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DETERMINANTS OF HEALTH CARE UTILIZATION
IN RURAL BANGLADESH

THE FINAL REPORT

Submitted to:

Primary Health Care Operations Research
Center for Human Services
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EXECUTIVE SUMMARY

A. Introduction

In an attempt to suggest ways to improve utilization of primary health care (PHC) services in rural Bangladesh, this research examines some of the factors that are likely to influence utilization of medical care and choice of care providers by the people in need of such services. This has major implications to PHC programs because in Bangladesh the program has to function parallel to and often in competition with many alternative types of health care providers available in the countryside.

Government health services, the only source of organized health care in the rural areas of Bangladesh, though free of cost and managed by trained professionals, do not provide services that attract the rural people. Reports from the government as well as private sources indicate that there is much under-utilization of PHC facilities, despite tremendous health needs and repeated efforts by the government to improve its services. On the other hand, a great majority of the sick people are found to use services of non-formal,

private sources of care ranging from graduate physicians of modern medicine to traditional faith healers.

Experience of experimental model health care programs in the country has shown that by providing better quality and reasonably adequate services, the utilization rate of service facilities can be improved to some extent, but that the overall coverage still remains low. Utilization of non-formal private practitioners, irrespective of the type, would not be considered a problem if the services were reasonable in quality and cost. Quite on the contrary, they have been found to be costly, often non-scientific, and may even be detrimental to the patient's health.

B. Goal and Objectives

The goal of the study is to recommend changes in the existing PHC system of Bangladesh, so that the utilization of its curative services may be improved. The objectives include:

- (a) To study the influences of various exogenous and endogenous factors on utilization of medical care during major illness events;
- (b) To draw complementary and supportive evidence on utilization from terminal illness (death), and childbirth events;
- (c) To conduct a Delphi survey in order to get additional inputs for the solution development process; and
- (d) To discuss possible alternative approaches to service delivery and recommend changes.

C. The Study Site

The study used data from Companiganj Health Project, which was established as a demonstration model for a comprehensive PHC program in Bangladesh under a joint sponsorship of the government and a voluntary organization. Companiganj is a sub-district in the southern part of Bangladesh with a population of 120,000. Except for its smaller size than the average, the socio-economic condition of the people, their ethnicity, customs, beliefs, problems etc. are representative of other rural sub-districts in Bangladesh.

The CHP had a comprehensive approach, which included preventive, promotive and curative health care, and family planning-- all delivered practically free of cost according to policy of the government. The curative services were delivered through two well equipped hospitals (referred to as main centers) and seven sub-center clinics, one each for approximately 17,000 population. Preventive and promotive services were delivered through two sets of field workers, male and female, who made routine home visits according to prefixed itinerary. The service delivery program followed by CHP represents the PHC system of the government at present.

D. Methodology

The study included first two phases of operations research methodology, i.e., problem analysis and solution development. The third phase, solution validation, was not included because of time constraints.

In the first phase three sets of data from CHP- births, deaths and major morbidity, along with their medical care utilization- were examined to understand the correlates of utilization. A series of bivariate and multivariate analyses of the data were done, using utilization of medical care services and choice of medical care providers as dependent variables and a set of independent variables, representing both user variables and health system variables. The results gave the major predictors for the dependent variables under consideration.

In the second phase the obtained predictor variables were categorized into constraints, facilitators and decision variables. In the light of these, various problem areas of the existing PHC system were identified. Meanwhile the results of the Delphi survey became available. The survey was aimed at identifying the reasons for PHC under-utilization from the perspectives of the community and obtaining their suggestions and group consensus regarding their solution. The findings of the survey were found to match very closely with the findings of the problem analysis. Different alternative

solutions to under-utilization problem were considered and their practical feasibility were discussed.

E. Major Findings

Problem analysis:

The study showed that four-fifths of the people tended to utilize some kind of medical care from outside sources when they were seriously ill. Three-fourths of these utilizers resorted to the providers of modern medicine, while the remaining went to indigenous practitioners and homeopaths. Two-thirds of the modern medicine dispensed, however, was provided by the Daktars, the unlicensed practitioners of modern medicine, while the remaining one third by the official PHC system. It was also evident that there was a fixed niche for the utilization of indigenous practitioners and homeopaths, while the major competition for provision of medical care existed between the formal PHC system and the Daktars.

Major predictors of overall utilization were age of an individual, socio-economic condition of the family, seasonality and the total number of practitioners available in a locality. The winter and the rain were strong negative predictors of utilization, while the other variables had positive predictability.

The frequent utilizers of Daktars were the people in 15-44 years age group, had formal education, were from higher socio-economic status or had adequate access to cash and suffered from acute diseases. In contrast, the more frequent utilizers of PHC facilities were old, had little or no education, came from lower socio-economic status and suffered from chronic diseases. These four variables were the major predictors for PHC utilization.

A comparison of service delivery aspects of Daktars and the PHC system showed that the services of the former were more convenient to people. The study also demonstrated that the formal PHC services were desirable to the people and it had ample of credibility among all strata of population. The PHC services, however, were not available or accessible to the people as they should have been at the time of acute needs. As a result, it played a much less significant role in the provision of curative services than it had potentials for.

The only health systems variable, that had some predictability on utilization was home visits by the female field workers, who proved themselves more effective than their male counterparts in this regard. Findings of this study also suggests that charging a reasonable fee for curative services is not likely to meet community resistance as it is usually feared, provided the goods and services are made available up to clientele satisfaction. The average cost of

the most popular provider in community (Daktars) is ten times higher than that of PHC.

Solution Development:

Majority of the determinant variables identified in the problem analysis phase were constraints. A few decision variables that had major predictability, clearly indicated that the services of PHC needed to be taken closer to people than they are at present.

Major problem areas of under-utilization identified by the participants of the Delphi survey concerned availability and accessibility of PHC facilities. Other problems included communication between providers of PHC and the community. Suggestions for improvement of PHC utilization, that scored the highest points in the Delphi group process included the establishment of a clinic facility for every 5,000 population, provision of emergency services through the clinics, improvement of supplies to the clinics, establishment of a better rapport between PHC providers and the community, improvement of general awareness of the community regarding PHC and improvement of quality control.

Four alternative solutions for increasing the utilization of PHC services were considered in the light of problem analysis and Delphi group process. These were: a) expansion of PHC clinic facilities by the government, b) inclusion of Daktars into the PHC system,

c) motivation of the community regarding self-support for PHC and
d) combination of government and community resources. Program
recommendations included : a) establishment of a community based PHC
clinic in every ward (approximately 7,000 population), with technical
support from the governmental PHC system, b) selection of an
accessible site by a PHC team comprising community residents and PHC
officials, c) staffing of the PHC clinics by locally trained
paramedics and traditional birth attendants, d) extended clinic hours
and e) consideration of a minimal fee-for-service charges as
additional incentive to PHC workers.

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Chapter 1

Background

A. Introduction

This study is an attempt to understand some of the factors that determine the utilization of health care services in a developing country, Bangladesh, and to develop potential solutions that will maximize the utilization of Primary Health Care (PHC) services in the country. The utilization of modern health care facilities provided by governments or other organized sources remains one of the major concerns of planners and implementors of health programs in developing countries (King, 1966; Taylor, 1972; Benyoussef & Wessen, 1974; Djukanovic & Mach, 1975; Mburu, 1979). The concern has increased after the declaration of Alma-Ata of "Health for All by the year 2000" and the introduction of the primary health care (PHC) concept as the infrastructure necessary to pursue this goal. This is because a major approach to understanding the functioning of a health services system is in terms of its utilization by the people it is designed to serve.

One common paradoxical phenomenon in the delivery of health service is its under-utilization even when it is free of cost and seemingly adequate. This is particularly true in most rural settings in developing countries where one would expect a higher rate of utilization because of the deficiency of modern health care facilities. Rather than using available health services, rural populations often purchase indigenous or folk medicines, or even allopathic (modern, scientific) medicine from informal sources such as drug shops to treat their ailments. In some cases, would-be patients "bypass" their local facility only to crowd into larger district hospitals (Djukanovic and Mach, 1975; Banerji, 1979).

Many health workers have tried to understand the causes of under-utilization. Earlier planners and implementors of health programs considered it the "ignorance" or "undue suspicion" of the community. Later attempts were made to explain under-utilization through "cross cultural conflict". Present day authorities, however, agree that under-utilization results from a combination of factors, that differ by geographical, historical, cultural and ethnic settings. Utilization is regarded as a complicated phenomenon determined by the interaction of biological, psychological and social factors that affect not only the volume but also the type and quality of service consumed (Kohn and White, 1976). In order to have a better understanding of the phenomenon and derive specific solutions for the problem, these factors need to be studied in detail in the context of individual countries.

B. The Bangladesh Setting

Bangladesh is among the poorest of the less developed countries. Per capita gross national product is about \$130 (U.S.) annual. Ninety per cent of the population is rural, and of these, about 40 per cent are landless laborers, with no regular source of income. The average population, 1,800 per square mile, is one of the most dense in the world. Over and above, since the country is in the deltaic region of two very large river systems, the Ganges and the Jamuna, water bodies cover nearly 40 per cent of the land area. As a result, in reality the population per square mile exceeds 3,000.

The weather forms an important background to life in Bangladesh. The glaringly hot summer which lasts from March through June is one of the three basic seasons of the year. The daily temperature can be as high as 110 degrees Fahrenheit and the humidity as much as 80 per cent. During this season, the earth becomes parched. Rivers and ponds dry up and the water becomes unsafe even for household utilities. Unpaved roads are choked with a two-inch layer of dust. Travelling during this season can be slow and uncomfortable.

Between July and October, the summer heat suddenly yields to a monsoon season with torrents of rain. The temperature quickly drops with each storm continuing several days at a stretch. Dried rivers and ponds swell and flood. Dusty unpaved roads quickly turn into thick, intractable mud. Travel between villages by road slows almost

to a standstill. Winter, November through February, brings the sun and comfortable temperatures around 50 degrees Fahrenheit. The roads dry up and villages become more accessible. The flat land readily yields itself to rice with the biggest rice crop of the year harvested in winter, and fresh fruits and vegetables filling the markets. (The effects of weather on the utilization of medical facilities will be examined in more detail later).

Poor health conditions in rural Bangladesh and the inadequacy of the organized health care system in these areas are well-known. A brief summary of major health-related statistics, presented in Annexure I, highlights a few of the problems. The overwhelming majority of the rural population lives below the subsistence level, and an estimated 45 per cent of the children suffer from protein-energy malnutrition (The Planning Commission, Government of Bangladesh, 1980). Gastrointestinal and respiratory tract infections, malaria, tetanus, typhoid, malnutrition, and problems associated with maternal and child health are the major diseases found in rural areas (Bangladesh: Country Health Programming, 1977). Data on cause of death for rural Comaniganj upazilla¹ show that diarrheal diseases, malnutrition, and pneumonia account for 40 per cent of all deaths. Other major causes of death are birth injury

¹ An upazilla is a civil administrative unit of the government similar to a county in the United States. Average population of an upazilla is about 250,000. Formerly the upazillas were called thanas.

and neonatal tetanus. Fifty per cent of all deaths occur to children under 5 years of age (Chowdhury and Khan, 1980).

Most of the diseases commonly found in rural Bangladesh are either preventable or curable. A well-designed primary health care (PHC) program, using a minimum of sophisticated technology, could significantly reduce the mortality and morbidity rates. In Companiganj upazilla, for example, where a model health care program was organized during the 1970's, death rates among children 1-4 years of age were reduced by 50 per cent and deaths due to diarrheal diseases and malnutrition were reduced by 60 per cent within a four-year period (Chowdhury and Khan, 1980). The very nature of the health problems indicate that intervention programs in Bangladesh should be directed towards the rural population in general, with particular emphasis on maternal and child health services. It is also evident that improvement of overall primary health care (PHC) services alone could significantly reduce both the morbidity and mortality patterns in the community.

It has been only about five decades since modern medicine, popularly known as allopathic medicine, became available to rural Bangladesh. The main reason that this form of medicine remained out of reach to the masses was its prohibitively high cost. Few allopathic practitioners were available in the back villages and their services remained accessible only to the rich who could afford to pay their fees.

For the majority of the people of rural Bangladesh, the two indigenous systems of medicine, Ayurveda and Unani along with popular folk cures (mostly herbal) and faith healing were sought during illness episodes. The homeopathic system of medicine, introduced from Europe at a much later date than the allopathic medicine, has also established itself as another system widely acceptable and available throughout the country.

Modern medicine has made inroads with local populations because of its fast and definitive action and the efficacy of certain drugs such as aspirin, chemotherapeutic agents and antibiotics. Such drugs are now being mass produced in the country making them less expensive than ever before.

A large number of semi-trained and self-trained practitioners have begun to provide allopathic-based services at a minimal fee. Meanwhile, indigenous systems of medicine such as Ayurveda and Unani are losing public and governmental patronization. Consequently, their practitioners have begun to diminish. Non-institutionalized home remedies and folk medical practices, however, continue to flourish owing to their popularity, and partly because their herbal cures are more affordable than institutionalized drugs. A classification of the numerous types of medical care providers that may be found in the non-formal sector of rural Bangladesh is presented in Table 1.1.

Table 1.1

The Types of Medical Care Providers in the Non-formal Sector

Type of Medicine	<u>Type of Providers</u>		
	Graduate Physician	Semi/Self-Trained Apprenticeship	Others
Modern	MBBS LMF	DAKTAR * (Compounder, Dressers, Pharmacists, Drug-shop owners, Mixed Practitioners)	Graduate Specialist Self-Claimed Specialists
Homeopathy	HMB DHM	Homeopathic Daktar (mostly through self-teaching books)	Self-claimed Specialists
Indigenous** (Ayurveda & Unani)	Kabiraj Hekim	Kabiraj, Vaida (mostly through apprenticeship)	Self-claimed Specialists
Indigenous** (Folk cures)	_____	Kabiraj, Vaida, Totka (Herbalist, mostly through apprenticeship)	Specialty: -bone setters -snake poison removers -Jaundice removers -Rheumatism healers, etc.
Indigenous** (Faith healers)	_____	Mullah, Thakur, Siddha Pir	Magico-religious: Ojha, Khoner Gachha

* Local term for practitioners of western medicine, derived from the word Doctor. In this dissertation, the term has been used explicitly to represent this group.

** All the practitioners of indigenous medicine have been grouped into one under the term for this dissertation.

For the first time during the early sixties a positive attempt was taken by the government to reach modern curative services to the rural masses through the establishment of Rural Health Centers in every upazilla. Though these centers provided treatment free of cost, they remained so grossly understaffed and under equipped that they could hardly make a dent on the tremendous need for medical services. Other health services provided only through the government institutions were preventive, promotive and family planning, all of which seem to have had better coverage than the curative services.

During the seventies health of the rural mass seem to have received renewed priority. For efficient functioning, all the scattered vertical programs in the rural areas were brought under one command of a upazilla health administrator and increasingly greater amount of funds were transferred to the areas. There was tremendous expansion of health manpower and health facilities and even today plans are on the way for further expansions. In spite of the all these efforts by the government, however, services are yet to reach the vast majority of the people, particularly in the rural areas, as indicated in The Second Five Year Plan, 1981-85 and The Third Five Year Plan 1986-90 of Bangladesh. Earlier, the WHO and UNICEF sponsored Primary Health Care Project Formulation team (1978) identified "community resistance, unawareness and non-cooperation to whatever is being offered by the present system of health services" as major obstacles to their use.

C. The Study Site: Companiganj Health Project (CHP)

Companiganj consists of an area of about 75 square miles in the southern part of Bangladesh. With a total population of about 120,000 people. Companiganj is called a small 'upazilla', the name for an administrative unit of the government that normally has an average population of about 250,000. Upazillas are divided into ten to fifteen 'unions', each with a population of about 20,000 people. Each union, in turn, is further divided into three wards, each consisting of 6000-7000 population.

In 1973, Companiganj was selected as a site for developing a demonstration model for a comprehensive health and family planning service delivery program suitable to serve the needs of rural Bangladesh. Under the joint sponsorship of the government of Bangladesh and a voluntary organization, the Companiganj Health Project (CHP) was thus initiated to design and provide primary health care to the population. Controlling the overall expenses of the project was critical so that the government could duplicate similar programs in other upazillas.

By the end of 1975, most of the service components of the CHP were fully operational. Medical services included disease prevention, health promotion with a focus on maternal and child nutrition and health, family planning, and basic medical care. A research and evaluation unit, administratively separate from the

service delivery group, was added to the project in order to monitor the project's impact on the health of the population. By government policy, all medical care was delivered virtually free of cost to participants.

Because of the very nature of the CHP, it had to make speedy progress with special inputs, and test and evaluate different innovative programs and mix of services along its way. In the mid seventies, when the CHP was at its peak, Companiganj had better health facilities and manpower than any other similar upazillas in Bangladesh. In due course of time, however, many of its service delivery components were incorporated and generalized into the government's PHC program. At present each upazilla PHC system has similar physical facilities, manpower and service delivery pattern (described below) as there was in Companiganj under the CHP.

1. Preventive and Health Promotive Services of CHP

Prevention and health promotion services were delivered directly into the villages through home visits by two groups of health care workers: male and female. The workers were assigned to a fixed work area. But as the male and the female workers carried out different sets of activities, the plan of their work area assignment differed. The work area of a male worker was called a sub-sub sector. There were 28 sub-sub sectors in the upazilla. Each sub-sub sector consisted of a population of 750 to 800 households with a population

between 4,000 and 5,000 individuals. According to a schedule, each household received one visit from a male health worker approximately every one to one-and-a-half months.

Health workers were recruited from the locality they were to serve for the most part. Tasks were divided differently between men and women workers. The male workers' tasks included collection of blood smears from fever cases, vaccination against smallpox, recruitment and follow up of clients for family planning and distribution of family planning materials. They also distributed vitamin A capsules to children under 6 years of age, vaccinated BCG to children under 15 years twice a year in special vaccination rounds, and administered treatment for minor ailments.

Female workers were assigned to work twice a week in the union-based sub-center clinics to give ambulatory care. For the remainder of the week they made home visits primarily to carry out family planning and maternal and child health (MCH) activities as assigned to them by a supervisor, usually a Family Welfare Visitor (FWV) or a Public Health Nurse.

Besides the task differences described above, there were some basic differences between the male and the female workers of CHP. The former were usually matriculates (10th grade pass) with one to two years' of technical training. They mostly came from middle class families and were in the government services for a long time (average

ten years) before they were included into the CHP program. In the community they were better known as malaria Daktars or smallpox Daktars because of the specific tasks they performed for those two diseases. All the female workers, on the other hand, were new recruits with little or no formal education (the requirement for job application was that they should be able to read and write in Bengali with ease); and they usually belonged to poor families. They received three months of initial formal training at the CHP, followed by practical training and repeated reorientations on the job. Because of their such background, they were able to identify themselves with the common mass and communicate with them more easily than the male workers.

Local customs sometimes dictated how medical services were to be delivered in the home. For example, it was originally planned that the locally recruited and trained female workers would perform antenatal and postnatal check-ups. However, pregnant women would not allow them to do so because they did not carry the respect of traditional midwives. Consequently, some traditional birth attendants were selected and trained to perform the task. Even though these women could be considered totally illiterate, their performances were far better than anticipated.

The nutrition program included follow-up of children under three years of age with growth charts. Education was given to mothers regarding MCH and family planning. A food supplement devised by the

project, called "Pushtikor," which was a blend of wheat and chickpea flour, was provided at a subsidized price for malnourished children and pregnant mothers.

2. Direct Medical Services in Clinics

Curative facilities were established in each of the seven unions in the upazilla. The two main centers were established to provide general patient care. They were designed for both inpatient and outpatient care, and were equipped with an emergency room, a pathology laboratory and an operation theatre. The main centers were open from 8 a.m. to 3 p.m. on weekdays, while emergency services were made available daily round-the-clock.

The remaining five facilities, called sub-center clinics, concentrated on primarily on providing curative services for women and children including MCH, family planning, and dealing with nutrition problems. The sub-center clinics were open only twice a week from 8 a.m. to 3 p.m. and they did not provide any emergency services.

In both types of centers the quality and supply of medicines and other ancillary drugs was maintained continually at an optimal level. Except for a very minimal token registration fee (0.50 Bangladesh Taka, or \$ 0.02) no other charge was made to the patient for services.

Both for the main centers and the sub-centers, the intake procedures were the same. As the patients came in, they were registered serially and seated in an waiting area. The treatment of older children and adults was primarily based on symptoms and physical examinations. In complicated cases, some laboratory tests were done and the patient was referred to one of the medical officers on duty. Referral of patients was a common practice and was encouraged.

Patients under three years age, were categorized as more vulnerable than others, and, therefore, followed a different course of clinic activity than the others. They first had anthropometric measurements taken and recorded on a growth chart. If any problem in the child's growth was noticed, the attendant of the child was notified and necessary education regarding proper child care was given. If the child was moderately or severely malnourished the family was issued food with supplements. Next the child reported to immunization where the clinic workers decided whether the proper immunization schedule had been followed. Again education, motivation, and actual immunization followed according to need. The child might then visit a nutrition demonstration area, where proper food preparation and feeding were demonstrated. The fourth encounter was with the actual illness care provider. The child was given a brief physical examination and treatment after recording symptoms.

