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UNDER-UTILIZATION OF HEALTHCARE SERVICES IN BANGLADESH:
AN EMERGING ISSUE
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Centre for Policy Dialogue

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It is now widely recognised that there is a need to take the scope of the population policy in Bangladesh beyond the confines of achieving population stabilisation through reduction of fertility. Although in recent years the approach to reduction of fertility has changed from narrow family planning to a broad based reproductive health approach, it is being increasingly felt that Bangladesh's population policy should encompass other equally important issues which have wide implications for the development process and the quality of life of people of Bangladesh. To address some of the related pertinent issues the Centre for Policy Dialogue has initiated a programme which aims at undertaking a series of studies covering the broad area of **Population and Sustainable Development.** The major objective of these studies is to enhance national capacity to formulate and implement population and development policies and programmes in Bangladesh, and through close interaction with the various stakeholder groups, to promote advocacy on critical related issues. The programme which is scheduled to be implemented by the CPD between 1999 and 2002 shall address, *inter alia,* such issues as population dynamics and population momentum and their implications for education and health services, the nexus between population correlates, poverty and environment, impacts of urbanisation and slummisation and migration, as well as human rights. The study has benefited from generous support provided by the United Nations Population Fund (UNFPA). The programme also envisages organisation of workshops and dialogues at divisional and national levels and also holding of international thematic conferences.

As part of the above mentioned CPD-UNFPA collaborative programme the CPD has planned to bring out a series of publications in order to facilitate wider dissemination of the findings of the various studies to be prepared under the aforementioned CPD-UNFPA programme. The present paper on the theme of ***Under-Utilisation of Healthcare Services in Bangladesh: An Emerging Issue*** has been prepared by Dr. M. Mazharul Islam, Professor, Department of Statistics, University of Dhaka.

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Executive Summary

This study analyzes the patterns and determinants of maternal and child health care utilization in Bangladesh using data from the 1996-97 Bangladesh Demographic and Health Survey (BDHS). The study focuses on the 6,230 women who had a child in the five years preceding the survey. The results show that only 29 percent women received some ANC during pregnancy. Of those who received some ANC, majority of them (27 percent) received care from qualified doctor (20 percent) and nurse or trained midwives or FWV (7 percent) from government facilities. Of the 29 percent of the women who received some ANC, about 7 percent cases it was adequate (at least 3 visits with first visit during the first three months of pregnancy from medically trained personnel i.e. doctor, nurse and FWV) and the rest 22 percent was inadequate. Only 8 percent of births are assisted by medically trained personnel Almost 13 percent of children under five years had a cough with rapid breathing (i.e. ARI) in the two weeks before the survey, and about 70 percent of them received some treatment - majority of them (46 percent) received treatment from unqualified health provider (such as pharmacy, shop, traditional doctors or homeopathic doctor), and the rest one-forth (24 percent) received treatment from government provided health facility and qualified private health provider/doctor.

One of the central findings of the study is that although majority of those who had received ANC choose government health facility, but for delivery assistance majority of them utilized traditional birth attendants (TBA). The use of TBA for delivery assistance is more common among vast majority of rural mothers, and among those who are Muslims and having poor economic condition. The results also show that unqualified health providers are consulted more for treatment of childhood illness than the qualified government provided health providers in Bangladesh.

Both bivariate and multivariate analysis indicated several important factors which were common to both maternal and child healthcare services use. Education, particularly mother's education, is one such significant predictor for use of ANC and use of the health facility and providers during childhood illness. Mother's mobility status also a common factor for utilization of both maternal and child health care.

Among the demographic factors, mother's age at child birth and parity are two important predictors of utilization of ANC and delivery assistance from medically trained personnel. This indicates that births to women during adolescence are at greater risk of receiving no maternity care. Mother age and parity, however, do not seem to be strongly related to seeking treatment for childhood ARI, but age of child is a strong determinant of receiving treatment for ARI. Sex of child is also a strong predictor of receiving treatment for ARI from health facility and qualified health provider; male child is 1.6 times more likely to receive treatment from health facility than female child indicating a sex bias in seeking treatment for childhood illness. The results also indicate that a closely spaced subsequent birth reduces the likelihood of receiving the treatment for childhood ARI. Income and social class of the mothers were found to be important predictors of receiving ANC and delivery assistance from qualified providers.

Factors measuring the accessibility, availability and communication to health message (program related factors) such as urban residence, distance to the THC, distance to the health clinic, distance to FWC, presence of NGO income generating activities, TV in the community and mass media exposure to health message were also found to have strong effect on receiving ANC and delivery assistance from qualified providers.

The study identified a number of socio-economic, demographic, community and accessibility factors for non-optimal utilization of healthcare services in Bangladesh. Through appropriate short and long term intervention these factors cane be influenced to improve the situation. While there may be some cultural factors, that stand as barrier for optimal utilization of the healthcare services, which cannot be influenced through intervention. But the problem can be solved by making the health service available in a way that is culturally acceptable.

Under-utilization of Healthcare Services in Bangladesh: An Emerging Issue

1. Introduction

1.1 *Background of the Study*

There has been growing concern that Bangladesh is facing persistent health crisis, and considerable efforts are being given by the government, NGOs and international communities to improve the poor health condition of the people. Though the mortality rates have declined in recent decades in Bangladesh, the levels are still very high by any standard. Mother and children are especially more vulnerable to high mortality and morbidity in the community. Traditionally, maternal and child health has been considered as an important indicator for describing mortality conditions, health progress and indeed the overall social and economic well-being of a country. Despite recent decline, the infant and child mortality rates in Bangladesh are still amongst the highest in the world. One child out of every eight dies before reaching age 5 (BBS, 1996), compared with one in 40 in developed countries. According to the 1995 Health and Demographic Survey (HDS) of Bangladesh Bureau of Statistics (BBS), infant and under-five mortality rates were 78 and 115 per 1000 live births respectively (BBS, 1996). Maternal mortality is also one of the highest in the world, which is estimated to be roughly 4.3 per thousand live births (BBS, 1996). This accounts for about a third of total female deaths (Khan et al., 1986; Alauddin, 1986).

Considering the alarming situation of maternal and child health, Bangladesh as a member of the World Health Organization (WHO) and as signatory of the Alma-Ata Declaration is committed to achieve the goal of 'Health for All' by the year 2000 AD through implementing an integrated Health and Population Sector Program (HPSP). The HPSP is an approach to reorganize the components of the health and family planning infrastructure and its activities into a health care system so as to be able to provide basic health care down to the grass roots level, with community participation and inter-sectoral support. The HPSP (1998-2003) uses a sector wide management (SWM) approach which has as its main focus – an Essential Service Package (ESP) which comprises Reproductive Health Care, Child Health, Communicable Disease Control, Limited Curative Care, and Behaviour Change Communication (BCC).

In most developing countries, the main factors identified for better health are health intervention programmes and greater utilization of these facilities (Preston, 1980; Moller et al., 1989; Joseph, 1989). It is interesting to note that in many developed societies of Western Europe the health problems were very similar not so long ago and have been finally controlled by the development of suitable health programmes and their greater utilization (Ebrahim, 1978).

The Government of Bangladesh, since the independence in 1971, has been investing substantially in the institution building and strengthening of health and family planning services in the country, giving special attention to the vast population that resides in the rural areas. The main thrust of the health programmes has been in the provision of primary health care (PHC) services. The Government has already initiated institutionalization of maternal and child health care and family planning activities through a phased program on Maternal and Child Health and Family Planning (MCH-FP) services. In order to cater the needs for providing MCH-FP services, a wide range of service infrastructure and outlets such as Health and Family Welfare Center (H&FWC), Rural Dispensary (RD), and Satellite Clinic (SC) at Union level and Thana Health Complex (THC) at Thana level has been established throughout the country. These are the focal points to provide health and family planning services in both rural and urban areas. Moreover, the Government is implementing an integrated health and FP service delivery through static centers called Community Clinics (CCs) for 6,000 population at village level.

To reduce the infant and child mortality through immunization against six major infections diseases, the Government of Bangladesh gave utmost emphasis on the need for successful implementation of the Expanded Programme on Immunization (EPI) initiated by the WHO in collaboration with the UNICEF and the World Bank. The government is committed to meet the goal of Universal Child Immunization in Bangladesh. In order to reach all children at an early age and to guarantee uninterrupted services, the present strategy of service delivery is oriented towards the provision of vaccination services through both fixed facilities and outreach sites.

The Government's efforts to provide health facilities at the various levels, though free of cost and managed by trained professionals, has however, not lead to desired level of use of the services. Reports from the government as well as private sources indicate that primary health care facilities are greatly under-utilized, despite the tremendous health needs and repeated efforts by the government to improve these services (PRICOR, 1987; FPHP, 1999). Although, antenatal care and safe delivery is an acknowledged requirement not only for mothers health, but also for the new-born babies (Gortmaker, 1979; Levy et al., 1971; Moller et al., 1989), it seemed most women in Bangladesh do not perceive the necessity of antenatal care and safe delivery. A recent study shows that only a negligible proportion of women use the Family Welfare Centre (FWC) or Stellite Clinic (SC) for antenatal care (Khanum, 1996). Home deliveries are also universal in Bangladesh (95 percent), and only 8 percent deliveries are attended by medically trained personnel (Mitra et al., 1997). According to the 1995 Health and Demographic Survey (HDS), only 14 percent cases the morbid persons go to governmental health care facilities for treatment and 19 percent pregnant women go to qualified doctor in government service facilities (BBS, 1996; Islam and Hossain, 1997). A recent study demonstrated that, while over 80 percent of women sought help for obstetric morbidity, only 13 percent went to a government facility for treatment and nearly half went to untrained providers such as village practitioners (Ahmed, et al., 1998). In view of the average population of a Thana and the prevailing morbidity, a large number of disease episodes are not dealt with by the government health services. In other words most of the people in rural areas remain

outside the reach of the government health system. On the other hand, a great majority of the sick people is found to use private facilities and traditional faith healers. The scenario thus presented is somewhat discouraging and is a source of considerable concern to the policy makers and programme managers.

At a number of national forums, now questions are being raised as to what factors are responsible for the low performance of the government health programme? Why, as various studies indicate, the public health services have failed to reach people? What changes or interventions are required and what level to improve the functioning of the programme? The available literature on health and family planning, which has grown in volume over the decades has however, failed to pinpoint specific bottlenecks of the programmes. There is growing need for more studies to understand these issues.

Utilization of maternal and child health services has been identified in a number of studies as an important factor determining maternal, infant and child mortality (Forteney et al., 1988; Kady et al., 1989; Rossiter et al., 1985; Holian, 1989; Bhandari et al., 1989; Paul, 1991). Utilization of MCH services also have strong effects on subsequent contraceptive use (Hotchkiss et al. 1999), and thus help reduce the fertility. In this regard, questions about the process of seeking and using services are of important. However, the use of health services is a complex behavioral phenomenon. It is related to the organization of the health-delivery system and is affected by the availability, quality, costs, continuity and comprehensiveness of services; social structure and health beliefs also affect use (Andersen, 1968; Fiedler, 1981; Kroeger, 1983). For preventive services like prenatal care or immunizations, the perception of need is more complicated than in the case of disease recognition, and involves beliefs about susceptibility, consequences and effectiveness of the intervention (Rosenstock, 1966). Empirical studies of preventive services have often found that use of services is more strongly correlated with demographic and socioeconomic characteristics than with health beliefs (Hingson and Hingson, 1976). Many studies in developing nation have found a strong effect of maternal education on use of maternal and child health services (Parker and Reinke, 1983; Monteith et al., 1987; Warren et al., 1987; Rutstein and Schoemaker 1990; Canvovas, 1991).

1.2   *Objectives of the Study*

The overall objective of this study is to examine the maternal and child health care seeking behaviour and identify the factors effecting the use or non-use of maternal and child health care services in Bangladesh with particular attention to the utilization of public health care facilities for effective antenatal care (ANC) and delivery care as well as for treatment of childhood morbidity. The specific objectives are to: (i) analyze the patterns and determinants of maternal health services utilization, and (ii) examine the patterns and determinants of childhood morbidity and treatment.

1.3 *Rationale and Limitations of the Study*

A systematic identification of the critical individual factors which may facilitate or impede the effective use of health services for reproductive health care and for treating childhood disease may help us to identify those who may be particularly disadvantaged, and hence provide information that policy makers can use to target services to those in greatest need. This will also enable health educators to design better intervention programs to ensure that the momentum that has been generated in improving maternal and child health will not only be sustained for the long term success of these strategies, but will also provide the basis for a more comprehensive primary healthcare system in the future.

It must be stated at the onset that while the emphasis of this paper is on user-related factors, it is important to acknowledge that it is only a part of the picture. Cultural factors (e.g. religiosity, prejudices, subordinate status of women, etc,) are not examined because this cannot be done by exploring DHS data. The role of some important service related factors, such as service quality, availability, cost, and other indicators of access, are also important components of the healthcare system. An explicit analysis of these issues is not possible using DHS data. Bangladesh Demographic and Health Survey (BDHS), however, contains some limited information on accessibility of health care services, which has also been analyzed here. Nevertheless, some indicators of population health and development is discussed as background information in the next section.

