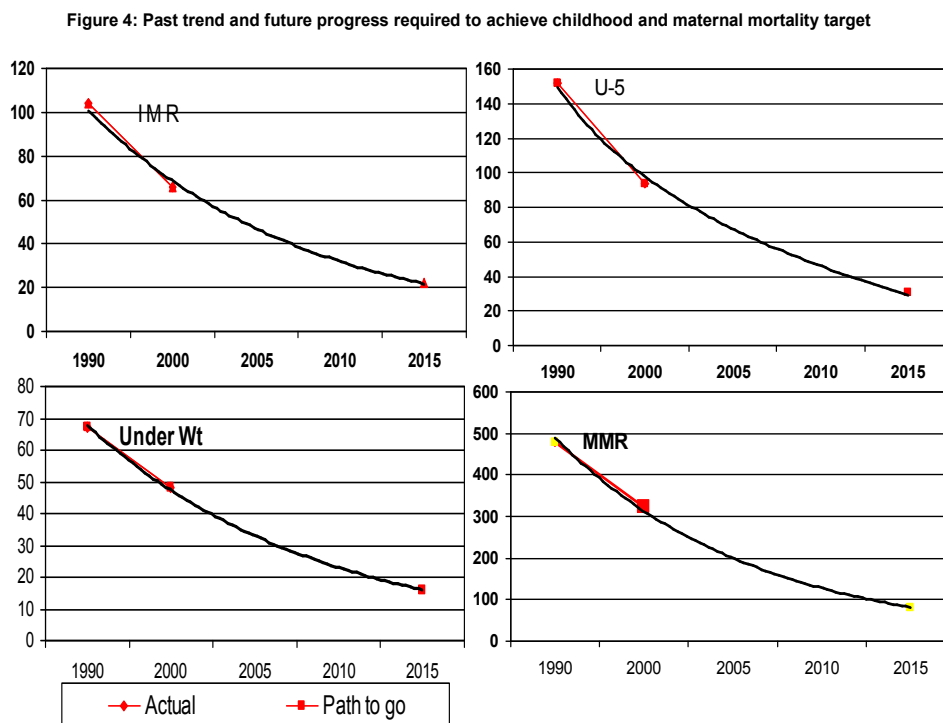


Table 9 presents the projected targets with 2000 as the benchmark year and the actual pace of achievement during the nineties. A comparison of the projected targets with the actual pace of progress achieved during the nineties shows that for all indicators, while being higher than the actual trends, these are not far off the mark (Figure 4). The projected reduction rate for child mortality, child nutrition, and maternal mortality is higher than the average progress recorded in the nineties. This means that for the goal to be achieved, the pace of progress will need to increase significantly. The gap between required annual progress rate and the achieved annual progress rate during nineties is higher for child nutrition and maternal mortality than that of child mortality. The results, thus, stressed on need for renewed emphasis on maternal and child health care and child nutrition program to achieve the MDGs in Bangladesh.

Table 9. Projected targets with 2000 as the benchmark year and the actual pace of achievement during the nineties in Child Mortality and Maternal Health Indicators

Indicators	1990	2000 (Benchmark data)	Progress over 1990- 00 (%)	Annual progress over 1990-00 (%)	2015	Annual progress over 2000-15 (%)
Infant Mortality Rate (IMR)	105	66	-37.1	-3.7	22	-4.4
Under-Five Mortality Rate	152	94	-38.1	-3.8	31	-4.5
% Children Underweight	67	48	-28.4	-2.8	16	-4.4
Maternal Mortality Rate (MMR)	480	322	-32.9	-3.3	81	-5.0

Fortunately, much is known about the causes of infant and child mortality, including the importance of clean water and the benefits of oral rehydration therapy for diarrhea, the role of vaccinations, especially against measles, the value of insecticide treated nets and prophylactics for malaria prevention and treatment, the importance of pre-natal and post-natal interventions in reducing mother mortality.

CONCLUSION

The study demonstrates that rural/urban residence has significant effect on childhood mortality in Bangladesh, independent of the characteristics of mother and children, and the relationship is explained by the differing social, environmental and access and utilization of health care.

The analysis shows that, although the childhood mortality is consistently lower in urban areas, the urban-rural differentials in childhood mortality is diminishing in recent years, because the declining trends in childhood mortality in urban areas becoming slower than that in rural areas. Over the last 15 years, the infant mortality declined by 30 per cent in urban areas compared with 38 per cent in rural areas. The last three successive Demographic and Health Surveys (DHSs) in Bangladesh conducted between 1993/94 and 1999/2000 also indicate that the urban-rural differentials in childhood mortality has narrowed down in recent years, and in urban areas childhood mortality remained almost unchanged since 1996, although it is consistently declining in rural areas. Rapid growth of urban population in recent years due to rural to urban migration is considered as one of the major explanation for such urban/rural diminishing differentials in childhood mortality in Bangladesh. This study documents a sharp differentials in childhood mortality between migrants and non-migrants within urban areas in Bangladesh. Urban migrants appeared to be greatly disadvantaged in terms of child survival. Mortality before age five is 1.6 times higher among children born to urban migrants compared to the children born to lifelong urban natives (102 and 62 per 1,000 live births, respectively).