All the workers could refer patients from the field or sub-centers to main centers, where more elaborate ambulatory care and/or secondary care were provided. Patients requiring the services of a specialist were referred to more sophisticated district hospitals or institutional hospitals at the expense of the project.

Most of the upazilla's households were within three miles of one of the main centers and within two miles of one of the sub-centers. One of the main centers was located near the main market place, and the other at the opposite end of the upazilla, about six miles away. As will be shown later, the effect of variation in distance of different households from the main medical centers and the sub-centers on overall utilization and choice of practitioner is one of the particular interests of this study.

Chapter 2

The Study Purpose

A. The Operational Problem

In many developing countries, organized health services, such as government-sponsored primary health care centers and model health care projects often function parallel to and in competition with alternative care providers that employ indigenous or folk remedies. There are also numerous non-professional (lay) providers of modern medicine, who are usually popular and enjoy ample confidence of the community, irrespective of the quality of treatment they may provide. This is particularly found to be true in rural areas. Table 1.1 has already presented the numerous types of alternative care providers that are available in rural Bangladesh. For that reason, any attempt at improving the delivery of PHC services in a country such as Bangladesh requires a thorough examination of the determinants underlying the choice of health care providers by the population to be served.

Government health services, the only source of organized health care in the rural areas of Bangladesh, though free of cost and managed by trained professionals, have failed to provide services

that attract the rural people. For example, the hospital bed utilization rate in the rural areas is only 30 per cent of capacity (Bangladesh: The Second Five Year Plan, 1982). A study by Chowdhury, et al. (1981) show that many rural clinics remain idle during working hours because of lack of patients. Only 10 per cent of the people in rural areas were found by Skoda, et al. (1977) to consult a government facility when they were sick.

Experimental and model health care programs in the country, with better inputs in a limited area and flexibilities in reorganization of services, have not been able to substantially improve either the utilization rates or coverage of the population (Pyle and Chowdhury 1980). In the Gana Unnayan Prochesta (GUP) project of the Faridpur district, or the Manikganj Project of Dhaka district, for example, the clinics are very busy during the morning hours, but by late morning to early noon they become quiet for lack of patients and remain quiet until late afternoon when the clinics are closed. Clinics in the Rangpur-Dinajpur Rehabilitation Services (RDRS) in Rangpur district, or the River Project in Rajshahi district, on the other hand, remain busy until late in the afternoon, but their estimated coverage of the population is rather low. Similarly, in the Comaniganj Health Project (CHP) area, 80 per cent of seriously ill people receive some kind of medical care. Of these, only 25 per cent visit the project facilities. The rest go to informal sources of care ranging from faith healers and folk medical practitioners to untrained or semi-trained modern medical practitioners.

As indicated earlier, under-utilization of government primary health care services, the only source of organized modern health care, is a well-recognized major problem in Bangladesh. The Second Five Year Plan of the government has expressed concern as follows:

The utilization of even the existing health facilities in rural areas is very poor. The bed utilization rate in Thana Health Complex is only 30 percent as against more than 100 percent in the urban areas. This is not due to less morbidity in the rural areas, rather it reflects generally the poor quality of services arising out of poor management and technical inefficiency coupled with gross inadequacy of supply of drugs, medical and surgical requisites. Consequently, the rural health institutions do not enjoy complete confidence of the local people leading to the phenomenon of bypassing such institutions and overcrowding in the urban hospitals.

In the recently published Third Five Year Plan (1986-1990) the same concern has been reiterated, indicating no significant improvement from the past. Modern medicine is the most prevalent source of care in rural Bangladesh (Claquin 1981, Sarder & Chen, 1981; Ashraf et al., 1982). In fact, Ashraf et al., (1982) found indigenous system of medicine almost disappearing in their study area, although certain folk medical practices still persisted. People, however, tended to purchase their treatment from a modern private source rather than going to government health centers. Studies related to health services are few in Bangladesh, but those available tend to show very poor utilization of government health services.

A WHO/UNICEF survey done in 1977 regarding diarrheal diseases shows that only 10 per cent of the 11,500 respondents consulted a government facility during the previous occasion of their bed ridden state of illness (Skoda, 1977). Tarantola *et al.*, (1977) conducted a similar survey on a 27,000 randomly selected households to determine where people went for health care the previous time a child was sick. The results show that only 17 per cent consulted a government physician, 38 per cent consulted private modern medical practitioners, 13 per cent homeopath, and 14 per cent refrained from approaching anyone at all. A review of 915 death cases studied by Claquin (1981) revealed that only 10.8 per cent of the deceased had consulted government facility before their death.

In a study of distribution of non-governmental health facilities, Sarder and Chen (1981) concluded: "Despite high financial costs, the non-government systems are utilized heavily because of availability, social access and social perception of illness causation. Government services are not yet competitive because of poor availability, access, quality and cost." Chowdhury *et al.*, (1982) did a study of health disease and health care in rural Bangladesh. Based on an anthropological approach their findings are similar to those of Sarder and Chen. They found that government services are used mostly by the poor for whom buying health care is beyond their means. The unqualified practitioners, both modern and indigenous, were found to be able to provide better psychological

satisfaction to their clients, but their practices were found often to be hazardous.

Despite high levels of under-utilization, the government of Bangladesh, with the help of international and bilateral agencies, has recently taken up extensive health manpower development and rural clinic construction programs for expansion of health services in the rural areas. The facts reviewed above indicate that these facilities also will remain grossly under-utilized unless there is a major reorganization of service delivery plans.

C. Factors associated with Utilization

The choice of medical care during illness is a complex process that is determined by the interaction of multiple factors. Some of these are related to the sick individual's personal, family and community characteristics, while others can be attributed to the characteristics of the health services available to the individual.

Interest in utilization of health services is fairly recent in the developing world, while extensive research has already been conducted on the subject in the developed countries, particularly in the U.S.A. (e.g. Kasl and Cobb, 1966; Fabrega and Roberts, 1972; Bice et al., 1972; Anderson and Bartkus, 1973; Wan and Scifer, 1974; Becker et al., 1977). Studies done in the developing countries on utilization have so far have been able to identify only a few common factors which

seem to influence the utilization pattern. As a result, health plans based on the presently available knowledge have not been able to improve the utilization or impact of health services to a large extent.

Research on health care utilization seems to have taken several different directions and incorporated different domains throughout its development. Earlier research on the subject emphasized socio-demographic characteristics of the persons needing medical care and spatial distribution of physical facilities and other resources such as manpower. Various authors (Kasl and Cobb, 1966; Mechanic, 1968; Anderson and Bartkus, 1973, for example), were critical about such parochial approaches mainly because they failed to consider the health status of the users. They also did not take into consideration socio-psychological variables, which the critiques considered to be important correlates of health care utilization behavior. Such realizations led to the development of what is known as socio-psychological models, which encompass health-related motivation, perception of illness, perceived threat, perceived accessibility and acceptability of health care, in addition to socio-demographic variables.

More recently, there has been an increasing interest in socio-anthropological research regarding the subject. Culture in any given community forms the basis of anthropological studies. In the context of medical anthropology, community classification of diseases, beliefs and perceptions regarding cause of those diseases, indigenous

practices and healing systems are all taken into account and analyzed to explain the health behavioral pattern of a given community.

Most researchers studying determinants of health care utilization have a general agreement on the direct correlation of need to utilization. Usually indicated by type, severity and/or duration of illness, need has been found to be the immediate cause and major determining factor for health service use. The cause of need can be defined in two ways: 1) perceived/felt need by an individual or 2) need evaluated by health delivery personnel, system or community. The former has been found to be the more important predictor of health care utilization.

Spatial distribution of health manpower and other physical facilities have been a subject of major interest among planners and policy makers in health. This is because accessibility to health services is often expressed in such terms as number of clinics per county, etc.. Another measure of accessibility is the geographical accessibility i.e. distance of physical facilities (clinic, hospital, etc.) from different population settlements. Almost all the studies have shown distance of a care source to be inversely correlated with its utilization. Exceptions however may take place when the need for going to a better facility is very strong.

Nearly all the researchers who studied health in a cross-cultural perspective have observed that indigenous medicine often

competes with western medicine. Concepts, etiology, classification and cure of diseases among traditional societies differ considerably from the modern scientific medicine. But they still do exert a considerable influence on people, particularly in the way they choose their treatment. This has been found to be true in a number of countries including Ethiopia (Young, 1976), Melanesian Societies (Hamnett and Connel, 1981), Ghana (Fosu, 1981), Mauritius (Sussman, 1981) and Ecuador (Pederson and Coloma, 1983). It is generally agreed among authors that this phenomenon itself can give rise to sufficient differential use of modern health care in a pluralistic setting. There is however divergent opinion about the way that these two medical systems interact. Some authors believe that indigenous medicine plays a complementary role to modern medicine, while others opine that they actually compete with it.

The PHC concept backed by WHO strongly recommends that indigenous medicines should be viewed as complementary to modern medicine, and where possible, it should be incorporated into the PHC system itself. The changeover in such an attitude, however, is a very slow process.

Home treatment and self treatment are a strong source of primary health care in the developing countries. The extent of home remedies can range from some 20 per cent to 80 per cent, at least for the first source of care, in the context of different countries. Thus, extensive practice of home treatment can also influence utilization.

Several other factors, mostly socio-demographic in nature have also been found to influence utilization of health services. More common among these are: age (Welch et al., 1973; Anderson and Bartkus, 1973; Wan and Soifer 1974; Berki and Kobashigawa, 1976), education (Bice et al., 1972; Benyoussef and Wessen, 1974; Berki and Kobashigawa, 1976; Quah, 1977, Rao and Richard, 1984), occupation (Bice and White, 1969; Benyoussef and Wessen, 1974; Rao and Richard, 1984), and socio-economic status (SES) of the family (Bice et al., 1972; Welch et al., 1973; Benyoussef and Wessen, 1974; Anderson and Bartkus, 1973; Berki and Kobashigawa, 1976; Quah, 1977; Rao and Richard, 1984). Some authors have also found sex (Berki and Kobashigawa, 1976), level of modernization (Benyoussef and Wessen, 1974) family type (Rao and Richard, 1984); race (Bice et al., 1972) and cost of service (Bice et al., 1972; Wan and Soifer, 1974), to be additional correlates of health service utilization.

Children and elderly groups, because of their higher need for medical care, are higher utilizers of health care services than adolescents and adults. Women have also been found to be more frequent utilizers than men. Others suggest that these variables often play a more direct role rather than through morbidity or need conditions. (Welch et al., 1973; Berki and Kobashigawa, 1976; Kroeger, 1983).

Many studies have found education of an individual or head of a household to be positively correlated, not only with overall

utilization of health care services, but also with the choice of practitioner. Several authors have also shown that the education of women, in particular, has significantly positive influence on family and community health. With increased education people resort more to scientific medicine than indigenous or popular remedies. Suchman (1965) reasoned that with higher education people tend to become more cosmopolitan (rather than parochial) and become more inclined to use scientific medicine. Kroeger's review of literature (1983) from Taiwan, Korea, Thailand, Mexico, Tunisia and Iran found that formal education turned people away from indigenous healing and diverted them towards modern medicine.

These findings, however, are not universal. Studies from Nigeria by Ademuwagun (1975) and Tunisia by Benycussef and Wessen (1974) show that such influences may be true in urban settings only. A study by Kroeger in Ecuador shows that primary level education did not have any effect on pattern of health care utilization, but secondary level education did.

Most studies have found occupation to have a significant association with medical care utilization. Education and socio-economic status (SES) of a person has strong correlation with his occupation. These two variables also have significantly strong association with utilization in turn. The influence of occupation may actually represent an indirect influence of education and SES. Evidence from India (Rao and Richards, 1984) shows a strong

correlation of SES to utilization. In Nigeria and Mexico higher SES was found to be related to higher level of effort to seek modern health care.

Beliefs and perceptions regarding illness and cure; trust and preference for practitioner; confidence and satisfaction in treatment, etc. are also believed to be important correlates of health care utilization, although these measures are difficult to obtain. Some recent studies with an anthropological approach, suggest that the role played by these variables are very strong.

The under-utilization phenomenon is a well recognized factor for WHO and UNICEF. A book edited by Djukanovic and Mach (1975) suggests numerous factors (Annexure II) which may contribute to the utilization pattern with none known to be the most significant factor.

D. The Goal and the Objectives of the Study

The goal of this study is to recommend changes in the existing PHC system of Bangladesh, so that the utilization of its clinic facilities by the people may be improved. The recommendations will be based on: 1) an analysis of the existing health care utilization pattern of the population in the context of socio-demographic, need and other related factors that are likely to influence such utilization; 2) an analysis of the results of a delphi survey regarding the existing PHC services.

It is expected that the results of the study will make valuable contribution towards understanding the problem of under-utilization of Primary Health Care (PHC) services in Bangladesh and, thereby, have major implication for health planners and implementors working towards its improvement. For convenience of analysis, different variables included in the study are grouped into predisposing, enabling, need and health service factors according to an explanatory model of health care utilization behaviour by Andersen (described later).

The objectives of the study are:

A. Problem analysis

1. To study the influence of various predisposing, enabling, need and health services factors on overall utilization of medical care services during major illness episodes.
2. To study the influence of the above factors on choice of medical providers during these major illness.
3. To do a comparative study of some aspects of service delivery by the most popular care provider in the community with that of Companiganj Health Project (representing PHC) services.
4. To draw complementary and supportive evidences from medical care utilization during terminal illness and child birth events in the same community.

5. To develop a determinant model of medical care utilization based on the major findings from above and using multivariate analysis.

B. Solution development

1. To categorize the predictors of medical care utilization into constraints, facilitators and decision variables.
2. To conduct a delphi group process survey in the community to incorporate their inputs in the solution development process.
3. To discuss alternative solutions.
4. Recommend changes in the existing PHC system.

Chapter 3

Methodology Employed

The data sets used in this study were collected by the Research and Evaluation unit of the Companiganj Health Project (CHP). In order to study the impact of the program on the community, the Research and Evaluation Unit was added to the project soon after its inception. It was purposely kept separate, both functionally and administratively, from the service delivery sector, so that one did not have any influence on the other. The delphi survey (described later), which was carried out as part of solution development process, was also conducted by the investigators of the same Research and Evaluation Unit.

During its seven years of existence, the Research and Evaluation Unit conducted a number of longitudinal and cross-sectional research studies. Major areas of research included fertility, mortality and other socio-medical studies. A few "Knowledge, Attitude and Practice" (KAP) studies regarding family planning were also completed, as were studies of the impact of various components of the program on the population.

For their routine data collection on vital events, the Research and Evaluation Unit used a 10 percent sample of the households in Companiganj area. Majority of the studies carried out in Companiganj

used the same sample or a sub-sample of the main. One study was specifically launched to examine health service utilization patterns of the community. The research being reported here utilized that data along with data on births and mortality events.

A. Problem Analysis

The major objective of this part of the study is to describe and make explanatory assertions about a population, the Companiganj upazilla, regarding their medical care utilization. Hence, a community based survey was considered to be the most appropriate design. Data on vital events were collected from Companiganj on an ongoing basis since the inception of CHP, i.e., from two years before the specific surveys on utilization. A ten percent cluster sample of households were drawn from each of 28 domiciliary service units under CHP area. An initial enumeration survey of the sample was drawn and surveyed once a month to determine birth, death, migration, cause of death, medical care sought during the time of those events and other related information.

The requirements of a medical care utilization survey during illness episodes is necessarily more intensive than general surveys. According to several authorities, at the minimum, a bi-monthly surveillance is necessary in order to capture adequate information. Compared to births or death, illness data is considered more difficult to collect. Because such standards of data collection were

costly and demanded highly-trained personnel and intensive work, it was decided that illness and medical care utilization data would be collected from an appropriately selected sub-sample.

A two stage systematic sub-sample was selected consisting of 310 households and 1,747 individuals from 14 of the original 28 sample clusters. Bi-weekly surveillance rounds were undertaken in each sub-sample for a period of one year. Collection of vital statistics and related information from the main sample, however, continued for two more years. The sampling procedure described above is presented in a diagrammatic form in Figure 3.A, while Figure 3.B shows the locations of the main sample and sub-sample within the CHP area.

Data collected from those samples can be grouped into three major categories: 1) an enumeration survey of the primary sample 2) the registration of birth and death in the sample and 3) the data on major morbidity and related medical care utilization. Collection of these data was not a part of this study. A fairly detailed description of data collection procedures were given in the proposal for this study. Hence, further details of this particular step will be avoided in this report.

Figure 3.A

Diagrammatic Presentation of Sampling Procedure of CHP Study
on Utilization

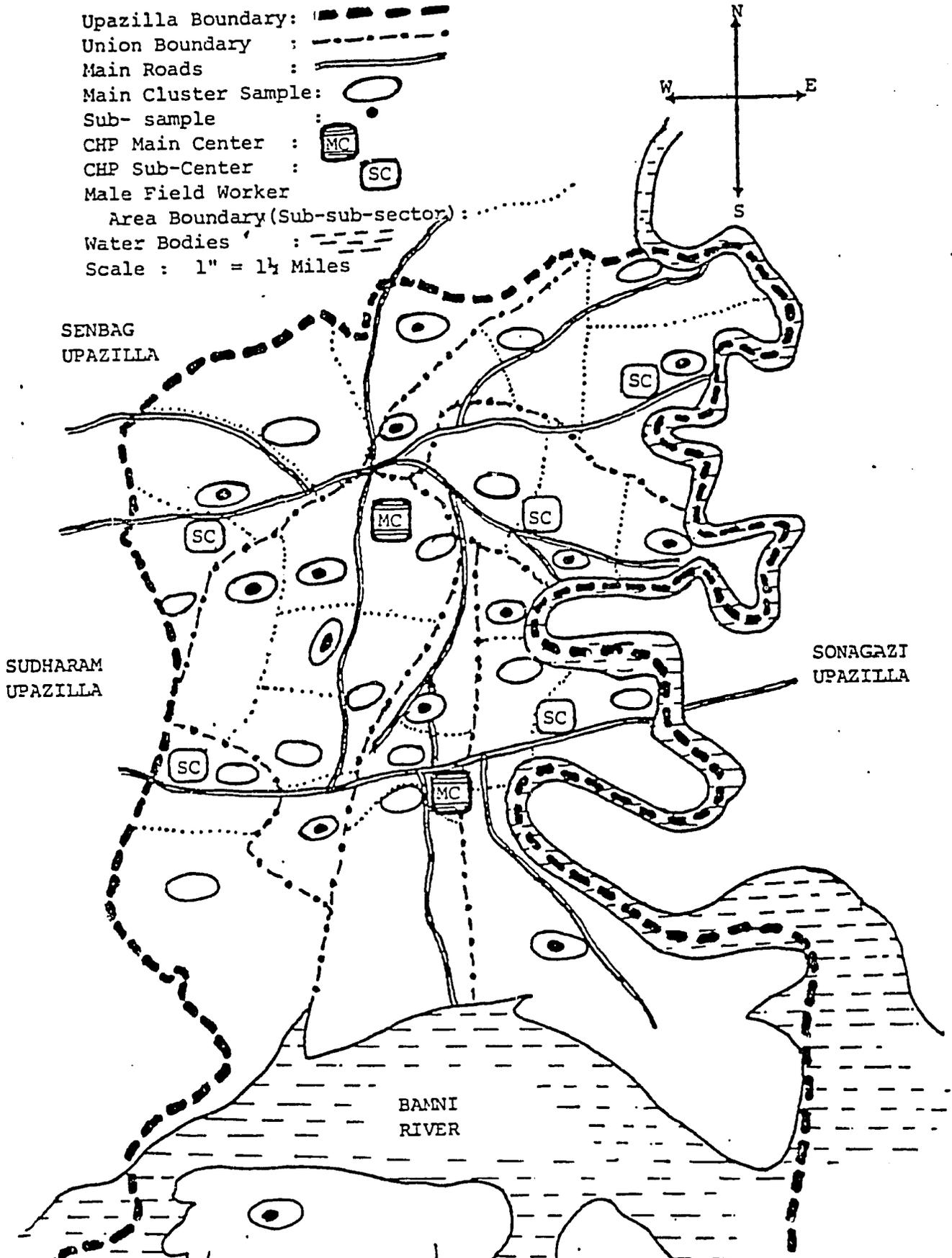
<u>Procedure</u>	<u>Unit of Measure</u>	<u>Population</u>
Survey Population	Companiganj upazilla	120,000 (approx)
Sampling Unit	28 field worker units (sub-sub-sectors)	4000-5000 (approx for each)
Sampling frame	List of households	
Survey elements	Households individuals	
Primary Sample (cluster sample)	1891 households (Approx. 68 households from each unit)	11,500 (approx)*
1st Stage Sub-Sample	14 field worker units	5750
2nd Stage Sub-Sample	310 households	1747**

* The main sample used for demographic surveillance for a period of five years i.e. from 1975 through 1979.