1.4 *Population Health Care Access and Development Indicators*

According to a population projection based on the 1991 Census, it is estimated that the total population of Bangladesh is about 123 million in 1997 and it is growing at a rate of 1.8 percent per annum (Ministry of Planning, 1998). The 1991 Census enumerated a total population of 112 million in 1991. Bangladesh's recent population of 123 million live in the comparatively small area of 147,570 sq. km., which makes Bangladesh the most densely populated country in the World (850 persons per sq. km.). Bangladesh ranks as sixth and ninth most populous country in Asia and the World respectively. There is, however, evidence of some decline in population growth in recent years. In 1973, population was 74 million and the rate of population growth was then 3.0 percent per annum. Over the last two decades, the total fertility rate has also declined dramatically, from 6.3 children per woman in 1975 to 3.3 in 1996/97 (MHPC, 1978; Mitra et al., 1997). Such steep decline in fertility has occurred in Bangladesh without a substantial improvement in socio-economic status, health condition and other factors thought to be needed to bring about a fertility decline. Some argue that the decline in fertility level was achieved mainly because of a more than average successful family planning programme (Cleland and others, 1994; Islam et al., 1998), which help rise the contraceptive prevalence rate to a moderately high level. According to the 1996-97 Bangladesh Demographic and Health Survey, the contraceptive prevalence rate in Bangladesh is 49 percent (Mitra et al., 1997) which was only 7.5 percent in 1975 (MHPC, 1978). Despite this, due to past high fertility and recent decline in mortality rates, Bangladesh's population has a tremendous growth potential built into its young age structure. Around 43 percent of the total population is aged below 15 years and women of reproductive age (15-49 years represent 46 percent of the total female population.

Some community characteristics can be expected to have an effect on health and family planning utilization. Such factors as distance to health and family planning services outlets, presence of NGO income generating activities, presence of health and family planning field workers are ways of measuring the general level of development of the area. Table 1.1 presents some service availability factors by urban and rural areas as demonstrated by the 1996-97 Bangladesh Demographic and Health Survey.

Table 1.1: Percent of ever married women aged 10-49 living in communities covered by health and family planning services according to urban-rural residence, BDHS 1996-97

Type of facility	Urban	Rural	Total
Distance to a thana health complex (THC)			
0-1 miles	61.9	14.9	20.3
2-4 miles	28.8	31.8	31.5
5+ miles	9.2	53.3	48.2
Mean distance to a THC	1.1	6.2	5.6
Distance to a FWC			
0-1 miles	53.4	41.9	43.2
2-4 miles	30.1	48.6	46.4
5+ miles	16.5	8.5	9.4
Mean distance to a FWC	2.3	3.3	3.2
Distance to a health clinic (HC)			
0-1 miles	89.3	46.5	51.4
2-4 miles	8.0	44.8	40.5
5+ miles	2.7	8.8	8.1
Mean distance to a HC	0.5	2.2	1.9
Distance to a pharmacy			
0-1 miles	98.6	76.5	79.1
2-4 miles	1.4	22.3	19.8
5+ miles	0.0	1.2	1.1
Mean distance to a pharmacy	0.01	0.8	0.7
% community with TV	32.0	17.0	18.7
% community with NGO income generating activities	58.9	59.2	59.2
% community with FP field worker	98.9	94.7	95.2
% community with Satellite clinic	72.3	93.6	91.1
% community with health worker	67.7	89.1	86.6

The results show that almost half of women live within five miles of the Thana Health Complex (THC) in Bangladesh, while only 18 percent live within 1 mile of the THC. The average duration of THC from the community is 5.6 miles; in rural areas the average distance is 6.2 miles and in urban areas it is 1.1 miles. Forty-three percent of women live within one mile of a family welfare centre (FWC), while 51 percent live within one mile of a health clinic (HC). Women live on an average 3.2 miles and 1.9 miles distance respectively from a FWC and HC. In urban areas the average duration of a health clinic and a FWC are respectively 0.5 and 2.3 miles, while in the rural areas the corresponding distances are 2.2 and 3.3 miles respectively.

Overall, governmental health services appear to be widely available, with urban women living closer to most services than their rural counterparts. About 19 percent of women have access to television in their communities. A health facility is said to be in the community if it is within less than one mile of the village. Health and family planning services are available to the majority of women in Bangladesh; 95 percent of ever-married women live in communities with family planning field workers, 91 percent live in an area covered by a satellite clinic and 87 percent of women live in communities covered by health workers. Nearly 19 percent of the women have access to television in their communities; Urban women have higher rate of access to television (32 percent) compared to rural women (17 percent).

Table 1.2: Selected indicators of development and health care access in Bangladesh

Indicators	
GNP per Capita (U.S. $), 1996	273
Population density/Sq. km.	850
% Population below poverty line (1996-97)	45
% Urban population/total, 1991	20
Total fertility rate, 1996	3.3
Life expectancy at birth (yr.), 1997	
Male	61
Female	60
Both sex	60
Infant mortality rate (per 1000 live births), (1992-96)	82
<5 mortality rate (per 1000 live births), (1992-96)	116
Maternal mortality ratio(/1000 live birth), 1996	4.3
% Babies with low birth weight (1995-97)	25
% Adult female literate (15+ yr.), 1991	25.8
% Population covered under	
essential health care (1995-97)	51
Physician/population, 1997	4,512
Nurse/population, 1997	10,714
Hospital bed/population, 1997	3,261
% Total expenditure on education, religion	
and cultural affairs (1997-98)	13.7
% Total expenditure on health, (1997-98)	4.4
% Total expenditure on Family Planning, (1997-98)	5.2
Per capita government expenditure	
on health and FP (US $), 1997	3.2

Sources: *Annual Development Programme 1997-98,* Ministry of Planning*;*
       Statistical Pocket Book 1998, Bangladesh Bureau of Statistics (BBS),
       Bangladesh Demographic & Health Survey, 1996-97,
       Birth Death Sample Registration, BBS;
       The Fifth Five Year Plan 1997-2002, Ministry of Planning

The accessibility of health services in a country is influenced by the socioeconomic conditions, allocation of resources for health, and the national health policy. It is a constitutional obligation of the government of Bangladesh to provide medical care to every citizen. Table 1.2 presents some important indicators on population health and development of Bangladesh as background information for understanding access and

utilization patterns of health care. Bangladesh is a very poor country (45 percent of the total population live below poverty level) with a small GNP of $273, and there has been little change in GNP during last 2 decades. The GNP is said to be closely related with the life expectancy (Fosu, 1994). However, Bangladesh has been able to raise its average life expectancy to 60 years which was 47 years during seventies. The main contributing factor for increasing trend in life expectancy is possibly the declining trend in infant and child mortality rate which declined respectively to 82 and 116 per 1,000 during 1992-96 from 117 and 173 per 1,000 during 1982-86 (Mitra et al., 1997). Child mortality has fallen faster than infant mortality during the period. A moderately high coverage of immunization (85 percent) among under five children, widespread uptake of tetanus toxoid by pregnant women, improvement in rehydration management of diarrhoeal diseases, expansion of Vitamin A supplementation and improved management of ARI are mainly responsible for declining trends in under-five mortality. However, a high proportion of low birth weight (25 percent) shows a gloomy picture of child health and nutrition status. The percentage of total expenditure on health is only 4.4 percent of the total annual development budget. The corresponding figure for family planning is 5.2 percent. In 1997, the per capita expenditure on health and family planning is about 3.2 US dollar (145 Taka) in Bangladesh. Bangladesh has a very poor adult female literacy rate (26 percent). Only 51 percent of the population has access to health services which is very low by any standard. The ratios of physician and nurses per population are also very low in Bangladesh. By 1997, doctor-population ratio reached to 1:4512, hospital bed-population ratio was 1:3261 and nurse-population ratio was 1:10,714 (Table 1.2).

1.5   *The Health Care Delivery System in Bangladesh*

Since its independence in 1971, the Government of Bangladesh has undertaken various programmes in different five year plans to achieve the goal of health for all (HFA). One of the major programme was the development of physical infrastructures like thana (now upazila) health complex (THC), district hospitals, medical college hospitals and other specialized instiues and hospitals throughout the country. At national level, the highest authority is the Ministry of Health and Family Welfare (MoHFW) which is responsible for policy making and macro-planning. Untill the fourth five year plan (1990-95), there were two directorates under the MoHFW – one for health services and the other for family planning. Each directorate was headed by a Director General.

To make the Bangladesh Health and Family Planning Programme sustainable and cost-effective through community participation, the government of Bangladesh has under taken an integrated health and family planning programme approach in its Fifth Five Year Plan (1997-2002). Under the new approach, Government has introduced a package of essential health services to meet the major health needs of the people of the country. At the community level, it has been planed to deliver the Essential Service Package (ESP) through a one-stop outlet called Community Clinic (CC). The government has already finalized the physical layout and functions of a CC and the construction of CC throughout the country is underway. The establishment of CC is thought to be a major reform of the existing Health and Family Planning service-delivery system. According to the plan a CC will, on an average, cover 6,000 population in the community. Each CC

will have a Health Assistant (HA) and a female Family Welfare Assistant (FWA). The HA will provide the health services and the FWA will provide non-clinical family planning services.

The ESP consists of five major components, such as i. Reproductive health: antenatal and postnatal care, safe delivery, RTI/STD, HIV-AIDS, maternal nutrition, family planning, etc.; ii. Child health: EPI, ARI, Vit-A, Measles, malnutrition etc.; iii. Communicable diseases prevention control: TB, Malaria, Leprosy, Kala Azar etc.; iv. Limited curative care: conjuctivities, scabies, ringworm etc.; and v. Behavoural Change Communication (BCC) or Information Education and Communication (IEC).

The government is following a three tier service delivery system: (a) community level-through community clinic, (b) union level- through union health and family welfare centres (UHFWC) and (c) thana level – through the thana health complex (THC).

There are about 4,062 Union Health and Family Welfare Centres (UH&FWFC) now functioning in the country. The UH&FWC is a permanent facility with daily outdoor patients services and headed by a Medical Officer (MO). Additional staff include a Family Welfare Visitor (FWV), Family Welfare Assistant (FWA), Health Assistant (HA), (sometimes) a pharmacist and two staff for menial tasks.

In each rural thana there is a thana health complex (THC) which is a permanent facility offering daily health and family welfare services for in and outdoor patients as well as supervisory services to other health services within the thana. It was planned to establish a total of 397 THCs in the country of which 390 had so far been made functional. Of the total 64 districts, 60 district hospitals have so far been constructed. Each of these hospitals have the bed capacity of 50-200 beds. Some of them are already upgraded to 250-bed hospitals.

A typical THC is a two story building and is headed by a Thana Health and Family Planning Officer (TH&FPO). Under TH&FPO there are 8 doctors (the Medical Officers) working in each THC. Among them 4 are general medical officers, one obstetrician/gynae specialist, one surgical specialist, one internal medicine specialist and one dentist. One of the medical officers is responsible for MCH/FP who also provides technical supervision over Family Welfare Centre (FWC) staff. Five nurses/midwives are assigned to the THC. A medical Assistant is assigned to the outpatient department. Accommodation for staff is provided at the THC compound. The THC covers on an average a population of around 200,000 people.

1.6   *Organization of the Report*

The report has been organized into five chapters. Chapter 1 is the introductory one giving background, objectives, rationale and limitation of the study. Chapter 1 also provides some important indicators of population healthcare access and development as background information. The chapter also describes the existing healthcare delivery system in Bangladesh. Chapter 2 describes the source of data, the conceptual framework,

the measurement of the dependent and independent variables, and the methods of analysis. Chapter 3 analyzes patterns and determinants of maternal health services utilization in Bangladesh. Chapter 4 presents patterns and determinants of child morbidity and treatment in Bangladesh. Chapter 5 provides discussion and policy implication of the study.

2.   Data and Methods

2.1   Source of data

The data used in this study come from the 1996-97 Bangladesh Demographic and Health Survey (BDHS). Since the DHS is such a well-known program, it will not be described fully here. A detailed description of the history and design of the program can be found in many readily available publications (Boerma et al., 1991) and the detailed of the 1996-97 BDHS may be seen in Mitra et al. (1997). The 1996-97 BDHS employed a nationally representative two-stage sample. The sample was selected from the frame of the Integrated Multipurpose Master Sample (IMPS), newly created by the Bangladesh Bureau of Statistics on the basis of the 1991 Census data. The survey considers ever-married women of age 10-49 years as eligible for interview. A sample of 9,099 households were selected from which 9,127 eligible women were successfully interviewed. Fieldwork began on 2 November 1996 and ended on 11 March 1997.

There were two main survey instruments: the household questionnaire and the individual questionnaire. The survey utilized another questionnaire called community questionnaire to collect community level data about some general characteristics including health and family planning service availability, their distance from the community of the sample points. The respondents of the community questionnaire were the members or chairman of the union council, village heads, local school-teachers, female opinion leaders and imams. The household questionnaire elicited information on the age, sex, marital status, and education of each member, in addition to indicators of socioeconomic status such as the characteristics of the dwelling, the existence of modern amenities, and the possession of modern appliances. The individual questionnaire included a maternal and child-health component which obtained information on the use of health-care services by the mother during pregnancy and delivery, childhood immunizations, and prevalence and treatment of diarrhoea for children born since October 1992, in addition to a retrospective fertility history and information on contraceptive use, fertility preferences, marriage, and the respondent's and her current partner's general background and work experience.

Although the BDHS collected fairly detailed data on the characteristics of individuals and households, and on the type of maternal and child health services utilized, no attempt was made to inquire about an individual respondent's beliefs concerning the effectiveness of modern medicine. Further, there was no effort to determine why a respondent chose to use one type of service rather than another, or to collect objective information concerning the cost and quality of different sorts of care.

