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# Research Paper

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## Factors Influencing Infant and Child Mortality in Bangladesh

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This study, based on 1993-94 Bangladesh Demographic and Health Survey (BDHS), attempts to identify important factors influencing infant and child mortality. Application of Cox's proportional hazard model suggest that socio-economic status of the parents are associated with child survival. The factors that have received the most attention are maternal education, sanitation and access to safe drinking water. For instance, risk of infant mortality is 13% lower among the women having primary education and 25% lower among the women having secondary or higher education than those having no education. It was observed that 35 and 29% lower among the households having safe drinking water and good sanitary facilities, respectively than those who do not have such facilities. Similarly, risk of child mortality decreases with increased female education and wider access to safe drinking water and good sanitary facilities. So attention should be given to female education and expansion of public health system in order to reduce the risk of infant and child mortality.

**Key words:** Infant mortality, child mortality, proportional hazard model, relative risk

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## Introduction

Infant mortality, that is mortality during the first year of life, is an important indicator for describing the overall social and economic well-being of a country. Child survival is a critical issue because it plays an obvious role in the supply of surviving offspring. In moderate and high mortality populations, childhood deaths may constitute half of all deaths and differences in levels of child survival between developing and developed countries are very marked, more so than for any other age group (Preston, 1980; Kathryn and Amin, 1992).

Infant mortality has long been very high in Bangladesh as compared to the other countries in the region. This century has seen a gradual decline from a level in excess of 200 infant deaths per 1,000 live births in the early decades to 150 per 1,000 or so in the early 1970. The 1980 produced a steeper decline to around 111 per 1,000 in the mid-1980 and about 100 per 1,000 by the late 1980 (Cleland and Seatfield, 1992). Infant and child deaths have shown a different pattern to cause death of adults. Neonatal tetanus has persisted as a major cause of infant deaths. One of the underlying reasons for the high tetanus death rate among infants is the unsanitary conditions, surrounding the process of childbirth. Recent studies showed that at least two-thirds of the births in Bangladesh are not attended by the trained medical staff and a few of the remaining one-third delivers under adequately hygienic conditions (Paul, 1991).

Mosley and Chen (1984) identified 14 intermediate or proximate determinants that directly influence the risk of morbidity, mortality and factor like maternal education, sanitation, access to safe drinking water, maternal and child health care services have received much attention. Several studies have showed that infant and child mortality levels show substantial differences according to certain social and economic conditions of the population concerned (Baily, 1989; Das Gupta, 1990; Roy and Jeyachandran, 1996; Utomo and Iskan dar, 1989). The maternal health care services such as use of, tetanus toxoid (TT), iron and folic acid tablets, attendance for check up during pregnancy, delivery assisted by trained health professional and institutional deliveries play an important role in improving the survival status of children. The utilization of maternal health care and child health care services are influenced by socio-economic, demographic and cultural factors (Paul, 1991; WHO, 1991).

The aim of this report is to identify the determinants of infant and child mortality in Bangladesh. Identification of these factors would help the policy makers to take necessary steps to hasten the mortality decline.

## Materials and Methods

**Source of Data:** This study utilizes the data extracted from the 1993-94 BDHS. This is a nationally representative two-stage sample survey that were selected from the integrated Multi-purpose Master Sample (IMPS) maintained by the Bangladesh Bureau of Statistics (BBS). Each division was stratified into three groups: statistical metropolitan area, municipalities (other urban areas) and rural areas. In the rural areas, the primary sampling unit was the mauza, while in urban areas, it was the mahalla. Because the primary sampling units in IMPS were selected with probability proportional to size from the 1991 census frame, the units for the BDHS were sub-selected from the IMPS with equal probability so as to retain the overall probability proportional to size. A total of 304 primary sampling units were selected for the 1993-94 BDHS out of the 372 in the IMPS. Thus a total of 9681 households were selected for the survey, of which 9174 were successfully

interviewed. In these households 9900 women were identified as eligible for the individual interview and the interviews were completed for 9640 or 97% of these. The 1993-94 BDHS was conducted by Mitra and Associates with technical support from the Macro International, USA, and NIPORT jointly. The survey was funded by USAID, Dhaka.

**Statistical Analysis:** The analysis was conducted by means of Cox's proportional hazard model (Cox, 1972). A discrete time hazard model was used for estimating the hazards-regression coefficients (Allison, 1982). The covariates for this study refer to the mother's and father's level of education, type of place of residence, work status of mother, access to mass-media (whether watch TV at least once a week), sex of the child, access to safe drinking water, access to good sanitary facilities, place of delivery, whether received TT during pregnancy, mother's age at the time of birth of the child.

