Abstract

Title of the paper: *Health Care Behavior of Mothers and Infant and Child Mortality in Bangladesh*

The study attempts to investigate infant and child mortality in relation to mothers' health care behavior and its determinants in Bangladesh, using the data of Bangladesh Demographic and Health survey 1996-97. The finding shows that higher the status of mothers (education and decision-making), the higher the chance of infant and child survival. Infant and child mortality rates are moderately high in Bangladesh, varying widely from division/region to division/region. This study also indicates that infant mortality rate is the highest among the mothers who neither received any antenatal care or delivery care.

Logistic Regression Analysis was used to identify the important contributory of variables that may have influence on infant and child mortality. The variables we used here as health care behavior of mothers are antenatal care, assistance during delivery, place of delivery, tetanus vaccine, breast-feeding and immunization. The results of logistic regression coefficients suggests that the health-care variables including immunization of children, antenatal care, assistance during delivery, tetanus vaccination for mothers during pregnancy, and breast-feeding status are statistically significant on infant and child mortality. This research findings support to the modernization and gender stratification theories in relation to mothers` health care behavior on infant and child mortality in the context of Bangladesh. Education and behavioral indicators of mothers are the contributory factor for infant and child mortality that is amenable to policy.

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Note: This paper was written while the author was in the Institute of Social Studies, The Hague, The Netherlands as master student.

Resume of the author

Educated and trained in the Netherlands and China and also in the country on development issues that covers wide spectrum including public health, social development, environment, gender and HIV/AIDS etc. I have been working in the field of public health for over 12 years and gained in theoritical and practical experience in programme development, monitoring and evaluation, research including; operational research, needs assessment, situation analysis, data verification and analysis, report writing, disseminating the research findings specially in **Reproductive health** including safe motherhood, maternal health, pregnancy, childbirth and TB control program. Experience in project planning and management, administrative, financial management (maintaining computerized budgeting). Also experience in partnership in both government sector and NGOs. Computer related: Ms Word, Excel, Power Point, EPI Info.6, SPSS, using e-mail and the Internet. Sufficient knowledge on MIS, gender issue, human resource development, interpersonal communication, negotiation/problem solving and strategic planning. Good contact with National and INGOs, professional groups- Civil surgeons, medical doctors, media etc. The author is interested to work in the areas of TB & HIV/AIDS, HIV/AIDS, Reproductive health, Child health, Family Planning, Social development.

Introduction

Bangladesh is the world's most densely populated agricultural country and remains one of the poorest, least developed in the world. With a population of about 130[1] million, some ' 50 million people live below the poverty line. The Bangladeshi population is young aged i.e. with 43 percent of its total

population under 15 years of age. The dependency ratio is very high and as a result, the overall country's development is hindered. Out of the total population 23.39 per cent people were living in the urban areas while 76.61 per cent people living in rural areas. There has been a decline in the total fertility rates from 7 births per woman in the mid-1970s to 3.1 in 1999-2000. Life expectancy has steadily increased to 59 years. GNP per capita stands at $360. The female and male literacy rates are 26 and 49 percent respectively. Women are particularly disadvantaged, with regards to them mortality rates, health conditions and inadequate access to labor markets. Bangladesh ranks 149 out of 173 nations on the human development index". According to the World Health Report 2000 Bangladesh's ranked 88[3] in all the countries of the world.

Approximately 15 million children die each year from ordinary diseases and malnutrition, and 150 million children suffer from ill health and poor growth in the world. Children's health depends on their physical, mental, and social environment. Consequently public health measures, such as improvement of water and food availability, and socio-economic conditions affecting families, e.g. female literacy, as well as household behavior, are major determinants of child health. However, history shows that infant and child mortality rates do not automatically fall without special child-oriented intervention. There is a need to reassess the needs and problems of children and to develop dynamic yet practical child health policies where progress for children is a key goal of overall national development. A goal of the Bangladesh's fifth five-year plan

[1]According to recent census conducted in January 2001.

[2]2000 World Population sheet of the Population

[3] Reference Bureau, June 2000. ′ World Health Report-2000 an assessment of "overall health system performance"

(1992-1997) is to achieve considerable reductions in infant, child and under five mortality.