We restrict our analysis to the last births born to ever-married women during the five years period prior to the interview date. The analysis thus based on 6,230 births that occurred during the 59 months immediately preceding the date of interview.

2.2 Conceptual framework

In specifying the determinants of utilization of healthcare services, several models of illness and health care utilization behaviours have been developed over the last few decades (Andersen, 1968; Rosenstock, 1967; Suchman, 1965; Suchman,1967; Fabrega, 1972; Chrisman, 1977; Igun, 1979; Ludwig and Gibson, 1969; Kroeger, 1983). Among these models, the Behavioural Model proposed by Anderson (Andersen, 1968) and later modified with his colleagues (Aday and Andersen, 1974; Aday, Andersen and Fleming, 1980; Andersen and Newman, 1973; Andersen et al. 1983) is the most dominating and widely used model. The Anderson Behavioural Model asserts that the use of health care services is a function of three sets of individual characteristics: predisposing, enabling, and need (Fig. 1.1). In this model, the use of health services is seen as a sequential and conditional function of the individuals' predisposition to use health services, their ability to obtain them, and their need to consume them. The predisposing factors reflect the fact that some facilities have a greater propensity to use health care services than other based on individual characteristics which include demographic (age, parity, education etc.) and health-related attitudinal (e.g. medical knowledge) factors. The enabling component reflects the fact that though the family may be predisposed to use health services, it must have some means for obtaining them. The enabling factors which may promote or hinder the use of health services include family resources such as income, family support, as well as community resources like the availability of health care providers. Though the predisposing and enabling components are necessary for the use of health services, they are not sufficient. In order for individuals or families to use health services, they must perceive some illness or its possibility among its members. This need, according to Anderson (Andersen, 1968) is the most immediate cause of the health service use. The need factors refer to the amount of illness that is perceived by the individual to exist (e.g. perceived health status, number of symptoms reported, number of disability days etc.) and the patterned reaction of the individual to the perception of illness (e.g. regular physician checkups etc.).

Fig. 2.1 Conceptual framework for the analysis of health services utilization
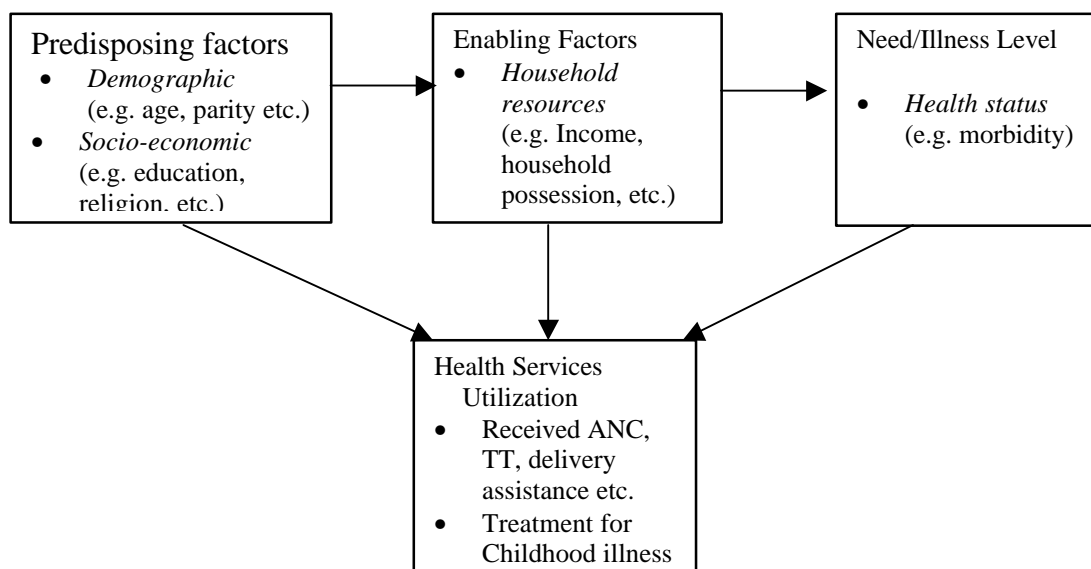
The Anderson Behavioural Model was originally applied to the use of hospital, physician and dental services (Adersen, Lion and Andersen, 1984; Wolinsky and Coe, 1984). However, it has been extended to other types of utilization such as in-home services (Coulton and Frost, 1982; Bass and Noelker, 1987) and nursing home services (Wolinsky et al., 1992; Wolinsky et al., 1993). Also, some investigators have successfully applied a modified version of the model to explain the use of other prominent health care services in developing countries such as traditional healers and informal drug sellers or peddlers in Accra, Ghana (Fosu, 1989), the use of antimalarials for episodes of fever presumed to be malaria in Guinea (Glik et al., 1989), and the use of home remedies and folk health care in Katmandu, Nepal (Subedi, 1989). As our interest lies in identifying the user related factors responsible for under-utilization of health care services, we have chosen a modified version of the Andersen's framework developed by Kroeger (1983) which incorporates "predisposing", "enabling", and "health services system" factors.

The sets of variables specified in the model could be translated into programmatic, applied, and policy initiatives. For instance, predisposing variables will help to identify the target groups and will suggest the changes that need to be made in the health care delivery system in order to make it more responsive to the needs of such groups.

2.3 *Measurement of Health Service Utilization*
(Definition of outcome or dependent variables)

To study the patterns and determinants of utilization of maternal and child health-care services, three outcome variables were considered. These are: (1) whether antenatal care (ANC) was received during pregnancy; (2) person attended during the delivery, and (3) treatment for childhood morbidity. For univariate and bivariate and multivariate analysis each of the variable was divided into different levels depending on the adequacy of care (Table 2.1).

Table 2.1: Description of the dependent variables in the analysis

Name of the variables	Codes/Categories
A. Maternal health services	
1. Antenatal care (ANC) received	1 = Adequate
	2 = Inadequate
	3 = None
2. Delivery assistant	1 = Medically trained personnel
	2 = TBA
	3 = Others/none
B. Child health services	
Received treatment for ARI two weeks prior to the survey	1= Govt. health facility or health providers
	2= Other sources
	3= None

Antenatal care: In the BDHS, women were asked if they had visited any one during their pregnancy, and if so, who they visited, and when and how many times they had visited for the births occurred during the last five years preceding the survey date. We, therefore, distinguish three groups of women: those who received antenatal care during pregnancy with a medically trained person (i.e., only doctor, nurse/midwife & family welfare visitor) in the first trimester and had 3 or more visits (adequate care); those with no care, and any other (inadequate care).

Delivery care: Mothers were asked who attended them during each of their deliveries. Delivery care is categorized into three levels according to the source of care: those who were attended by medically trained persons; those who were attended by TBA (trained or untrained), and none or any others.

Treatment of childhood morbidity: The most common childhood morbidity-cough and/ or rapid/difficult breathing in the last two weeks before the survey is examined in this study. The primary aim of questions on childhood morbidity in the BDHS was to assess treatment patterns. The main interest was in identifying children who were at a high risk of not receiving effective care. Hence, the emphasis was on use of medical facilities including hospitals, small clinics and private doctors. Children who were taken to these facilities were compared with those who were not.

2.4   *Measurement of Explanatory Variables*

The independent predictors of maternity and child health care services utilization included mainly the user related indicators of service access, socioeconomic and demographic factors. Table 2.2 outlines the operationalization of the explanatory variables.

We have utilized respondents' place of residence as a proxy to control for the differing levels of service access seen between urban and rural areas. Ownership of radio or television also chosen as a measure of access and communication to health messages.

The importance of age or birth cohort of mothers in health behaviour has long been recognized. It has been suggested that younger women tend to use healthcare services more frequently than older women, because the availability of modern health-care services has increased in recent years. A cohort effect may also be operating, since generally older women tend to have lower educational levels due to lower availability of educational services in the past. On the other hand, experience and skills acquired by older women should have a positive influence on the use of health services. Hence, to determine such influences, the age of the mother at the time of the birth of her child is categorized into five groups (Table 2.2).

Another structural variable included here was religion. Religion was represented by a dummy variable for Muslims and non-Muslims. Muslim women are expected to differ in receiving healthcare services due to their restricted movement and cultural norm than the non-Muslims. The educational attainment of the woman was grouped into three

categories (no education, primary and secondary and above) so as to capture critical educational transitions, which are directly related to employment prospects, and socio-economic status. Mothers were further distinguished according to their work status. As majority of the Bangladeshi women are housewife and add no cash to their household income, and those work, some of them work for cash and others for kind.

Table 2.2: Description of the independent variables used in the analysis

Name of the variables	Codes/Categories	Frequency	Percentage
Mother's age at birth	1 = <20	1,997	32.1
	2 = 20-24	2,045	32.8
	3 = 25-29	1,238	19.9
	4 = 30-34	607	9.7
	5 = 35 +	343	5.5
Mother's parity	1 = 1	1,191	19.1
	2 = 2	1,526	24.5
	3 = 3	1,148	18.4
	4 = 4	800	12.8
	5 = 5+	1,565	25.1
Mother's education	0 = No education	3,591	57.6
	1 = Primary	1,671	26.8
	2 = Secondary & above	968	15.5
Birth order	1 = 1	1,677	26.9
	2 = 2	1,455	23.4
	3 = 3	1,004	16.1
	4 = 4	713	11.5
	5 = 5+	1,381	22.2
Religion	0 = Non-Muslim	516	8.3
	1 = Muslim	5,714	91.7
Father's education	0 = No education	3,012	48.3
	1 = Primary	1,650	26.5
	2 = Secondary & above	1,568	25.2
Father's occupation	1 = Agriculture	1,582	25.4
	2 = Agricultural worker	833	13.4
	3 = Non-agricultural worker	2,146	34.4
	4 = Professional worker	248	4.0
	5 = Sales and service	1,317	21.1
	6 = Other's/unemployed	104	1.7
Division	1 = Barisal	408	6.6
	2 = Chittagong	1,541	24.7
	3 = Dhaka	1,902	30.5
	4 = Khulna	614	9.9
	5 = Rajshahi	1,331	21.4
	6 = Sylhet	434	7.0

Name of the variables	Codes/Categories	Frequency	Percentage
Age of child	1 = <1 year	1,245	20.0
	2 = 1-2 years	1,320	21.2
	3 = 3+	3,665	58.8
Mother's mobility	1 = Unrestricted	997	16.0
	2 = Restricted	3,072	49.3
	3 = No mobility	2,161	34.7
Place of residence	1 = Urban	557	8.9
	2 = Rural	5,673	91.1
Electricity	0 = No	4,903	78.7
	1 = Yes	1,327	21.3
Access to radio or TV	0 = No	3,488	56.0
	1 = Yes	2,742	44.0
Household possession	1 = Lower	4,354	69.9
	2 = Middle	1,273	20.4
	3 = Upper	603	9.7
Household status	1 = Lower	4,724	75.8
	2 = Middle	1,026	16.5
	3 = Upper	480	7.7
Slum residence	0 = No	6,131	98.4
	1 = Yes	99	1.6
Source of drinking water	1 = Piped water	221	3.6
	2 = Well Water	5,835	93.6
	3 = Other sources	174	2.8
Toilet facility	1 = Modern toilet	464	7.4
	2 = Pit toilet	2,010	32.3
	3 = Open / hanging latrine	2,115	34.0
	4 = No facility & others	1,641	26.3
Total		6,230	100.0

The age of the child is included in the analysis since it is associated with health and health-related behaviour of child. Birth order of the index child and parity of the mother was included to capture both the women's previous experience with pregnancy and birth, and family-size effects associated with health-service use. Maternal and child health care utilization may also vary with the mother's mobility status. Three groups of women were distinguished according to their mobility status: no mobility, restricted mobility (i.e. can go health care centre or outside village with son or husband), unrestricted mobility (i.e. can go health care center or outside village alone).

To control for economic status of the women, four proxy measures are used. The first proxy is the women's husbands' educational attainment, because education is closely associated with earnings of males in Bangladesh. In addition to serving as a proxy for

household income, husband's education also reflects tastes and preferences. Men with higher educational attainment may play a more important role in child-care decisions than men with less schooling (Caldwell, 1990). The second proxy for the family's economic welfare is an index of husband's occupation; we use a standard classification of occupations employed by the World Fertility Survey (Table 2.2). The third proxy measure of economic status is an index of household possession of durable goods. Responses were scored and a dichotomous variable was created giving the highest score to those having a TV. The scores were than totaled and categorized to three groups signifying low, medium and high economic status. A similar proxy measure of housing quality was also created.

2.5   *Methods of Analysis*

Births in the past 5 years are used as the unit of analysis. However, this approach has a constraint that some women may be represented more than once within each sample, and may contribute disproportionately to the analysis. For the analysis frequency distributions for all variables were examined, and cross tabulations of independent and outcome variables were reviewed to examine the interrelationship between them. For bivariate analysis, chi-square statistics were used to test whether the difference in outcome variable is significant for different categories of explanatory variables.

Multivariate analysis was done to assess the relative effects of the explanatory variables on outcome variables. Since our outcome variables include both dichotomous and trichotomous variables, we employed both binary logistic and multinomial logistic regressions.

