

The Production Function of Health in Urban Areas of Bangladesh: A Selective Study on Mother's with impact on Children

Momtaz-Ara-Begum*

Abstract: *Health production function from mother's health status point of view, this study considers some socio-economic and demographic variables. This study has examined the effects of socio-economic and demographic variables and assessed the impacts on the health of mother and children under five in Bangladesh. Mothers' education is an important determinant of the health of children even after we control for income, the number of children, health environment, access to safe water, access to hygienic toilet and other socioeconomic variables. Women's health and nutritional status is a national concern because it also affects the next generation. So Government should make more investment in women's education health and nutrition which promotes equity, widespread benefits for mother and child health and economic growth as well as to reducing poverty and improving efficiency in the country.*

Keywords: Urban Health; Mother's and Child Health; Healthcare in Bangladesh; Health Economics

1. Introduction

Bangladesh is one of the developing nations of the world, having more than 40 percent of the population living below the national poverty line (based on CBN method). The country has achieved important health gains over the last decade. But, equivalent progress has not been realised in the area of maternal health. The maternal mortality ratio as an indicator of maternal health in Bangladesh remains unacceptably high. In many ways the existence of a high MMR represents the failure of the health system to effectively respond to the needs of women in the country, yet it must also be seen as the endpoint in a lifetime experience of gender discrimination, neglect and deprivation for Bangladeshi women. From a health systems perspective, maternal mortality is an indicator not only of women's health but also of access, quality and effectiveness of a country's health sector.

Health status is a broad concept and many issues complicate its definition and measurement. Advances in the method used to measure health status have taken place during the past decade, although more advancement is needed.

Objectives

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General Objectives:

To understand and estimate the health production function of Bangladesh from mother's health status point of view and also examine health determining variables of mother and child.

Specific Objectives:

- (i) To calculate mother's health status in terms of Quality Adjusted Life Year (QALY) using Euro QoL (EQ)-5D.
- (ii) To find out child health using HAZ.
- (iii) To examine how mother's education affects child health.
- (iv) To estimate the impact of socioeconomic and demographic variables on mother's health.
- (v) To test hypothesis:
 - (a) Educated mothers are healthier compared to uneducated or less educated mothers.
 - (b) Educated mothers have healthier children.

2. Literature Review

Women's health is crucial not only for their wage earning role but also for the performance of their many household activities. Within the family, women assure the responsibility of maintaining the home and caring for the dependents – children and the elderly. They collect water and fuel, they cook and feed the family, and they perform other tasks essential to household maintenance. These familiar responsibilities carry high opportunity costs, as reflected in absenteeism from the workforce associated with pregnancy or the care of sick child, for example.

Evidence suggests that efforts to improve the health and nutrition status of women could be critical to the goal of poverty reduction. The weight of poverty falls more heavily on women than on men. In addition to low health and nutritional status, poor women have low education levels. Moreover, women either have less access to remunerative activities or are discriminated in terms of wages for the similar jobs. Because of the lower earnings of women, the dual work-burden imposes severe time constraints, restricting their access to social and health services (Rosen House, 1989).

Women's health status is affected by complex biological, social, and cultural factors that are highly interrelated. To reach women effectively, health system must take into account the biological factors that increase health risks for women and such social cultural determinants of health as age during marriage as well as psychological factors such as depression arising from gender violence. Over the longer term, broader efforts, particularly increased female education, will help reduce many of the barriers to women's health. It is found from health production function studies that marginal contribution of

public investment to women’s education is much higher as compared to an equal investment in women’s health and nutrition.

Among the potential determinants of child health, mother’s education has been the major preoccupation of the economists. More educated mothers may have healthier children because they have better knowledge about healthcare and nutrition; have healthier behaviour in prevention and promotion of health through providing safe and sanitary environment for their children. The educational level of mothers at home is also a strong factor influencing child health. Children of mothers with little or no formal education were also more likely to be stunted compared to children of more educated mothers. The importance of maternal education for child health is evident even after controls for socioeconomic status are included. Thus, in addition to the economic benefits of higher education, increased maternal education influences child health outcomes in other ways. As women become more educated, they feel greater control over their lives and become more responsible for their children's survival. Educated mothers are more likely to identify the aspects of modernisation and thus to seek modern healthcare.