Infant and child mortality, those are mortality during the first and five years of life, are important indicators for describing the overall social and economic well being of a community, country or region. Infant and child mortality levels are still considered to be high in Bangladesh despite the introduction of various health interventions, including the family planning programme. One of the important reasons for high rates of infant and child mortality is limited use of health care services by mothers (Kabir and Amin, 1993). Utilization of health services is a complex behavioural phenomenon, affected by a multitude of factors including accessibility, distance, cost, quality of care, as well as personal altitudes (breastfeeding, hygiene etc.) and socio-economic characteristics.

Women are often the principal providers of household health care and usually have major responsibilities for income generation and domestic work; thus the demands on women's time greatly influence household health care seeking behavior (Leslie 1992).

To accelerate health service utilization for young children particularly, personal and household characteristics of husbands and their attitudes towards health care services and its utilization by mothers are important factors. In Bangladeshi society father is the key person for making any decision in the family. Mothers in the rural Bangladesh are fully dependent upon their husbands in terms of treatment, clothing, food, shelter and many other family affairs. A study entitled 'development of maternal care package for the use of clinics in rural areas in Bangladesh' showed that husbands know very little about locally available health facilities, pregnancy and delivery-complications. So when children, wife or him needs care, he does not have the capability to make a proper decision at the right time. Because most of the health including family planning interventions are given to mothers or newly married women.

Social factors play an important role in Bangladesh for women, like if a pregnant woman wants to go to doctor for antenatal check up, she needs permission from her mother-in-law or husband. Some mothers-in-law tell the pregnant women that they themselves did not need to go to doctor during their pregnancy and yet gave birth safely, there is no need for them to go to a doctor for antenatal check up. From the religious point of view, some parts of the regions (Sylhet) normally pregnant women are not permitted to go out of home whether to visit a doctor or any other place. Especially if the doctor is male, the pregnant mother has to face a serious cultural and religious problem. But these norms or attitudes have been changing due to motivation of people by NGOs and government health workers along with mass media like radio and television though the access of these are not satisfactory.

In an attempt to understand the factors that determine mothers" utilization of health services, Chatterjee (1990) posited the role of need, permission, ability and availability. He argued that when permission and ability interact with need, a demand for health seeking is generated. Actual utilization of health services occurs when this generated demand overlaps with availability[4].

Another factor-affecting mothers' health care behavior is that, traditionally in rural Bangladesh, pregnancy is considered a natural state rather than a condition requiring medical attention and care. Such perceptions and beliefs constitute the 'lay health culture' that is an intervening factor between the presence of a condition and its corresponding treatment. Postnatal and infant and child health care are similarly affected by this culture, with the result that mothers often do not avail themselves of preventive or curative medical services intended to safeguard their own and their children's health and well-being.

Reducing health risks for mothers and children is to increase the proportion of babies delivered at the clinics. Proper medical attention and hygienic conditions during delivery can reduce the risk of infections and facilitate management of complications that can cause death or various illnesses for the mother or the newborn child (Mitra and et. al, 1997). The BDHS96/97 indicates that about 95 per cent of births in Bangladesh are delivered at home and more than half of these births (57 per cent) are attended by untrained traditional birth attendants (dais), followed by relatives/others at 25 per cent. Professional doctors attended only 5 per cent of births. More than half (54%) of the children are fully immunized.

4 Chatterjee, M. 1990), Indian Women: Their health and economic productivity. *World Bank Discu*

Breastfeeding plays an essential and sometimes underestimated role in the treatment and prevention of childhood illness. As many as 10% of ali deaths of children under five could be prevented by a modest increase in breastfeeding. Breastfeeding protects babies and young children from a range of potentially fatal conditions. When mothers breastfeed exclusively (that is, without giving any other food or fluid including water) during at least the first six months of life, there is a dramatic decrease of diarrhea related death and, to a lesser extent acute respiratory infections and even small amounts of water-born diseases decrease breast-milk intake and weight gain, and increase the risk of diarrhea. Breast-feed practices almost universal in Bangladesh, with 91 per cent of mothers reporting that they breastfeed their

children.