3.   Patterns and Determinants of Maternal Health Services Utilization

3.1   *Introduction*

Antenatal care (ANC) is essential for both the mother and child health. The risk of maternal mortality and morbidity as well as neonatal deaths can be reduced substantial through proper antenatal care, such as regular antenatal check-ups during pregnancy and delivery under safe and hygienic condition (Moller, et al. 1989, Joseph, 1989). The importance of maternal health services in reducing maternal and infant morbidity and mortality has received significant recognition in the past decade (Rosenfield and Maine, 1985; Herz and Measham, 1987; Ebrahim, 1982). Studies demonstrating the high levels of maternal mortality in developing countries and research identifying causes of maternal death have repeatedly emphasized the need for prenatal care and availability of trained personnel to attend women during labor and delivery (Maine, 1986; Fauveau, 1988; Fortney, 1988).

This chapter focuses on the utilization of antenatal care, and on where and under whose care women deliver their birth in Bangladesh. It also examines the factors determining the variation in the utilization of maternity care.

3.2   Utilization of Antenatal Care (ANC)

Table 3.1 presents the percent distribution of births in five years preceding the survey by source of antenatal care received during pregnancy along with number of visits and timing of visit. A woman may have visited more than one antenatal care provider, but in this analysis, we have considered only the most qualified one. The result shows that a vast majority of women do not receive antenatal care in Bangladesh; nearly three-quarters (71.4 percent) of mothers did not receive antenatal care during pregnancy. About 29 percent of the women received some ANC. Among those who received care, majority of them (27 percent) received care from the government provided health professional such as doctor (20 percent), nurse or trained midwifes or family welfare visitor (FWV) (7 percent), and the rest 2 percent received care from other persons (birth attendant, private doctor and other sources) (Figure 3.1). The overall coverage for antenatal care is very low in Bangladesh, although, a vast majority of women (85 percent) appeared to recognize that antenatal care is beneficial for maternal and child health (Mitra et al., 1997). This implies that some socioeconomic, demographic and programmatic factors are responsible for low coverage of antenatal care in Bangladesh.

Figure 3.1 Percent distribution of births by source of antenatal care, Bandladesh 1996-97
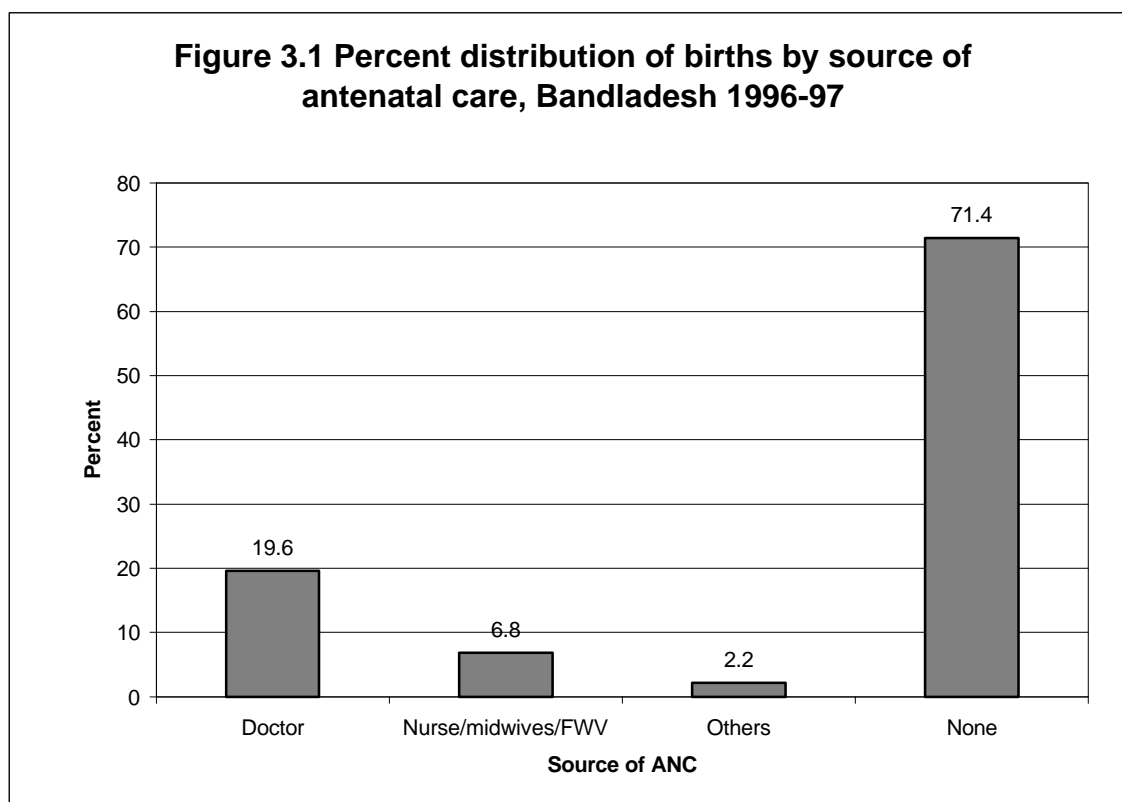
Antenatal care visits are considered most effective if the visits are started early pregnancy

period and continued at regular intervals throughout the pregnancy. Generally, on the average 12 to 13 visits are recommended during the whole pregnancy period with monthly visit for the first 7 months, fortnightly in the 8th month, and then weekly until birth. Results in Table 3.1 indicates that on the average pregnant women who seek antenatal care do so shortly before the fifth month of pregnancy and the median number of visits is 1.7. A comparison with the results from the 1993-94 BDHS shows that the level of antenatal care coverage in Bangladesh has remained virtually unchanged since 1993-94 when 28 percent mothers received antenatal care (Mitra et al., 1994:100).

Table 3.1: Percent distribution of live births in the five years preceding the survey by source of antenatal care, by number of antenatal care visits and by the stage of pregnancy at the time of the first visit, Bangladesh 1996-97

Characteristics	Percent of live birth
Sources of antenatal care	
Government Health professional	
Doctor	19.6
Nurse / Trained midwife & Family welfare visitor	6.8
Other persons	
Birth attendant (trained & untrained)	0.2
Other	2.0
No one	71.4
Number of visits	
None	71.4
1	8.8
2-3	13.6
4 +	5.8
Don't know	0.4
Median number of visits	1.7
Months pregnant at time of first visit	
No antenatal care	71.4
< 6 months	20.4
6-7 months	5.8
8+ months	2.1
Don't know	0.3
Median number of months pregnant at first visit	4.9
Total	100.0
Number of births	6,230

As we have mentioned earlier that for an effective antenatal care, in addition to a visit to a medically trained persons, the number and timing of visits are also important, we have classified the women who received ANC in to two categories: adequate and inadequate. If the woman received care from a medically trained persons (i.e., doctor, nurse/midwife & family welfare visitor) in the first trimester and had 3 or more visits we termed it "adequate" care and in any other cases we termed it "inadequate" care. Thus, among the women who received ANC, 6.6 percent cases it was adequate and the rest 22 percent received inadequate care, and 71.4 percent received no ANC (Table 3.1).

3.3   *Utilization of Delivery Care*

In order to reduce the risk of infections and facilitate management of pregnancy complications that can cause death or serious illness for the mother or the newborn, proper medical attention during delivery is very important. The high perinatal mortality and maternal mortality in Bangladesh may be attributed to the low prevalence of delivery care. Table 3.2 presents the percent distribution of births in the five years before the survey by place of residence and types of assistance during delivery. If the mother was assisted by more than one type of provider, only the most qualified person is considered in the analysis. Result show that almost all births (95 percent) took place at homes. Over all only 4 percent deliveries occurred at health facilities. Use of health facilities for delivery is much more higher in urban areas (23 percent) than in rural areas (2.2 percent).

It has been observed that nearly two-third (65 percent) of births are assisted by traditional birth attendant (*dai*), and an other one-fourth (25.7 percent) births are attended by relatives. Only 8 percent of births are assisted by medically trained personnel provided by government facilities of which 5 percent utilized doctors and other 3 percent utilized nurses or midwives or family welfare visitors. All these figures indicate a very poor rate of utilization of government health care facility at the time of delivery. As expected, births in urban areas are more likely to be assisted by medical personnel (doctors, nurses, midwives, or family welfare visitors) than urban births (35 percent vs. 6 percent). On the other hand, traditional birth attendants, relatives and other are utilized more by the mothers from rural areas than their urban counterparts (Table 3.2).

A comparison with the results from the 1993-94 BDHS shows that there has been a slight decrease over time in the proportion of births assisted by medically trained personnel. Data from the 1993-94 BDHS shows that about 10 percent of births were assisted at delivery by a doctor, trained nurse or midwives (Mitra et al., 1994:105). The corresponding figure in 1996-97 is only 8 percent.

Table 3.2: Percent distribution of live births in the five years preceding the survey by place of delivery and type of assistance during delivery, Bangladesh 1996-97

Background characteristic	Urban	Rural	Total
Place of delivery			
Health facility	23.0	2.2	4.1
At home	74.4	97.0	95.0
DK/missing	2.5	0.8	1.0
Type of assistance during delivery			
Government health professionals			
Doctor	24.1	3.4	5.2
Nurse/midwife & family welfare visitor	10.6	2.1	2.8
Other persons			
Trained TBA[1]	9.6	7.3	7.5
Untrained TBA[1]	41.2	58.7	57.2
Relative/other	14.3	26.9	25.7

No one/DK	0.2	1.7	1.5
Total	100.0	100.0	100.0
Number of births	557	5673	6,230

Note: Tables are for births in the period 0-59 months preceding the survey
[1] TBA:Traditional birth attenndant

3.4   Determinants of Utilization of ANC

3.4.1   Bivariate Analysis

Bivariate analysis with chi-square test shows numerous significant association between different background characteristics and ANC received. Table 3.3 presents the percentage of the women who received ANC (adequate or inadequate) during pregnancy of their last birth by selected socio-demographic characteristics. The age of mothers clearly stands out to be one of the most important factors both in the utilization of antenatal care and the choice of health care provider. Mothers aged within 20s show higher prevalence of receiving adequate ANC compared to teenagers and women older than aged 30 years.

Table 3.3: Percentage distribution of live births in the five years preceding the survey for which the mother received antenatal care during pregnancy according to selected demographic and socioeconomic characteristics of the mother, Bangladesh 1996-97

	Antenatal care (ANC) received			
Background characteristics	Adequate[a]	Inadequate[b]	None[c]	Number of births
Mother's age at birth ***				
<20	6.3	23.0	70.7	1,997
20-24	7.2	23.1	69.7	2,045
25-29	7.6	20.9	71.5	1,238
30-34	5.3	19.4	75.3	607
35+	3.5	18.7	77.8	343
Parity ***				
1	11.4	25.9	62.7	1,677
2	6.9	24.0	69.1	1,455
3	5.9	23.6	70.5	1,004
4	4.1	19.8	76.2	713
5+	2.3	15.3	82.4	1,381
Ever used any contraceptive ***				
Yes	7.9	24.1	68.0	4,407
No	3.6	16.9	79.5	1,823
Future fertility intension ***				
Want	8.1	24.4	67.5	2,385
Don't want	5.5	20.7	73.8	3,611
Undecided	7.7	18.3	74.0	234
Last birth was wanted ***				
Yes	7.0	22.2	70.9	5,550
No	3.5	21.0	75.4	680
Mother's education ***				
No education	2.4	15.5	82.0	3,591
Primary	5.1	26.2	68.8	1,671
Secondary & above	24.8	38.9	36.3	968
Religion ***				
Non-Muslim	9.3	28.0	62.7	516
Muslim	6.4	21.5	72.1	5,714
Region of residence ***				
Barisal	7.1	21.5	71.4	408

	Adequate[a]	Inadequate[b]	None[c]	Number of births
Chittagong	7.0	25.8	67.2	1,541
Dhaka	8.1	19.6	72.3	1,902
Khulna	5.5	24.6	69.9	614
Rajshahi	4.8	22.2	73.0	1,331
Sylhet	5.1	15.2	79.7	434

	Antenatal care (ANC) received			
Background characteristics	Adequate[a]	Inadequate[b]	None[c]	Number of births
Mother's mobility *				
Unrestricted	10.8	28.9	60.3	997
Restricted	7.2	23.2	69.6	3,072
None	3.8	17.2	78.9	2,161
Mass media exposure				
Yes	11.8	29.7	58.5	2,767
No	2.4	15.9	81.7	3,463
Place of residence *				
Urban	26.8	36.4	36.8	557
Rural	4.6	20.6	74.8	5,673
Electricity in the household*				
No	3.3	18.1	78.6	4,903
Yes	18.7	36.8	44.5	1,327
Access to radio or TV *				
No	2.5	16.1	81.5	3,488
Yes	11.9	29.6	58.5	2,742
Husband's education *				
No education	2.4	16.1	81.5	3,012
Primary	4.4	22.0	73.6	1,650
Secondary & above	17.0	33.5	49.5	1,568
Husband's occupation *				
Agriculture	3.0	17.3	79.7	1,582
Agricultural worker	1.6	13.2	85.2	833
Non-agricultural worker	6.4	24.3	69.3	2,146
Professional worker	27.7	34.9	37.3	248
Sales and service	9.9	26.7	63.3	1,317
Other's/unemployed	13.5	26.9	59.6	104
Household assets index *				
Lower	2.9	17.6	79.5	4,354
Middle	9.9	30.7	59.4	1,273
Upper	26.0	36.0	38.0	603
Household quality *				
Lower	3.8	19.8	76.5	4,724
Middle	6.5	25.8	67.6	1,026
Upper	34.6	36.3	29.2	480
Source of drinking water *				
Piped water	45.0	32.4	22.5	221
Well water	5.2	21.9	72.9	5,835
Other sources	4.6	12.0	83.4	174
Toilet facility *				
Modern toilet	32.1	37.9	30.0	464
Pit toilet	7.7	27.8	64.5	2,010
Open/hanging latrine	3.5	17.2	79.2	2,115
No facility	2.0	16.7	81.4	1,641
Total	6.6	22.0	71.4	6,230

[a] Received at least three antenatal care visits with first visit during the first three months of pregnancy from medically trained personnel (i.e., doctor, nurse & family welfare visitor).
[b] Received antenatal care from untrained persons.

