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# Socio-economic Variables Affecting Infants And Children Mortality In Bangladesh

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## Abstract

Infant and child are not only the assets but also they are the future of a country or a nation. Women are core of development because they bear children and they are nearly half of the total population. Infant and child mortality are powerful indicators to measure overall health situation of a country. In fact, infant and child mortality are also powerful social indicator. The aim of this study is to identify the effects of socio-economic variables on infant, child and under-five mortality of Chorghat Thana in Rajshahi District, Bangladesh. For this, a number of 800 rural women have been interviewed through a structured questionnaire by purposive sampling technique. In this study, logistic regression model is employed to determine which factors that effect on infant, child and under-five mortality. In this analysis, it is indicated that mothers education and occupation, husbands education and occupation, received tetanus's injection and medical check up during pregnancy and watches TV have significant effects on infant, child and under-five mortality.

## INTRODUCTION

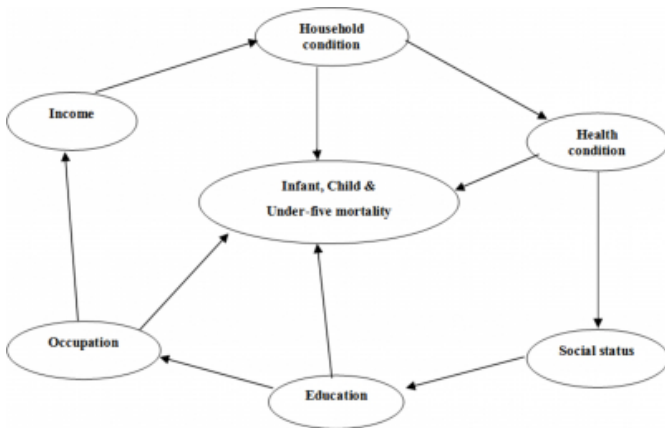
Bangladesh is one of the most density-populated countries in the world and 150 million populations in 2007 (CIA, 2007). Infant mortality in Bangladesh is one of the highest in Asian countries. There is substantial decline in the infant mortality rate in Bangladesh. It was 150 per 1000 live births in 1975, to 53 and under-5 mortality is 71 in 2007 (UNESCAP, 2007). Life expectancy at birth is 60.7 years for male and 60.9 years for female (U.N, 2004). Becher et al., (2004) identified that risk factors for childhood mortality can be grouped as follows: socioeconomic status, fertility behaviors, environmental health conditions, nutritional status and the use of health services. Infant and child mortality levels also show substantial differences according to the social and economic characteristics of the population. Kabir et al. (2001) was found to identify important factors influencing infant and child mortality. It was suggested 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. The levels of the mother's education showed a distinct influence on infant and child mortality, the rates being lower for mothers with some schooling. This phenomenon may be attributed to children of educated mothers enjoying better diets and better overall care than the children of non-educated mothers (Bairagi, 1980).

Mozumder et al. (2007) examined the decline can be attributed to increasing educational levels among parents, and changes in the length of birth interval associated with fertility decline. Of course, provision of primary health care services are associated with reduced risk. Access to tube well water was also associated with reduced mortality risk for young children.

This is consistent with the view that factors such as nutrition and hygiene, which are related to the education and socio-economic status of the parents, are important determinants of child survival gender differentials in infant and child mortality are associated with cultural values (Chen et al., 1981).

**Figure 1**

Figure 1: Interrelationship between socio-economic attributes



Kabir et al. (2001) analyze attempts to identify important factors influencing infant and child mortality. It was suggested 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. This suggests that health interventions implemented in the past decade may not have been as effective as intended in reaching the poor. The analysis on mortality determination shows that at the national level access to electricity, incomes, vaccination in the first year of birth, and public health expenditure significantly reduce child mortality. The electricity effect is large and independent of the income effect. While in urban areas, access to electricity is the only significant mortality determinant, in rural areas. The study emphasized whether health intervention programs reduced socioeconomic inequalities of neonatal, infant and child mortality and whether the inequalities have changed overtime. (D'Souza and Bhuiya, 1982).

Mitra and Associates (2004) indicated that the mortality rates in BDHS report are defined as follows:

Infant mortality ( ${}_1q_0$ ): the probability of dying before the first birthday.

Child mortality ( ${}_4q_1$ ): the probability of dying between the first and the fifth birthday.

Under-five mortality ( ${}_5q_0$ ): the probability of dying between birth and the fifth birthday.

Thus, the purpose of the present work is to identify the factors affecting infant mortality, child mortality and under-five mortality in rural area of Charghat Thana of Rajshahi

district, Bangladesh.