Mothers' health care behavior, for either preventive or curative purposes, is a main factor in determining child survivorship. For this, this paper focuses on health care behavior of mothers and infant and child mortality in the context of Bangladesh. Because mothers are usually seen as care givers, reproductive workers among all other household members in terms of child caring and rearing, along with their many other works in home and outside of home in Bangladesh.
Thus health care behavior of mothers is related in many ways to, and determine the level of infant and child mortality. The author try to find out the answers of the following questions:

- How socioeconomic and demographic characteristics affect health care behavior of mothers for infant and young children?
- How health care behavior of mothers influence on infant and child mortality? and
- What are the factor/s that creat/s for seeking health care of mothers?

Concept of maternal health-care seeking behavior

The concept health-care seeking and giving behaviors include those practiced in the home, such as providing rehydration solution for a child with diarrhea, as well as those practiced outside of the home, such as taking a child to a health clinic for immunization or treatment of an illness. Here the author means health-care seeking behavior is antenatal care, TT vaccination, place of delivery and assistance during delivery for mothers and immunization, fever, diarrhea, and acute respirator}' infection and other preventable diseases for children.

Concept of maternal health- care giving behavior

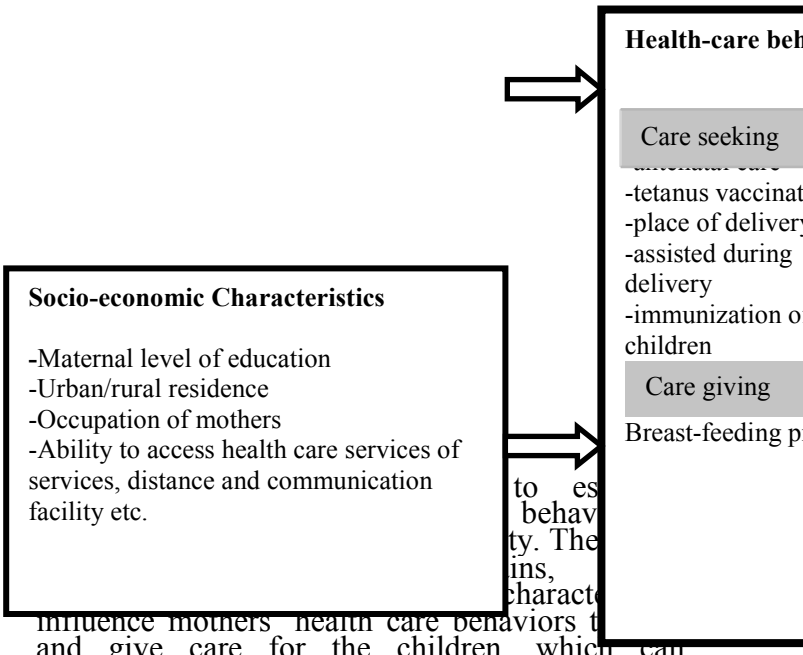
A great deal of care that falls under this heading occurs in the home by the household's

specially mothers' primary caregiver. Care giving behavior depends upon personal

attitudes and beliefs of mothers like breast-feeding practice, hygiene-related and

emotional support etc. It does not involve money and opportunity cost but need attention

to the children of mothers.



Demographic Characteristics

-Age of mothers at the time of birth
-Sex of the child
-Parity
-Birth interval between the births

influence mothers' health care behaviors t and give care for the children, which can contribute to reduce infant and child mortality to some extent.

Definitions of variables on mothers' health-care seeking behavior are:

- Antenatal check-up-mothers received at least one pregnancy-related check-up provided by doctor or a health worker in a health facility or at home (received/not received)

- Tetanus toxoid vaccine-mothers received two or more tetanus toxoid injections during pregnancy (received/not received)

- Place of delivery in a health facility: include hospital, upazila health complex, family welfare centre (yes or no)

- Delivery assisted by a health professional- include a doctor, nurse/midwife (yes or no)

- Immunization status of child age 12-23 months- received BCG (tuberculosis), measles, and three dose of each of DPT (diptheria, pertussis, tetanus) and polio vaccines, (fully/partially immunized or did not receive any immunization)

- Breast-feeding- mothers practice breastfed for

at least six months (yes or no)

Data and method of data analysis:

The data from the 1996-1997 Bangladesh Demographic and Health Survey, a nationally representative sample of 10,000, ever-married women age 10-49 years were used. The survey was conducted under the authority of the National Institute of Population Research and Training (NIPORT) of the Ministry of Health and family Welfare. The survey was implemented by Mitra and associates, Macro International Inc. of Calverton, Maryland provided technical assistance to the project as part of the international demographic and health survey program. The United States Agency for International Development (USAID), Dhaka Bangladesh provided Dhaka Bangladesh financial assistance. The Bangladesh demographic and health survey (BDHS) was conducted from 2 November 1996 through 11 March 1997. Four types of questionnaires were used for the BDHS: a household, a woman, a husband and a service availability questionnaire.