** The sub-sample used for collection of health care utilization data for one year i.e. 1977.

Figure 3. B.

Companiganj Upazilla
Showing Main Cluster Sample and Sub-sample Areas



1. The Data Sets

According to the objectives of the problem analysis phase, three sets of data were used: serious illness, terminal illness and childbirth events. Each of these is a subset of original data generated by the surveys indicated above and comprises the main variables relevant to the study.

Each subset contains individual data such as the age, the sex and the type of disease, family data such as socio-economic status and distance from the source of medical care, and community data such as the total number of practitioners in the community and the season of the year. The variables have also been categorized into predisposing, enabling and need factors (Table 3.A) according to the model by Andersen (1968) for convenience of the study. For illness events additional data on health care system factors such as place of treatment and travel time to clinics were also collected. (Note: these data were not collected for terminal illness or childbirth events).

2. The Variables

a. Dependent Variables

The major dependent variable in this research is utilization of medical care services, defined as contact with a provider personally

or through a representative for the purpose of receiving treatment during a serious illness, terminal illness or childbirth. The major interest of the study was on serious illness events. Supportive evidence was also used from terminal illness and childbirth events.

The first dependent variable used in the study was the overall utilization of medical care services during illness. Service utilized, or not utilized, formed the dichotomous dependent variable. The choice of providers among those who utilized services formed second dependent variable. For the purposes of the study, the health care providers in Companiganj were classified into four major categories: Companiganj Health Project (CHP), Daktars (the non-formal practitioners of modern medicine), indigenous practitioners (including Ayurvedic and Unani physicians, herbalists and faith healers), and homeopaths.

Some aspects of the services of Daktars, found to be the most popular source of care, were compared with services offered by the CHP. A dichotomous dependent variable, consisting of the utilizers of CHP and the utilizers of Daktars were used.

b. Independent (Explanatory) Variables

<u>Variables</u>	<u>Indicator</u>
Age	Age groups in years
Sex	Male or female
Religion	Muslim or Hindu
Socio-Economic Status (SES)	Size of land holding
Education	Years of education
Occupation	Type of work, profession, etc.
Type of disease	Diagnosis based on symptoms and description of diseases
Severity of disease	Duration of incapacity
Distance	Distance from patient's home to source of care
Travel time	Time in minutes from home to site of clinic or practitioner
Waiting time	Time in minutes at the site of clinic or practitioner
Expenses of treatment	Total cost of treatment including cost of medicine and fees.
Number of practitioners	Number of other practitioners available in each sub-sub-sector
Season	Month of occurrence of the episode
Preference	Preference for source of care categorized into four main types
Visit by male worker	Household received at least one visit or none at all from CHP male workers
Visit by female worker	Household received at least one visit or none at all from CHP female workers

Several authors have tried to explain the health care utilization behavior of people through the use of certain conceptual models (Suchman, 1965; Andersen, 1968; Fabrega, 1972; Aday et al, 1983; for example). These models are helpful to give a basic framework for understanding the complex subject of utilization in a simplified manner. But everyone agrees that utilization is such a complex and controversial subject and no single or combined model available at present can provide a satisfactory framework for explanation. It may not even be worthwhile to try to fit into a single model all of the possible explanatory factors that are involved to determine the utilization behavior. Such a model would then become too cumbersome and complicated to understand. For the purpose of present study, however, the most frequently used model, the one originated by Andersen (1968) and later developed and used by Kohn and White (1976) seems to be the most appropriate one. It takes into consideration the basic components of individual behavior in relation to health services system.

The model holds that at the time of a medical "need" (illness, etc.), some individuals have greater propensity to use health services than others. Such propensity can be predicted by individual characteristics that exist prior to the onset of illness. These characteristics include demographic, social structural, and attitudinal-belief variables. After an individual becomes "predisposed" to use health services, some means must be available to

him to do so. These "enabling" factors include family and community resources and other characteristics of the community.

Thus under the model there are sets of: (1) predisposing factors - the social and psychological factors that cause an individual to take an action, i.e., various demographic factors, knowledge, attitude, values, etc.; (2) enabling factors - that make it possible for a person to avail the services, i.e., cost, accessibility and availability of other resources, etc.; and (3) reinforcing (health services systems) factors - those on which health personnel have some control, i.e., attitudes of provider, behavior towards patients, etc. Finally there is (4) the need factor which is constituted by illness in a family or an individual - actual or perceived.

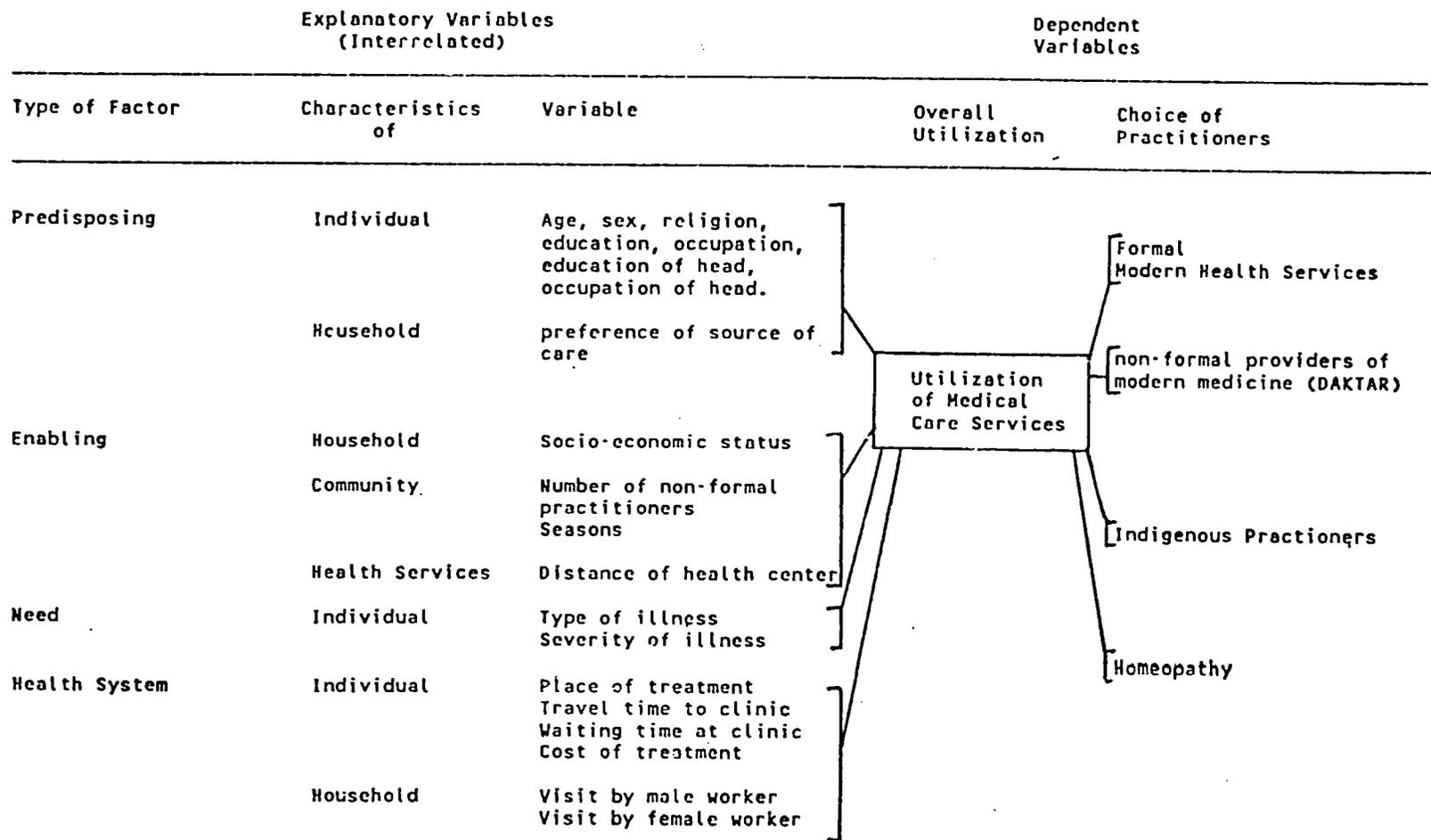
Explanatory variables to be used in this study and their relationship to overall utilization and choice of medical care is presented in Figure 3.C. by using a simplified illustration of Kohn and White model by Kroeger (1983).

3. Indicator of Socio-economic status

Landholding status has been found by several authors to be the best indicator of SES in Bangladesh; therefore, in the present analysis amount of landholding by individual's family has been used as the main indicator of SES. In rural areas, such as Companiganj,

Figure 3.C.

Utilization and Choice of Provider in Relation to Explanatory Variable under Study



people tend to purchase as much landed property as possible. Families who have other sources of income (a business, for example) usually convert their monetary savings into landed property as soon as opportunity arises.

In the initial stage of the present analysis several other possible indicators of SES were included. These were: education, the number of valuable possessions owned by the family, land tenure status, the occupation of the head of the household and the number of rooms in the household. They were all found to correlate significantly and positively with landholding status.

4. The Steps used in Analysis of the Data

Data collected from each study was verified, coded and transferred onto computer tapes. Checking and cleaning procedures were carried out and then linked by using identification numbers of individuals, which remained unique in all the studies. An immense data file resulted with a large number of variables, many that were not necessary for this study. Subsequently three smaller sub-set files (one each for illness, terminal illness and births, as indicated earlier), were prepared including only the variables that were intended to be used in this study.

Initially, one-way frequency tables of the newly created files gave a general impression of the sub groups in the sample. It also

showed that the data were in fairly good form. The distribution of values were within expected levels and the number of missing values were few. For the purpose of further analyses both the ordinal and nominal variables were grouped into usable formats.

a. Bivariate analyses

Numerous bivariate contingency tables were created in order to understand the relationship between the dependent and independent variables and also between important independent variables. Bivariate analysis was also done to make comparison between two specific population sub groups in the sample: the utilizers of CHP and the utilizers of Daktars. The Chi-Squared test was used to investigate the significance of association between two variables. This statistic provided a test of the null hypothesis (that there is no association between two variables).

The value of Chi-Square was calculated by the following formula:

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

with $(r - 1) (c - 1)$ degrees of freedom.

where O_i = observed frequency
 E_i = expected frequency
 K = total number of classes
 r = total number of rows
 c = total number of columns

b. Multiple Linear Regression and Logistic Transformation

The bivariate analyses procedures described above give a proper understanding of the population sub-groups in question and also show the significance of the associations between the dependent and independent variables. It does not show the relative contribution of each predictor variable in estimating values of the predicted variable. Such estimates can be obtained by multiple regression procedures.

Multiple regression is a technique through which one can analyze the relationship between a dependent variable and a set of independent variables. By assuming that the dependent variable is a function of independent variables, the least squares multiple linear regression is given by the model:

$$Y = a + b_1X_1 + b_2X_2 \dots \dots \dots + b_nX_n + e$$

where:

Y = The dependent variable; e.g. utilization (utilizers or non-utilizers of any health care or of the CHP).

X_{1,2,n}, = The independent or explanatory variables (e.g., sex, economic condition, etc.). It may be either interally scaled or categorical (including binary as long as it is ordinated).

- a = Estimate of a parameter in the population that corresponds to $X=0$.
- $b_{1,2,n}$ = Estimates of partial regression coefficient of Y on an X (for specific independent variable), when other variables are kept fixed.
- and e = An error variable, also known as residual (i.e. the variation in Y unexplained by X), drawn at random from $N(0, \sigma_{Y,X})$. It is independent of X and is normally distributed.

The linear regression analysis makes four assumptions. The model assumes:

1. Linearity: that a linear relationship exists between the dependent and independent variables.
2. Normality: that the distribution of Y for each X is normal.
3. Homoscedasticity: that the variances of the Y distribution for each value of X are the same.
4. Independence: that the residual (e) and variable X are independent of one another.

The closeness of fit of the model is assumed by the explained variance (R^2) and statistical significance of each coefficient is tested by the F statistics.

The multiple regression model, however, also assumes that the values of the dependent variable are ordinal. In the case of the present analyses, it is dichotomous i.e. utilizers and non-utilizers, or utilizers of CHP and non-utilizers of CHP.

A dichotomous dependent variable characteristically violates two assumptions underlying the ordinary least squares (OLS) regression model equation: i) homoscedasticity i.e. constant variance across the value of Y, and ii) normality of distribution at each level of independent variable.

In a dichotomous situation the regression curve is also unlikely to be linear at the extreme values, because the scale of the proportion is limited by the values of 0 and 1 and a change in any relevant explanatory variable at the extreme ends of its scales (0 or 1) are unlikely to produce a change in proportion. As a result a sigmoid regression curve is found instead of a straight linear one. Ordinary least squares is inappropriate for such dichotomous circumstances.

Three kinds of transformations are available in order to handle proportionate distributions: i) Angular transformation ii) Probit transformation and iii) Logit transformation. The effect of all the three transformations are more or less the same. For this study a logistic transformation has been used.

Logit modeling closely parallels linear probability modeling. The only one essential difference is that instead of using the proportion in category 1 as the criteria variable it uses Logit - the natural logarithm of the odds of falling into category 1 rather than category 2 of the dependent variable. Logit of P can be expressed as:

$$\text{Logit (P)} = \text{Log} \left(\frac{P}{1 - P} \right)$$

and the Logit model itself as:

$$\text{Logit (P}_i) = b_0 + b_1X_{1i} + b_2X_{2i} + \dots\dots\dots b_kX_{ki}$$

where:

b_0 = regression constant,

$b_{1,2,3k}$ = partial regression coefficient,

and $X_{1,2,3k}$ = independent variables

The b coefficients of the logit equation serve the same function as that of OLS model and are estimated by maximum likelihood estimation (MLE) method. The test for significance of association, the logit, however, is done by Chi-squared test rather F test.

B. Solution Development

The Delphi Survey

The Delphi group technique was employed as part of solution development process. The method was particularly useful for getting a first hand impression of the community regarding the existing PHC services within a limited time frame. It was also possible to get their suggestions and informed group opinion on how the utilization of PHC can be improved. Delphi was also found to be cost effective and could be completed within three months' period.

The survey was conducted in Mohanpur upazilla, which at present has a similar health services as that of Companiganj. CCDB, the parent organization of CHP, has an extensive community development program in the area, for which entry into the community was easy. Companiganj area was purposefully avoided, because the CHP was closed down five years back and after such a long gap people could have biased recollection of the program. The existing PHC program of Companiganj was not found to be as representative of CHP as it was in case of Mohanpur.

The survey team initially identified 40 possible participants, comprising government health officials, health care providers from the private sector and also responsible members from the community. Of these 31 agreed to participate and there was no drop out during the four successive rounds of the survey. A list of the participants along with their age and profession is attached as Annexure III.

Because of the lack of complete reliability on the local postal services, it was decided to reach the questionnaire forms to the respondents personally. In case of a farmer and a traditional birth attendant, who were illiterate, the investigators had to employ regular field survey methods to fill out the forms, i.e., read out the questions to the respondents and fill out the forms according to responses. The investigators involved were highly experienced and they were careful to avoid personal bias during the process of interview. These, of course, are slight deviations from the typical Delphi survey, where the respondents had to be literate and the questionnaire forms were to be sent by mail. For situations like Bangladesh, however, such deviations were unavoidable and might have been useful adaptations.

The first set of questionnaire given out to the respondents were mainly thought stimulating types. They included simple questions like whether the respondents thought that their local health centers were properly utilized by the people and the suggestions that they might have regarding their improvement. The responses of the first

round could be grouped into eight areas of major concern, such as location of the center, supplies to the clinics and their credibility among people. All the items listed under each of these major categories of concern were included in the second set of questionnaire and circulated among the respondents for their comments and scoring. From a total point of ten for each item included, the respondents were told to give a number according to its importance. The responses thus received were recompiled according to each item, including their total score and summary of each comment. The compiled results were then circulated among the respondents as the third questionnaire with request to give their reaction to the comments received. In the fourth and the final round the respondents were requested to give their final score based on their informed judgement on each of the item, which then further included the reactions to earlier comments. For this study, the two items that scored the maximum number under each major category have been considered for solution development.

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Chapter 4

Results:

Utilization of Medical Care Providers During Illness Episodes

Data collection on illness and respective medical care utilization was carried out for a period of one year in a sub-sample which comprised 310 households and 1,747 individuals. During this period, 998 cases of serious illness were reported.

A. The Socio-Demographic Distribution of Illness Episodes

The age and sex distribution of the illness episodes is presented in Table 4.1 along with age specific rates of serious illness. It may be noted that because the study was designed to detect only serious cases of illness, these rates should not be considered directly comparable to other surveys or to represent general morbidity. The rates are included in the table mainly to show a comparison across the age groups.

The highest proportion of illness (34 per cent) is found among children under five years of age. A sharp drop occurs in the subsequent age group (24 per cent), with a gradual and steady decline of detected illness episodes in higher age groups.

Table 4:1

Age and Sex distribution of Illness
Episodes and Age Specific Illness Rates

	<u>Age Groups (yrs)</u>					n
	<5	5-14	15-44	45+	Total	
	%	%	%	%	%	
Male Illness	37	26	21	16	100	468
Fem. Illness	31	23	25	22	100	530
Tot. Illness	34	24	23	19	100	998
Population	16	33	38	14	100	1747
Illness rate/ 100 persons/ year	120	43	35	77	57	

The rate of illness is also the highest among the under five year age group with 120 episodes per 100 children per year. The next highest rate is among the 45 year and older group with 77 episodes per 100 persons per year. The rate of episodes among 5-14 years and 15-44 year age groups are significantly lower with 43 and 35 episodes per 100 persons per year respectively.

Females represent a slightly higher proportion of all illnesses (53 per cent), and their illness rate with about 60 episodes per 100 person per year is slightly higher than that of males, who have about 55 episodes per 100 persons per year. These differences, however, are not significant.

As discussed earlier, the SES of a person has strong positive correlation with his level of education and occupation. Variation in the extent of illness episodes also correlates with education and occupation of the individual. Thus, as shown in Table 4.2, more than 75 per cent of ailments occur among the two poorest groups, while only 66 per cent of the population belongs to these SES groups. The illness rate of the poorest group is 68 episodes per 100 persons per year in contrast to about 40 illness episodes per 100 persons per year for individuals in the most economically advantaged category.

It should be noted that nearly 50 percent of the illness cases cannot be categorized by occupation, primarily because of very young age. Of the remaining half of those categorized, approximately

Table 4:2

Distribution of Socio-economic Status (SES)
of Study Population and their Rate of Illness

	<u>SES Category*</u>				Total	n
	Poor	Lower Middle	Upper Middle	Rich		
Population %	38	28	18	17	100	1747
Illness %	45	31	13	12	100	998
Illness rate/ 100 persons/ year	68	63	41	39	57	

* SES has been categorized according to the amount of land owned by each family.

60 per cent, mostly women, are engaged in household work. Other occupations represented are: land owners of various SES (21 per cent), landless agricultural laborers (11 per cent), service or business occupations (5 per cent).

The distribution of the population by educational status demonstrates a clear skewing with 82 per cent of the ailing population having no education, nearly 40 per cent of them being children of minor age. Of the remaining 18 per cent cases, 46 per cent have education below primary school level, 35 per cent at the primary level and the rest 19 per cent at high school level.

B. Correlates of Medical Care Utilization

The survey demonstrated that of the total of 998 cases of reported illness episodes, 775 episodes (78 per cent) utilized medical care of some kind from outside sources. This is irrespective of whether they tried any home remedy before or during the course of outside treatment. The remaining 223 cases (22 per cent) did not resort to any kind of outside care, except for the occasional use of home remedies.

The model proposed by Andersen (1968) and elaborated by Kohn and White (1976) which examines the effects of certain factors in order to assess the relationship between the perceived morbidity of an illness and the consequent utilization of health services was

employed. (See the discussion in Chapter Two). The four basic categories delineated by the researchers were: (1) predisposing factors, (2) enabling factors, (3) need factors, and (4) the health services system factors. As pointed out earlier, predisposing, enabling and need factors are viewed as independent or explanatory variables. The health services system's factors are considered constant for all people in a given population, and may influence the magnitude of association among various predisposing, enabling and need factors as well as the use of services.

Predisposing Factors

The predisposing factors included in the analysis are: age, sex, level of education and occupation of an individual; education and occupation of head of the households; and religion. Effect of each of these variables on overall utilization of medical care is shown below:

Age: The data suggest that the rate of medical care utilized by individual varies significantly with age. Table 4.3 examines the relationship between the utilization of medical care and age group. The lowest rate of utilization was for those under five years of age (67 per cent). The rate increased progressively with age groups and was the highest among ages 45 and older (91 per cent). The most distinctive demarcation line for the rate of utilization appears to be age 15 years. Below this age, the proportion of utilization was below 70 percent, while, above this age, the utilization rate exceeded 90 per cent.