The disadvantaged condition of the urban migrants also evident from the relatively poor rate of utilization of health care among the children of urban migrant compared with urban natives. This study identifies two distinct child mortality regimes in urban Bangladesh, one for natives and one for migrants. The analysis also reveals that rural-urban migration promotes child survival, since the long-time migrants have experienced lower childhood mortality than the recent migrants and rural natives. The migrant-native mortality differentials fairly correspond with the differences in socio-economic status. Like childhood mortality rates, rural-urban migrants are seems to be moderately disadvantaged by economic status than their urban native counterparts

The study reveals that even though female rural-to-urban migrants in Bangladesh may improve their standard of living substantially compared with women who remain in rural areas, migrants generally do not attain the standard of living enjoyed by urban natives regardless of duration of stay in the urban areas.

Although there would be no dispute about the higher prevalence of poverty in rural areas than in urban areas in Bangladesh, but within the urban areas, household poverty is more prevalent among the migrants, particularly long-time migrants than life long urban residents.

Poor and non-poor childhood mortality differentials are higher in urban area than in rural areas. Within the urban areas, the child survival status is even worse among the migrant poor than the average urban poor, especially the recent migrants. The results confirm that urban poor are more disadvantages in terms of child survival than the urban non-poor. The analysis of under-five mortality rates by wealth indicate that children from poor families are more likely to die than children from better off families. The under-5 mortality rate of the poorest 20 per cent of the population is more than two times that of the richest 20 per cent in Bangladesh. This poorest-richest differential in childhood mortality is higher in urban areas than that in rural areas. The poorest population in the urban area have similar or higher childhood mortality than that in rural areas. However, the richest have substantially lower mortality in the urban areas than in rural areas. Within the urban areas, rural-urban migrants have higher childhood mortality than the average urban population irrespective of wealth quintiles.

The study demonstrates that housing condition such as household construction materials and access to safe drinking water and hygienic toilet facilities are the most critical determinants of child survival in urban areas, even after controlling for migration status. This indicates that by simply improving the water and sanitation condition of the household, child survival status can substantially be improved, rather than by a general effort to increase the assets and income of the households.

The study underscores the importance of mother's education, especially beyond secondary levels, to child survival in urban areas. Mothers parity, household size, mother's autonomy (measured by household headship), household economic status, mothers age at the time of birth, and preceding birth interval have significant differential effects on child survival in urban areas. The analysis reveals that maternal and household factors partly explain infant and child survival patterns in urban Bangladesh. This, however, does not imply that the effects of migration on child survival had diminished, but rather were mostly accentuated after controlling for maternal and household factors.

The underlying efforts to improve child health in urban Bangladesh, thus, is that of urban poor, particularly the urban migrants, who are growing more rapidly than the rural poor due to heavy rural-urban migration. Urban planners should be concerned about the rapidly expanding cities and the concentration of perhaps disaffected migrants in urban areas. The study results highlight the need to target migrant groups and urban poor within urban areas in the provision of health care services. Further research is needed to understand the health care needs of migrants in urban areas in order to develop the appropriate health policy and planning.

Bangladesh has one of the most vulnerable economies, characterized by extremely high population density, low resource base, high incidence of natural disasters, and extremely

adverse initial circumstances associated with the inheritance of a war-ravaged economy, the implications for long-term savings, investment, and growth were deemed extremely bleak. These have adverse implications for long-term savings, investment, and growth. Such defining features impart certain uniqueness to the development of the framework to achieve the Millennium Development Goals (MDGs), which would provide a much improved world by 2015, where extreme poverty is cut in half, all children are in primary school and infant, child and maternal mortality are greatly reduced. Notwithstanding the early negative predictions, Bangladesh has achieved considerable success in several spheres such as population control, reduction in child mortality and child malnutrition, maternal mortality, disaster mitigation, mainstreaming women into the development process, catalyzing grass-roots activism through NGOs and community based organizations (CBOs), and in making democratic transition.

The growth performance and income-poverty reduction have also improved in the decade of the nineties compared with the previous decades, though much leaves to be desired in these areas. These successes show the importance of undertaking public action (through the Government and non-government sectors) at low-income level to realize higher social possibilities. These signs of improvement indicate that development is possible even in the most trying of circumstances. Bangladesh which was once termed 'the test case of development' may indeed represent a learning site for keeping the hopes alive for other equally less fortunate post-colonial societies with adverse initial conditions.

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