In addition, more educated mothers are more likely to have better health themselves, which genetically leads to better health for their children. Cultural and socioeconomic environment affects women’s exposure to diseases and injuries, their diet, their access to and use of health services, and the manifestations and consequences of diseases. Indoor cooking, for example, is one of the most serious occupational health and environmental hazards in the developing world because of the acute and chronic-and sometimes fatal-consequences of inhalation of smoke and toxic gases as well as accidental burnings (WHO, 1986; World Bank, 1992).

3. Analytical Framework

An analysis of health status is an important aspect of human development. Not only improvements in health improve the productivity of the labour force but also improve the impacts of other forms of human capital formation, e.g. education. A health production functions in an analytical method for determining how to allocate resources among alternative programmes to achieve an increase in HS. Thus a production function of health can be presented as follows:

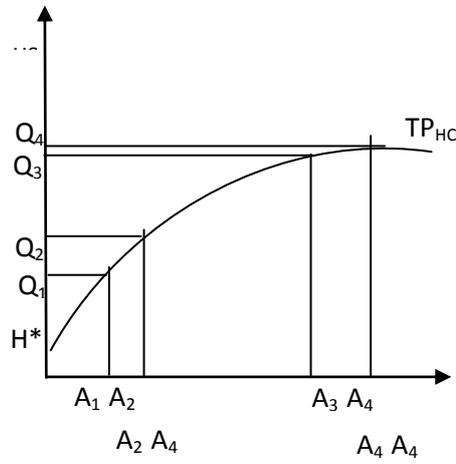
$$HS = f (HC, PCY, E, HB, LS \dots \dots \dots \text{etc}) \dots \dots \dots (1)$$

$$HS_i = A (HC)^\alpha (PCY)^\beta (E)^\gamma (HB)^\delta (LS)^w e^{u_i} \dots \dots \dots (1a)$$

With other things remaining the same, it can be written,

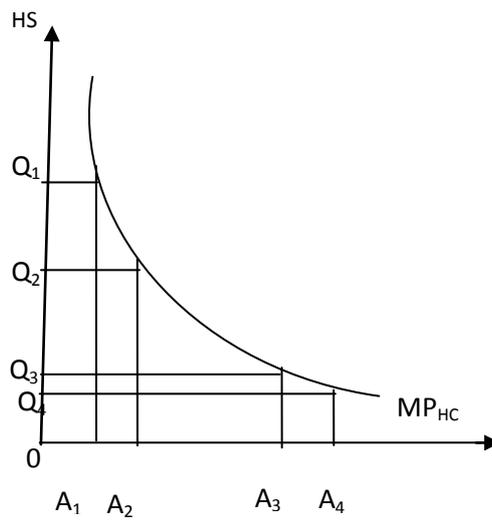
$HS = f (HC)$, where changes in other factors will shift the function. A health production function is an analytical tool for determining how to allocate resources among alternative programmes to achieve an increase in HS. Assuming that the policy objective is to decrease the IMR, on which programmes should additional fund be spent? Two programmes exist for reducing IMR (Infant Mortality rate):

- (i) ICU (Intensive Care Unit) &
- (ii) Maternal & Child Health Programmes.



HC Programme size

Figure: 1.1 The relationship between TP and Programme size.