Table 4:3
Distribution of Medical Care
Utilization During Illness by Age Groups

Medical Care Utilization

Age Groups (years)	Utilized %	Not Utilized %	Total %	n
<5	67	33	100	336
5 - 14	69	31	100	242
15 - 44	91	9	100	230
45 & +	91	9	100	190
Total	78	22	100	998

Chi-square= 74.4; for 3 d.f. p <.001

Occupation: The data suggest that people in the occupational groups were significantly more likely to utilize health services than those classified in the younger and non-working category. As indicated earlier, nearly half of the illness cases were unemployed due to age barrier, physical handicap or non-availability of jobs. The rate of medical care utilization for those were 68 per cent, while the proportion for all those who could be considered employed was more than 86 per cent. No significant difference, however, was observed in the rate of utilization among different occupational categories, although there was an increased trend for utilization with increased cash stability of individual's occupation. Use rate of 86 per cent among household workers gradually increases to 92 per cent as the cash return of the occupation reached its maximum among businessmen or service holders.

Occupation of head of the household also showed a significant association with medical care utilization ($p=.01$). The rate of utilization among all the head-of-household occupational groups was approximately 80 per cent with the exception of landless agricultural workers, the poorest occupational category, where the utilization rate was significantly lower (69 per cent).

Education: The level of education of an individual had significant positive association with his or her utilization of medical services ($p=.003$). The persons with no education were least likely to use medical services. Use increased with level of education. The

highest utilization occurred among those having a high school education or above (91 per cent). Education of an individual, however, is influenced by his age. Children under five years' age could not possibly have any education. As such, utilization according to education of head of households is likely to give a better measure. As shown in Table 4.4, utilization was also positively correlated to the education of the head of household.

Sex: An age group specific comparison of the relationship of sex and utilization, presented in Table 4.5, shows that there was a significant sex difference in utilization in the age group 15-44 years ($P < .05$). Across all the age groups the utilization rate for males was slightly higher than for females, even though women of childbearing age, 15-44 years, are known to have a greater need for medical care.

Religion: Religion appeared to play an insignificant role in the utilization of medical services. There was no significant difference in utilization between Muslims and Hindus.

Enabling Factors

Variables included under enabling factors are socio-economic status (SES) of family, season of the year, number of non-formal practitioners in a sample unit and distance of a household from the main center and sub-center clinics of CHP.

Table 4:4

Distribution of Medical Care
Utilization During Illness by Education
of Head of Household

Medical Care Utilization

Educations Level	Utilized %	Not Utilized %	Total %	n
None	75	25	100	749
< Primary	76	24	100	60
Primary sch.	86	14	100	132
High school	84	16	100	57
Total	78	22	100	998

Chi-square= 7.7; for 3 d.f. p=0.05

Table 4:5

Distribution of Medical Care Utilization
During Illness by Age Group and Sex

<u>Medical Care Utilization</u>						
Age Groups (years)	Sex	Utilized ' %	Not Utilized %	Total %	n	chi- square p
< 5	M	70	30	100	174	N.S.
	F	64	36	100	162	
5 - 14	M	71	29	100	122	N.S.
	F	68	32	100	120	
15 - 44	M	96	4	100	98	Sig
	F	87	13	100	132	
45 & +	M	92	8	100	74	N.S.
	F	91	9	100	116	
Total	M	79	21	100	468	N.S.
	F	77	23	100	530	
G.Total	M & F	78	22	100	998	

N.S.= Not significant

Sig.= Significant at p <.05 level

Socio-Economic Status (SES): Table 4.6 shows the distribution of medical care utilization according to SES groups, as defined by the amount of land owned by the families. As expected, utilization rate is the lowest (74 per cent) among the poor and highest (86 per cent) among the rich. The utilization rate is similar in the two middle class SES groups (79 per cent).

Season: According to Table 4.7, the maximum rate of utilization was found in the summer (96 per cent), followed by the rainy season (78 per cent) with the least utilization in winter (73 per cent). It is also worth noting that during summer months the rate of illness episodes seem to be significantly lower than in the other two seasons.

Utilization According to the Number of Available

Practitioners: As indicated in Chapter 3, the non-formal practitioners in Companiganj comprise various combinations of modern, indigenous and homeopathic approaches to treatment (see Table 3.1). Medical care utilization had significant positive associations with the number of non-formal practitioners available in each CHP domiciliary service unit, which usually contained 4,000-5,000 people. As shown in Table 4.8, the utilization was the lowest when the number of practitioners available was 0-4 in number (73 per cent). Utilization increased to 75 per cent when five to nine practitioners were present, and it exceeded 80 per cent when the number of practitioners was above ten.

Table 4:6

Distribution of Medical Care Utilization
During Illness by Socio-economic Status (SES)

Medical Care Utilization

SES' Category	Utilized %	Not Utilized %	Total %	n
Poor	74	26	100	449
Lower Middle	79	21	100	306
Upper Middle	79	21	100	127
Rich	86	14	100	116
Total	78	22	100	998

Chi-square= 9.1 ; for 3 d.f. p <.028

Table 4:7

Distribution of Medical Care
Utilization During Illness by Season

Medical Care Utilization

Season	Utilized %	Not Utilized %	Total %	n
Winter	73	27	100	481
Summer	96	4	100	109
Rain	78	22	100	408
Total	78	22	100	998

Chi-square= 19.1 ; for 2 d.f. p <.001

Distance From CHP Clinics: The sub-centers of CHP were at a much closer proximity to sampled households than the main centers. For example, 40 per cent of the households with illness episode were within one mile radius from the former, while only 15 percent of those were within the same radius from the latter. The data show that households living within one mile radius of either of the centers were utilizing medical services the most (80 per cent). Beyond this distance the utilization rate reduced steadily.

Need Factors

The need factors included in the analysis are diagnostic categories of the diseases and length of suffering due to disease.

Disease: Table 4.9 correlates the common groupings of diseases with utilization and non-utilization of medical care. It should be noted that only diseases which led to disabling conditions were selected; hence, the distribution presented in the table may not follow a general morbidity pattern. Moreover, instead of categorizing the diseases according to strict medical definitions (acute amoebic dysentery, pneumonia, chronic otitis media, etc., for example), they have been classified according to broad common conditions usually identified by the community. Originally the diseases were diagnosed into medical classification, but for the purpose of present study community classification of disease is a more desirable and practical approach.

Table 4:8

Distribution of Medical Care Utilization
During Illness by Number of Practitioners
in the Locality

<u>Medical Care Utilization</u>				
No. of Pract.	Utilized %	Not Utilized %	Total %	n
0 - 4	73	27	100	106
5 - 9	75	25	100	490
10 +	82	18	100	402
<hr/> Total	78	22	100	998

Chi-square= 7.9 ; for 2 d.f. p = 0.02

Table 4:9

Distribution of Medical Care Utilization
During Illness by Diagnostic Categories
of Diseases

<u>Medical Care Utilization</u>				
Disease Category	Utilized %	Not Utilized %	Total %	n
Respiratory diseases	66	34	100	208
Fever	75	25	100	243
Gastroint. diseases	78	22	100	165
Others/ Unknown	82	18	100	185
Deficiency diseases	86	14	100	21
Aches/Pains	87	13	100	54
Neonatal/ infancy	92	8	100	61
Accidents/ Emergency	96	4	100	48
Total	78	22	100	985

Chi-square= 39.9 ; for 7 d.f. $p < 0.001$

This is because when people tend to seek care, they do it according to what they define as the nature of the disease rather than the medically diagnostic categories.

In Table 4.10, the diagnostic categories of diseases have been grouped into type of illness according to medical care utilized or not. Emergency and accidents, acute condition or chronic courses of illness are easily identified in the community. Hence it is likely that these illness categories have important influence on medical care utilization.

The disease groups incorporated varies significantly with age but not with sex. Distribution of disease type by age shows that acute diseases are more common among lower age groups, while chronic diseases, and emergency and accidents, which include cerebro-vascular accidents and of the like, are more common among higher age groups.

According to diagnostic categories of diseases by age, neonatal and childhood diseases, respiratory and gastro-intestinal diseases are more common to lower age groups, while aches and pains, emergencies and accidents and "others and unknown" category (non-specified and uncommon) of diseases are more common among higher age groups. Fever seems to be equally common to all the age groups. Socio-economic status does not have any significant correlation with disease pattern. Education and occupation of an individual or of the head of a household also show no correlation with disease pattern.

Table 4:10

Distribution of Medical Care Utilization
During Illness by type of illness

Medical Care Utilization

Illness type	Utilized %	Not Utilized %	Total %	n
Acute	75	25	100	585
Chronic	81	19	100	345
Accidents/ Emergency	96	4	100	55
Total	78	22	100	985

Chi-square= 16.2 ; for 2 d.f. p <.001

As shown in Table 4.9, emergency and accident cases and diseases most common to neonates and children are the most likely reasons for medical care utilization (above 90 per cent). Aches and pains (majority is composed of general body pain, joint pain and low back pain), deficiency diseases and diseases in 'others and unknown' category receive second priority (80 - <90 per cent utilization). The lowest utilizations of medical services are found with fever, gastro-intestinal diseases and respiratory tract diseases (below 80 percent). The above findings are reiterated in Table 4.10, where it shows that in terms of utilization priority, emergency and accidents come first, diseases that run a chronic course second, and common acute diseases third.

Length Of Suffering: Length of suffering from illness shows a bimodal ('U' shaped) distribution. For nearly 50 per cent of the total diseases length of suffering was less than 15 days. Only 10 percent of the diseases had length of suffering for 15 - 29 days and another 7 percent, 30 -59 days. For suffering above sixty days the proportion of diseases rises again to 34 per cent.

Length of suffering has strong positive correlation with age and disease pattern. As shown in Figure 4.A, the length of suffering for each age group follows a similar pattern to that of the mean. As age advances, the length of illness above 60 days increases significantly, while the proportion of suffering up to 14 days decreases. This pattern of distribution seems to be related to type

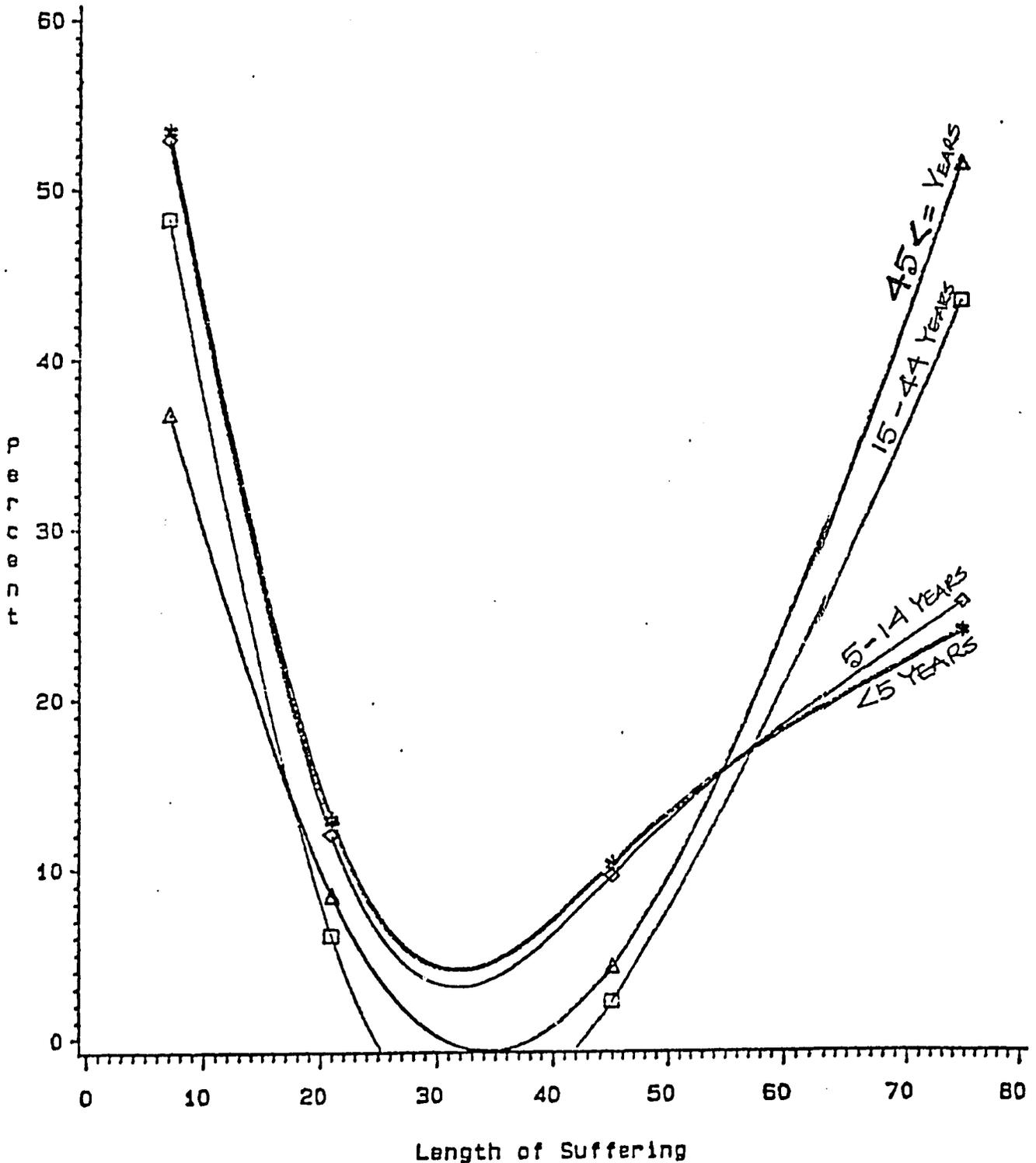
of diseases. Earlier it had been shown that with advancement of age, people tend to suffer more from chronic diseases than acute diseases. Since chronic diseases certainly tend to follow longer course, the proportion of suffering also increases for higher age groups.

In Table 4.11 distribution of length of suffering is shown according to utilization of medical services. Like the distribution of suffering itself the rate of medical care utilization also seem to have a bi-modal distribution. The highest rate of utilization is found for diseases which have lasted for sixty days or longer, while the rate is the lowest for diseases which have lasted between 30 days to 60 days. Such curvilinear relationship of length of suffering with utilization can be explained by the age distribution of the sufferers. Bivariate analyses of the two show that more than 70 per cent of diseases in the 15-29 days sufferer group and more than 80 per cent in the 30-60 days sufferer group are among children under 5 years of age. It was shown earlier that the younger children are least likely to utilize medical care services.

A similar pattern of distribution can also be observed from Figure 4.B, where the rate of illness for each interval of suffering according to age groups is presented. The figure also shows that although the rate of illness for 60 days and above may be substantially lower for <5 children, it still remains higher than the two intermediary level (i.e. 5- 14 and 15- 44 years) age groups, because the overall rate of illness for them are considerably higher.

Figure 4.A.

LENGTH OF SUFFERING BY AGE GROUP



$Age < 5$ $5 \leq Age < 14$ $15 \leq Age < 44$ $45 \leq Age$

Figure 4.B

Rate of Illness by Length of Suffering
According to Age Groups

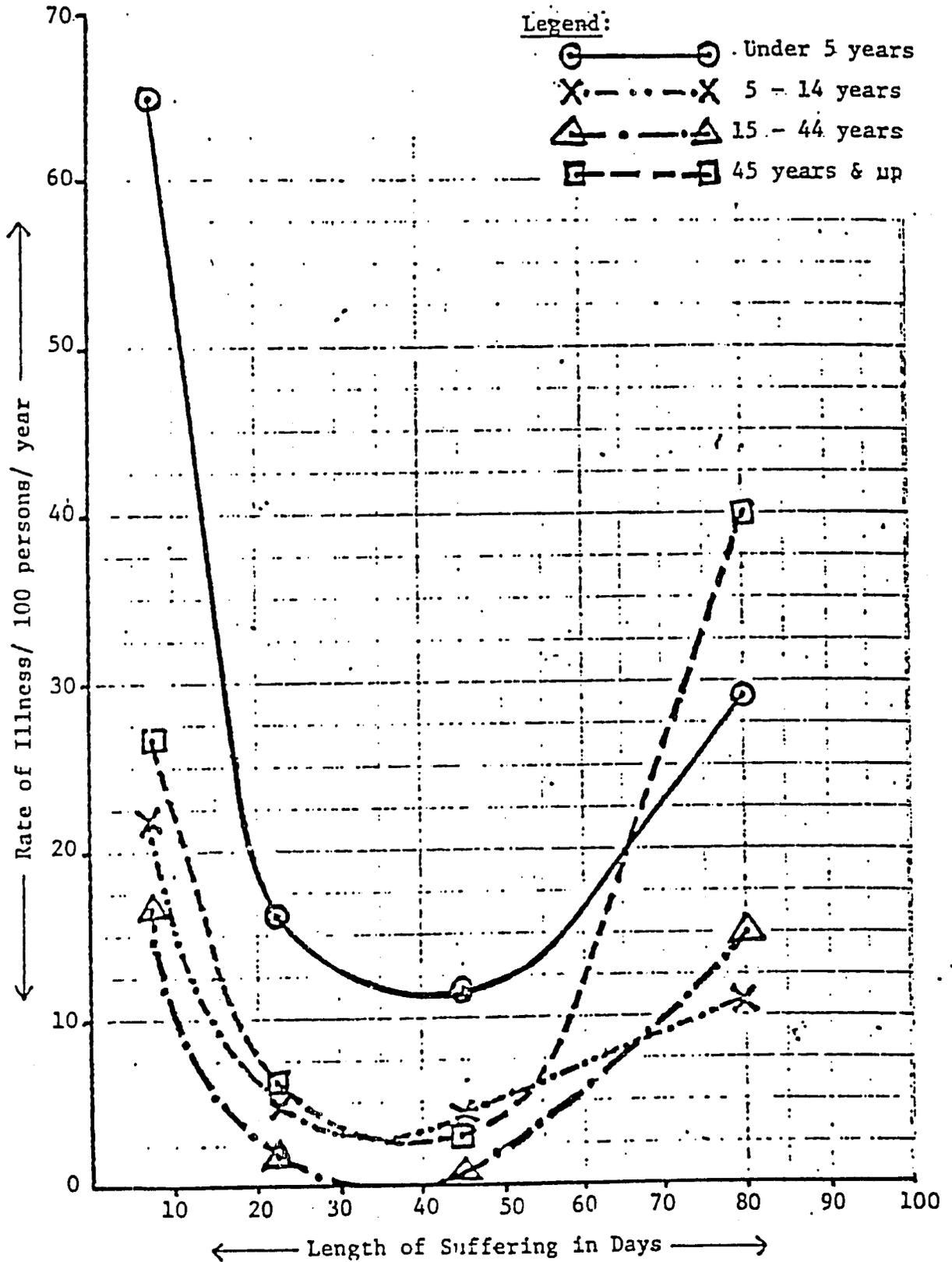


Table 4:11

Distribution of Medical Care Utilization
During Illness by Length of Suffering

<u>Medical Care Utilization</u>				
Suffering Days	Utilized %	Not Utilized %	Total %	n
1 - 14	76	24	100	486
15 - 29	76	24	100	102
30 - 59	69	31	100	70
60 & +	84	16	100	340
Total	78	22	100	998

Chi-square= 12.0 ; for 3 d.f. p =.008

Health System Factors

Variables considered here are visits by male and female workers to the ill person's house, number of contacts made with households by the male and female workers and the number of activities by health workers as recollected by the households.

All these activities represent the process of domiciliary services provided by the CHP. Since such house visit concern mainly preventive and promotive health activities, it is expected that the more the contacts are made, the more the households are likely to become health conscious, which will be converted into better utilization of medical care during illness.

Analysis of the variables shows that 'visit' by male workers strongly correlates with 'contact' of households by male workers and the same is true for female workers. These results are expected. Male workers made at least one visit to 86 per cent of the households and they were able to make at least one contact with 77 per cent of the households. Female workers on the other hand, were able to pay at least one visit to only 29 per cent of the households and they were able to make contacts with 25 per cent of the households. Level of recollection show that more than 80 per cent households were able to recollect at least one content of activities by health workers. None of these variables, however, show any association with overall utilization of medical care services. Only in case of female visits

and female contact, there is a slightly increased trend for medical care utilization. The overall contact by female workers, however, is so low that no conclusion can be derived.

From the presently available results it can be said that health services factors included in the analysis have very little influence on overall utilization of health care services.

C. Reasons For Not Receiving Medical' Care

This section examines the 223 (22.3 per cent) cases of illness that did not resort to any kind of medical care. An examination of the reasons for their negligence of medical care shows that 48 percent of those are related to poverty. In other words, those households did not have enough money to spend on medical care at the time of their event and cited poverty to be their reason for not seeking care. More than two third of these patients live beyond three miles from the clinics making the latter inaccessible.

Thirty four per cent cases considered their ailment to be minor and so did not feel the necessity of seeking any care. Fourteen per cent cases were frustrated either because their previous treatments were ineffective or because they had no one to bring them medicine. The three reasons described above account for 96 per cent of the cases who did not receive care. The remaining 5 per cent of cases consisted of various less important reasons like trying home remedy,

perceived negligent attitude of the provider or lack of confidence on the provider near at hand.