Inadequate ANC, however, shows declining trend with the age. Both adequate and inadequate ANC show negative relationship with mother's parity. For example, 11.4 percent of the mothers with parity 1 received adequate ANC, while it is only 6.9 percent for the mothers with parity 2 and then gradually declined with parity. Women's contraceptive use status also have positive relationship with the utilization of ANC. Those mothers who wanted more children and whose last birth was wanted birth were more likely to received ANC than their counter parts. The proportion of mothers who received ANC (both adequate and inadequate) is substantially higher in urban areas (63 percent) than that in rural areas (25 percent).

There are some regional variation in ANC received. Overall Chittagong division shows higher prevalence of ANC received followed by Khulna, Barisal, Dhaka Rajshahi and Sylhet division shows lowest performance of ANC received. However, adequate ANC shows highest prevalence in Dhaka division followed by Barisal, Chittagong, Khulna, Sylhet and Rajshahi.

Both mother's and father's education show strong positive relationship with the ANC received. For example, only 2.4 percent of mothers having no education received adequate ANC, while it was about 25 percent among mothers having secondary or above level of education. Father's occupation also have substantial effect on ANC received. About 63 percent of the children to the mothers whose husbands are professional worker (i.e. in while collar job) received ANC compared to only about 20 percent for the husbands who are agriculturist.

ANC shows highest prevalence among mothers who have unrestricted mobility. Only 3.8 percent of the mothers who have no mobility received adequate ANC compared to 10.8 percent for the mothers who have unrestricted mobility (Table 3.3). Mass media exposure also have positive effect on ANC received.

Non-Muslim (mostly Hindus) mothers are more likely to received ANC (37 percent) than their Muslim counterparts (28 percent). Mothers economic status as measured by the household possession of durable items, household quality, toilet facility and source of drinking water also show substantial effect on ANC received.

Table 3.4 provides interrelationship between service accessibility and utilization of ANC. A health facility is said to be in the community if it is in the village/mahalla or within less than 1 mile distance from village/mahalla. It is evident from the table that ANC utilization rate is substantially higher if there is a health facility such as THC or FWC or health clinic or rural dispensary in the community. This is true for both adequate and inadequate ANC. The utilization of ANC and the distance of a health care facility is negatively associated. For example, about 13 percent of the mother received adequate ANC if there is a health clinic in the community, while only 4 percent mothers received

adequate ANC if the health clinic is 2 or more miles far from the village. A TV set in the community also shows positive effect on the utilization of ANC.

Table 3.4: Percentage distribution of live births in the five years preceding the survey for which the mother received antenatal care during pregnancy according to selected community and accessibility of maternal & child health service factors, Bangladesh 1996-97

Background characteristics	Antenatal care (ANC) received			Number of births
	Adequate[a]	Inadequate[b]	None[c]	
Distance to THC ***				
In the community	19.8	33.4	46.8	575
1 mile	10.9	28.1	60.9	402
2+ miles	4.8	20.4	74.8	5,211
Distance to health clinic ***				
In the community	12.8	27.8	59.4	1,628
1 mile	5.3	19.8	74.9	1,495
2+ miles	3.8	20.2	76.0	3,065
TV in the community ***				
Yes	10.8	25.7	63.5	1,074
No	5.7	21.4	73.0	5,113
Distance to FWC***				
In the community	8.8	25.9	65.3	1,167
1 mile	6.2	20.7	73.0	1,573
2+ miles	5.9	21.5	72.6	3,447
Distance to pharmacy ***				
In the community	8.5	23.9	67.6	3,504
1 mile	4.7	19.5	75.8	1,393
2+ miles	3.3	20.1	76.5	1,291
Distance of rural dispensary				
In the community	10.6	28.1	61.3	899
1 mile	8.9	21.1	70.0	639
2+ miles	5.5	21.1	73.5	4,650
Total	6.6	22.1	71.3	6,188

Note: Tables are for births in the period 0-59 months preceding the survey.
[a] Received at least three antenatal care visits with first visit during the first three months of pregnancy from medically trained personnel (i.e., doctor, nurse & family welfare visitor).
[b] Received antenatal care from untrained persons.
[c] Didn't receive antenatal care.
* = $p \leq 0.05$; ** = $p \leq 0.01$; *** = $p \leq 0.001$.

3.4.2 *Multivariate analysis*

In the previous section, we have examined the differentials of utilization of ANC by bivariate analysis, which can only provide us a preliminary idea of how important each variable is by itself. Though bivariate analysis is a useful first step in studying the relationship between two variables, it is, however, fail to quantify the independent effect or relative importance of each of the variable. Multivariate analyses enable us to examine to what extent the observed relationships are independent of each other and how the differentials in utilization altered when the association is adjusted for the simultaneous effect of the different characteristics of the respondent and her households. Since our dependent variable (ANC received) is a trichotomous variable having three mutually exclusive categories (none, inadequate and adequate), we have employed a multinomial

logistic regression model. The result is presented in Table 3.5. The regression coefficients and the relative odds of only significant covariates are presented in the table.

Results of multivariate analysis indicate that different socioeconomic, demographic, household characteristics and health care access variables have similar patterns of relationship with any kind of health care outcome (i.e. adequate or inadequate ANC). Mother's parity, education, mobility status, place of residence, mass media exposure, father's occupation, household possession of electricity, household possession of durable items, presence of NGO income generating activities, TV in the community, distance to health clinic and distance to THC show significant effect on receiving adequate and inadequate ANC (Table 3.5).

For all health-care outcomes, mother's parity has significant negative effect on utilization of antenatal care. Women with higher parity are less likely to use both adequate and inadequate ANC. Each parity of mothers decreased the odds that mother received some (inadequate) prenatal care by 8 percent and of adequate care by 13 percent.

Mother's education appeared as important predictor of ANC. Mother's education show strong positive association with receiving antenatal care. Each year or grade of mother education raised the odds that mother had received adequate care by 26 percent and of inadequate care by 13 percent (Table 3.5). Father's occupation shows significant effect on ANC. Women whose husbands are professional worker (i.e. white collar job) and whose husbands are businessmen had higher odds of receiving adequate ANC than those women whose husbands are agriculturist. Mother's mobility status also appeared as an important predictor of receiving both adequate and inadequate antenatal care. Mothers with unrestricted mobility (can go health care centre or outside village alone) are 1.4 times more likely to receive adequate ANC and inadequate ANC than those with no mobility (Table 3.5). Mother's mass media exposure also shows significant effect on utilization of ANC. Mothers having mass media exposure are 1.5 times more likely to use adequate ANC and 1.4 times more likely to use inadequate ANC than mothers having no mass media exposure.

The non-service related community-level factors such as place of residence (urban/rural), presence of NGO income generating activities and TV set in the community also have significant effects in expected direction. Women residing in urban community or in the community having a TV set, and NGO income generating activities are observed to have used ANC more intensively in connection with recent births than residents of rural communities and those without TV set in the community or no NGO income generating activities.

Table 3.5: Multivariate logistic regression estimates of regression coefficient and relative odds of receiving adequate and inadequate antenatal care from medically trained personnel

Covariates	Received adequate ANC (reff.=None)		Received inadequate ANC (reff.=None)		Number of births
	Coefficient (β)	Odds ratio	Coefficient (β)	Odds ratio	
Parity	-0.137**	0.87	-0.086***	0.92	6,230
Place of residence					
Urban (reff.)		1.00		1.00	557
Rural	-0.511**	0.60	-0.359**	0.70	5,673
Electricity in the household					
Yes (reff.)		1.00		1.00	1,327
No	-0.391**	0.68	-0.431***	0.65	4,903
Mother's education (yrs.)	0.232***	1.26	0.125***	1.13	6,230
Religion					
Non-muslim (reff.)				1.00	516
Muslim			0.276**	1.31	5,714
Husband's occupation					
Agriculturist (reff.)		1.00		1.00	1,582
Agricultural worker	0.104	1.43	0.019	0.98	833
Non-agricultural worker	0.362	1.45	0.250**	1.28	2,146
Professional worker	0.785**	2.19	0.511**	1.66	248
Sales and service	0.376*	1.45	0.227*	1.25	1,317
Others	1.248**	3.48	0.488	1.63	104
Mother's mobility status					
Unrestricted (reff.)		1.00		1.00	997
Restricted	-0.346**	0.71	-0.338***	0.71	3,072
No mobility	-0.63**	0.38	-0.694***	0.50	2,161
Mass media exposure					
Yes (reff.)		1.00		1.00	2,767
No	-0.409**	0.66	-0.296***	0.74	3,463
Household assets index	0.022*	1.02			6,230
Toilet facility in household					
Modern toilet (reff.)		1.00		1.00	464
Pit toilet	-0.568**	0.57	-0.386**	0.68	2,010
Open/hanging latrine	-0.84**	0.50	-0.640***	0.53	2,115
No facility & others	-0.798**	0.45	-0.552**	0.58	1,641
Distance to thana heath complex			-0.023**	0.98	6,230
Distance to health clinic	-0.106***	0.89	-0.053**	0.95	6,230
Presence of NGO income generating activities					
Yes)				1.00	3,698
No			-0.171**	0.84	2,489
TV in the community					
Yes		1.00		1.00	1,074
No	-0.338*	0.71	-0.178*	0.84	5,113

reff. = reference category, *= p<.05, **= p<.01, ***= p<.001

Urban mothers are 1.7 times and 1.4 times more likely to receive adequate and inadequate antenatal care respectively than the rural mothers. The fact that such an urban-rural differential persists even after the effects of other socio-demographic factors and supply factors for ANC services have been controlled statistically might be indicative of

a broader social awareness/acceptance of the importance of such services for the health of women and children in urban than in rural areas, or perhaps demand for higher child quality in urban than in rural households. A TV set in the community increased the likelihood of receiving the adequate and inadequate ANC by 1.4 and 1.2 times respectively. Presence of NGO income generating activities in the community also appears as an important predictor of receiving inadequate ANC, but it has no significant effect on receiving adequate ANC.

Mother's economic status as measured by household possession of durable items shows significant positive effect on receiving adequate ANC. Each unit increase in household assets raised the odds of receiving adequate ANC by 2 percent (Table 3.5). Household assets does not show any significant effect on receiving inadequate ANC. Possession of electricity in the household (a proxy measure for household well being) also have positive effects on utilization of ANC. Births to the mothers having no electricity in the household are 1.5 times less likely to receive adequate ANC than their counterparts. Modern toilet facilities in the household also associated with the economic condition of the households. Modern toilet facility in the household is an important predictor of receiving adequate and inadequate ANC.

Among the various supply factors associated with ANC services, distance to the thana health complex (THC) and distance to a health clinic are observed to have significant effects along the lines anticipated. Distance to the THC is negatively associated with inadequate ANC but it does not have any significant effect on adequate ANC. Bangladeshi women also appear to be negatively responsive to the distance to the nearest community level health clinic, a proxy measure for the time and travel cost of service use.

3.5   *Determinants of Utilization of Delivery Care*

Bivariate analysis with chi-square test shows numerous significant association between different background characteristics and utilization of delivery assistance. However, for the sake of brevity we concentrate only to the results of the multivariate analyses which provides adjusted association of different characteristics of the respondent and her households with utilization of delivery care (results of bivariate analysis may be seen as appendix Table A).

To identify the factors effecting the utilization of medically trained personnel (doctor or nurse or FWV) and TBA we employed multinomial logistic regression as our dependent variable is a trichotomous one. The results are presented in Table 3.6.

It has been observed that mother's parity has significant negative effect on receiving delivery assistance from health care services and it has no significant association with utilization of TBA during delivery. Women with higher parity are less likely to use health facilities for delivery assistance.

Mother's education show strong positive association with receiving delivery assistance from government health facility. Each year of mother education raised the odds that mother had received delivery assistance from government provided health personnel by 18 percent. Mother's education have no significant association with receiving delivery assistance from TBA when other factors are controlled (Table 3.6).