Here we only analyze and discuss about women's questionnaire because women behavior is our interest of study. The women's questionnaire was used to collect information from ever-married women age 10-49 years.

Other secondary information like articles, monograms, published and unpublished documents, Internet etc. is used.

Description of variables used in the analysis:

Dependent variables	**Description**
Infant mortality	The probability of dying before the first birth day
Child mortality	The probability of dying between the first and fifth birth day

Independent variables: (health care behavior)

Receive antenatal check up

Yes	Mothers received antenatal check-up by doctor/nurse while pregnant
No	Mothers did not receive antenatal check-up by doctor/nurse while pregnant

Received Tetanus Injection

Yes	Mothers received tetanus injection while pregnant
No	Mothers did not receive tetanus injection while pregnant

Place of delivery

Hospital/clinic	Mothers delivered specific child in a medical institution
No	Mothers did not deliver specific child in a medical institution

Received Professional at delivery

Yes	Mothers received assistance from doctors/nurses during delivery
No	Mothers did not receive assistance from doctors/nurses during delivery

Mothers breast-fed the child

Yes	Mothers breast-fed the child
No	Mothers did not breast-feed the child

Child immunization status

Full	Child age 12-23 months received 3 doses of DPT, 3 doses of BCG, and 1 dose of measles
Partial	Child age 12-23 months received some of the recommended immunization, but not fully immunized
No	Child age 12-23 months did not receive recommended

immunization

Explanatory variables: (Demographic characteristics determining utilization of health services including care giving/seeking for the children)

Mothers age at birth

up to 19 years Mothers age was up to 19 years of birth of the specified child

20-29 years Mothers age was 20-29 years of birth of the specified child

30-49 years Mothers age was 30-49 years of birth of the specified child

Sex of the Child

Male Child is boy

Female Child is girl

Parity

1 Child is a first-order birth

2-3 Child is a second-third order birth

4+ Child is a four and more order birth

Birth interval

<18 months Birth interval of child is less than 18 months

18-35 months Birth interval of child is 18-35 months

36 or more months Birth interval of child is 36 and more months

Explanatory variables: (socio-economic background characteristics of mothers):

Level of mothers education

No education mother is illiterate

Primary education Mother is literate up to primary

Secondary or more Mother is literate secondary or more education

Place of residence

Urban Mothers lived in urban areas

Rural Mothers lived in rural areas

Mother`s working status

Working Mothers are currently working aside from her homework

Not working Mothers are not currently working aside from her homework

Result of the findings:

Table: Infant and Child mortality by background characteristics of mothers, Bangladesh, 1996/97

Selected Background characteristics	Probability of dying (per 1000 live births)	
	Infant 1q0	Child 4q1
Mother`s highest educational level		
No education	98.1	51.6
Primary	82.3	32.3
Secondary and higher	64.8	14.5
Type of place of residence		
Rural	91.2	43.7
Urban	73.0	25.3
Division		
Barisal	86.3	36.4
Chittagong	76.8	59.0
Dhaka	90.8	43.8
Khulna	75.2	12.5
Rajshahi	94.6	34.9
Sylhet	138.0	47.8
Medical maternity care		
No antenatal or delivery care	90.1	-
Either antenatal or delivery care	61.2	-
Both antenatal and delivery care	48.6	-
Total	89.9	41.9

Infant and child mortality rates by selected background characteristics are presented in the above table. The figure of the table shows the basic socioeconomic indicators of the mothers, including level of education, rural-urban residence, divisions/regions of the country, and medical maternity care. (Please find discussion in the concluding section)

Table: Infant and Child mortality by demographic characteristics of mothers, Bangladesh, 1996/97