Table 4.12 shows the distribution of reasons for not receiving care according to SES of the households. There is a significant difference in the reasons cited by each of the SES groups. As expected, the poorest group cited 'poverty' to be their reason in two third of their cases. The reason 'poverty' becomes progressively less important as the SES goes up. Except for the poor, all the other SES groups' most frequently cited reason is the consideration of their ailment to be minor. The reason alone accounts for nearly two thirds of the cases among the rich and around half the cases for the lower and upper middle classes. Among the poor, on the other hand, consideration of an ailment to be minor is proportionally much less. 'Frustration' as a reason seems to be slightly more common among the two upper SES groups than the lower two.

D. Summary

In this chapter correlates of overall utilization of medical care services during illness has been presented. Out of 998 cases of reported illness 78 per cent were found to resort to some kind of medical care while 22 per cent did not. A socio-demographic distribution of the illness cases shows that the rate of illness is significantly higher among children and elderly, compared to

Table 4:12

Distribution of Reasons for not Utilizing Medical Care
During Illness by Socio-economic Status (SES)

SES Category	<u>Reasons for Non-utilization</u>				total %	n
	Poverty %	Consider minor %	Frustra- -tion %	Others %		
Poor	66	18	14	3	100	119
Lower Middle	33	51	10	6	100	63
Upper Middle	22	49	18	11	100	27
Rich	7	65	21	7	100	14
Total	48	34	13	5	100	223

Chi-square= 41.9 ; for 9 d.f. p <.001

adolescents and adults. Distribution according to SES shows that 75 per cent of the illness are among lower SES groups. Their rate of illness is also significantly higher than the two upper SES groups under consideration.

Nearly 50 per cent of patients do not have any occupation. Agriculture and household work represent the greatest bulk of occupational categories for the remaining 50 per cent of patients. Eighty two per cent of the ailing population have no education, while majority of the remaining have upto primary school level only.

Among the predisposing factors an individual's age, level of education and occupation, and level of education and occupation of head of the households have been found to be significantly associated to overall medical care utilization. No relationship was found according to sex or religion of the patient. Among the enabling factors, SES of households, season, total number of private practitioners in a given community and distance of CHP centers from households are significantly associated with utilization. Diagnostic categories of diseases and length of suffering by individual are the two need factors that also have significant association with utilization. None of the health services system factors included in the study, such as visit to households by male or female workers of CHP have any relationship with utilization.

Nearly half of the illness cases who did not resort to any outside source of medical care cited poverty as their main reason for non-utilization. About one third of the cases considered their ailment as minor and another 14 per cent suffered from frustration regarding their treatment. Practice of home remedy reported in the present study is significantly lower than reported elsewhere, mainly because the study deals with serious diseases only.

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Chapter 5

Results:

Choice of Medical Care Providers

One of the primary objectives of this study is to examine the factors that influenced a rural population in Bangladesh to choose certain types of health care providers over others and to delineate the reasons for those choices. The purpose of this section of the study is to examine the households' preferences for health care providers and the factors that influence subsequent choices for health care providers during actual illness episodes.

As presented earlier, the different types of providers that are available in rural Bangladesh can be broadly classified into:

(1) formal government health services, the only source of modern primary health care (PHC); in this study the formal PHC services is being represented by the Compañiganj Health Project (CHP), (2) Daktars: the self-trained, semi-trained, unregistered, non-formal practitioners of modern medicine, (3) practitioners of indigenous medical systems such as Ayurveda and Unani and those practising folk cures and faith healing and (4) homeopaths.

A. Preference for Source of Care

Results presented on Tables 5.1 and 5.2 were computed from responses to two open-ended questions posed to the sample households

Table 5.1

Distribution of Preference for Primary Health Care (PHC)
 Provider Among Households by Socio-economic Status (SES)

Preference for PHC

SES Category	Daktar %	CHP %	Homeopath %	Indigenous %	Total %	n
Poor	54	41	1	4	100	162
Lower Middle	66	32	2	0	100	88
Upper Middle	37	60	3	0	100	35
Rich	62	33	0	5	100	21
Total	56	40	2	2	100	306*

Chi-square= 17.6; for 9 d.f. p =.03

Daktar: Non-formal, semi-trained or self trained
 practitioners of modern medicine.

CHP : Companiganj Health Project.

* Excludes four missing cases

Table 5.2

Distribution of Reasons for Preference for Primary
Health Care Provider by Socio-economic Status (SES)
of Households

SES Category	<u>Reason for Preference</u>				Total %	n
	Close to Home %	Free Medicine %	Good Services %	Other %		
Poor	44	30	7	19	100	162
Lower Middle	63	20	6	11	100	88
Upper Middle	31	20	26	23	100	35
Rich	33	29	5	33	100	21
Total	47	26	9	18	100	306*

Chi-square= 28.3; for 9 d.f. $p < .001$

* Excludes four missing cases

regarding their health care preferences. The opinion survey was taken during the collection of baseline information prior to actual disease surveillance, recorded episodes of illness and utilization of any form of health care during the study.

The questions asked were: "If you or any member of your family falls ill today, who would you prefer to approach first for treatment?" and "Why would you prefer to go to her/him?" The responses tabulated represent only the households that had at least one illness episode during the survey period.

Table 5.1 presents the distribution of preference for PHC source according to SES of the families. There was a significant difference ($P < .001$) in preference for the type of health care when examined according to SES. Daktars had the highest preference among the lower middle class and lowest preference among the upper middle class. The opposite was true for the preference of CHP. Indigenous practitioners were preferred chiefly by the poorest SES. Overall, the largest proportion of the sample (56 per cent) expressed their preference for village Daktars, while 40 per cent preferred to go to the CHP. These two sources together comprised 96 per cent of the population's choices.

The reasons for preference for a medical care provider, as shown in Table 5:2, also differed significantly according to SES ($P < .001$). Proximity and physical accessibility were significantly more critical

among the two lower SES categories. As shown in Table 5.2, 47 per cent of the respondents based their choices on the perceived proximity of the care sources to their homes. Accessibility was further reflected by the second most frequent reason given for preference--the availability of free medicine (financial accessibility). Such responses appeared to indicate that quality of services was far less critical to respondents than the issue of accessibility.

The distribution of reasons for preference by provider type revealed that Daktars and homeopaths were preferred mostly because of their proximity to households (76 per cent in case of the former and 52 per cent in case of the latter). On the other hand, CHP was preferred mostly (63 per cent) because of its free services and medicine. In 26 per cent cases, however, preference for CHP was for its quality of services, a reason not indicated for any other provider. Majority of the reasons cited for preference of indigenous practitioners were related to such factors as belief, trust, satisfaction and convenience.

B. Correlates of Choice for Medical Care Provider

The distribution of the actual utilization of medical care providers was found to be widely divergent from the provider preferences expressed verbally earlier in the survey. As noted in Chapter Four, of the 998 cases of illness episodes, 775 cases

received treatment from some outside provider source. Forty-nine per cent of the population utilized Daktars, 26 per cent the CHP, 16 per cent the indigenous practitioners and 9 per cent the homeopaths.

Table 5:3 tabulates the difference between the expressed preferences for medical care providers and their actual utilization during an illness episode. These statistics indicate only cases that received actual medical care; thus, the size of the sample was reduced by approximately 22 per cent from the original sample. The table indicates that there was no significant difference in the actual utilization of medical care provider according to preference for any particular type.

The table also shows the marked disparity between expressed preference for a particular type of provider and the actual utilization of one at the time of need. Only four per cent of the illness cases showed preference for indigenous practitioners and homeopaths. In reality, however, 25 per cent of the total cases actually ended up using their services (see last column of Table 5.3). Out of the 40 per cent cases (309 individuals) that showed preference for CHP facilities only 28 per cent actually used them. More than 47 per cent of this group used Daktar's services and the remaining 25 per cent used services of indigenous practitioners and homeopaths. On the other hand, about 26 percent of the cases who showed preference for Daktar subsequently utilized CHP services.

Table 5.3

Distribution of Preference for Primary Health Care (PHC)
Provider During Illness by Actual Use of Providers

Preference for PHC

Provider Utilized	Daktar %	CHP %	Indigenous %	Homeopath %	Total %	n (%)
Daktar	56	39	3	2	100	374 (49)
CHP	55	43	1	1	100	199 (26)
Indigenous	63	34	2	1	100	125 (16)
Homeopath	45	51	2	2	100	66 (9)
Total	56	40	2	2	100	764* (100)

Chi-square= 11.8; for 9 d.f. p =.225

(%) Indicates % of actual utilization during illness.

* Excludes 223 non-utilizers and 11 missing cases.

Daktar: Non-formal, semi-trained or self trained practitioners of modern medicine.

CHP : Companiganj Health Project.

These findings suggest that the choice of practitioner at the time of need may be influenced by additional factors such as those influencing overall medical care utilization examined in Chapter Four. The paradigm presented by Andersen(1968) and Kohn and White(1976) will be used once again to tease out those additional influencing factors.

Predisposing Factors

Age, education, occupation, sex and religion were the predisposing factors of an individual included in the analyses. In addition, education and occupation of head of a household were also considered.

Age: Table 5.4 presents the distribution of provider utilization according to age groups. It is evident from the table, that the most frequent utilizers of Daktars were those in the 15-44 year age group, individuals of working and child-bearing age. Sixty-three per cent of this age classification utilized the services of a Daktar.

The most frequent utilizers of CHP, on the other hand, were persons 45 years of age and older, followed by the 5-14 years age group. Indigenous practitioners and homeopaths were more likely to be utilized for children under 5 years of age. The utilization of the former, however, showed only slight decrease in the higher age groups, while the latter had a negative correlation with age.

Table 5.4

Distribution of Type of Provider
During Illness by Age Groups (in years)

Age Groups	<u>Provider Type</u>				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
<5	43	17	21	19	100	225
5 - 14	45	30	17	8	100	167
15 - 44	63	22	11	4	100	207
45 & +	45	38	17	1	100	173
Total	49	26	16	9	100	772

Chi-square = 80.2; for 9 d.f. $p < .001$

Daktar: Non-formal, semi-trained or self-trained
practioners of modern medicine.

CHP : Companiganj Health Project.

Education: Only 26 per cent of the population had any form of formalized education, and for that reason, education could not be considered a major influencing factor on choice of care; nonetheless, the utilization of a Daktar appeared to have a direct and significant correlation with education ($P = .02$): the higher the education, the greater the likelihood of a person utilizing a Daktar. Those having what was equivalent to a high school education used Daktars in 70 per cent of their illness episodes. The use of the CHP remained at about 25 per cent for most educational levels; however, it dropped to 10 per cent when the educational level reached high school or above. The utilization of homeopaths and indigenous practitioners were more common to people with little or no education.

Occupation: Occupation of an individual also appeared to have a significant influence on choice of medical care ($P < .001$); however, the influence seemed to be mainly due to accessibility to cash. Occupations having more accessibility to cash income, such as persons in service/business and land owners, were more likely to utilize a Daktar. The CHP was utilized more by people who had less access to cash flow, such as the agricultural landless and those engaging in household work. Utilization of indigenous practitioners and homeopaths appeared to be more common to low income and non-occupational groups.

Sex: Males were more likely to use Daktars than females who were more likely to rely on the CHP, but these differences were not found

to be significant. Use of indigenous practitioners and homeopaths was almost equal for both sexes.

Religion: This appeared to have little bearing on the choice of care providers. It should be noted that Hindus comprised only about 7 per cent of the illness cases. They were found to be slightly more likely to use Daktars; however, the differences were not significant.

Education and occupation of head of households: These factors did not seem to have any significant influence on the choice of medical care practitioners.

Enabling Factors

The enabling factors under consideration were the socio-economic status (SES) of the illness case, the effects of the season of the year, the number of total practitioners available in a locality and the distance of the CHP facilities from the residence of the case.

Socio-economic status: Since SES of an individual correlates positively with his education and occupation, it was expected that the choice of providers would vary accordingly. Table 5.5 demonstrates that the utilization of Daktars showed a positive correlation with SES and the use of the CHP a negative one. Indigenous practitioners were evenly utilized across all the SES categories, although their use was slightly higher among the two

Table 5.5

Distribution of Type of Provider
During Illness by Socio-economic Status (SES)

SES Category	<u>Provider Type</u>				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
Poor	46	29	15	10	100	332
Lower Middle	41	30	19	10	100	241
Upper Middle	56	16	20	8	100	99
Rich	70	17	12	1	100	100
Total	49	26	16	9	100	772

Chi-square = 34.2; for 9 d.f. p <.001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

practitioners available in a community had a positive association with utilization of the CHP and a negative one with the utilization of Dokter (Table 5.7). This finding seems to be somewhat different from middle class groups. Use of homeopathy was significantly less in the highest income group.

Season: As described in the introduction to Chapter Three, the weather sharply defines village life in Companiganj. The seasons influence accessibility to health care, the availability of jobs, cash flow and the epidemiology of disease. The three primary seasons of the year are summer which lasts from March through June; the rainy season, July through October; and winter, November through February.

Daktars were the most utilized of all health care providers during all seasons. As shown in Table 5.6, the use of Daktars was highest during winter months, the lowest point of utilization of the CHP. During summer the rate of utilization of Daktars reduced slightly with a proportionate increase in the utilization of the CHP. The highest utilization of CHP was seen during the rainy season, when utilization of Daktars were the lowest. In fact, 61 per cent of the total patients seen at the CHP facilities were seen during the rainy season. This see-saw effect of utilization between Daktars and the CHP has been observed during the influence of other factors as well.

The utilization of the indigenous practitioners reduced markedly during the rainy season, while the utilization of the homeopaths

Table 5.6

Distribution of Type of Provider
During Illness by Season

Seasonal Category	<u>Provider Type</u>				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
Winter	53	17	21	9	100	350
Summer	48	20	23	9	100	102
Rain	46	35	10	9	100	320
Total	49	26	16	9	100	772

Chi-square = 39.1; for 6 d.f. p < .001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.7

Distribution of Type of Provider During Illness
by Number of Practitioners in Locality

No. of Pract.nr	<u>Provider Type</u>				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
1 - 4	56	23	14	7	100	77
5 - 9	51	25	18	5	100	367
10 & +	44	27	16	13	100	328
Total	49	26	16	9	100	772

Chi-square = 16.4; for 6 d.f. p = .01

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

remained fairly constant through all the seasons.

Number of non-formal practitioners: The total number of non-formal practitioners available in a community had a positive association with the utilization of CHP and a negative one with the utilization of Dokter (Table 5.7). This finding seems to be somewhat different from the earlier one in Chapter Four (Table 4.8) that more the providers in a given community, the higher the utilization of their services.

A geographic breakdown of the location of non-formal practitioners' clinics, drug shops and the CHPs may help to explain this phenomenon. As shown in Figure 5.A, most of these health-related services in Companiganj were located near the marketplaces, the central hub of commerce and socialization for a group of villages. This was also true for CHP facilities, the sites for which were donated and selected by the community. As the distance from the marketplace increased, the concentration of such health services decreased.

A person residing close to area A (Fig.5.A), where a CHP clinic, as well as ten other private facilities were located, was more likely to seek medical care than a person who resided in areas B or C (finding of Chapter Four). Also, if a CHP facility was near at hand, the likelihood was greater of person utilizing that than a person in

Table 5.8

Distribution of Type of Provider During Illness
by Distance of CHP Main Centers from Households

Distance of Main Centers	<u>Provider Type</u>				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
0-1 mile	39	34	11	16	100	123
2-3 mile	45	25	21	9	100	198
3 miles +	53	23	16	8	100	451
Total	49	26	16	9	100	772

Chi-square = 25.0; for 6 d.f. p <.001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

distant areas, if other factors remained constant. Logically, on the other hand, a person located at a distance from the market, as in area C, will be more likely to use the nearest practitioner rather than the more distant CHP.

Distance of CHP facilities: Tables 5.8 illustrates that the utilization of the CHP facility became significantly higher and Daktar utilization decreased proportionately when people lived within one mile of the CHP. The further the distance from the CHP facilities, the more the utilization of the Daktar increased. The use of homeopaths also had a negative correlation with distance from CHP. The utilization of indigenous practitioners, on the other hand, remained more evenly distributed regardless of distance.

Need Factors

Disease: The nature of illness, the type of disease, the acuity or chronicity of the episodes and emergency factors all seem to have affected the choice of practitioners and health care systems.

Tables 5.9 and 5.10 demonstrate that Daktars and homeopaths were more likely to be utilized for acute illness conditions. In fact, nearly 64 per cent of the patient loads carried by the former and 70 per cent by the latter were suffering from acute diseases. On the other hand, only 5 per cent of patients of the former and 2 per cent

Table 5.9

Distribution of Type of Provider During Illness
by Type of Illness

Illness Type	<u>Provider Type</u>				Total	
	Daktar %	CHP %	Indigenous %	Homeopath %	%	n
Chronic	41	34	19	6	100	284
Acute	54	20	15	11	100	435
Accident/ Emergency	40	40	18	2	100	45
Total	49	26	16	9	100	764

Chi-square = 31.8; for 6 d.f. p <.001

Daktar: Non-formal, semi-trained or self-trained practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.10

Distribution of Type of Provider During Illness
by Diagnostic Categories of Diseases

Disease Category	<u>Provider Type</u>					n
	Daktar %	CHP %	Indigenous %	Homeopath %	Total %	
Respiratory Diseases	55	18	10	17	100	137
Fever	57	26	10	7	100	181
Intestinal Diseases	54	24	13	9	100	129
Others/ Unknown	40	36	20	4	100	150
Deficiency Diseases	33	33	17	17	100	18
Aches/Pains	53	30	15	2	100	47
Neonatal/ Childhood	27	7	54	12	100	56
Accidents/ Emergency	40	40	18	2	100	46
Total	49	26	16	9	100	764

Chi-square = 112.3; for 21 d.f. p <.001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.11

Distribution of Type of Provider During Illness
by Length of Suffering in Days

Suffering Days	<u>Provider Type</u>				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
1 - 14	54	18	17	11	100	366
15 - 29	51	24	14	11	100	76
30 - 60	40	27	19	14	100	48
60 & +	43	37	17	3	100	282
Total	49	26	16	9	100	764

Chi-square = 38.9; for 9 d.f. p < .001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.12

Distribution of Type of Provider During Illness
by Visit from CHP Female Workers

Contact Type	Provider Type				Total %	n
	Daktar %	CHP %	Indigenous %	Homeopath %		
No Contact	51	24	18	7	100	573
Fem.worker Contact	43	31	14	12	100	19
Total	49	26	16	9	100	772

Chi-square = 9.7; for 3 d.f. p = .02

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

of the latter comprised emergency and accident cases. In contrast, the utilization of CHP was significantly higher for chronic conditions and emergencies and accidents. Utilization of indigenous practitioners were significantly higher for neo-natal and childhood diseases.

Duration of illness: Table 5.11 demonstrates the correlation between the duration of an illness and the utilization of the different providers. The correlation is positive for CHP and negative for Daktars. The length of suffering did not appear to alter the use patterns of indigenous practitioners, while homeopaths were seldom continued to be used if the suffering lasted two months or longer. The findings in the table reiterate the facts that acute conditions, which usually have shorter duration were seen proportionately more by Daktars, while the diseases of longer duration by the CHP.

Health Services System Factors

In the determination of overall utilization of medical care during illness (in Chapter Four) none of the health services factors included in the analysis such as: domiciliary visits and contacts by male or female workers of CHP for preventive and promotive services, showed any clearcut association. In the choice of providers, however, the effect of female workers' visit had a significant effect on CHP use. As shown by Table 5.12, the household that received at

least one visit from a female worker was significantly more likely to utilize a CHP than households that received no female visitation. Such influence was not observed in case of male workers' visits even though the males made visits to a significantly larger number of households.

C. A Comparison of Service Delivery between Daktars and CHPs

In order to get a better understanding of the reasons why patients chose between the Daktars and the CHPs, a comparison was made between availability and accessibility, the place of treatment given, the travel time necessary to get to the services, the waiting time to get treatment at the providers' place and the relative costs of treatment.

Availability and Accessibility: As mentioned earlier, CHP's curative services were delivered through seven ambulatory clinics. The two main centers had in-patient, laboratory, maternity and operating facilities and were open daily between 8:30 am to 2:30 pm. The remaining five sub-centers were open only two days a week with the same office hours. Thus, the scheduling of days and hours highly limited the availability of CHP centers. (It should be noted that the office hours set for the clinics did not necessarily represent the preferred time for treatment by the people themselves. In fact, the "bankers' hours" for the clinic were at the peak working time both for both males and females).