HC Programme size

Figure 1.2 Marginal effect Programme size

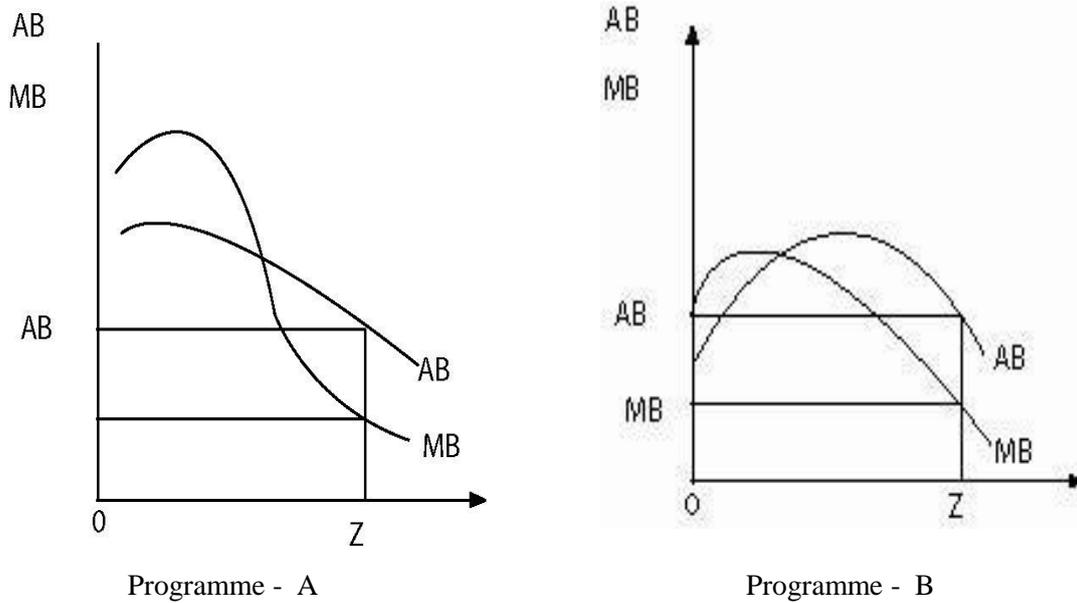


Figure 1.3 Average and marginal benefits from an after native health programmes.

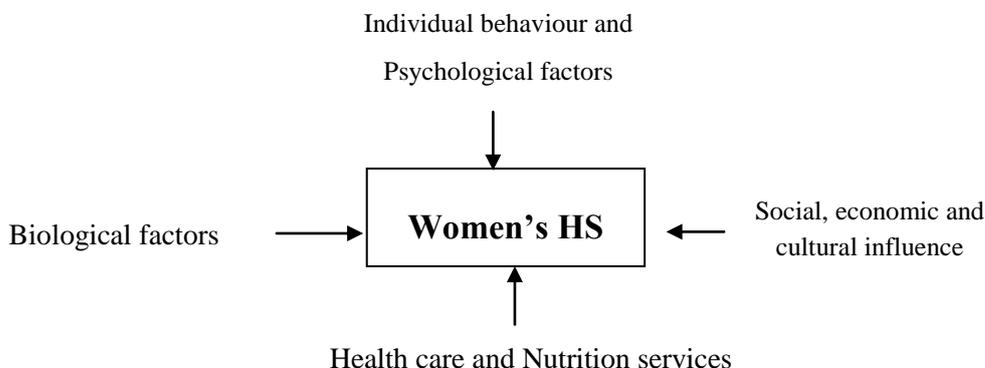
Here, ICU is at size A_3 and MCH programme is at size A_1 . Economists prefer to examine the marginal relationships between inputs and outputs of various programmes.

The marginal benefit per taka spent on MCH programme is greater than the ICU programme. This is shown in figure 1.2, where marginal change $Q_1 - Q_2 > Q_3 - Q_4$. So, the society is to divert more resources to MCH programmes. Figure 1.3 shows the AB (Average Benefit) & MB (Marginal Benefit) of two programmes. ABs are equal to two programmes but MBs of programme B are greater than those of programme A. If the resource allocations are made on the basis of MBS, programme B is better than programme A.

To estimate health status of general population, especially women in Bangladesh, it is considered various socio-demographic parameters. Euro-Qol method is used for measuring health related quality of life. Child health is measured by height for age in the world development indicator as given by the standard anthropometric measures compared to the reference population.

Child health has become a key indicator of economic development. Among the potential determinants of child health, mother's education has been the focus of economists. More educated mothers may have healthier children because they have better knowledge about healthcare and nutrition, have healthier behaviour, and provide more sanitary and safe environments for their children. More educated mothers are more likely to have better health, which generally leads to better health for their children.

We assess the health status of women (age 15-49) by using the determinants of women’s health:



Study Areas:

The study was conducted for a period of 60 days, from March 10, 2008 to May 9, 2008. Mothers, fathers and the first child, who is under five, of the mother of the selected areas are the population of the study.

The study was done in the selected four thanas of Dhaka City Corporation.

- a. Mirpur Thana
- b. Dhaka Cantonment Thana
- c. Kafrul Thana
- d. Pallabi Thana

Hypothesis-1: Educated mothers are healthier compared to uneducated or less educated mothers.