This paper is constructed as follows: Introduction is included in section 1. Sources of data are included in section 2. Section 3 contains methodology of this study. Results are narrated in section 4. Section 5 contains discussion of this study. Lastly, references are mentioned at the end of the manuscript.

**SOURCES OF DATA**

In this study, a number of 800 respondents were questioned during survey period in 2007. The respondents were randomly interviewed by some selected questions from several villages in the rural area of Charghat Thana of Rajshahi district, Bangladesh by purposive sampling technique. Various socio-economic and demographic variables were considered at the time of data collection but in this analysis socio-economic variables are considered. A number of 246 respondents out off 800 respondents were infant, child and under-five mortality.

**METHODOLOGY**

Cox's (1972) developed the logistic regression model that can be used not only to identify risk factors but also to predict the probability of success. This model expresses a qualitative dependent variable as a function of several independent variables, both qualitative and quantitative. Logistic regression analysis carried out using the software SPSS10.0. Logistic regression is a form of regression, which is used when the dependent is a dichotomy and the independents are of any type. In logistic analysis different mortality is treated as dependents variable. Let Y be infant mortality, child mortality and under-five mortality that is a dichotomous dependent variable, which takes values 1 and 0, that is Y is classified in the following way:

**Figure 2**

$$Y = \begin{cases} 1, & \text{if the mortality is occurred} \\ 0, & \text{otherwise} \end{cases}$$

Respondent's education, husband's education, respondent's father's occupation, respondent's occupation, husband's occupation, religion, family income, received TT injection, medical checkup, watches TV and listening radio are considered as independents variables in this model.

Note that this model is run three times for infant mortality, child mortality and under-five mortality.

**RESULTS**

In this study, the main mother’s occupation is housewife with percentage is 88.1, another occupation are services and others occupation such as servant, jobs, street worker etc, with mothers is 6.9% and 5.0% respectively. Similarly, the husbands occupation, in the present study the information suggests that 80.4% farmer, 14.1% are services and 5.5% are other works such as day labor, business etc. The results showed that provide that medium income contains the highest proportion of family (79.0%), lower proportion of family are high income (10.1%). The others family contain 10.9% in low income. Table 1 indicated that the 69.8% mothers had not received any formal education, which another 17.1% mothers had completed primary education and 13.1% mothers had complete secondary and above education level. Husband’s education is also important variable generally it is likely that higher educated people belong to higher economic status. From the above table, 58.5% fathers of children are illiterate, 28.4% fathers are primary education while secondary and above level education is successive completed (13.1%). Religion is very important characteristics in relation to the mortality particularly Islamic believes. It is an important community characteristic. Majority people of Bangladesh are Muslims. Also other people are non-Muslims such as Hindu, Buddha, and Christian. In my study area 94% mothers belongs to Muslim community and 6% belongs to non-Muslim community.

**Figure 3**

Table 1: Percentage of some selected respondents by socio-economics characteristics

Characteristics	Number of respondents	Percentage
<b>Religion</b>		
Muslim	752	94.0
Non-Muslim	48	6.0
<b>Mothers education</b>		
Illiterate	558	69.8
Primary	137	17.1
Secondary and above	105	13.1
<b>Husbands education</b>		
Illiterate	468	58.5
Primary	227	28.4
Secondary and above	105	13.1
<b>Mothers occupation</b>		
Housewife	705	88.1
Services	55	6.9
Other	40	5.0
<b>Husbands occupation</b>		
Farmer	643	80.4
Services	113	14.1
Other	44	5.5
<b>Family income</b>		
Low income	87	10.9
Medium income	632	79.0
High income	81	10.1
<b>Received tetanus injection</b>		
No	83	10.4
Yes	717	89.6
<b>Medical check up</b>		
No	700	87.5
Yes	100	12.5
<b>Watches T.V</b>		
No	136	17.0
Yes	664	83.0
<b>Listens Radio</b>		
No	238	29.8
Yes	562	70.2

Table 2 shows that respondent educational status has positive effect on infant mortality. Respondent with primary, secondary and higher educated have 0.108 and 0.743 times lower risk of infant mortality than illiterate counterpart. Husband educational levels have significant effect on infant mortality. The risks of infant mortality for primary and secondary and above level husbands have 0.846 and 0.507 times less than risk the husbands of illiterate. Mothers and husbands occupation has significant effects on infant mortality. The odd ratio 1.415 and 3.277 was for “others” group which includes jobs, servants, street worker etc, and services group that they are 1.415 and 3.277 times higher risk have children losses at infant mortality than “housewife” groups. Similarly, the risk of infant mortality for service and other group which includes jobs, fisherman, unemployed retired etc, that they are 0.713 and 0.223 times less than risk the husband of farmer. My study areas, watch TV and listening radio also effects on infant mortality. In this case the odd ratio is 0.136 and 0.668. This means that infant mortality for household, which watch TV and listening radio to have 0.584 and 0.876 times less than risk household,

which do not watch TV and listening radio. Moreover they become more conscious about their infant health as a result infant mortality declining. Our result, received tetanus injection is also highly significant effects on infant mortality. The infant mortality is 0.403 time lower risk for mothers who received tetanus injection than who do not take this injection. The other variable such as family income and received medical check up has no significantly effects on infant mortality.