Table 5.13

Distribution of Place of Treatment During
Illness by Type of Provider (Daktar & CHP)

Provider Type	<u>Place of Treatment</u>			Total %	n
	At Home %	Clinic/ Hospital %	Proxy Visit %		
Daktar	54	16	30	100	573
CHP	4	95	1	100	201
Total	37	43	20	100	577

Chi-square = 335.9; for 2 d.f. $p < .001$

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.14

Distribution of Travel Time to Treatment During
Illness by Type of Provider (Daktar & CHP)

Provider Type	<u>Travel Time in Hours</u>			Total %	n
	< 1 Hr. %	1-3 Hr. %	3 Hr.+ %		
Daktar	62	33	5	100	177
CHP	33	65	2	100	193
Total	47	50	3	100	370

Chi-square = 38.4; for 2 d.f. . . p < .001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.15

Distribution of Waiting Time at Clinic During
Illness by Type of Provider (Daktar & CHP)

Provider Type	<u>Waiting Time in Hours</u>			Total	n
	< 1 Hr. %	1-3 Hr. %	3 Hr'+ %	%	
Daktar	16	79	5	100	177
CHP	2	73	25	100	193
Total	9	76	15	100	370

Chi-square = 44.7; for 2 d.f. p <.001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

Table 5.16

Distribution of Cost of Encounter for Treatment
During Illness by Type of Provider (Daktar & CHP)

Cost of Encounter in Takas

Provider Type	< 1 Tk. %	1-9 Tk. %	10-19 Tk. %	20-29 Tk. %	30 &+ Tk. %	Total %	n
Daktar	7	60	19	9	5	100	376
CHP	87	11	1	1	0	100	201
Total	36	43	12	6	3	100	577

Chi-square = 375.1; for 4 d.f. p < .001

Daktar: Non-formal, semi-trained or self-trained
practitioners of modern medicine.

CHP : Companiganj Health Project.

In terms of sheer staff size, there were only seven adults in each CHP facility in contrast with the approximately 150 non-formal practitioners in Companiganj area. Because of practical reasons and convenience, people usually sought ambulatory care from non-formal practitioners during the late afternoon or evening hours. Daktars did not maintain any strict office hours and nearly all of them in this setting were available for house calls.

Place of Treatment: As shown in Table 5.13 more than 54 per cent of the patients treated by Daktars were being seen in their own homes. Similarly, the local custom of "proxy visits" was more readily carried out with Daktars than with the CHPs. The provider is visited by a representative of the patient (usually a father, husband or some adult or adolescent member in the household) rather than the patient himself who narrates the symptoms of the disease and then returns home to carry the treatment back to patient. As shown on Table 5.13, nearly 30 per cent of patient visits to a Daktar were proxy visits.

In contrast, the CHPs were set up on more of a modern, industrialized society's concept of medical delivery with 95 per cent of the patients treated via clinical visits. Rarely were patients seen at home or were proxy visits accepted. Every patient, however sick, had to travel from home to clinic to receive treatment from the CHP.

Travel time to clinic: For one half of the patients in the survey, travel time to the source of care was one to three hours (Table 5.14), for an additional 47 per cent, travel time was less than one hour. The remaining 3 per cent had to travel longer than three hours to get to treatment. The median travel time to reach a Doktor was below one hour, while it took between one and three hours to reach a CHP facility. Sixty two per cent of the patients who went to Doktor travelled less than one hour, while 65 per cent of the patients who went to CHP had to travel one to three hours.

Waiting time in clinic: The average waiting time in the clinic for 76 per cent of the total patients was between one and three hours (Table 5:15). The median waiting time at both Doktor and CHP clinics was one to three hours. The distribution of the remaining patients, however, was significantly different for the two sources. In case of the Daktars, 16 per cent of the patients had to wait for less than one hour, while in case of the CHP patients, the proportion was about two percent. While only nine per cent of the Daktars' patients had to wait beyond three hours, more than 25 per cent of the CHP's patients had to wait beyond that time. Waiting time can be critical in a situation where no work means no pay and people depend entirely on their daily wages for subsistence.

Cost of treatment: In relationship to the cost of treatment, the CHP offered services at a far lower rate than Daktars. As shown in table 5.16, nearly 80 per cent of the total patients spent less than

10 Takas for their treatment and only three percent above 30 Takas (at the present rate of exchange 30 Takas are equivalent to \$ 1.00 U.S.). In contrast, 87 per cent of the patients utilizing the CHP spent less than one Taka for their treatment, including the cost of medicine. Only 11 per cent patients spent as much as 10 Takas. Ostensibly, the CHP's services were free.

Summary:

It was found that the two major choices for medical care were the Daktars and the CHP. Even though the CHPs were set up as formal systems for delivery of health care and were staffed by a well-qualified team, were well-equipped technologically and provided comprehensive care at little or no cost, the population substantially preferred and actually utilised the services of Daktars who could be characterized as deliverers of informal modern medical care, as having grossly limited knowledge, technology and services at their disposal. Even though the CHPs services were virtually free, the population still chose Daktars, in spite of the fact that it might pose a significant financial burden to extremely limited resources..

These two providers appeared to be in direct competition with one another for patients. As demonstrated by the tables in this chapter, as the utilization of either the Daktar or CHP increased, the other decreased without affecting the distribution of utilization of the other two providers: indigenous healers and homeopaths.

Age, education, income and socio-economic status of an individual were significant determinants in choice of care providers. The most frequent utilizers of the services of Daktars were in the 15 to 44 year age group, had higher educations and had more access to cash. In contrast, utilizers of CHPs tended to be older, to have little or no education, and to have limited access to cash. Children were the primary utilizers of indigenous practitioners and homeopaths. Daktars and indigenous practitioners were utilized more in winter months and CHPs used more during the rainy season.

Daktars and homeopaths were more likely to be utilized for acute conditions, while the CHP was chosen more for chronic conditions and emergency and accidents. The utilization of indigenous practitioners appeared to have a better balance between acute and chronic conditions. The length of suffering from an illness appeared to have a positive correlation with use of CHPs and a negative one with Daktars and homeopaths.

Only one of the health services factors included in the analysis, visitation from female health workers, had a direct significant association with the choice of CHP as a medical care provider. In terms of availability, accessibility, travel and waiting time to treatment, the Daktars' services were found to be more aligned with the customs, traditions and expectations of the people they served.

Both indigenous medicine and homeopathy were found to have carved a niche of their own in the provision of health care to Companiganj, however small, and that their services were not widely influenced by the majority of the explanatory variables under consideration.

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Chapter 6

Results:

Utilization of Medical Care Services during Terminal Illness

Terminal illnesses (those that resulted in the death of the patient) have been included in this research in order to provide supplementary information to regarding the determinants of medical care utilization. During a period of five years, there were 916 deaths recorded in the main sample. Of these only 66 per cent utilized medical care providers at all, a proportion significantly less than those seen during illness episodes. The same explanatory model was applied to this data as earlier.

A. Correlates of Medical Care Utilization:

Predisposing Factors

Among the different predisposing factors under consideration, none of the individual variables, including age, sex, education, and occupation show any significant association with medical care utilization, but the predisposing family variables--education and occupation of head of households--do. This finding is markedly different from what was found during illness episodes. One possible explanation is that the head of household dominates the decision-making picture when a household member is incapacitated by illness.

Table 6:1

Distribution of Medical Care Utilization
During Terminal Illness by Education
of Head of Household (H/H)

<u>Medical Care Utilization</u>				
Education Level	Utilized %	Not Utilized %	Total %	n
None	60	40	100	540
Primary	70	30	100	149
High School	77	23	100	227
Total	66	34	100	916

Chi-square= 20.9; for 2 d.f. p <.001

Table 6:2

Distribution of Medical Care Utilization
During Terminal Illness by Occupation of
Head of Household (H/H)

H/H Education Level	<u>Medical Care Utilization</u>		Total %	n
	Utilized %	Not Utilized %		
Household worker	60	40	100	151
Agriculture landless	64	36	100	459
Agriculture Landowner	76	24	100	214
Service/ Business	72	28	100	92
Total	66	34	100	916

Chi-square= 13.7; for 3 d.f. p =.003

As shown in Table 6.1, there was a strong positive correlation between education of head of household and utilization of medical care services. Similarly, utilization was significantly higher among households whose heads were agricultural land owners or were engaged in service or business than those headed by landless laborers or household workers (Table 6.2).

Enabling Factors

Most of the enabling factors considered, including seasons of the year, total number of private practitioners in the locality, the distance of the CHP main center or sub-center to households-- did not appear to have any significant association with utilization of medical care during terminal illnesses; only the SES of the households had. As shown in Table 6.3, utilization was the lowest among the poor and it increased as the SES went up. The apparent difference in utilization rates between upper middle and rich classes is not significant.

Need Factors

Tables 6.4 and 6.5 present the distribution of diseases by medical care utilization during terminal illness in the surveyed population. Like in illness episodes, the diagnosed diseases have been categorized according to basic nature of illness (Table 6.4) and

Table 6.3

Distribution of Medical Care Utilization
During Terminal Illness by Socio-economic
Status (SES) of Family

SES Status	<u>Medical Care Utilization</u>		Total %	n
	Utilized %	Not Utilized %		
Poor	58	42	100	323
Lower Middle	73	27	100	127
Upper Middle	78	22	100	74
Rich	79	25	100	56
Total	66	34	100	580

Chi-square= 18.7; for 3 d.f. $p < .001$

a broad, general classification of diseases (Table 6.5). The diseases included represent the immediate cause of death.

In 24 per cent of the cases the underlying as well as the immediate causes of death were identified. Among those, concurrent presence of malnutrition (deficiency diseases) and diarrheal diseases were identified in 75 per cent of the cases. These figures reflected the classic intertwining between diarrhea and malnutrition; thus, those who died from diarrhea also had a further underlying cause of malnutrition and vice versa. Since the purpose of this study is to explore the patterns of utilization of medical care, it was concluded that no significant amount of additional information regarding the underlying causes of death would enhance the study.

In a comparison of utilization of medical care according to nature of illness (Table 6.4) it was found that patients with acute illnesses were likely to use services the most, followed by those with chronic illnesses. Emergency and accident victims utilized services the least. A disease specific breakdown showed that the utilization rate remained fairly even, averaging around 65 per cent, with most of the disease groups. The exceptions were respiratory diseases where the utilization rate became significantly higher. Utilization became significantly lower in the case of neonatal and childhood diseases and malnutrition-related diseases (Table 6.5).

Table 6.4

Distribution of Medical Care Utilization
During Terminal Illness by Type of Illness

Medical Care Utilization

Illness type	Not		Total %	n
	Utilized %	Utilized %		
Accidents/ Emergencies	62	38	100	209
Chronic	64	34	100	392
Acute	72	28	100	257
Total	66	34	100	858*

Chi-square= 6.3; for 2 d.f. p =.04

* Excludes 58 undiagnosed cases

Table 6:5

Distribution of Medical Care Utilization
During Terminal Illness by Diagnostic
Categories of Diseases

Disease Categories	<u>Medical Care Utilization</u>		Total %	n
	Utilized %	Not Utilized %		
Neonatal/ Childhood	58	42	100	104
Deficiency	60	40	100	128
Fever	64	36	100	28
Intestinal Diseases	66	34	100	160
Accidents/ Emergency	66	34	100	131
Others	66	34	100	148
Respiratory Diseases	77	23	100	159
Total	66	34	100	858*

Chi-square= 14.3; for 6 d.f. p =.02

* Excludes 58 undiagnosed cases

Figure 6.A.

Utilization of Medical Care During General Illness and Terminal Illness according to the Type of Illness

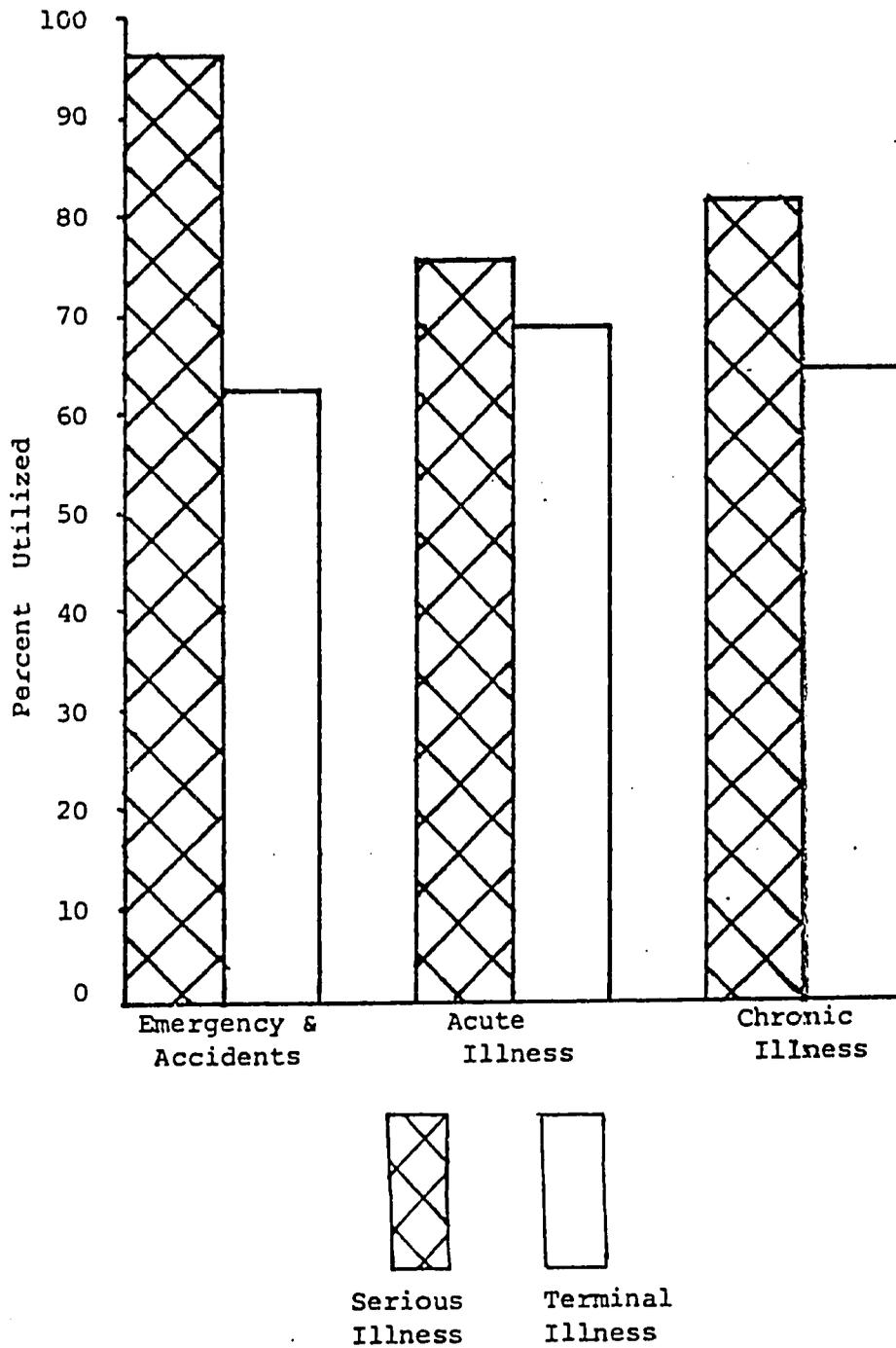
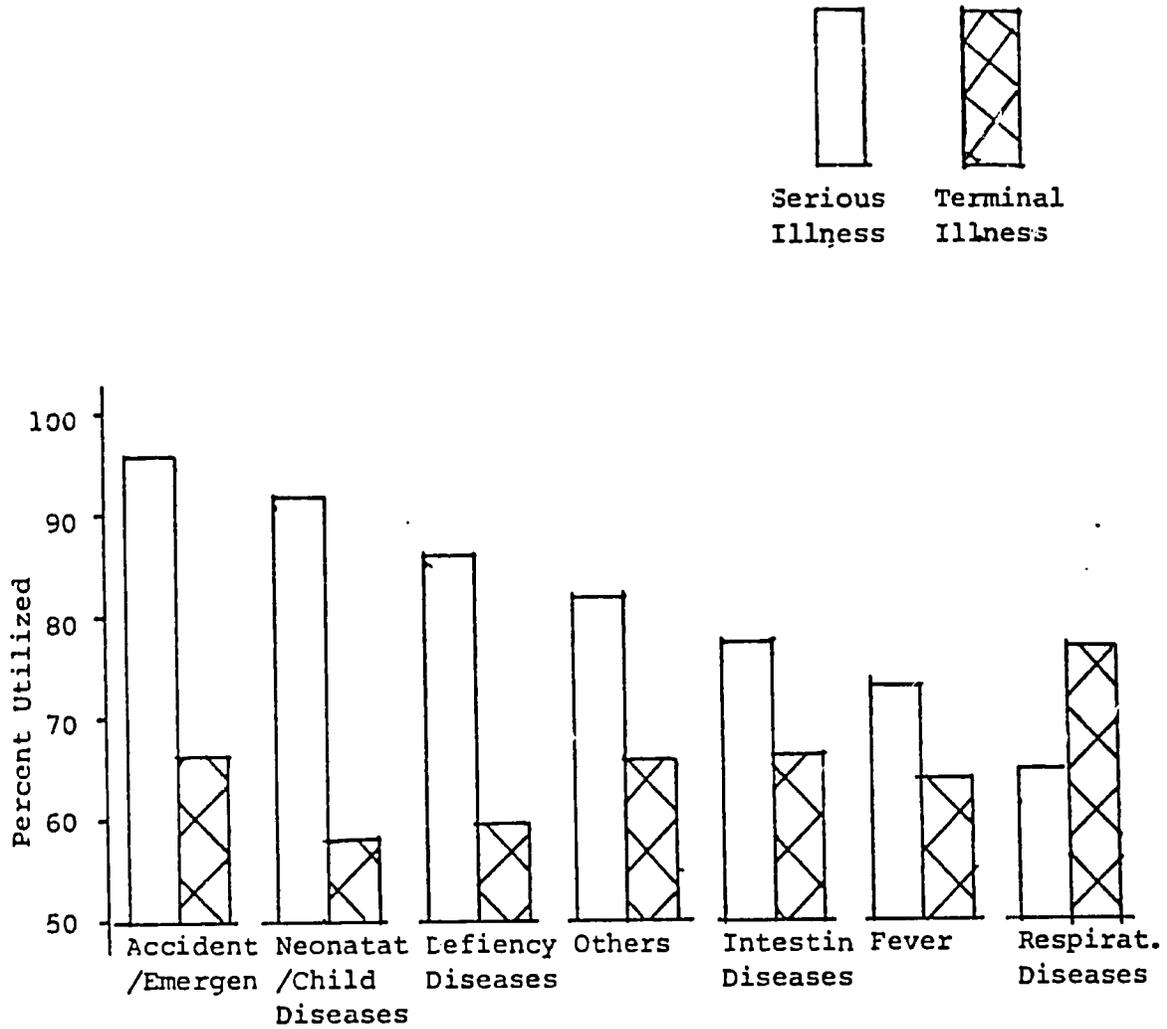


Figure 6.B

Utilization of Medical Care Services During
 General Illness and Terminal Illness
According to Distribution of Diseases



It is useful here to contrast the utilization patterns between terminal and non-terminal illnesses. As shown in Fig. 6.A and 6.B, the typical patterns appear to be almost diametrically opposite from each other. Emergency and accident cases, neonatal and childhood diseases and deficiency diseases were found to have the maximum utilization rates in the case of general illness and the lowest rates for terminal illness. Fever and respiratory diseases evoked the lowest response for illness cases and the highest rates for terminal illness. Terminal respiratory diseases particularly surpassed the utilization rate during illness.

B. Correlates of the Choice of the Medical Care Provider

The factors determining the choice of medical care provider demonstrate a small number of significantly associated variables as with the correlates of medical care utilization. But they show similar patterns of influence toward utilization as they were found with general illnesses.

Two critical differences emerge, however. First, none of the patients were found to have utilized CHP services at the time or within six days of their death. Although, approximately 28 per cent of the patients with terminal illness did utilize the CHP's services seven days or earlier prior to their death, an analysis showed that more than 90 per cent of these used the services of a Daktar at the time of death. The remaining 10 per cent utilized indigenous

practitioners or homeopaths. Consequently, the utilization of Daktars during terminal illness episodes rose to 76 per cent from 49 per cent during severe illness. Second, the utilization of homeopaths reduced to three percent level for terminal illness, while the utilization of indigenous practitioners increased to 21 percent. (Note: For convenience of analyses the indigenous practitioners and homeopaths have been grouped together in this section. The utilizers of the CHP will be considered again later in this chapter under section C).

Since the same variables showed significant association with utilization during terminal illness as with serious illness episodes, a summary of only the major findings will be dealt with here.

Predisposing Factors

The age of an individual directly correlated with utilization of Doktor. There was an inverse correlation with utilization of indigenous and homeopath practitioners (Table 6.6). Patients with no education were more likely to utilize indigenous practitioners and homeopaths. Similarly patients who were not employed were more likely to go to indigenous practitioners and homeopaths. It should be noted that 55 per cent of the cases having no education and 80 per cent cases having no occupation were children under 5 years of age.