Econometric Model

The relationship between mother’s health status and her educational level is examined by using the following health production equation of mothers:

$$Himi = \alpha_0 + \alpha_1 edu_{mi} + \sum_{j=1}^8 \alpha_j X_{ji} + U_i \text{ ----- (1)}$$

$i = 1, 2, \dots, 500.$

where Himi is the Euro QoL – 5D value of the mother, edumi is the years of schooling of the mother, and

- X2i = age of the mother (in years)
- X3i = age-squared of the i th mother (= X²_{2i})
- X4i = household monthly-income in which the mother belongs;
- X5i = education level in terms of years of schooling of husband;
- X6i = age of husband (in years)

- X7i = mother’s occupation (five categories)
- X8i = husband’s occupation (five categories)
- X9i = healthcare expenses last one year
- X10i = age at marriage of mother
- X11i = age at first childbirth.
- X12i = no. of children (siblings)
- X13i = mothers received 3-shots of ATS during pregnancy
- X14i = child delivered by trained personnel
- X15i = access to safe water
- X16i = access to hygienic latrine
- X17i = working environment (RMG workers, household works, housewives)
- X18i = habituated to betel leaf/ zarda/ bidi/ tobacco products

Hypothesis-2: Educated mothers have healthier children.

The height-for-age Z-score (HAZ) is used as measure of child health (see section four for further discussion). The child anthropometric measurements such as height-for-age, provide useful information for the child health status, are easy to administer, and are comparable across different ages and sexes. The HAZ is a particularly good health indicator as it is a measure of both short- and long-term health and nutritional status (Behrman and Rosenzweig, 2002). Using others anthropometric data such as MUAC (Midupper Arm Circumference), weight-for-age Z-score (WAZ) and weight-for-height (Body mass index, BMI) yields similar results (Cheu and Li, 2006). The height-for-age Z-score is defined as follows:

$$HAZ_i = \frac{h_{ij} - h_j}{\delta_j}$$

where h_{ij} is the observed height of child i in group j , where a group is defined according to child sex and the birth month. h_j and δ_j are the median and standard deviation of the height in group j , using WHO/NCHS (National Center For Health Statistics) Global database on child growth (1986 and 1995; also updated in 2006).

The relationship between child health and mother’s education is examined by using the following child health equation:

$$HAZ_i = \beta_0 + \beta_1 \text{ medu}_i + \sum_{j=2}^{23} \gamma_j X_{ji} + \sum_i \epsilon_i \text{ ----- (2)}$$

$j=1, 2, \dots, 500.$

where HAZ is defined above, is a measure of child health, medu is the mother’s level of education measured as the no of years of schooling, X_j are other control variables and \sum_i is the stochastic disturbance term.

- X₂ = Mother’s age (in years)
- X₃ = Father’s age (in years)

- X_4 = Father's education (total no of years a schooling)
 X_5 = Child's age (in months)
 X_6 = Child's age-squared
 X_7 = Sex of the child (Dummy male = 1, 0 otherwise)
 X_8 = Mother's height (in cm.)
 X_9 = Mother's age at the time of marriage (in years)
 X_{10} = No. of siblings of children (parity)
 X_{11} = Household income per month (in Tk)
 X_{12} = Log of household income
 X_{13} = Has access to safe water sources (yes = 1) (Dummy)
 X_{14} = Has sanitary toilet/ has a flushing toilet (yes = 1, Others = 0) Dummy.
 X_{15} = Has BCG vaccine yes = 1,0 otherwise.
 X_{16} = Has DPT vaccine yes = 1,0 otherwise.
 X_{17} = Has polio vaccine yes = 1,0 otherwise.
 X_{18} = Has measles vaccine yes = 1,0 otherwise.
 X_{19} = All vaccinations covered (yes= 1,0 otherwise.)
 X_{20} = Mother does physical exercise (yes = 1, 0 otherwise), Dummy
 X_{21} = Is the mother addicted to betel leaf-zarda, bidi, tobacco, gul etc. persons habit = 1, 0 otherwise (Dummy)
 X_{22} = Mother reads newspaper or others health related programmes on TV or Radio? (yes = 1, 0, otherwise) (Dummy)
 X_{23} = Exclusively breastfed by the number of mothers (at best 6 months + colostrum)

4. Methodology

Sample size design:

The following statistical formula is used to calculate the sample size considering admissible variation in the population parameter.

$$n = z^2 pq/d^2$$

Where,

n = sample size to be determined.

z score = 1.96

p = the proportion in the target population estimated to have a particular characteristics. If there is no reasonable estimate to be used 50 percent (.50)

q = 1.0-p

d = Degree of accuracy desired, usually set at 0.05

If 95 percent confidence interval is considered, the z-score value is 1.96. In this study a whole number 2 is considered. According to this formula, the expected sample size becomes $n=400$.