In this study, mother’s education has significant positive effect on child mortality. Mother’s education in rural areas with primary and secondary and above levels of education are 0.351 and 0.224 times less than risk to have children losses at child mortality than the mothers with of illiterate. The category “primary education” has a lower likelihood of occur child mortality than those mothers who are secondary and above level of education. Occupation of mothers has significantly effect on child mortality. The odd ratio 2.648 and 2.584 was for “services” group and “others” group which includes jobs, servants, and street worker etc, that they are 2.648 and 2.584 times higher risk to have children losses at child mortality than housewife groups. The category “services” has a lower likelihood of occur child mortality than their other counterparts. Watches TV have also significant effect on child mortality; in this case odd ratio is 0.331 that means child mortality for family with watches TV had 0.331 times less than risk the family without watches TV. The other variable such as husband’s education, family income, husband’s occupation, listens radio, religion, received tetanus injection, medical check up has no significant effects on child mortality.

Mother’s education has significant positive effect on under-five mortality. Mother’s educations in rural areas with primary and secondary and above levels of education are 0.303 and 0.374 times less risk than to have children losses at under-five mortality than the mothers with of illiterate. The category “primary education” has a lower likelihood of occur under-five mortality than those mothers who are secondary occur and above level of education. Similarly, the risks of under-five mortality for primary and secondary and above level of educational husbands have 0.589 and 0.463 times less risk than the husbands of illiterate. Couples occupation has significant on under-five mortality. The odd ratio 5.024 and 3.228 was for services and “others” group which includes jobs, servants, and street worker etc, that they are 5.024 and 3.228 times higher risk have children losses at under-five mortality than “farmer” groups.

Similarly, the risk of under-five mortality for service and other group that includes jobs, fisherman, unemployed retired etc, that they are 0.303 and 0.374 times less risk than the husband of farmer. Watches TV have also significant effect on under-five mortality; in this case odd ratio is 0.306 that means under-five mortality for family with watches TV had 0.306 times less than risk the family without watches TV. Received tetanus injection and medical check up are also highly associated with under-five mortality. The odd ratio 0.458 and 2.156 indicating that the under-five mortality for respondents, who received tetanus injection 0.458 times less than risk the respondents, who do not received tetanus injection and the under-five mortality for respondents, who received medical check up 2.156 times higher risk than the respondents, who not medical check up. The other variable such as family income, listens radio, religion has no significant effects on under-five mortality.

**Figure 4**

Table 2: Association of infant, child and under-five mortality with respect to socio-economic characteristics by chi-square (χ<sup>2</sup>) test

Socio-economic characteristics	Infant mortality			Child mortality			Under-five mortality		
	χ <sup>2</sup> test	Asy. sig.	sig.	χ <sup>2</sup> test	Asy. sig.	sig.	χ <sup>2</sup> test	Asy. sig.	sig.
Religion	.509	.476	Insig.	3.665	.056	Sig.	5.456	.020	Sig.
Mothers education	9.57	.008	Sig.	47.28	.000	Sig.	51.77	.000	Sig.
Husbands education	16.27	.000	Sig.	41.23	.000	Sig.	51.39	.000	Sig.
Mothers occupation	5.96	.051	Sig.	20.67	.000	Sig.	22.04	.000	Sig.
Husbands occupation	4.12	.128	Insig.	1.45	.484	Insig.	1.77	.413	Insig.
Family income	6.10	.048	Sig.	.552	.759	Insig.	5.32	.070	Sig.
Watches TV	21.13	.000	Sig.	10.31	.001	Sig.	54.46	.000	Sig.
Listens Radio	15.21	.000	Sig.	2.274	.132	Insig.	26.67	.000	Sig.
Received TT injection	15.29	.000	Sig.	.046	.046	Sig.	11.48	.000	Sig.
Medical check up	1.86	.173	Insig.	8.93	.003	Sig.	14.12	.000	Sig.