Table 6.6

Distribution of Type of Provider Utilized
During Terminal Illness by Age Groups

Age Groups (years)	<u>Type of Provider</u>		Total %	n
	Daktar %	Trad.Pract/ Homeopath %		
<5	62	38	100	284
5 - 14	80	20	100	40
15 - 44	85	15	100	52
45 & +	92	8	100	202
Total	76	24	100	578*

Chi-square= 60.1; for 3 d.f. p <.001

* Excludes 26 missing cases

Patients having household heads with high school education or higher appeared to utilize indigenous practitioners at a significantly higher rate than those in other, lower educational categories. Analysis of this variable with disease patterns showed that emergencies, accidents (including cerebro-vascular accidents) and acute diseases predominated as cause of death in those households. These diseases were more likely to be seen by indigenous practitioners during terminal illness than the Daktars.

Enabling Factors

Distribution of practitioners according to SES shows a bi-modal ('U' shaped) trend. The poorest SES group was one of the peak users of Daktars. With the lower middle SES there was a subsequent decline in the utilization of Daktars with a proportional increase in the use of indigenous and homeopath practitioners. With the middle SES, the use of Daktars shows an increase with a second peak for the upper SES.

The utilization of the Daktar in terminal illness cases also had a direct correlation with the total number of private practitioners available in a community.

Table 6.7

Distribution of Type of Providers Utilized
During Terminal Illness by Type of Illness

Illness type	<u>Type of Provider</u>		Total %	n
	Daktar %	Trad.Pract Homeopath %		
Accidents/ Emergencies	56	42	100	123
Chronic	83	17	100	237
Acute	77	23	100	180
Total	76	24	100	540

Chi-square= 27.3; for 2 d.f. p <.001

Need Factors

The choice of practitioners according to disease type showed that acute and chronic cases were more likely to receive care from a Doktor, while for emergency and accident cases indigenous practitioners were more likely to be consulted (Table 6.7).

C. Correlates of CHP Utilization

Predisposing factors

As indicated earlier, about 28 per cent of the terminal illness cases (250 individuals) sought medical care from a CHP during a period seven days or more prior to their death. The highest proportion of utilizers of CHP facilities in their terminal illness were people aged 15-44 years (Table 6.8). This finding contrasts to those for non-terminal illnesses, with the same age group as one of the low utilizers. On the other hand, patients aged 45 years and older, the highest user group of the CHP during illness episodes, were comparatively low users of the CHPs during terminal illness episodes.

The categorization of terminal illness cases by education and occupation also showed some contrasting features from that of severe illness. The patients with higher education and those with more established occupations such as agricultural land owners, people in service and business utilized CHP facilities significantly more than

Table 6.8

Distribution of Utilization of CHP
During Terminal Illness by Age Groups

Age Groups (years)	<u>Utilization of CHP</u>		Total %	n
	Utilized %	Not Utilized %		
<5	22	78	100	446
5 - 14	43	57	100	68
15 - 44	44	56	100	81
45 & +	28	72	100	309
Total	28	72	100	899*

Chi-square= 1.3; for 3 d.f. p =.72

* Excludes 17 missing cases

Table 6.9

Distribution of Utilization of CHP During
Terminal Illness by Distance of CHP Main Centers

Distance of CHP in Miles	<u>Utilization of CHP</u>		Total %	n
	Utilized %	Not Utilized %		
0 - 1	36	64	100	143
1.01 - 2	32	68	100	196
2.01 & +	24	76	100	560
Total	28	72	100	899*

Chi-square= 8.9; for 2 d.f. p =.01

* Excludes 17 missing cases

Table 6.10

Distribution of Utilization of CHP During
Terminal Illness by Type of Illness

Illness type	<u>Utilization of CHP</u>		Total %	n
	Utilized %	Not Utilized %		
Accidents/ Emergencies	12	88	100	209
Chronic	40	60	100	392
Acute	24	76	100	257
Total	28	72	100	858*

Chi-square= 6.3; for 2 d.f. p =.04

* Excludes 58 undiagnosed cases

that the non-educated, and those who had no, or a less established, occupation. The occupation of household head played a similar role to that of occupation of the individual. In regard to the education of the household head, the pattern was similar to illness utilization, i.e., households having heads with no education, or primary educations, tended to go to a CHP more. Least CHP use was made by households having heads with high school education .

Enabling Factors

As in case of illness, the poor and the lower middle SES groups tended to visit the CHP proportionately more than the upper SES groups. Also as expected, the distance from the CHP facilities showed a negative correlation with utilization (Table 6.9).

Need Factors

The distribution of type of illness by utilization of CHP shows that patients with chronic diseases ending in death were most likely to visit CHP (Table 6.10), a finding similar to that of illness cases. While in illness episodes, the emergency and accidents category showed one of the highest utilizations of the CHP, in the case of terminal incidents, accidents and emergencies were the lowest utilizers.

Utilization for acute terminal cases was also substantially lower than illness cases. It could be surmised that the rapid course of death from accidents and emergencies did not allow sufficient time for access to formalized medical facilities.

D. Summary

The correlates of medical care utilization during terminal illness were presented. Only 66 per cent of the cases were found to utilize medical care services, a proportion significantly less than was found during illness cases. Out of fourteen explanatory variables under consideration only four were found to have significant association with overall utilization of medical care providers. The effect of two of those four variables, education and occupation of household head, were not found to have any effect in case of general illness. Effect of SES were similar to that of utilization during general illness, while disease categories, demonstrated a contrasting influence.

Regarding the choice of medical care provider during terminal illness, the number of variables having significant association remained few. Their effects, however, were quite similar to those of serious illness cases. Such a finding indicates that similar factors guide choice of medical care provider both in case of general and terminal illness. This finding is further supported by the correlates of CHP use, which are also exactly the same as those found

in the choice of medical care provider during general illness. None of the patients were found to utilize CHP facilities at the time of his/her death, the reason being surmised as the CHP's non-availability and non-accessibility.

Twenty-eight per cent of the patients did visit the CHP facilities seven days or more prior to their death, but at the time of actual death more than 90 per cent of those patients resorted to the services of a Daktar. As a result, in the distribution of medical care providers during terminal illness, a significantly high proportion of the sample resorted to Daktars (75 per cent) while the remaining group chose indigenous practitioners and homeopaths.

These findings further substantiate that in rural Bangladesh a high proportion of the patients were more apt to utilize modern medicine while there remained a fixed niche for indigenous medicine and homeopaths. Further it demonstrated that the competition for provision of medical care actually existed between the two sources of modern medicine, the CHP and the Daktar, while having very little effect on the utilization of indigenous practitioners or homeopaths.

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Chapter 7

Results:

Utilization of Medical Care Provider During Pregnancy and Childbirth Events

Like the death events in Chapter 6, birth events have also been included in the analyses in order to look for complementary evidence to medical care utilization. It should be noted that pregnancy and childbirth are considered completely natural events and unrelated to sickness to the people in rural Bangladesh. Medical care is generally sought when unusual events such as unexpected bleeding or pain take place during the normal course of pregnancy. .

Traditional birth attendants, who are expected to take care of all the normal deliveries as well as abnormal conditions, are known as "Dais". Almost all the Dais learn their trade by being an apprentice to other established Dai, and they carry a significant traditional value in the society. Increased availability of modern medicine in the recent decades has been minimally effective in influencing the role or the value of the Dais. Although there is an increased awareness of the community towards modern medicine, its utilization during pregnancy related events remains limited to extreme emergency conditions only.

From the year 1975 through 1979, a total of 2,691 births took place in the sample population. Out of these, only 47 (2 per cent)

cases visited CHP facilities. The breakdown of these 47 cases showed that 22 attended at the onset of labor, 20 during labor after they have been initially handled by other types of birth attendants, and the remaining 5 attended during their immediate postpartum period.

A. Correlates of CHP Utilization

The only predisposing variable found to have any relationship with utilization of CHP is the age of the mother. In this analysis, the effect of age will be considered simultaneously with the complications of pregnancy (i.e. need factor) because both these variables were found to be highly correlated.

The breakdown of CHP visits by age group of the mothers is presented in Table 7.1. Teen agers and elderly women, that is, women below 20 years and above 40 years age respectively had the highest proportion of CHP utilization (3 per cent each). Young adult mothers (21-30 years), who form nearly 50 per cent of the total cases, used the CHP facilities the least.

The varying proportion of use of CHP facilities by mothers of different age groups seems to be related to the occurrence of complications among mothers. As it is presented in Table 7.2, the incidence of complication of pregnancy followed a similar trend as that of CHP utilization across the age groups. Complications of

Table 7.1

Utilization of CHP During Childbirth
by Age Groups of mothers

<u>Utilization of CHP</u>				
Age Groups (years)	Utilized %	Not Utilized %	Total %	n
13 - 20	3	97	100	627
21 - 30	1	99	100	1039
31 - 40	2	98	100	641
41 & +	3	97	100	89
Total	2	98	100	2666*

Chi-square= 7.6; for 3 d.f. p =.05

* Excludes 25 missing cases

Table 7.2

Presence of Complications During Childbirth
by Age Groups of mothers

Presence of Complication

Age Groups (years)	Yes %	No %	Total %	n
13 - 20	20	80	100	632
21 - 30	11	89	100	1321
31 - 40	12	88	100	647
41 & +	23	77	100	91
Total	14	86	100	2691

Chi-square= 38.4; for 3 d.f. p <.001

pregnancy and childbirth were significantly higher among teenage and elderly mothers.

Based on the above findings, it is likely that pregnant women experiencing complications used the CHP facilities more often than those with uneventful pregnancies. Tables 7.3, 7.4, and 7.5 further establish the positive association between complications and CHP use.

Table 7.3 demonstrates that the use of the CHP was significantly higher for cases with complications than without. Out of the 47 cases who visited the CHP, 40 were due to some form of complication.

Table 7.4 demonstrates the utilization of CHP also varied according to the type of complication. The four categories used to define complication were also used in an ordinal manner as indicators of severity of complication. Excessive bleeding was the simplest and the most common form of complication. Except for very unusual circumstances, it would not be considered an immediate life threat. A number of local folk treatment (herbs) were also available which succeeded in controlling the excessive bleeding temporarily. Prolonged labor (more than two days according to definition of the study) could be considered a more severe life-threatening condition both for the mother and the baby, because quite often it may mean obstructed labor due to malpresentation of the fetus, or cephalo-pelvic disproportion. In most cases of this nature, surgical intervention was indicated. The third category of complication,

Table 7.3

Utilization of CHP During Childbirth
by presence of Complications in Labor

<u>Utilization of CHP</u>				
<u>Complication</u>	<u>Utilized</u>	<u>Not</u>	<u>Total</u>	
	<u>%</u>	<u>Utilized</u>	<u>%</u>	<u>n</u>
		<u>%</u>		
Present	11	89	100	360
Absent	1	99	100	2306
Total	2	98	100	2666*

Chi-square= 210.0; for 1 d.f. p <.001

* Excludes 25 missing cases

Table 7.4

Utilization of CHP During Childbirth
by Type of Complications

Utilization of CHP

Type of Complication	Utilized %	Not Utilized %	Total %	n
None	1	99	100	2306
Bleeding	8	92	100	212
Prolonged Labor	12	88	100	107
Others	22	78	100	41
Total	2	98	100	2666*

Chi-square= 247.0; for 3 d.f. $p < .001$

* Excludes 25 missing cases

Table 7.5

Utilization of CHP During Childbirth
Outcome of Delivery

Delivery Outcome	<u>Utilization of CHP</u>		Total %	n
	Utilized %	Not Utilized %		
Live Birth	1	99	100	2344
Miscarriage	3	97	100	178
Still Birth	8	92	100	14
Total	2	98	100	2666*

Chi-square= 40.2; for 2 d.f. p <.001

* Excludes 25 missing cases

listed as "others", were the more severe problems such as toxemia of pregnancy and massive laceration of the birth canal with puerperal sepsis. As illustrated by Table 7.4, as the nature and severity of the complication increased, the proportion of patients utilizing the CHP also increased.

The Table 7.5 shows that significantly higher proportions of miscarriages and stillbirths were among the users of the CHP. Such an outcome to pregnancies could not reasonably be attributed to the care and services of the CHP, but rather to the fact that patients who utilized the CHP were already undergoing severe pregnancy complications. As was shown earlier, (Table 7.3 and Table 7.4), 85 per cent of the pregnant women visiting the CHP (40 out of 47 cases) had some kind of complication and more than 50 per cent of those were very severe in nature. This may help to explain why 43 per cent of all the complication cases seen by the CHP (17 out of 40 cases) resulted in fetal loss.

Among the enabling factors under consideration the SES of the family was not found to have any significant relationship with the utilization of the CHP, nor did the distance of households from sub-centers of CHP. Distance of households from the main centers, on the other hand, did show that attendance of mothers were negatively associated with utilization ($P=.03$). Analysis of incidence of complications according to seasons show that they are significantly

higher during the summer ($p < .001$), when the utilization of CHP by childbirth cases also go up.

B. Choice of Provider for Attending Delivery

The question posed regarding who attended the delivery was open ended. As a result, several different types of persons were mentioned by the respondents. As shown in Table 7.6, their distribution ranged from graduate physicians at CHP to none. An overwhelming majority, 92 per cent of the total births, were attended by local traditional midwives, the Dais. Use of CHP, as it has already been presented, was mentioned only in 47 cases (2 per cent), which represents all categories of CHP personnel.

The second important category of birth attendants next to the Dais were family members. They were usually elderly women in the household who were well-acquainted with the art of delivery from long observation and often came into action when labor was sudden with no other professional help at hand. During the survey period, relatives conducted three per cent of all the births. Forty nine cases showed no attendants. Analysis shows that these were usually the cases of spontaneous abortions and miscarriages. It is likely that these events took place so quietly and completely that the mothers did not need assistance from anyone.

Table 7.6

Distribution of Attendants
at the time of Child Delivery

<u>Category</u>	<u>No.</u>	<u>Percentage</u>
Homeopath	8	0.3
Village Doctor	12	0.4
CHP Doctors	13	0.5
CHP Nurse/Auxiliaries	29	1.1
None	49	1.8
Family Members	81	3.0
Dais (TBA)	2465	91.6
Others	34	1.3
<hr/>		
Total	2691	100.0

Homeopaths and other Daktars were usually not called in to attend a delivery unless there were complication of some kind. Out of a total of 20 cases attended by them, 15 had complications. Here they played a role similar to that of the CHP. (Note: The "Others" category mostly include persons such as neighbors, faith healers, etc.)

Since the distribution of birth attendants was highly skewed with 92 per cent of births attended by only one category of person, further analysis of variation regarding birth attendant utilization will not be of much value.

C. Summary

Pregnancy and childbirths are considered completely natural events in rural Bangladesh and regular antenatal and postnatal check ups have not been a part of traditional practices. Traditional birth attendants, known as the Dais, are available everywhere to attend to the need of child delivery. As a result, utilization of medical providers presented a completely different distribution than those of general illness and terminal illness events. More than 92 per cent of the births were attended by the Dais and the remaining were distributed among family members and other medical care providers. Only 47 births were attended by CHP facilities, but out of these, 40

cases suffered from some kind of complication. Analyses showed that utilization of CHP facilities was significantly associated with the age of mother, complication of pregnancy, distance of CHP main centers from households and season.

Chapter 8

Results:

Multiple Linear Logistic Regression

Multiple linear logistic regression analyses have been done in order to study the simultaneous effects of different independent variables under consideration on overall utilization of medical care services and the utilization of the CHP and to pinpoint the determinants of choice between the services of the CHP and that of Daktars. The bivariate analyses done in the previous chapters established the type and significance of association between an independent variable and a given dependent variable. It was not possible, however, to examine the effects of one particular independent variable while controlling for the effect of others. Multiple regression analysis was chosen because it allows an estimate of these measures. In addition, it shows the relative importance of each independent variable included in the model to explain the dependent variable.

The fraction of variance (R-square) explained by the total model is also given. From the computed regression coefficients one can determine which set of variables has a maximal influence on the dependent variable and thereby has major predictability. The major predictor variables, can have several practical implications. They may be applied to a given individual or a situation in order to predict their patterns of medical care utilization. They may also be

applied to develop alternative programs with the intention of altering the utilization of medical care services.

Based on the objectives of this study, regression equations have been constructed for three dependent variables. The first one is the overall utilization of medical care services (use=1, non-use=0) both for serious illness and terminal illness. Childbirth is not included in this analysis because more than 98 per cent of the cases used some kind of services, out of which 92 per cent of the services were provided by Dais. In such extremely skewed distribution it was felt that nothing additional could be gained by further analysis.

The second dependent variable is the utilization of CHP services (CHP use=1, CHP nonuse=0). A regression equation for this dependent variable has been constructed for the two events under consideration i.e. serious illness and terminal illness. The third dependent variable considered represents the two special categories of medical care providers i.e. the CHP and Daktars (Use of CHP=1, Use of Daktar=0). Only the illness events have been used for this equation.

The independent variables used in the equations are as follows:

1. Age (in years) of individual
2. Socio-economic status (SES) of family
3. Seasonality of a particular event (as two dummy variables) as follows:

Winter=1, otherwise=0.

Rain=1, otherwise=0.

4. Total number of practitioners in locality
5. Distance of CHP main center from households
6. Distance of CHP sub-centers from households
7. Type of illness (as two dummy variables) as follows:
 - Chronic=1, otherwise=0.
 - Acute=1, otherwise=0.
8. Length of suffering (in days) by individual

It can be observed from the above list that the only predisposing factor included in the equations is the age of an individual. Numbers two through six belong to enabling factors, while the last two are need factors. All these were found to have significant relationship (at <0.05 level) with the overall utilization of medical care services during illness events in bivariate analyses. Variables which did not show such level of significance (sex or religion for example) have been excluded. None of the health service factors could be included in the equation under similar justification. It may be noted, however, that a few other predisposing factors, such as education and occupation of individuals or head of households were also found to have significant association with some of the dependent variables in bivariate analyses. Since both education and occupation have strong positive correlation with SES of individuals, those variables were excluded from the equations.

In determining the predictive model for choice between Dokter and CHP for those who did utilize medical care services, certain

additional factors related to service delivery were added. These are (continued from the above list):

9. Place of treatment (as two dummy variables) as follows:

home=1, otherwise=0.

clinic=1, otherwise=0.

10. Travel time (in hours) to place of treatment

11. Waiting time (in hours) at the place of treatment

12. Total cost of treatment

All these variables have shown significant association with the choice of medical care.

Similarly, in the regression analyses for terminal illness only the variables that showed a significant association with the independent variables listed above, were included.

Pearson's correlation coefficient of independent variables used for each of serious illness and terminal illness events are presented in tables 8.1 and 8.2 respectively.

It is understandable that each independent variable used in the regression equations is likely to show diverse predictability for a

Table 8.1

ILLNESS: Correlation Coefficients of Variables
Used in Regression Equation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	1.00													
2. SES	-.02	1.00												
3. Wnt	-.05	0.02	1.00											
4. Ran	-.01	0.01	-.32	1.00										
5. TPr	-.06	-.19	-.05	0.03	1.00									
6. DMn	0.02	0.05	0.10	-.10	-.20	1.00								
7. DSb	0.04	-.17	0.09	-.07	-.35	0.46	1.00							
8. CIl	0.15	0.06	-.03	-.03	-.06	-.02	0.00	1.00						
9. AIl	-.19	-.07	0.01	0.05	0.05	0.03	0.02	-.48	1.00					
10. RxH	-.01	0.16	-.01	-.02	-.07	0.14	0.04	-.08	0.08	1.00				
11. RxC	0.21	-.05	-.18	0.15	0.05	-.11	-.08	0.10	-.15	-.45	1.00			
12. TTm	0.08	-.04	-.03	-.05	-.17	-.20	0.26	0.12	-.12	0.03	0.13	1.00		
13. Wtm	0.18	-.04	0.10	0.03	0.01	0.03	0.04	0.19	-.18	-.06	0.19	0.25	1.00	
14. Rct	0.10	-.12	0.20	0.18	0.03	-.07	-.06	0.05	-.07	-.42	0.68	0.08	0.31	1.00

Legend: 1. Age: Age of individual; 2. SES: Socio-economic status;
3. Wnt: Winter; 4. Ran: Rain; 5. Tpr: Total practitioner;
6. DMn: Distance from main center; 7. DSb: Distance from
sub center; 8. CIl: Chronic illness; 9. AIl: Acute illness;
10. RxH: Treatment at Home; 11. RxC: Treatment at clinic;
12. TTm: Travel time to treatment; 13. Wtm: Waiting time
at treatment center; 14. Rct: Cost of treatment.

Table 8.2DEATH: Correlation Coefficients of Variables
Used in Regression Equation

	1	2	3	4	5	6	7
1. Age	1.00						
2. SES	0.15	1.00					
3. Dist. Main	-.06	0.12	1.00				
4. Dist. Sub	-.07	0.03	0.51	1.00			
5. Chron. Ill	0.26	0.02	-.04	-.03	1.00		
6. Accident	-.16	0.23	0.03	0.01	-.47	1.00	
7. Acute Ill	-.21	-.07	0.03	0.02	-.54	0.34	1.00

given dependent variable. Some of those may be strong predictors while others may add very little to the accuracy of the model. In order to derive the best fitted model it is important to eliminate the unimportant variables. The object of model fitting is to obtain the simplest model that at the same time adequately fits the data, so that it can be useful for prediction purpose (Dowdy and Wearden, 1983).