In this case, it is feasible to collect data from 500 mothers and children under five years.

5. Findings

Analysing health production function related variable impacts on mother's health

Table 1: Ordinary least squares estimates of the effect of socioeconomic status and demographic variables impact on the health of mother. [Health production estimates]

	Coefficient
Mother education	0.084*** (0.073) (1.151)
Father education	0.041* (0.056) (0.732)
Age (mother's)	-.003** (0.012) (-0.25)
Age squared	0.009** (0.005) (1.8)
Mother's occupation	0.003** (0.006) (0.491)
Father's occupation	0.006* (0.004) (1.49)
Health care expenses	(0.540* (0.530) (1.186)
Age of marriage of mother	0.016** (0.006) (2.667)
Age at first child birth	-0.013** (0.005) (-2.623)
Number of children	-0.031*** (0.009) (-3.256)
ATS	0.003* (0.006) (0.0501)

	Coefficient
Child delivery by Trained personnel's	0.022* (0.016) (1.385)
Access to safe water	-0.020*** (0.017) (-1.216)
Access to hygienic latrine	-0.000*** (0.019) (-0.008)
Working environment	0.052*** (0.081) (2.888)
Habituated to pan/bidi/Zarda/Tobacco	-0.035* (0.017) (-2.092)
Observation	0.500
R-squared	0.701

Note: Standard errors in parentheses are robust to heteroskedasticity and clustering at the family level. *** Significant at 1% ** significant at 5% * significant at 10%.

By analysing mother's health production estimates, it is concluded that mother's education is significantly positively associated with their own health. The coefficient of mother education is 0.084 indicate that controls other variables; 1 unit increases in education, health status will increase by 0.084 units. So, mother education is an influential factor for health.

The coefficient of father education is 0.041; referring this variable is enhanced health status of mother by 0.041 units. It shows a positive relationship between father's education and mother's health. It is 10 percent level of significance. It ensures educated father has an important role on mother's health.

The effect of age of mother is negatively related to her health. The estimate of age of mother is -.003. It shows that if mother's age increases, her health status will decrease. The estimate is at 5 percent level of significance. Usually, age and health is inversely related. This finding is similar to general notation of age and health relationship.

The estimate of mother's occupation is 0.003 indicates that if all other variables are held constant then 1.0 unit increase in mother occupation will improve 0.003 units mother health status. Mother's occupation is at 5 percent level of significance and positively associated with her health position. Occupation is classified by five groups such as garment worker, teacher, government employee, NGO workers and others. Most of the mothers are housewives. They have no economic power. Economic power is an important

element for taking any decision. When one person is sick, she can go to doctor for her treatment due to economic solvency. So, occupation has an important role for her health.

Father's occupation is positively associated with mother's health. The coefficient is 0.006 indicates that control other variables; 1.0 unit increases in father's occupation, mother's health status will increase by 0.006 units. This variable is low significant than mother's occupation. Fathers who are engaged in handsomely paid profession have a great opportunity to take care of mothers' health.

Health care expense is one of the important factors for estimating health production function. The value of this variable is 0.540, which states that average health expenditure on healthcare is positively associated with mother's health. Health expenditure of a person being sick is related to health status. If a person is seriously suffering from a disease, she has to incur huge health expenses. Most of the healthcare cost is out of pocket. In this analysis, this parameter is 10 percent level of significance.

Age of marriage is an important indicator of mother's health. The estimates of this variable is 0.016 indicates that if age of marriage increases by 1.0 unit, health status of mother will increase by 0.02 units. This parameter is positively significant and refers that age of marriage should be standard. Under-aged mother's health deteriorates with the increase of age. This scenario prevails in Bangladesh. Maternal mortality ratio is high in South Asian region due to early marriage of women. This picture confirms this study.