Selected Demographic characteristics	Probability of dying (per 1000 live births)	
	Infant 1q0	Child 4q1
Mother`s age at birth		
Less than 20 years	106.2	43.6
20-29 years	79.3	41.2
30-39 years	84.7	41.6
40-49 years	115.6	32.6
Parity		
1 child	108.6	35.9
2-3 children	78.8	40.7
4-6 children	82.4	47.2
7 or more children	101.5	46.2
Previous birth interval		
Less than 2 years	136.1	59.1
2-3 years	70.4	41.9
4 or more years	55.5	29.4
Sex of the child		
Boy	94.9	36.9
Girl	84.3	47.0

This table examines differentials in infant and child mortality by demographic characteristics of the mothers and children. The above table represents various indicators of infant and child mortality for 10 years preceding the survey. These are may be factors associated (directly or indirectly) with mother and children`s lives. The most important of these mother's age at birth, sex of the child, parity and previous birth interval.

Table: Selected health-care seeking behavior of mothers and probability of infant and child dying, Bangladesh, 1996/97

Selected health care behavior characteristics	Probability of dying (per 1000 live births)	
	Infant 1q0	Child 4q1
Antenatal care seeking		
Doctor/trained nurse	85.16	19.76
No	112.36	39.11
Assistance during delivery		
Doctor/trained nurse	88.85	23.91
No	101.26	36.07
Place of delivery		
Hospital/Clinic	89.96	29.21
No	99.43	42.15
Immunization of children		
Complete	73.88	23.17
Incomplete	95.93	35.97
No	107.00	42.15
Breast-feeding practice		
Yes	99.06	30.36
No	306.14	15.30
Tetanus toxoid seeking		
Doctor/trained nurse	85.16	19.76
No	113.11	39.12

The probability of infant and child mortality rates by selected health care behavior characteristics (antenatal and toxoid care seeking, place of delivery, assistance during delivery, breast-feeding practice, and immunization of children) of mothers are shown in above table. The result shows that the probability of infant and child mortality are less likely to the children whose mothers received antenatal care from doctor/trained nurse that those mothers did not receive this care. For instance, mothers who received antenatal care from medical professional the probability of their infant mortality is 85

deaths as against 112 deaths per 1000 live births who did not receive any antenatal care. The probability of infant mortality is 88 death per 1000 live births when mothers delivered by doctor or nurses as against 101 deaths when mothers did not deliver by health professional. Place of delivery is an important indicator for child survival. If mothers delivered at the hospital/clinic, in that case the probability of infant mortality is lower than those, who did not deliver at the hospital/clinic (90 versus 99, deaths per 1,000 live births). Data show that breast-feeding practice has a great impact on infant and child mortality. The probability of infant mortality is about 3 times (306 versus 99) higher for those, whose mothers did not practise breast-feeding than those who practised breastfeeding. On the other hand, the probability of child morality is more than two times higher for mothers who used to breast-feed than those who did not practise breastfeeding. It is relatively very big difference. One reason may be very small number (only 6) of mothers reported that they did not practise breast-feeding. We need to investigate further in this regard. Child immunization is the most important variable for child survival. Findings show that children who did not receive immunization are more vulnerable than those who received. For example, infant are more likely to die if they did not receive immunization at all or partially than those received complete immunization (107 against 73 deaths per 1,000 live births). This pattern is also same for tetanus toxoid care, mothers who received tetanus toxoid, the probability of their children survival is greater than those who did not receive (85 against 113 deaths per 1,00 live births). Study also explores those mothers who received antenatal care from medical persons, they also received tetanus services and as a result the probability of infant and child mortality are same.

Table: Logistic regression analysis on some selected health care behavior variables of mothers, Bangladesh, 1996/97

Health care behavior	Infant mortality (1q0)	Child mortality (4q1)
Antenatal care		
Doctor/nurse	-0.3780*	-0.2563**
Others®	0.0000	0.0000
Assistance during delivery		
Doctor/nurse	-0.0427**	0.5672***
Others®	0.0000	0.0000
Place of delivery		
Hospital/clinic	0.1839	0.3964
Home ®	0.0000	0.0000
Tetanus vaccine received		
Yes	-0.2419*	-0.1874**
No ®	0.0000	0.0000
Breast-fed		
Yes	-0.1004***	0.3057
No ®	0.0000	0.0000
Immunization		
Yes	-0.6081*	-0.5319*
No ®	0.0000	0.0000

Note ® = reference category *=<0.001; **=<0.01; ***=<0.05

The objective of logistic regression analysis is to identify the important contributory of variables that may have influence on infant and child mortality. The above table shows the significance of selected health care behavior of mothers in relation to infant and child mortality. The result of logistic regression coefficients suggests that the health care variables including immunization of children, antenatal care, assistance during delivery, tetanus vaccination for mother during pregnancy, and breast-feeding status are statistically significant on infant and child mortality. But is should be pointed out that the logistic regression coefficient for place of delivery for infant and child mortality is not statistically significant.