Figure 5

Table 3: Logistic regression estimates for the effect of socio-economic variables on infant, child and under-five mortality as the dependent variables

Soci-economic variables	Infant mortality		Child mortality		Under-five mortality	
	Co-efficient ( $\beta$ )	Odds ratio	Co-efficient ( $\beta$ )	Odds ratio	Co-efficient ( $\beta$ )	Odds ratio
<b>Religion</b>	-	1.000	-	1.000	-	1.000
Muslim (Ref)	-	-	-	-	-	-
Non Muslims	-0.437	0.646	.435	1.545	-.071	0.931
<b>Mothers education</b>	-	1.000	-	1.000	-	1.000
Illiterate (Ref)	-	-	-	-	-	-
Primary	-0.623	0.536	-1.046	0.351**	-1.193	0.303*
Secondary and above	-0.115	0.892	-1.498	0.224*	-.983	0.374*
<b>Husbands education</b>	-	1.000	-	1.000	-	1.000
Illiterate (Ref)	-	-	-	-	-	-
Primary	-0.168	0.846	-1.152	0.316*	-0.530	0.589
Secondary and above	-0.679	0.507**	-0.462	0.630	-0.770	0.463**
<b>Family income</b>	-	1.000	-	1.000	-	1.000
Low income (Ref)	-	-	-	-	-	-
Medium income	-0.103	0.902	0.584	1.794	0.306	1.358
High income	0.199	1.220	0.434	1.543	0.648	1.912
<b>Mothers occupation</b>	-	1.000	-	1.000	-	1.000
Housewife (Ref)	-	-	-	-	-	-
Services	1.187	3.277*	0.974	2.648***	1.614	5.024*
Other	0.347	1.415	1.789	2.584*	1.172	3.228*
<b>Husbands occupation</b>	-	1.000	-	1.000	-	1.000
Farmer (Ref)	-	-	-	-	-	-
Services	-0.338	0.713	0.294	1.342	-1.193	0.303*
Other	-1.502	0.223*	-0.007	0.993	-0.983	0.374*
<b>Received TT injection</b>	-	1.000	-	1.000	-	1.000
No (Ref)	-	-	-	-	-	-
Yes	-0.900	0.406*	-0.285	0.752	-0.780	0.458*
<b>Medical check up</b>	-	1.000	-	1.000	-	1.000
No (Ref)	-	-	-	-	-	-
Yes	0.323	1.381	0.847	2.333**	0.768	2.156*
<b>Watches TV</b>	-	1.000	-	1.000	-	1.000
No (Ref)	-	-	-	-	-	-
Yes	-0.539	0.584	-1.105	0.331**	-1.184	0.306*
<b>Listens Radio</b>	-	1.000	-	1.000	-	1.000
No (Ref)	-	-	-	-	-	-
Yes	-0.133	0.876	-0.267	0.766	-1.157	0.855
Constant	0.938	2.554	-1.465	0.231	2.312	10.09

\* Significance at  $p < 0.01$  \*\* Significance at  $p < 0.05$  \*\*\* Significance at  $p < 0.10$  Ref: Reference

DISCUSSION

The socio-economic conditions of the peoples created differentials in the level of mortality. Socio-economic factors have a high influence on mortality level. The distribution of economic conditions and social benefits is closely related with mortality patterns of a community the variables reflecting the picture of social and economical status of a community are termed as socio-economic variables. The mother’s occupation may be a reasonable indicator of broad socio-economic status, but it is only loosely related to income. In bivariate analysis, it is found that infant mortality is significantly associated with mother’s education, husband’s education, mother’s occupation, family income, watches TV, listens radio and received tetanus injection. Child mortality is significantly associated with mother’s education, husband’s education, mother’s occupation, watches TV and medical check up. Under-five mortality is significantly associated with mother’s education and occupation, husband’s education, religion, family income, received tetanus injection, medical checkup during pregnancy watches TV and listening radio. In logistic

analysis, couples education, couples occupation, received tetanus injection and medical check up of woman were the significant predictors on infant and child mortality. Under-five mortality are significant predictors is couples education, couples occupation, received TT injection, medical checkup and watches TV. The findings of the present study might be helped for planners and policy makers to take appropriate decision to reduce infant, child and under-five mortality of the country. Therefore, the following recommendations can be suggested on the basis of this study:

Infant and child mortality will be reduced if mothers and husband education as well as empowerment of rural women are enhanced extensively. It is obvious that educated mothers and husbands would make better use of modern health facilities, both for preventive and curative purposes.

Income generating activities would be created in the rural area and consequently they can easily obtain TV, radio and other modern equipments.

To provide medical facilities to the door steps of the common people especially for the rural women. As a consequence, they can easily receive TT injection and medical check up.

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