It shows from estimate age at first childbirth that it is negatively correlated with mother's health status. This variable is at 5 percent level of significance. If the age at first childbirth increases by 1.0 unit, health status of mother will decrease by 0.013 units. It shows an interesting picture that age at first childbirth should be a standard period of mother's age.

The number of children is an important factor for mother's health status. It postulates that if the number of children increases, health status of mother will decrease. It clearly shows from the estimating result. The coefficient of this variable is -.031 indicates that control other variables; in case of 1.0 unit increases in the number of children, health status of mother will decrease by 0.031 units. Mother's health position is not good in Bangladesh. Women in the country have a higher number of children. When they are giving birth to a large number of children, their health deteriorates. So, optimum number of children of a mother ensures her better health status.

The Anti-Tetanus Serum (ATS) variable coefficient is 0.003. It is at 5 percent level of significance and positively correlated with mother's health. If the estimate of ATS sets all other variables at zero, then in case of 1.0 unit increases in ATS, mother's health will increase by 0.003 units. The ATS has positive impact on pregnant mother's health status.

It is an essential factor for safe motherhood delivery. All women aged between 15-64 years have to take ATS injection for removing health hazards. But very few mothers in Bangladesh receive medical checkup during pregnancy. Only 28.6 percent pregnant women are given ATS injection. This is the worst position for women health about ATS injection.

Mother's health depends on the effect of child delivery by trained personnel. This variable is positively linked with mother's health. The estimate has ensured this notation. For safe birth delivery, it is required 100 percent trained personnel. In Bangladesh, there is lack of inadequate skilled persons for giving assistance to mothers during child delivery. This study confirms that 38 percent trained TBA and 17 percent doctors are playing important roles for assisting mothers during childbirth. A large proportion i.e. 44.60 percent women have no opportunity for taking safe motherhood facilities. For child delivery, they have to go untrained TBA/neighbour/relative/others. This study also shows pregnancy related problems such as miscarriage 3.3 percent, stillbirth 6.7 percent, abortion 3.3 percent, and other problems 86.7 percent. This result indicates there is a huge requirement of trained personnel to ensure safe motherhood in Bangladesh.

Access to safe water is an important attribute to ensure mother's good health. Pure water is a necessary for drinking and washing activities. Generally, there is notation that safe water is positively associated with better health. It is confirmed by the estimate of access to safe water. This study shows that 28.2 percent households obtain drinking water from tube-wells and the rest 71.8 percent obtain it from tap water. Most of the households cannot use pure water due to unavailability of supply of clean water from WASA (Water Supply & Sewerage Authority). One percent people use drinking water by boiling it. It confirms that majority people take unsafe water. They have no access to and affordability of safe water for lower socioeconomic status.

Access to hygiene latrine is an essential part for a mother's good health. Unhygienic latrine users are suffering from various types of diseases. This study confirms that 30 percent households use sanitary latrine, 68.60 percent households use pit latrine, and 14 percent use hanging and open latrine. This is a miserable scenario for access to safe latrine. As most of households cannot afford to use environment friendly latrine, this variable is negative association with health status.

Working environment is one of the most important factors for a mother's health. It is significantly positive association with her health. The coefficient of working environment is 0.052 indicates that if all other variables are set equal to zero, 1.0 unit increase in working environment ensures 0.05 unit better health position of mothers. It is 1 percent level of significance.

Mother's health is negatively affected by habituated to betel leaf/bidi/zarda/ tobacco/gull. This study reveals this argument. The estimate -0.035 states that controlling for other

variables by 1.0 unit increases this variable consumption creation 0.035 unit negative health problems. It is 10 percent level of significance.

6. Results of Econometric Analysis: Effect of Mother's Education on Child Health

Table 2: Ordinary least squares Estimates of the effect of Mother's Education on the health of children (Dependent variable: HAZ) (for child)

	Coefficient
Mother's education	0.038 *** (0.002)
Age (mother)	-0.046 *** (0.002)
Age squared	0.001 *** (0.000)
Sex	0.045 *** (0.009)
Log per capita household income	0.175 *** (0.013)
The number of children	-0.116 *** (0.008)
Have running water	0.321 ** (0.021)
Have own water source	0.237 *** (0.016)
Have a flushing toilet	0.354 * (0.025)
Observations	0.500
R-squared	0.701

Note: Standard errors in parentheses are robust to heteroskedasticity and clustering at the family level. *** Significant at 1% ** significant at 5% and * significant at 10%.