Conclusion and policy recommendations

Conclusion

This research findings support to the modernization and gender stratification theories in relation to mothers' health care behavior on infant and child mortality in the context of Bangladesh. The data showing significant and strong direct support for each of the theoretical perspectives considered, but the evidence in support of gender stratification theory is of particular note. As indicated women's status indicators, female secondary education have the strongest effects. This suggests that women's reproductive autonomy and education level are particularly important predictors of infant and child mortality. The presented data suggested that these two women's status variables have strongest effects on infant and child mortality. Female education proved to be one of the best predictors of infant and child mortality. Estimates indicate strong support for hypothesized relationships: the higher the status (education and decision making) of women, the higher the chance of infant and child survival.

In concluding this paper, we would like to stress that after successfully conducting the proposed study in the context of Bangladesh, where socio-economic conditions are poor, and the health of the whole community is threatened especially for young children. Where health services and transport facilities are less developed. Where gender biases favor males, however, women and female children are particularly vulnerable to health risks. Simple organizing a satellite clinic once a month at the community level is not enough. Apart from economic and environmental conditions, social customs and cultural traditions profoundly influence a mother's health-care behavior. The infant and child mortality rates would be significantly reduced through changing mothers' health care behavior. This will be as a result of the efficient introduction and implementation of the intervention programs to meet the needs of the people in Bangladesh.

Background characteristics of mothers

The education of mothers is one of the strongest correlates of infant and child mortality. The results indicate that there is a negative relationship between mothers' education and infant and child mortality. It means that higher the mothers' level of education, lower the infant and child mortality. Because education provides mothers with decision making power, making them more aware of their children's welfare, and

increasing their knowledge about childhood diseases and their ability to understand illness and provide timely treatment (Cieland and van Ginneken, 1988). Urban mothers are much more likely than rural mothers to receive medical facilities for their children and as a result, the probabilities of infant and child mortality are lower in urban areas than rural areas. Another reason may be for lower infant and child mortality in urban areas is that availability and accessibility of service.

This study also indicates that infant mortality rate is the highest among the mothers who neither received any antenatal care nor delivery care than those mothers who received both antenatal care or delivery care

Demographic Characteristics of mothers

In this section some selected demographic characteristics of mothers are described in relation to infant and child mortality. Children born to women under age 20 and over age 40 have higher mortality than those born to mothers age 20-39, most likely because a mother's physical condition is most favorable to child bearing during her twenties and early thirties. First born children and children of high births order (higher parity) experience higher mortality than children of birth orders two to four. Short birth intervals increase mortality of children in two ways. Children born after a short interval are likely to have mothers in poor health, and such children tend to have low birth weight and increased chances of neonatal mortality. For children who are not first born, previous birth interval has by far the largest effect on infant and child mortality of any factor analyzed in this report. Children born less than 24 months after a previous birth are more than twice as likely to die during infancy and two-thirds more likely to die during childhood compared with children born after a longer interval. Because one-third of second and higher order births in Bangladesh are born less than 24 months after a previous birth, a program that encourages mothers to space births at intervals of at least 24 months would have a major impact on infant and child mortality.

Health -care behavior of mothers

Results in this paper include estimated effects of mothers' health care behavior such as antenatal visits, tetanus immunization, assistance during delivery, place of delivery, breast-feeding and immunization of children are shown in table 5.7 and figure 3. These results will be useful both in evaluating current maternal and child health programs and in providing guidelines for the future development and implement program.

Antenatal care

Antenatal care during pregnancy is considered an important health care behavior both for mother and child. Data show that mothers who received antenatal care from professionals their children is less likely to risk of dying than those whose mothers do not receive this
care. This result may imply that more and better antenatal care service during pregnancy may increase the children's chances of survival.