Table 3.6: Odds ratios for variables estimated from trichotomous logistic regression of delivery assistant, Bangladesh 1996-97

Covariates	Relative odds of delivery assistant (ref. = Other's[c])			Covariates	Relative odds of delivery assistance (reff.=Others)		
	Medically Trained personnel[a]	TBA[b]	Number of birth		Medically Trained personnel[a]	TBA[a]	No. of birth
Parity	0.89*		6,230	Toilet facility			
Mother's education	1.18***		6,230	Modern toilet (reff.)		1.00	464
Mass media exposure				Pit toilet		1.53*	2,010
Yes	1.00		2,767	Oper/hanging		1.91***	2,115
No	0.73*		3,463	No facility		1.24	1,641
Future fertility intentionen				Distance to			
Want more (reff.)	1.00		2,385	health clinic	0.94*	0.98*	6,230
Do not want	0.77*		3,611	TV in the			
Undecided	0.47*			community			
Last birth was wanted				Yes (reff.)		1.00	1,074
Yes (reff.)	1.00		5,550	No.		0.76*	5,113
No	0.56*		680	Presence of NGO			
Place of residence				income generating			
Urban (reff.)	1.00	1.00	557	activities			
Rural	0.38***	1.31***	5,673	Yes	1.00		
Region of residence				No	0.77***		
Barisal (reff.)	1.00	1.00	408	Presence of Govt./NGO			
Chittagong	0.95	1.34**	1,541	health clinic			
Dhaka	0.60*	0.64***	1,902	Yes	1.00		
Khulna	1.90*	0.82	614	No	1.04		
Rajshahi	0.52**	0.49***	1,331				
Sylhet	0.94	0.84	434				
Religion							
Non-Muslim	2.87***	1.31*	516				
Muslim (r)	1.00	1.00	5,714				
Household electricity							
Yes (reff.)	1.00	1.00	1,327				
No	0.57***	0.73**	4,903				
Husband's occupation							
Agriculturist	1.00		1,582				
Agricultural worker	0.99		833				
No-agricultural worker	1.23		2,146				
Professional worker	1.87*		248				
Sales and services	1.41*		1,317				
Other	2.99*		104				
Mother's mobility status							
Unrestricted (reff.)	1.00	1.00	997				
Restricted	0.66*	0.93	3,072				
No mobility	0.55**	0.76*	2,161				
Household assets	1.03**		6,230				
Household quality (score)	1.08**	1.07**	6,230				

reff.= reference category
*=p<.05, ** = p<.01, *** = p<.001

a Doctor, nurse and family welfare
b Trained and untrained traditional birth attendant
c Relative, none, others

Mother's future fertility intention and wanted status of last birth are important predictor of receiving delivery assistance from health facilities. Mothers who wanted more children are more likely (1.3 times to 2.1 times) to use health facilities for delivery assistance than those who did no want more children or who remained undecided. If the last birth was an wanted birth, it increased the odds of receiving delivery assistance from health facilities.

Urban mothers are 2.6 times more likely to receive delivery assistance from health professional than their rural counterparts. However, rural mothers are more likely (1.31 times) to use TBA for delivery assistance than urban women. Region of residence is also an important predictor of receiving delivery assistance from both medically trained personnel and TBA (Table 3.6). Mothers from Khulna and Barisal division are more likely to use medically trained personnel for delivery care than other divisions, while mothers from Chittagong and Barisal divisions have higher odds of using TBA than mothers from other divisions.

Mother's mass media exposure also shows significant effect on utilization of government health facility at the time of delivery. Mothers having mass media exposure are 1.4 times more likely to use health facilities for delivery assistance than mothers having no mass media exposure. Non-Muslim mothers are 2.87 times more likely to use medically trained personnel than their Muslim counter parts, while Muslim mothers are more likely to use TBA at the time of delivery than their non-Muslim counterparts.

Mother's mobility status also appeared as an important predictor of receiving delivery assistance from medically trained personnel and from TBA. Mothers with unrestricted mobility (can go health care centre or outside village alone) are 1.5 times more likely to receive delivery assistance from medically trained personnel. However, unrestricted mobility has negative association with receiving delivery assistant from TBA. Those who have restricted mobility or no mobility are more likely to receive delivery assistance from TBA than those with unrestricted mobility (Table 3.6).

Mother's economic status as measured by household possession of durable items shows significant positive effect on receiving assistance at the time of delivery from medically trained personnel. Each unit increase in household assets raised the odds of receiving delivery assistance from trained personnel by 3 percent. Household assets does not show any significant effect on receiving delivery assistance from TBA. Possession of electricity in the household reflects better economic condition of the households. Births to the mothers having no electricity in the household are less likely to receive delivery assistance from medically trained personnel than their counterparts. Household quality index also have positive effects on receiving delivery assistance from government health facilities and TBA. Each unit increase in the quality of households increased the odds of receiving delivery assistance from medically trained personnel and TBA by 8 percent and 7 percent respectively (Table 3.6).

Distance to the thana health complex (THC) is negatively associated with reception of delivery assistance from medically trained personnel and TBA. Distance to health clinic also negatively associated with delivery assistance received from medically trained personnel. Presence of NGO income generating activities in the community also appears as an important predictor of receiving delivery assistance from TBA, but it has no significant effect on receiving delivery assistance from medically trained personnel.

4. Patterns and Determinants of Childhood Morbidity and Health Services Utilization

4.1 Introduction

To understand the utilization patterns of health care services for childhood morbidity, we concentrate our attention to a major childhood morbidity: acute respiratory infection (ARI) in Bangladesh. In Bangladesh, ARI is one of the major causes of morbidity and mortality among children. According to a recent study, 23 percent of infant deaths and 25 percent of deaths among children aged 1-4 years were attributable to ARI (Baqui et al., 1997). Common symptoms associated with severe respiratory infection include fever, cough, and difficult or rapid breathing. According to WHO guidelines, ARI shows the symptoms of iaability to suck or drink, presence of fast or difficult breathing or chest in drawing with caugh and cold. In the BDHS information on the symptoms of ARI were collected by asking mothers if their children under age five had been ill with cough accompanied by short, rapid breathing during the two weeks preceding the survey. Mothers were also asked what they had done to treat the illness if their children had experienced such symptoms of ARI. It is worth mentioning that the BDHS estimate ARI prevalence corresponding to an estimate of the prevalence of children who need treatment from presumed pneumonia and does not include other ARI-related conditions covered under the WHO guidelines for ARI case management. In Bangladesh, where large majority of the women of reproductive age are illiterate or have few years of schooling (only 16 percent of the respondents have had secondary or above level of education), the reports of any disease in general and ARI in particular is subject to be imprecise, since they are on a mother's subjective assessment.

4.2 Prevalence of Childhood ARI

It has been observed that almost 13 percent of children under five years had a cough with rapid breathing (i.e. ARI) in the two weeks before the survey (Table 4.1). Slightly lessthan one-third (31.5 percent) of under five children were reported to have cough in the two weeks preceding the survey. According to BDHS 1993-94, the prevalence of ARI was 16.1 percent among the children of age under five years (Figure 4.1). Comparison between two results indicates that prevalence of childhood ARI has decreased over time.

Table 4.1: Among under-five children, the percentage having cough, cough with rapid breathing during the last two weeks preceding the survey, Bangladesh 1996-97

Symptom	percent
Having cough in last two week	31.5
Cough with rapid breathing (ARI)	12.8
Total number of children	5,654

Figure 4.1 Prevalence of ARI among under-five children in 1993-94 and 1996-97
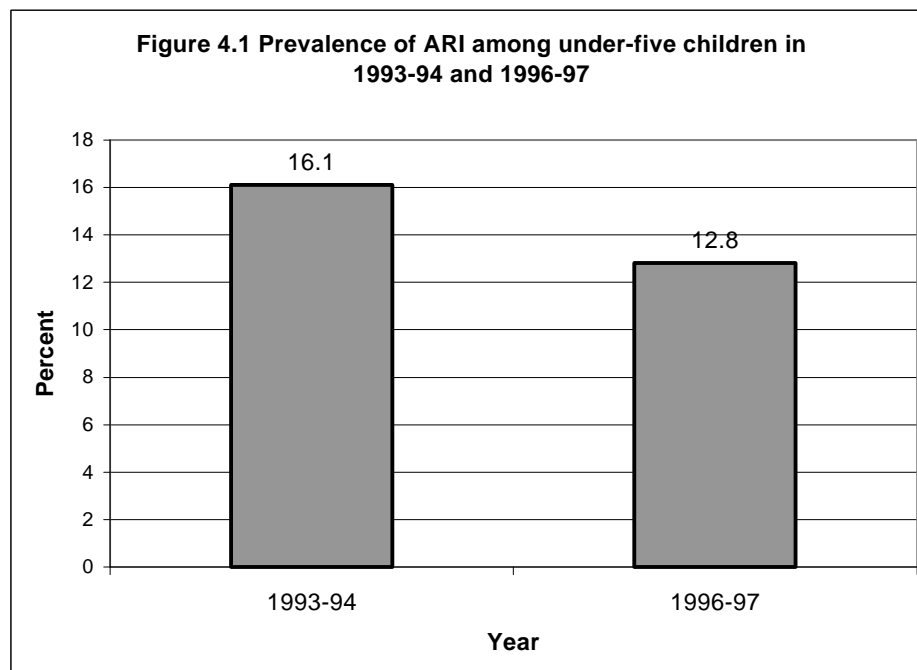
4.3   *Determinants of Childhood ARI*

Multivariate logistic regression analysis identifies age of child, subsequent birth interval, wanted status of last birth, nutritional status of children, mother's mobility status, father's occupation, household quality and distance to THC as significant predictors of ARI. Age of child has significant negative association with ARI. Each month of age of child decreased the odds of having ARI by 3 percent. Subsequent birth interval also have similar association with childhood ARI. Each month increase in subsequent birth interval decreased the likelihood of ARI by 2 percent. Child's nutrition status appeared as an important predictor of ARI. ARI shows significant negative association with the nutrition status of the children (Table 4.2).

Father's occupation is also an important predictor of ARI. Children whose fathers are non agricultural worker or whose fathers are professional workers and businessmen are more likely to have ARI than the children whose fathers are farmer. This result seems to be conflicting. The higher prevalence of ARI among children whose fathers are professional worker and businessman than children whose fathers are agriculturist may be attributed to the subjective nature of reporting the symptoms of ARI. The agriculturist may have under reported the disease due to lack of perception about it. Besides the effect of sampling fluctuation can not be ruled out.

Mothers mobility status shows significant negative effect on the prevalence of ARI. Children to mothers with no mobility are more likely to have ARI than those whose mothers have unrestricted mobility. Household quality, which is a proxy measure of economic conditions of the respondent, shows significant negative association with ARI. An increase in the quality of household decreased the odds of having ARI by 12 percent. Distance to THC from community shows positive association with ARI (Table 4.2).

Table 4.2: Multivariate logistic regression estimates of coefficient and odds ratios for significant risk factors of ARI among under five children during two weeks preceding the survey, Bangladesh 1996-97

Covariates	Coefficient (B)	Odds ratio	No. of children
Age of child (months)	-0.033***	0.97	5,654
Subsequent birth interval (months)	-0.016*	0.98	5,654
Wanted last birth			
Yes (reff.)		1.00	5,041
No	0.266*	1.31	613
Mother's mobility status			
Unrestricted	-0.333**	0.72	911
Restricted	-0.155	0.86	2,806
No mobility (reff.)		1.00	1,937
Father's occupation			
Farmer (reff.)		1.00	1,434
Agri. labourer	0.017	1.02	843
Non-agri. labourer	0.238*	1.27	1,943
Professional worker, sales and services	0.399**	1.49	1,434
Weight for age			
Severely underweight		1.00	999
Moderately underweight	-0.194	0.82	1,710
Not underweight	-0.337**	0.71	2,071
Household quality index (score)	-0.124***	0.88	5,654
Distance to THC	0.022*	1.03	5,654

reff.= reference category, *=p<.05, **=p<.01, ***=p<.001

Figure 4.2 shows the percentage of the ill children with ARI who have received treatment from different sources. About 31 percent of the sick children received no treatment for their ailment. About 69 percent received some treatment. Among those who received treatment, majority of them (45.8 percent) received treatment from non-qualified health provider (such as pharmacy, shop, traditional doctors or homeopathic doctor), and the rest one-forth (23.5 percent) received treatment from government provided health facility and qualified private health provider/doctor.

Figure 4.2 Percentage of Ill Children with ARI Who Have Received Treatment From Different Sources
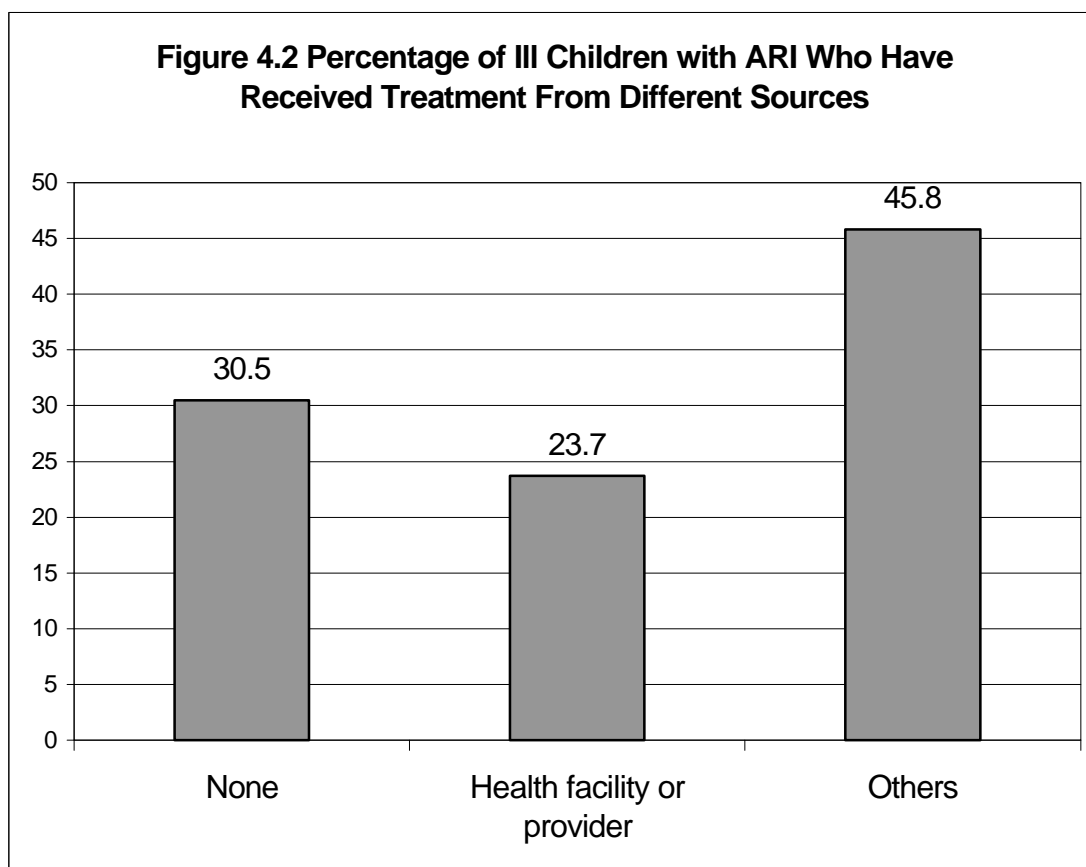
4.4 *Factors Associated with Child Health Care Utilization*

For the sake of brevity we avoid the description of the results of bivariate analysis showing unadjusted differentials of child health care utilization and concentrate only to the multivariate analysis using logistic regression technique (results of bivariate analysis may be seen as appendix Table B). As our dependent variable, the child health care utilization, is a trichotomous variable, we employed a multinomial logistic regression. Table 4.3 presents the results of the multinomial logistic regression analysis showing the odds of receiving treatment from health facility/provider and from other unqualified providers for significant predictors.