Analysing estimates data in Table 2, it may be concluded in the following results.

Mother's education is positively related to child health and this variable is 5 percent level of significance. The coefficient of mother's education is 0.038, which implies that mother's education is enhanced by 1.0 unit, while child health is increased by 0.04 units. An educated mother can easily take care and nurse her child than less educated/uneducated mother. Mother's educational status is spilt into six categories. For example, illiterate, can signature only, class I-V, class VI-VIII, class IX-SSC, HSC and graduate/masters or equivalent. This study explains that 38 percent mothers are illiterate. The educational qualification of 15.6 percent mothers is signature only, 16.8 percent class I-V, 9.6 percent class VI-VIII, 12.2 percent class IX-SSC, 5.4 percent HSC, and 2.4 percent graduate/masters or equivalent. If mother's education is low, its impact on child

health status is negative. If mother's education level is high, child health status is likely to improve. One of the main reasons for high child mortality rate is low educational status of the bearing mothers.

The age of mother is one of the important aspects for sound child health. It is found that the age of mother is negatively associated with her child health status. The estimate -0.046 means that controlling for other variables 1.0 unit increases the age of mother, her child health status will decrease by 0.05 units. Aged and underage mother cannot properly serve her child. This study confirms that the age of mother should be a standard form. This study shows that the average age of mother is 20.56 years. It can be said that most of the women are married before 18 years of age. They gave birth to their first child at an average age of 17.5 years. This type of mother cannot maintain her childcare. Women face various sexual problems after 35 years. If they try to give birth at this age, their health and child health are likely to deteriorate. An ill mother is not able to provide proper care for her child. So, age of the mother is an important factor.

Sex of the child is a vital factor for child health. Sex is divided by 1 for male and 2 for female. This variable is statistically at 5% level of significance. The estimate 0.045 indicates that if a child is a female, her health status increases by 0.045 units.

Log per capita household income has positive impact on child health status. It also means that the rate of change of household income is positively associated with child health. Household income is an important determinant of health status of children. From the regression analysis, it is observed that there is a strong relationship between children health status and mother's education. It indicates that increased income will enhance health status among children. But higher income of households reduces health hazards of children. Quintile-wise income also behaved consistently in reducing health hazards, which reduce sharply as income increases from lowest quintile to upper quintile. When middle-income group (3rd quintile) is considered as the reference, co-efficient for height-for-age (underweight) is negative and large for the 1st and 2nd quintile, meaning that the prevalence of underweight is higher for the poorest group of people. On the other hand, co-efficient for underweight is again large but positive for the 7th quintile, which means prevalence of being underweight is lower for the richest group of people. The behaviour of a child being underweight is sensitive to the extreme cases as the co-efficient are large for both lowest and highest quintile of income similar behaviour is observed in the case of a child being stunted. Again good health significantly increases as the level of income increases and is very sensitive in extreme cases.

Child health status is negatively linked to the number of children (siblings). The coefficient of this variable is -0.116 which states that as the number of children of mothers is increasing rapidly, the health of those children will diminish. This variable is at 5 percent level of significance. The number of children is an influential factor for ensuring child health. The optimum number of children of a mother ensures better health status. This scenario is absent in the lower income group population. It is creating not

only population problems but also health problems. To minimise health hazards, the number of children should be reduced.

Although more than 90 percent of people use safe water for drinking purposes, unexpectedly, individual source of drinking water has no significant effect on child health. However, when sources are categorised as safe and non-safe sources, results are consistent in affecting health as use of safe water improves children's both height and weight for age, while use of non-safe water deteriorates the same. Again creating a variable called non-safe sources of water including pond/river water used for the purposes as drinking, washing and bathing children significantly decreases health of children.