Place of delivery and assistance during delivery

These important elements in reducing health risks for mothers and children are to increase the proportion of babies that are delivered under medical supervision in health facilities. Findings of the analysis indicate that if mothers delivered at the hospital/clinic and assisted by medical professional, the chance of probability of their infant and child survival are higher than for mothers who did not deliver at the hospital/clinic and did not take any assistance from professional medical persons. The type of assistance a mother receives during the birth of her child also has important health consequences for both mother and child. Births that are delivered at home are more likely to be delivered without assistance from any medical trained person, whereas, births delivered at health facility are more likely to be delivered by trained medical professional. In Bangladesh, many children die owing to the lack of safe delivery facilities. Untrained dais, relatives and neighbors attend most of the deliveries, a practice, which presents risks to both the mother and the newborn baby. It is evident from the data that survival is higher among children born in proper health facilities and attended by professional doctors than those born at home attended by untrained dais or relatives.

Breast-feeding practices

The information presented here suggests that children who are breastfed are more likely to survive than those who are not breast-fed. The result shows substantial differences of probability of infant mortality between mothers who practiced breast-feeding (99 per 1000 births) and those did not practice (306 per 1000 births). The reason can be very small number of mothers (only 6) who did not practice breast-feeding. On the other hand, a negative result found for child mortality. It means mothers who practiced breast-feeding child mortality is about two times higher than those who did not practice. The cause may be there is no direct effect of breast-feeding for children aged 1-4 years. Shah and Khanna. (1990) argued that the effects of breast-feeding on infant survival seem to be greater during the early months of life. I think further investigation is needed on it. The result indicates that 74 percent Bangladeshi mothers reported that they gave colostrum to the child.

Immunization for children

The chances of survival of immunized children are higher than children who have not been immunized. For instance, the probability of dyeing

of immunized children aged 1-4 years is about 25 deaths per 1,000 live births, whereas, the children who have not been immunized the probability of dyeing is about 38 deaths per 1,000 live births.

Policy recommendations

Infant and child mortality rates reflect Bangladesh's level of socio-economic development and quality of life and those can be used for monitoring and evaluating population and health programs and policies. Many maternal health-care behaviors that determine survival of young children, such as use of health services, are themselves preconditioned by social and economic factors. The promotion of child health through reinforcing 'healthy' behavior at home and in the community is a growing focus. Improve care behavior of mothers, community-based health intervention and counseling can play critical role to reduce infant and child mortality. The policy is seen as a priority within the overall health policy, which aims to improve the quality of, and provide the opportunity for a productive life for every Bangladeshi young children, who will lead the country's development in future. The policy stipulates that all members within a family should have access to information and services that empower them to enrich their quality of life. Special attention can be given for Sylhet division, where level of education for mothers is low, society is much more conservative, communication and health facility are not so developed.

Policy Statement 1:

Strengthen motivational activities for child immunization among mothers

It is essential that all mothers should know why, when, where and how often their infants should be vaccinated. The immunization program in Bangladesh also needs to address the problem of gender discrimination in the immunization of children. The best protection against diptheria, tetanus, whooping cough, measles is prevention by ensuring the widest possible immunization coverage. Health worker should use every opportunity to increase immunization coverage, checking immunization status every time in the community. In addition, vitamin A supplements have been found to reduce the severity of both measles and diarrhea and, when children lack vitamin A, supplements are routinely provided.

Policy Statement 2:

Strengthen and develop appropriate strategies to ensure antenatal and tetanus toxoid program for pregnant mothers

This is the most important how often mothers need the services. An important component of antenatal care in Bangladesh is ensuring that all pregnant mothers and children are adequately protected against tetanus.
Antenatal care can be more effective in avoiding adverse pregnancy outcome when it is sought early in the pregnancy and continues through to delivery. Obstetricians generally recommended that antenatal visits be made on a monthly basis to the 28^{th} week (seventh month), fortnightly to the 36^{lh} week (eighth month), and then weekly until the 40^{th} week (until birth). If the first antenatal visit is made at the third month of pregnancy, this optimum schedule translates to a total of at least 12-13 visits during pregnancy.