The determinants of infant and child mortality have been investigated by considering the births that took place five years prior to survey. The analysis has been carried out for two mortality cohorts: infant (less than one month) and child (12-59 months) mortality.

## Results and Discussion

The results obtained from the Cox's proportional hazard model analysis are presented in Table 1. The results suggested that, risk of infant mortality is 13% lower among the women having primary education and 25% lower among the women having secondary and higher education than those having no education. Similarly, risk of child mortality decreases as mother's level of education increases. Several hypotheses have been advanced to explain this association, it is postulated that maternal education inculcates modern health knowledge, beliefs and practices; improves the effectiveness of health behavior (feeding practices, child care etc.); and changes the mother's role within the family, enabling her to take the necessary measures to prompt child health, including effective use of modern health services (Cleland and Van Ginneken, 1988).

The risk of infant death was 65% lower among the mothers who are employed than those who are not employed. A lower risk of infant mortality among the working mothers may be due to the fact that they might be well aware about immunization and care during pregnancy. This findings showed consistency with the results obtained by Gunasekran (1997). The risk of both infant and child mortality was significantly lower among the older mothers compared to the younger ones. For example, the risk of child mortality was 15% lower among the mothers in the age group 16-20 than those whose age is less than 16. The result confirms the findings of some other studies where it has been reported that children born to young mother had a significantly higher risk of child mortality than children born to mothers aged 20-34 (Mazumder *et al.*, 1989). A higher infant and child deaths among children born to young mothers may be due to the biological complications, immaturity and babies born under weight.

The risk of infant mortality was significantly lower (27%) for female child as compared to male child. In most developing countries, male child mortality exceeds female mortality (Chen *et al.*, 1981). In the neonatal period (less than one month), this is true among all population presumably because of biological factors affecting high male risk.

It was observed that availability of safe drinking water and good sanitary facilities has a strong association with risk of infant and child mortality. For instance, the child mortality

Kabir *et al.*: Factors influencing infant and child mortality in Bangladesh

Table 1: Relative risk of infant and child mortality according to some socio-economic and demographic characteristics of the respondents

Covariates	Relative risk of mortality		Relative risk of mortality (% lower with respect to RC)	
	Infant	Child	Infant	Child
Mother's education				
non (RC)	1.0000	1.0000		
primary	0.8671 *	0.7332*	13.29	26.68
secondary +	0.7512**	0.6666*	24.88	33.34
Father's education				
non (RC)	1.0000	1.0000		
primary	0.8913	0.9015	10.87	09.85
secondary +	0.9475	0.9111	05.25	08.89
Type of place of residence				
rural (RC)	1.0000	1.0000		
urban	0.9537	0.9813	04.63	01.87
Work status of mother				
not currently employed	1.0000	1.0000		
currently employed	0.3495**	0.8903	65.05	10.97
Whether watch TV every week				
no (RC)	1.0000	1.0000		
yes	0.9649	1.0581	03.51	05.81 +
Sex of child				
male (RC)	1.0000	1.0000		
female	0.7252*	0.9125	27.48	08.75
Household water supply				
not safe drinking water (RC)	1.0000	1.0000		
safe drinking water	0.6530**	0.7011*	34.70	29.89
Household toilet				
no sanitary latrine (RC)	1.0000	1.0000		
sanitary latrine	0.7126**	0.6053**	28.74	39.47
Place of delivery				
home (RC)	1.0000	1.0000		
hospital/clinic	0.9432	0.9861	05.68	01.39
TT during pregnancy				
no (RC)	1.0000	1.0000		
yes	0.9811	1.0411	01.89	04.11 +
Mother's age at the time of birth				
below 16 (RC)	1.0000	1.0000		
16-20	0.8014**	0.8464*	19.86	15.36
21 and above	0.7018**	0.8237*	29.82	17.63
-2log likelihood	5132	5244		

\* p < 0.05; \*\* p < 0.01

(RC) Reference category

+ Percent higher with respect to RC

level among the households with access to sanitary latrine was 24% lower than that of the households with no access to such facilities. The application of the United Nations methodology to developing countries namely, Costa-Rica, Jordan and Thailand also indicate that besides the socioeconomic factors, the important determinants of child mortality were expansion of public health system, mainly as a result of implementing a programme of primary health care; access to safe drinking water; the presence of sanitary facilities and good quality housing (UN, 1996).

From this survey it is concluded that infant and child mortality levels are still considered to be high in Bangladesh despite the introduction of various health interventions. Among other factors, infant and child mortality levels show substantial differences according to the social and economic characteristics of the population. Policies expand to educational opportunities, particularly for girls, would increase the access of people, to information and improve their ability to make good use of it in order to lead healthier lives.

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**Kabir *et al.*: Factors influencing infant and child mortality in Bangladesh**

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