Table 4.3: Odds ratios for significant variables estimated from trichotomous logistic regression of ARI, Bangladesh 1996-97

| Covariates | Relative odds of receiving treatment for ARI (reference category=none) | | Number of birth |
	From health facility or health providers	From other sources	
Age of child (months)	0.94**	0.97*	724
Sex of child			
Male (reff.)	1.00		375
Female	0.62*		349
Subsequent birth interval (months)	1.06*		724
Region of residence			
Barisal (reff.)		1.00	38
Chittagong		2.48*	213
Dhaka		1.22	224
Khulna		0.38*	71
Rajshahi		2.11	143
Sylhet		2.13	36
Electricity in the household			
Yes (reff.)	1.00		146
No	0.38**		578
Mother's education (yrs.)	1.10*		724
Mother's mobility status			
Unrestricted (reff.)	1.00		137
Restricted	0.64*		329
No mobility	0.49**		258
Toilet facility			
Modern/pit toilet	1.00		299
Open/hanging	0.86		234
No facility	0.44*		191

reff. = reference category, * = p<.o5, ** = p<.01, *** = p<.001

Age of child is a important predictor of receiving treatment due to illness from ARI. Each month increase in age decreased the odds of receiving treatment for ARI from health care facility or provider by 4 percent and from other sources by 3 percent. Sex of child also have significant influence on receiving treatment for ARI from health facility and providers. Male children were 1.6 times more likely to receive treatment from health facility or provider than female children. Sex of child has no significant effect on receiving treatment from "other" sources due to ARI. Subsequent birth intervals has significant positive effect on taking treatment from health facility and providers. One month increase in the subsequent birth interval increased the odds of receiving treatment due to ARI by 6 percent. Region of residence has significant effect on reception of treatment from "other" sources but it has no effect on reception treatment from health facility and providers. Children from Chittagong division were more likely to receive treatment from "other" sources than any other divisions, while children from Khulna division were least likely to receive treatment due to ARI.

Mother's education has no significant association with treatment received from "other" sources but it increase the odds of receiving treatment during ARI from health facility and providers by 10 percent. Children of the households having electricity were more likely (2.6 times) to receive treatment from health facility and providers than their counterparts (Table 4.3). Mother's mobility status also have significant positive effect on receiving treatment for ARI from health facility and providers.

5.   Discussions and Policy Implications

The main focus of this study was to analyze the patterns and determinants of maternal and child health care services utilization in Bangladesh using the 1996-97 Bangladesh Demographic and Health Survey data with particular attention to the utilization of public health care facilities for effective antenatal care (ANC) and delivery care as well as for treatment of childhood morbidity. Several issues have emerged from the analysis and need further discussion. The results show that only 29 percent women received some ANC during pregnancy and a vast majority of 71 percent did not received any ANC during pregnancy, despite the fact that the health services from government facilities are managed by trained health professionals and more or less free of charge. Of those who received some ANC, majority of them (27 percent) received care from qualified doctor (20 percent) and nurse or trained midwives or FWV (7 percent) from government facilities. Of the 29 percent of the women who received some ANC, about 7 percent cases it was adequate (at least 3 visits with first visit during the first three months of pregnancy from medically trained personnel i.e. doctor, nurse and FWV) and the rest 22 percent was inadequate.

The overall level of antenatal care coverage in Bangladesh, however, has remained virtually unchanged since the 1993-94 BDHS when mothers of 26 percent of births received antenatal care from medically trained personnel (Mitra et al., 1994: 100). That is utilization of ANC increased by 4 percent or in absolute term by only one percentage point over three years period, although there is strong demand for ANC as majority of women of reproductive age (85 percent) perceived that ANC is beneficial for maternal and child health (Mitra et al., 1997: 111). This suggests that for low antenatal care coverage, attitude may not be a problem but there may be some other factors such as cost, accessibility, or the perceived quality of the services available may be attributed to the under utilization of ANC. The coverage of ANC (29 percent) in Bangladesh is below average even for a developing country, according to World Health Organization (WHO) data. In a 1987 WHO report, the proportions of women who had at least one antenatal check-up from a trained person were found to range from low values of 20 percent in Honduras, 33 percent in Thailand, and 35 percent in Iraq, to high values of 80 percent in Columbia, 83 percent in the Philippines, and 98 percent in China. One recent study identified lack of knowledge about maternity care problems (60 percent), cost (46 percent), and lack of knowledge about service availability at service delivery points (39 percent) as important reasons for non-use of maternity care (Barkat et al., 1995). Similar findings were also reported by Islam et al. (1996).

The utilization of health facilities for delivery assistance shows even a gloomy picture; only 8 percent of births are assisted by medically trained personnel – either doctors (5 percent) or nurses, midwives and FWVs (3 percent), and there has been no improvement overtime since the 1993-94 BDHS when 10 percent of births were assisted at delivery by a doctor, nurse or midwives (Mitra et al., 1994: 105).

The results indicate that almost 13 percent of children under five years had a cough with rapid breathing (i.e. ARI) in the two weeks before the survey, and about 70 percent of them received some treatment. Those who received treatment, majority of them (46 percent) received treatment from unqualified health provider (such as pharmacy, shop, traditional doctors or homeopathic doctor), and the rest one-forth (24 percent) received treatment from government provided health facility and qualified private health provider/doctor. The prevalence of ARI declined from 24 percent in 1993-94 (Mitra et al., 1994:111) to 15 percent in 1996-97 among children under three years of age. The proportion of sick children taken to a health facility has increased from 28 percent in 1993-94 to 36 percent in 1996-97.

One of the important findings of the study is that although majority of those who had received ANC choose government health facility, but for delivery assistance majority of them utilized traditional birth attendants (TBA). The use of TBA for delivery assistance is more common among vast majority of rural mothers, and among those who are Muslims and have poor economic condition. Also for treatment of childhood illness, traditional healers or homeopathic doctors or other indigenous practitioner are much more attractive than the government provided health facilities in Bangladesh. The higher percentage of births where women received prenatal care than were attended at delivery is consistent with other studies in developing countries, (Leslie, 1989; Adekunle, 1990; UNICEF, 1989), and has often been attributed to the unpredictability of labor onset, and the difficulty of travel, particularly long distances, during labor and delivery.

The continued importance of the TBA (*dai*) as a birth attendant presumably stems from both the convenience of delivering at home and the disadvantages of delivering in a public or private hospital. The rationale for choosing TBA for delivery assistant to be as follows: TBAs are from the community and they are readily available and accessible at the time of need and the woman need not to face the difficulty of travelling to public or private service center. TBAs stay with the woman at home until their service is needed after delivery. Moreover, the service of a TBA is relatively inexpensive. On the other hand, though government health services are financially not so expensive, organizationally and physically they may not ideal to fulfil the demand of the clients. In Bangladesh, especially in rural areas, there is a problem of communication and transportation which involve both time and cost. Some times it is not the distance to the nearby health clinic but the bad road communication or mood of transportation in the vast riverine rural areas of Bangladesh make the nearby health clinic inaccessible to the women. Further, the element of choice becomes all the more important given a social and cultural climate in which women are reluctant to be examined by a male physician or unfamiliar nurse in public or private health. The public health facilities in Bangladesh still lack sufficient number of female health personnel and there is an increasing demand

that medical care for women be provided by women. For women who observe the traditional rules of modesty or Islamic *purdah* (seclusion, wearing of a veil), TBA may appear to be a better alternative for them. This is also supported by higher likelihood of use of TBA among Muslim women than their counterparts from other religions.

Both bivariate and multivariate analysis indicated several important factors which were common to both maternal and child health care services use. Education, particularly mother's education, is one such significant predictor for use of ANC and use of the health facility and providers during childhood illness. We have documented stronger effects of mother's than husband's education on maternal and child health-service use. For example, one year increase in maternal education increase the likelihood of receiving treatment from medically trained personnel for childhood illness by 10 percent. However, father's education shows no significant effect on receiving treatment for childhood illness. These results, undoubtedly, stem at least partly from the fact that women are the primary care-takers of children and therefore, mothers' attitudes and skills are especially important to the health of youngsters (Browner, 1989; Schultz, 1990; Elo, 1992). The finding of a strong maternal education effect on maternal and child health is consistent with findings from other regions of the world (cited earlier). Education not only increase knowledge about health care but also gives women greater power over their circumstances, leading to a greater utilization of modern health care (Caldwell, 1981). Educational level cannot, however, be raised overnight. What is needed is to promote female education and in the short term health programmes should focus on attracting less educated women. To achieve the short term goals, emphasis should be given to the IEC activities of the national health and family planning programme so that the community, particularly the poor and uneducated women become aware of the need for regular antenatal check-ups, safe delivery and treatment of children by qualified health personnel.

Mother's mobility status also a common factor for utilization of both maternal and child health care. The more the mother enjoy the freedom to move outside home, the higher the utilization of maternal and child health services from medically trained personnel. The unrestricted mobility of the mothers may be associated with the higher socio-economic status which empowered them in decision making process. Bangladesh is predominantly a Muslim country and women are normally barred from activities outside their homes owing to the practice of *purdah* (seclusion, wearing of a veil). This custom restricts the mobility of women, preventing them from traveling for health and family planning services. Even in a setting where *purdah* is not rigorously enforced, travel is difficult and expensive, and isolation of a woman in households is the norm.

Among the demographic factors, mother's age at child birth and parity are two important predictors of utilization of ANC and delivery assistance from medically trained personnel. Mother's future fertility intention and wanted status of the last child also shows negative association with receiving delivery care from a medically trained personnel. The positive association between mother's age and ANC indicates that births to women during adolescence are at greater risk of receiving no maternity care. This finding emerges in the multivariate analysis after controlling place of residence, level of

education and some other factors, which is in contrast to some studies concluding that older women in developing countries use formal maternal health services less frequently than younger women (Leslies and Gupta, 1989; Wong et al., 1987). Bivariate analysis, however, shows that adolescent and older women of age 30 and above are less likely to receive ANC and delivery assistance from qualified providers. It is likely that the young adolescent mothers were more educated and ready to accept the modern ideas, and yet perhaps often may not have reaped the full benefit of being educated which seems to have such a positive effect among older educated women. It is conceivable that the risk of under-use of services seen among women of younger age groups is a function of other factors affecting outcome which are more common among women first experiencing pregnancy during adolescence or at a young age. The study result shows that primiparous women or women with low parity are more likely to receive care. This finding is consistent with previous studies (Leslie and Gupta, 1989; Adekune et al., 1990), and is not particularly surprising, given that these women are also more likely to be educated and accepting of modern ideas.

Mother age and parity, however, do not seem to be strongly related to seeking treatment for childhood ARI, but age of child is a strong determinant of receiving treatment for ARI. Sex of child is also a strong predictor of receving treatment for ARI from health facility and qualified health provider; male child is 1.6 times more likely to receive treatment from health facility than female child indicating a sex bias in seeking treatment for childhood illness. The results also indicate that a closely spaced subsequent birth reduces the likelihood of receiving the treatment for childhood ARI. All these evidence support the hypothesis that an improved maternal and child survival will help reduce fertility level and vise versa in Bangladesh. One recent study in Morocco observed a very strong effect of MCH services use on subsequent contraceptive use (Hotchkiss, 1999). In Bangladesh there exist strong replacement effect of child mortality on contraceptive use and fertility (Rahman, 1998).

Several of the household level variables such as household possession of durable items, toilet facility in the household, electricity in the household and household quality (made of brick or other materials) which were used as proxy measure of income and social class of the mothers were found to be important predictors of receiving ANC and delivery assistance from qualified providers.