Tetanus toxoid injections are given during pregnancy for prevention of neonatal tetanus, one of the principal causes of death among infants. Typically, a pregnant mother will receive two doses of the toxoid. However, if a mother has been vaccinated during a previous pregnancy, she may require only one dose for a current pregnancy. Five doses are considered adequate to provide lifetime protection. Mother's level of education is linked to use antenatal care and tetanus toxoid services.
Finally, among health-care interventions, immunization of pregnant mothers against tetanus has a substantial effect in reducing neonatal mortality. Family health program should be strengthened to provide this basic health care service to all pregnant mothers.

Policy Statement 3:

Motivate the pregnant mothers about place of delivery and assistance during delivery

Proper medical attention and hygienic conditions during delivery and person(s) assisting with the delivery can reduce the risk of complications and infection that can cause death or serious illness for both mother and child. If a mother received antenatal care during pregnancy, she is more likely to deliver with medical assistance. The combination of poor antenatal care and inadequate medical supervision at delivery places these births at high risk of serious illness and death. Maternal education is closely tied to better supervision at delivery. Children delivered at a medical facility are likely to experience lower mortality than children delivered at home because such facility usually provide a sanitary environment and medically correct birth assistance. If complications develop during delivery, medical professionals can attend to the problem immediately. In a developing country such as Bangladesh, however, most mothers who deliver their children at a medical facility enjoy a high socio-economic status. Poor mothers only deliver their children in a medical facility if they anticipate a complication. In this situation, program should motivate the mother specially household head to receive available services at MCH centers and to make a strong referral system.

Policy Statement 4:

Strengthen advocacy for exclusive breast-feeding practices for al-least first 6 months.

BDHS 1996/97 indicated that 9 percent mothers still not practicing breast-feeding. Message should give to those mothers about the benefit of breast-feeding both for mothers and child. Integrate this advocacy program to the others activities like when a mother come to antenatal check up, health worker should campaign about breast-feeding.

Policy Statement 5:

Increase maternal formal and informal education

Mother's level of education is found to link seeking immunization services for children, seeking antenatal care, tetanus toxoid injection. Our evidence that women's education and reproductive autonomy as well as overall education levels are all useful predictors of decline in infant and child mortality have important policy implications for Bangladesh. Our result suggest that policies aimed at increasing education levels, particularly education for mothers, and at increasing the availability of service will generally contribute to a reduction infant and child mortality rates.

Policies to expand 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. The same goes for policies that work to ensure effective and accessible health services for all. Because people's ability to improve their health depends so much on economic conditions and education, the policy implications are clear: the Government should consider strategies to reduce poverty, expand schooling (particularly for girls), and help to strengthen mother's ability to care for their families.

Although it is not feasible to raise the socioeconomic status of every household in Bangladesh in a short period of time, the family health program can use information on the effects of socioeconomic characteristics to improve infant and child survival by targeting families at high risk. The result reported here indicates that health intervention programs should focus on illiterate mothers and on households that are poor. Such programs should make sure to reach both male and female children.
Educated mothers may not only have greater access to medical services, but may also have a better understanding of the benefits of vaccinations, and thus be better disposed to take advantage of the available services. So along with educational program

mothers should be motivated to take decision on antenatal care and tetanus toxoid injections, assistance and place of delivery during pregnancy. Program may be taken to those who are not receiving these services by making special arrangement. Mothers can be injected in informal way like extensive communication campaign on the mentioned topics and using multimedia like arranging special program on the television and radio, performing drama using local language, showing flip charts.

Policy Statement 6:

Strengthen She concept of integrated services for early childhood

Early childhood development is family development and services need to work together in order to provide the best possible service for children and families. There is also the issue of scarce financial and human resources, so that working collaboratively across Ministries and disciplines is more productive and effective. In models available from other countries, early childhood services are delivered through cooperating Ministries and provision and effectiveness of services has thus improved immensely. The terminology for this type of service varies but in Bangladesh especially NGO sector called it 'One Stop Shopping'. At such a clinic families can have their baby immunized and have health checks done. Community leaders, themselves, in such clinics often take responsibility for the conduct and maintenance of these services. Mothers' antenatal, postnatal, tetanus Toxoid, immunization for the children and others necessary services like fever, pneumonia, diarrhea should be provided from this one stop shopping.

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