Although most people use non-hygienic toilets, this analysis shows that use of hygienic toilets improves and non-hygienic toilets deteriorates health. Furthermore, washing mother's hands after defecation had no real impact on child health. On the other hand, distance of health centres from survey area significantly influences child health, meaning the longer the distance the higher the prevalence of health hazards. It has, however, been noticed that both height for age (stunting) and weight for age (underweight) behave similarly in response to the considered independent variables. Although there remain other influences including associative mattering, numerous studies show that mother's education has more influence on improving child health.

Effects of Mother's Education on the Health of Boys Versus Girls

Table 3: Ordinary least squares Estimates of the effect of mother's education on the Health of Boys versus Girls. (Dependent variable: HAZ) (for children)

Variables	(1) Girls	(2) Boys
Mother's education	0.044 *** (0.002)	0.043 *** (0.002)
Age (mother)	-0.054 *** (0.002)	-0.040 *** (0.002)
Age Squared	0.001 *** (0.000)	0.001 *** (0.000)
Observation	0.500	0.500
R-squared	0.701	0.701

Note: Standard errors in parentheses are robust to heteroskedasticity and clustering at the family level. *** Significant at 1%.

Child health has become a key indicator of economic development. Among the potential determinants of child health, education of mothers has been the focus of economists. More educated mothers may have healthier children because they have better knowledge about healthcare and nutrition, have healthier behaviour, and can provide more sanitary and safe environment for their children. More educated mothers are more likely to have better health, which generally leads to better health for their children. In this case, it explains the effect of mother's education and age on the health of boys and girls. It is

observed that mother's education may matter more for the height of girls than that of boys, because more educated mothers may allocate more household resources to girls than boys.

It can be seen that mother's education has almost an identical effect on the health of boys and girls. The coefficient of mother's education for boys and girls is at 5 percent level of significance. It has produced values 0.044 for girls and 0.043 for boys which is almost equal. In both the cases mother's education is positively associated with health status of boys and girls.

Age of the mother is statistically significant. It is negatively linked with children's health status. The coefficients of health status of boys and girls are -0.040 and -0.054. It states that in case of controlling mother's education variable, if age of mother increases by 1.0 unit, health status of boys and girls will decrease respectively by 0.040 and 0.054 units. In this situation girl's health deteriorates more in relation to age of mother than that of boys.

7. Conclusions

For an estimation of health production function from the mother's health status point of view, this study has considered some socioeconomic and demographic variables. Here, the effect of socioeconomic and demographic variables on the health of mother and children under five years are examined in some selected urban areas in some selected urban areas of Bangladesh. The effects of mothers' education are more needed for those types of children. It is found that mother's education is an important determinant of the health of those kinds of children even after there is control over income, the number of children, health environments, access to safe water, access to hygienic toilet and other socioeconomic variables. This suggests that the main effect of the mother's education on child health is in the pre- and post-natal care. Further sensitivity tests were conducted on the effect of mother's education on the health of mother. It was found that the mother's education is an important determinant of the health of mother even after control over household income, age of mother, age squared, mother's occupation, father's occupation, age of marriage of mother, age at first childbirth, number of children, access to safe water, access to hygienic latrine, working environment and other socioeconomic variables.

8. Recommendations

Studies with large sample size regarding the MECH care may be carried out in future, with more accurate scenario. Health education programmes should be strengthened with special emphasis on the MECH in the poor to increase awareness among the expectant mothers to reduce poverty, maternal and child mortality and morbidity among working mothers. There should be a provision of infant and childcare services near a woman's working place, so that mothers can be more benefited by it. Existing infrastructure of MCH (mother and child health) care services should be improved by appointing gynae and Obs. specialists in poor areas and logistics should be increased.

Limitations

Here the sample area and sample size were small. It may not represent the exact picture. Most of the study population were illiterate, so, the information given by them may not be accurate. So, the exact condition of MECH services by the mother of poor areas may not be exactly evaluated. Lastly, time and budget were both limited to conduct the research.

Suggestions

Investment should be more in female education. All girls including those who become pregnant should be encouraged and given equal opportunities to attend school. Legislative and other support for women's nutrition should be strengthened. Discrimination against women should be reduced. Practices harmful to women's health should be abolished; government has the power to curb such practices that harm women or are injurious to their health. Public education programmes should be conducted. Legal impediments to effective delivery of health services should be removed. Appropriate training and increased responsibility should be given to nurses and midwives. Private sector participation should be encouraged.

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