Factors measuring the accessibility, availability and communication to health and family planning messages (programme related factors) such as urban residence, distance to the THC, distance to the health clinic, distance to FWC, distance to SC, presence of NGO income generating activities, TV in the community and mass media exposure to health and family planning messages were also found to have strong effect on receiving ANC and delivery assistance from qualified providers. The regression analysis identifies many socioeconomic, demographic and programme related factors that are associated with the utilization of health care services. Together, they define substantial inequalities in access to, and the quality of, maternal and child health care. Part of the explanation for these pervasive differentials can be found in the organization and management of the health care system – that is, in the provision of services. While evaluating the Fourth Population

and Health Project of Bangladesh a group of experts in their End of Project Evaluation identified a number of problems of the healthcare delivery system in Bangladesh (FPHP, 1999). The important problems are: poor service delivery capacity, much emphasis to urban health, lack of all sorts of management, lack of sincerity and commitment of the health personnel and poor quality of services. Another explanation for the observed differences in maternal and child health care services among different subgroups of the population may be due to their differing pattern of demand for services. However, DHS data does not permit us to find the answer why, for example, the poorest and least educated women are less likely to use free public health care services. The analysis, suggests the need for reorganization of the service delivery system and integration of health and family planning services. The study findings, thus, provides evidence in favor of government's recent steps that are currently underway to setup a "Community Clinic" to provide integrated health and family planning services from a one stop common facility to 6,000 population living within one mile diameter in each village.

In focusing on "user" factors and some selected community and programme factors, we have acknowledged the limitations of our study is not being able to comment on other determinants of services utilization, both quantitative and qualitative, that are also critically important. The effects of health care knowledge and perception, effects of cultural factors and other programmatic factors (service delivery system, quality of care, cost etc.) on utilization of MCH services are not studied here as it was not possible to analyze these issues using DHS data. Further studies, both quantitative and qualitative, is needed to investigate the effects of these factors on maternal and child health care seeking behavior in Bangladesh. One possible direction for future efforts to improve data collection protocols might be to devote greater attention to the measurement of some of the normative/cultural dimension of health care utilization that are not well measured by DHS-like survey instruments. Along these lines, an intriguing idea proposed in a recent study in Thailand (Entwistle et al., 1996) is to attempt to capture the existence and nature of social networks that cause some behaviour and practices to be widely emulated within communities and others to be shunned. This will, however, required the incorporation of qualitative research methods into what herefore have been more quantitatively oriented exercises.

The study findings contain a number of implications for policy purposes that could be useful in devising ways to increase the utilization of MCH services and thus improve the maternal and child health and survival in Bangladesh. These can be summarized as follows:

❏ Promote education, especially female education

❏ Increase status of women in the community and their decision making power. Education, employment and unrestricted mobility are essential elements for women empowerment

❏ Strengthen IEC/BCC activities of reproductive health programme to educate community, especially the rural, poor and uneducated women about reproductive health services, need for maternal and child healthcare

❏ Establish health clinics (community clinics) in each community within a short distance (within 1 mile) and ensure easy accessibility

❏ Provide health and family planning services from the community clinic in an integrated manner

❏ Devise mechanism to attract adolescents, poor and uneducated women to receive maternal and child health care services from qualified service providers

❏ Integrate traditional birth attendants (TBAs) into main stream government health care system by providing them appropriate training for safe delivery and referral for complicated cases

❏ Promote effective communication on reproductive health matters and services between the community and the service providers

❏ Make the reproductive health services available in a culturally accepted manner (arrangement for privacy, providing maternity care by the female health personnel, adjusting clinic time etc.) and improve the quality of care and management

❏ Strengthen family planning programme and encourage birth spacing and small family norm

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Table A Percentage distribution of live births in the five years preceding the survey for which the mother received assistance of delivery according to selected demographic and socioeconomic characteristics of the mother, Bangladesh 1996-97

Background characteristics	Assistant during delivery			
	Medical trained personnel[a]	TBA[b]	Others	Number of births
Total	**8.1**	**64.6**	**27.3**	**6230**
Mother's age at birth ***				
<20	7.4	63.7	28.9	1,997
20-24	8.5	62.7	28.8	2,045
25-29	9.0	66.1	24.9	1,238
30-34	7.6	70.5	21.9	607
35+	7.0	65.7	27.3	343
Parity ***				
1	14.3	61.7	24.0	1,677
2	7.7	61.2	31.1	1,455
3	6.7	66.1	27.2	1,004
4	5.9	64.4	29.7	713
5+	3.0	70.8	26.1	1,381
Ever use contraceptive				
Yes	9.8	63.0	27.2	4,407
No	3.9	68.5	27.6	1,823
Future fertility intension ***				
Want	10.1	63.6	26.3	2,385
Don't want	6.9	65.4	27.7	3,611
Undecided/DK	6.0	63.0	31.1	234
Last birth was wanted				
Yes	8.6	64.5	26.9	5,550
No	4.0	65.4	30.6	680
Mother's education ***				
No education	2.9	66.8	30.3	3,591
Primary	7.3	66.2	26.5	1,671
Secondary & above	28.5	53.9	17.6	968
Father's education ***				
No education	3.1	65.9	31.0	3,012
Primary	5.5	66.5	28.0	1,650
Secondary & above	20.3	60.4	19.3	1,568
Mother's earning status ***				
Earning	6.0	62.3	31.7	1,247
Not earning	4.7	66.9	28.4	851
Not working	9.4	64.9	25.8	4,132
Father's occupation ***				
Agriculture	3.4	65.7	30.9	1,582
Agriculture worker	1.4	66.4	32.2	833
Non-agricultural worker	7.7	65.2	27.1	2,146
Professional worker	32.3	51.2	16.5	248
Sales and services	13.4	63.4	23.2	1,317
Other's/unemployed	14.4	71.2	14.4	104
Religion ***				
Non.Muslim	16.7	62.8	20.5	516
Muslim	7.3	64.8	27.9	5,714
Place of residence***				
Urban	34.8	50.7	14.5	557
Rural	5.4	66.0	28.6	5,673

Region of residence***

Barisal	8.6	71.8	19.6	408
Chittagong	7.8	75.3	16.9	1,541
Dhaka	9.1	62.0	28.9	1,902
Khulna	14.3	59.9	25.7	614
Rajshahi	4.9	53.9	41.2	1,331
Sylhet	5.3	70.3	24.4	434

Mother's mobility***

Unrestricted	12.8	63.5	23.7	997
Restricted	8.0	66.0	26.0	3,072
None	5.9	63.3	30.8	2,161

Electricity***

No	3.8	65.7	30.5	4,903
Yes	23.8	60.8	15.4	1,327

Access to radio or TV***

No	3.2	66.4	30.4	3,488
Yes	14.2	62.4	23.4	2,742

Household assets index***

Lower	3.7	66.7	29.6	4,354
Middle	10.7	64.1	25.2	1,273
Upper	34.2	50.9	14.9	603

Household quality***

Lower	4.2	65.4	30.4	4,724
Middle	10.9	70.2	18.9	1,026
Upper	40.4	45.0	14.6	480

Slum residence

No	8.1	64.6	27.4	6131
Yes	8.1	69.7	22.2	99

Source of drinking water***

Piped water	49.1	39.2	11.7	221
Well water	6.7	65.2	28.1	5835
Other sources	1.7	77.0	21.3	174

Toilet facility***

Modern toilet	40.2	44.3	1.5	464
Pit toilet	9.4	66.6	24.0	2010
Open/hanging latrine	4.1	73.0	22.9	2115
No facility	2.4	57.2	40.4	1641

Household assets index***3.7

Lower	3.7	66.7	29.6	4354
Middle	10.7	64.1	25.2	1273
Upper	34.2	50.9	14.9	603

Household quality index***

Lower	4.2	65.4	30.4	4724
Middle	10.9	70.2	18.9	1026
Upper	40.4	45.0	14.6	480

Source of drinking water***

Piped water	49.1	39.2	11.7	221
Well water	6.7	65.2	28.1	5835
Other sources	1.7	77.0	21.3	174

Toilet facility***

Modern toilet	40.2	44.3	15.5	464
Pit toilet	9.4	66.6	24.0	2010
Open/hanging latrine	4.1	73.0	22.9	2115
No facility & others	2.4	57.2	40.4	1641

Note: Tables are for births in the period 0-59 months preceding the survey.
[a] Doctor, nurse & family welfare visitor.
[b] Trained untrained traditional birth attendant.
*=p<0.05; **=p<0.01; ***=p<0.001.

Table B Percentage distribution of children under: five years who were ill with a cough accompanied by rapid breathing during the two weeks preceding the survey by types of treatment according to selected demographic characteristics, BDHS 1996-97

| Background characteristics | Treatment of ARI | | | |
	Health facility or provider[a]	Others[b]	None	Number of Children
Total	**23.7**	**45.8**	**30.5**	**724**
Age of child ***				
< 16 months	26.1	51.5	22.4	272
16-35 months	23.1	46.7	30.2	242
36-59 months	21.4	37.6	41.0	211
Sex of child				
Male	26.1	44.9	29.0	375
Female	21.2	46.7	32.1	349
Subsequent birth interval *				
<16 months	25.9	51.1	23.0	282
16-30 months	21.2	43.2	35.6	222
31 + months	23.5	41.4	35.0	220
Mother's age at birth				
<20	21.6	51.3	27.2	233
20-24	24.3	42.9	32.8	247
25~29	25.9	44.6	29.5	139
30+	23.8	42.9	33.3	105
Birth order				
1	27.5	50.0	22.5	205
2-3	22.7	44.8	32.4	299
4+	21.4	43.6	35.0	220
Future fertility intension *				
Want	25.3	50.5	24.2	289
Don't want & undecided	22.7	42.7	34.6	435
Wanted last birth				
Yes	23.2	47.1	29.6	628
No	26.0	37.5	36.5	96
Place of residence **				
Urban	37.7	37.7	24.6	61
Rural	22.5	46.5	31.1	663
Region of residence * * *				
Barisa1	23.1	41.0	35.9	38
Chittagong	27.7	52.1	20.2	213
Dhaka	22.8	42.9	34.4	224
Khulna	25.7	22.9	51.4	71
Rajshahi	21.0	51.0	28.0	143
Sylhet	14.3	57.1	28.6	36

Background characteristics	Treatment of ARI			
	Health facility or provider[a]	Others[b]	None	Number of Children
Total	**23.7**	**45.8**	**30.5**	**724**
Mass media exposure * * *				
Yes	30.4	44.1	25.5	329
No	18.2	47.1	34.7	395
Electricity in the household * **				
Yes	42.5	38.4	19.2	146
No	18.9	47.4	33.4	578
Religion				
Muslim	24.0	45.4	30.6	664
Non-Muslim	19.7	50.8	29.5	61
Mother's education * **				
No education	17.2	47.6	35.2	401
Primary	26.6	43.6	29.8	217
Secondary & above	42.9	42.9	14.3	105
Mother's earning status				
Earning	19.5	47.2	33.3	122
Not earning	24.7	45.4	29.9	97
Not working	24.6	45.3	30.1	505
Father's education *				
No education	19.3	47.0	33.6	321
Primary	24.3	44.8	30.9	229
Secondary & above	31.0	44.8	24.1	174
**Father's occupation ** **				
Agriculture, agricultural Worker & other's	18.5	47.4	34.1	250
Non-agricultural worker	21.9	46.5	31.6	269
Professional worker, sales & service	32.4	43.0	24.6	206
Mother's mobility status *				
Unrestricted	34.3	40.9	24.8	137
Restricted	23.2	46.0	30.8	329
No mobility	19.0	48.1	32.9	258
Household assets index * * *				
Lower	19.6	46.9	33.5	521
Middle	30.3	44.8	24.8	145
Upper	42.4	39.0	18.6	58
Household quality index * **				
Lower	20.0	47.5	32.5	590
Middle	33.7	42.2	24.1	83
Upper	50.0	32.7	17.3	51
Source of drinking water				
Piped water & tube well	23.8	46.0	30.2	689
Other sources	20.0	42.9	37.1	35
Toilet facility * **				
Modern & pit toilet	31.3	44.3	24.3	299
Open / hanging latrine	22.6	45.3	32.1	234
No facility & others	13.1	48.7	38.2	191

Background characteristics	Treatment of ARI			
	Health facility or provider[a]	Others[b]	None	Number of Children
Total	**23.7**	**45.8**	**30.5**	**724**
Distance of thana headquarter*				
1 mile	32.5	41.2	26.3	114
2+ miles	21.8	47.0	31.2	606
Distance of health clinic				
1 mile	24.1	47.6	28.3	383
2+ miles	22.9	44.3	32.7	337
Presence of NGO income generating activities				
Yes	24.8	43.9	31.3	431
No	21.5	49.7	28.8	288
TV in the community				
Yes	28.5	43.8	27.8	144
No	22.3	46.7	31.0	575
Distance of family welfare center				
1 mile	24.9	48.0	27.2	346
2+ miles	22.3	44.2	33.5	373
Distance of pharmacy *				
1 mile	24.7	47.4	27.9	579
2+ miles	18.6	40.7	40.7	140
Distance of rural dispensary				
1 mile	23.5	48.7	27.8	187
2+ miles	23.5	45.2	31.3	532
Total	23.5	46.1	30.4	719

[a] Includes Govt. hospital, Family welfare center, Thana health complex, Satellite clinic, EPI clinic, Community health worker, Private hospital/clinic and Private doctor
[b] Includes Pharmacy, Shop, Traditional doctor, NGO clinic, Homeopathic doctor and other.
Note: Tables are for births in the period 0-59 months preceding the survey.

* =p 0.05; ** =p 0.01; *** =p 0.001.