Between the two approaches commonly used to derive the fitted model, the backward elimination procedure (the other one being the stepwise regression procedure) has been used. In this approach the computation begins with a full model, including all the independent variables specified in the original equation. Next the independent variables are eliminated one by one as it is determined that they contribute little to the model.

The test of contribution of each independent variable is done by treating the variable as if it were the last to enter the equation and determining its level of significance. In a logistic regression, Chi-square test is used for the purpose. The variable with the smallest chi-square value is picked first and tested for significance at a pre-selected alpha level (0.05 in this case). If it is not found to be significant, it is removed from the equation and the regression equation is recomputed. The procedure continues one by one until the variable with the smallest chi-square value is found to be significant. This obviously means that the variables remaining in

the model will be significant also. Recomputation of the equation keeping this last variable gives the final best fitted explanatory model for the independent variables under consideration.

Tables 8.3 through 8.7 present the results of different regression equations under consideration. Of these, tables 8.3 and 8.6 show the partial regression estimates (beta coefficient) and the level of significance (p) for each independent variable used in the original equation for a specified dependent variable. The remaining tables show the fitted models as derived from the analyses. For the fitted models, the fraction of variance explained by each variable (Partial R) in the models are given. In addition to these, the intercept (alpha), fraction variance explained (R-square) and the total number of cases used for calculation of regression results, are also given at the bottom of each table.

A. Utilization of Medical Care Services

It can be observed from tables 8.3 and 8.4 that out of the 10 independent variables used in the regression equation for illness events only five were found to be significant. The fitted model of table 8.4 also selects out the same variables, i.e. age of individual, SES of family, winter and rainy seasons and the total

Table 8.3

Regression Estimates of Independent Variables
on Overall Utilization of Medical Care
During Serious Illness and Terminal Illness

Dependent Variable: 1 = Utilized Services
0 = Did not Utilize Services

Explanatory Variables	Serious Illness		Terminal Illness	
	b	p<	b	p<
Age	0.031	.001		
SES	0.157	.001	0.161	.001
Winter	- 2.219	.001		
Rain	- 1.913	.001		
Tot.Pract.nr	0.091	.001	0.012	.527
Dist.Main Center	- 0.000	.989		
Dist.Sub Center	0.006	.268		
Illness Chronic	- 0.552	.217	0.239	.303
Illness Acute	- 0.678	.119	0.340	.200
Ill.Duration	0.036	.234		
Intercept	1.789	.021	0.017	.953
R ²	.31		.12	
No.of Cases	998		580	

Table 8.4

Regression Estimates of Independent Variables
in Fitted Model on Overall Utilization of Medical Care
During Serious Illness and Terminal Illness

Dependent Variable: 1 = Utilized Services
0 = Did not Utilize Services

Explanatory Variables	Serious Illness		Terminal Illness	
	b	R	b	R
Age	0.033	.20		
SES	0.145	.12	0.148	.12
Winter	- 2.200	-.12		
Rain	- 1.913	-.10		
Tot.Pract.nr	0.079	.09		
Intercept	1.652		0.362	
R ²	.31		.12	
No.of Cases	998		580	

Note: Chi-Square p value for all the variables included
in the model are < .001.

Table 8.5

Regression Estimates of Independent Variables
in Fitted Model on Utilization CHP During
Serious Illness and Terminal Illness

Dependent Variable: 1 = Utilized CHP
0 = Did not Utilize CHP

* Explanatory Variables	Serious Illness		Terminal Illness	
	b	R	b	R
Age	0.012	.10	-0.015.	-.17
SES	-0.150	-.12		
Rain	0.941	.17		
Illness Acute	-0.840	-.15		
Illness Chronic			0.684	.12
Dist.Sub-center			-0.021	-.11
Intercept	-0.96		0.294	
R ²	28%		22%	
No.of Cases	775		580	

Note: Chi-square p value for all the variables included in the models are < .001

number of practitioners in the locality. These five variables are able to explain the same amount of variance (31 per cent) as was possible with the full model originally conceived. Two seasonal variables, winter and rain show negative association with utilization.

The estimated regression coefficient beta (b_i) is the amount by which Y (dependent variable) changes on the average when the specific X (independent variable) changes by one unit and all other X_i 's remain constant (Armitage, 1983). According to beta estimates of the fitted model (Table 8.4), the seasonal variables have the maximum values, followed by SES, total number of practitioners and age respectively. The value of beta, however, does not reflect on the amount of variance explained by each variable, because their units of measurement are not the same. For example, age is measured in years while SES in the amount of land holding. Individual R statistics ('partial Rs') are used for this purpose. As illustrated in Table 8.4 the regression coefficient of age in the fitted model may be the lowest, but the amount of variance it can explain for the model, and thereby its predictability, is the highest.

Only one of the independent variables used in the regression equation of medical care utilization during terminal illness, SES, is found to be a predictor. It can explain only 12 per cent of the variance in the specific utilization.

Explanation of variance (R-square) i.e. the predictive ability of regression models by 31 per cent and 12 per cent, as found in the case of utilization of medical care services, may seem to be low. But such result is not uncommon in a socio-medical research, because each of the variables under consideration can be influenced by numerous factors many of which may be unknown or difficult to measure.

B. Utilization of CHP Services

Table 8.5 shows that the SES of family and the acuteness of the illness are negatively associated with the utilization of the CHP during illness. Each of these variables is fairly strong predictor of CHP use. The most positive predictor of CHP use is the rainy season and the variable also has the maximum capacity to explain the amount of variance in the model. The other variable showing positive predictability of CHP use is the age of the individual.

The age of an individual and distance of CHP sub-centers from households are strong negative predictors of CHP use during terminal illness, while the presence of a chronic disease is a direct predictor.

Table 8.6

Regression Estimates of Independent Variables
on the Utilization of CHP and Daktars
During Serious Illness Episodes

Dependent Variable: 1 = Utilized CHP
0 = Utilized Daktar

Explanatory Variables	Serious Illness	
	b	p
Age	0.004	.63
SES	-0.173	.02
Winter	- 1.397	.04
Rain	- 0.882	.18
Dist.Main Center	0.005	.61
Dist.Sub-Center	0.003	.83
Tot.Practitioner	0.067	.25
Illness Chronic	0.658	.36
Illness Acute	- 0.809	.24
Treatment-Home	3.079	.02
Treatment-Clinic	5.296	.00
Travel time	0.537	.04
Waiting time	0.233	.18
Treatment Cost	- 0.645	.00
Intercept	-4.435	.00
R ²	81%	
No.of Cases	577	

Table 8.7

Regression Estimates of Independent Variables
in a Fitted Model on the Utilization of CHP and Daktars
During Serious Illness Episodes

Dependent Variable: 1 = Utilized CHP
0 = Utilized Daktar

Explanatory Variables	Serious Illness	
	b	R
SES	-0.183	-.08
Illness Acute	- 1.337	-.12
Treatment-Clinic	4.254	.38
Treatment Cost	- 0.677	-.21
Intercept	-0.861	
R ²	82%	
No.of Cases	577	

Table 8.8

Regression Estimates of Independent Variables
in a Fitted Model on the Utilization of CHP and Daktars
During Serious Illness Episodes

Dependent Variable: 1 = Utilized CHP
0 = Utilized Daktar

Explanatory Variables	Serious Illness	
	b	R
SES	-0.174	-.13
Winter	-0.924	-.14
Dist. Sub-Center	-0.022	-.10
Illness Acute	- 0.891	-.14
Travel Time	1.048	.38
Intercept	-0.556	
R ²	54%	
No.of Cases	577	

C. Choice Between CHP and Dokter

Inclusion of four additional service delivery factors, namely, the place of treatment, travel time to the source of care, waiting time in the clinic and the cost of treatment, seem to have made a significant contribution in differentiating the choice between the services of the CHPs versus Daktars. As can be seen from tables 8.6 and 8.7, two of these additional variables turn out to be very strong differentiating factors in the choice between the two providers. The fitted model (Table 8.7) includes only four variables and they are able to explain 82 per cent of the variance due to the model. Out of these, treatment in clinic is a strong positive explanatory factor of CHP use, while SES of the family acute diseases and cost of treatment show a negative predictability.

Treatment at clinic and its low cost, however, are almost given conditions for CHP utilization. As described earlier, CHP did not give any treatment outside its clinics except for very special circumstances; and according to rules of the government, it did not charge any fee for its services to its utilizers. Quite obviously, these two variables are able to explain a major variance due to the model.

If these two independent variables are removed from the regression equation, the predictive ability of the model becomes smaller (54%), but further insights about some other variables are gained. The

results of the newly fitted model, as presented in Table 8.8, shows that the travel time to source of care becomes a highly positive predictor of CHP utilization. On the other hand, the winter season and the distance of sub-centers from households get included as negative predictors. Inclusion of these new variables reaffirm the fact that the CHP facilities are less accessible than the Daktars.

D. Summary

Results of multiple linear regression analyses have been presented in this chapter. The dependent variables included are overall utilization of medical care services, utilization of CHP and choice between CHP and Doktor. First two of these variables have been considered both for serious illness and terminal illness, while the third dependent variable has been considered for serious illness only. From a list of different independent variables, which represents predisposing, enabling, need and health services factors--the influence of age, SES, seasons and type of illness--turn out to be predictive in the majority of regression equations. In the choice between the utilization of services of Daktars and the CHPs, service delivery factors become the major determinants.

The results obtained from the regression analyses reconfirm the findings that were obtained earlier in the bivariate analyses. In addition, it has permitted to study the simultaneous effects of different independent variables under consideration and selected the

major predictors for each dependent variable through model fitting. The amount of variance explained by each model has also been obtained indicating the relative importance and applicability of each model developed.

Chapter 9

Solution Development

A. Predictors of Medical Care Utilization

The Multiple regression analyses in the previous section has shown that the age of an individual, socio-economic status of a household and seasonal factors turn out to be important predictors for overall utilization of medical care, Choice of CHP services and also in differentiating the services between the CHP and Dokter. All these factors, however, are constraints, because decision makers of health do not have any control over these issues. Similarly, the type of illness, which has been included as a predictor in the choice of CHP and in its differentiation with Dokter, is also a constraint.

The few decision variables, which have shown up to be predictors in the regression equations, are very important to the planners and policy makers of health, because these are the factors on which they have some or total control. The positive predictability of the total number of practitioners in case of overall utilization of medical care; the negative predictability of the distance of CHP sub-centers in its choice during terminal illness and its differentiation with the services of the Daktars; and high travel time associated with the utilization of CHP services have important practical implications.

In a way all these decision variables indicate towards two facts vis. greater the availability of providers, higher is the rate of utilization; and CHP facilities are not as available as they should be. Hence, in order to increase the utilization of CHP services, the facilities must be made available nearer to the people than they are at present. This fact should receive high priority in solution development process.

B. The results of the Delphi survey .

It has been indicated earlier that the responses of the first round of Delphi survey addressing the improvement of PHC services could be categorized into eight major areas of concern. Those were location, design, operating hours, supplies and staffing of clinics, trust and credibility of the clinic staff, awareness of the community regarding available PHC services, payment for services and quality control. Initially there were differences of opinion about the appropriateness of the existing PHC clinics in each of these areas. Only 40 percent of the respondents felt that the clinics were ideally located for their proper utilization. The remaining 60 percent, who felt otherwise, had several suggestions as to how they could be better placed. On the other hand around 60 percent of the respondent opined that the design and operating time of the clinics were satisfactory.

Almost all the respondents, however, felt that the supply of medicines and equipments to the clinics, the staffing pattern and the

credibility of the staff were unsatisfactory and needed much improvement. In addition all the respondents felt that there was extreme need for increasing the awareness of the general public regarding the services that are available through the clinics and that some kind of public control be established in their activities.

The items that scored the maximum points in the final round of the Delphi survey is presented in Table 9.1. It is evident from the table that the suggestions mainly concern two broad problem areas:

- 1) Availability and accessibility of PHC facilities and
- 2) communication and rapport between the PHC providers and the community (recipient). It may be worthwhile to point out here that the former problem was clearly identified in the problem analysis.

Under the problem of availability and accessibility, the Delphi group process led to the suggestion for one PHC clinic for every 5,000 population. Such a definitive clinic population ratio was initially suggested by one respondent working with the existing PHC system, where each male field worker is assigned to an area of 4000-5,000 population. In subsequent rounds the idea was voted heavily to the maximum score. Although majority of the respondents felt that the design and timing of the PHC centers were satisfactory, there were important suggestions, such as having separate waiting and treatment areas for men and women and providing a few beds for emergency cases. Availability of emergency services round the clock was also heavily emphasized.

Table 9.1

Items with Highest scores in the delphi survey
By Major Categories

Item Scores

Category	Highest	Second Highest
Clinic Location	One PHC clinic for every 5,000 population	Clinic site be selected by a committee comprising PHC officials, local and public representatives.
Clinic Design	Separate arrangements for males and females	Some inpatient facilities for emergency patients
Operating Hours	Present timing with emergency services when needed	Both morning and evening hours
Supplies	Improvement of both quantity and quality of drugs and ancillaries	Establishment of 'Fair Price' drug shop attached to the clinics
Staffing	Posting of graduate physicians in each PHC clinic	Employment of trained traditional birth attendants with salary
Credibility and Trust of PHC Staff	Establishment of better rapport and spending more time with patients by PHC providers	PHC clinics to be used as general patient care centers rather than only family planning centers
General Awareness of People	Use of mass media	participation of PHC personnel in local institutions & functions
Fees	Existing system of no fee	Some subsidized fee for non office hour services
Quality Control	Improvement of supervision and support form higher authorities	Establishment of a local committee comprising PHC officials, and local and public representatives to oversee PHC activities

Majority of the respondents felt that the staffing of the PHC clinics were inappropriate, because they were not addressing the general health needs of the people. They opined that the PHC clinics should be used more as a place of general patient care rather than a family planning clinic, as they are being used at present. The respondents also felt that PHC providers should be more sympathetic to the patients' needs and spend more time in listening to their complaints and explaining the treatment given. One of the solutions for all these problems, the respondents felt, would be to replace the existing PHC staff by graduate physicians. They also suggested to employ trained traditional birth attendants (TBA) with full salary, so that they could be used more effectively. They held that the TBAs are closer to people and they appreciated the needs of the community better. It may be pointed out that the demand for graduate physicians expressed by people was not for the quality of care, but for changing the orientation of the clinics.

The respondents universally agreed to the fact that the people in general were largely unaware of the services that are available through the PHC clinics. They recommended the application of mass media for raising the awareness. They also recommended that the PHC personnel in the clinics should make themselves more known to the public by regularly visiting local institutions and participating in different community functions. Almost everyone was of the opinion that the introduction of fee for services would reduce the utilization of PHC facilities further. Some fee, however, could be

introduced for services after the regular operating hours as an incentive to the PHC providers. Finally, there was tremendous emphasis on the need for strong supervision and support from higher level PHC authorities and the need for having a local PHC committee to oversee and support the development and expansion of PHC activities.

C. Alternative approaches for improvement of PHC Utilization

Alternative I : Expansion of PHC clinics in the Community

Different analyses above indicate very clearly that in order to increase utilization of PHC services in Bangladesh, one of the prior conditions is to take the facilities closer to people. At present there is one PHC clinic for every 20,000 people (i.e. one for every union). Obviously this clinic population ratio is high. This study as well as other studies in the country have shown that nearly four fifth of the patients attending a rural clinic comes from within a mile's radius around it and then there is a sharp distance decay. Considering these facts, one logical alternative would be to have government supported PHC clinics scattered throughout the countryside. According to the group consensus in the Delphi survey one clinic for every 5,000 population does not seem too unrealistic, if PHC services have to be reached to the rural mass. In an average, one such clinic will serve the needs of five villages. Since the population concentration of the country is very high, the clinics

will usually be within a mile from all these five villages. With regular supply, supervision and support from upazilla health complex and union PHC centers, such a clinic should be able take care of majority of the health needs of those villages.

The obvious constraint of this kind of approach for a poor country like Bangladesh is the acute lack of financial and other material resources. With 85 percent of the present population of above 100 million living in the rural areas, there will be requirement for nearly 17,500 PHC clinics, which is four times the strength of the present union based clinics. However small or modest, this many number clinics can drain tremendous amount of limited resources, first through capital expenditures and later through yearly recurrent expenses. Moreover, the recruitment and training of appropriate staff for these clinics, their maintenance and supervision will be another gigantic task. Finally, the clinics may turn out to be effective, because they will be heavily utilized, but the expenses to operate these clinics will be so high that they may prove to be inefficient.

Bangladesh at present has 4,365 union based PHC clinics known as Union Health and Family Welfare Centers (UHFWC). Of these only about 1,100 centers are reasonably equipped and staffed according to their planned quota. The remaining are called 'functional' UHFWCs, because their building, equipments and staff are not yet in place, but they are to function as an UHFWC from some existing facility such as a

union based dispensary. It has been about eight years since the UHFWC program was introduced and within this period only about one fourth of the centers could be completed, mainly because of shortage of financial. At this rate of progress the it will take several decades before one clinic per 5,000 population could be made available to the people. Similar will be the case with drug and other ancillary supplies. As a result, massive expansion of PHC clinics, though seem ideal, is not a practicable alternative.

Alternative II: Inclusion of Daktars into the PHC System

The study has shown that the most successful care provider in the community is the Daktar- the unlicensed practitioners of modern medicine. They are already available throughout the countryside and enjoy ample of trust and confidence of the people they serve. Moreover they are self supported through their practice. One of the easiest and the least costly approach would be to incorporate a selected number of Daktars into the PHC system. With some training they could be entrusted to perform certain specific tasks of PHC under supervision and support from upazilla and union PHC officials. The Daktars should also welcome the idea, because with an official link with the governmental system their status in the community will certainly be raised further and this will be an enhancing factor for their practice.

The approach seems to be an attractive one and much at par with the basic philosophy of PHC. A number of problems which have been hindering the progress of PHC program in the country, such as a large clinic population ratio, placement and housing of the staff, salary and benefits for a huge manpower etc., can be met in an inexpensive way through the approach. Nevertheless, it has a number of potential problems. To begin with, the very selection of the Daktars will pose a difficult situation. Since the majority of them do not have any standardized training, and the quality of their practice and extent of their popularity etc. are only subjective measures, it will be very difficult to make a proper judgement in their selection. Secondly, proper training and orientation of all these practitioners will be a highly difficult task. This is not only for developing a proper course and curriculum, but also for the fact that all of them will already be pre-oriented in certain concepts of health, diseases and treatment, which will be difficult to remold if necessary.

Most important problem, however, seems to be that since these practitioners will not be regular employees of the PHC system, it will be difficult to regulate or guide their practice according to the needs of the PHC, unless they themselves are motivated to do so. It can be envisaged that they will try to keep in their practice whatever is popularly demanded by the public and discard whatever is disliked such as immunization for children. If this results, there will be very little positive impact on actual health of the population, although the utilization of the PHC practitioners may

increase. In fact, a similar earlier attempt by the government to upgrade the practices of village Daktars (Palli Chikitshak program) resulted in a failure at the expense huge amount of money.

Alternative III: Motivate community to self support PHC Activity

Unawareness of the community regarding the services available through the PHC clinics has been identified as one of the major reasons for under-utilization. But the non-availability of the PHC facilities near at hand and their non-accessibility have been established as stronger detrimental factors. On the other hand it has also been seen that people spend around Tk. 10 per encounter with a private practitioner, while the services of the PHC is practically free. Hence it is likely that the utilization will increase if the community is made properly aware through mass media and other means, provided the facilities are available up to the expectations of the community.

It has been discussed above that it is virtually impossible to make such facilities available exclusively through public sector in the near decades. It can be reasoned, however, that since there is acute need for proper health care, with extensive health education and technical support and guidance from the PHC system, communities can be motivated to take responsibilities of their own health. The simple logic behind this is that people in the private sector in general are spending around ten times more than the health budget of

the government. If this money can be expended in a systematic manner, there can be efficient health care for all. A strong believer of PHC philosophy should be very happy with the idea, because it includes extensive involvement, organization, support and control by the community. Once established, such a program has good potentials for long time sustenance.

In the context of Bangladesh this concept becomes too simplistic and idealistic. Poverty of greater majority of the people is very evident in Bangladesh. The money that circulates in the private sector is exclusively for curative care and people are not yet ready to pay for unfelt needs of health, such as preventive and promotive services. Moreover, majority of this money comes from the upper middle class and the rich. This study has demonstrated that people from these SES hardly seek any care from the PHC system mainly for their inconvenience. On the other hand the most important utilizers of the formal PHC are the poor for whom buying health care is beyond their means. As a result, the conversion of the available money into the community for general health care at the expense of the convenience of the rich is almost impossible. The amount of money available from the poorer sectors will not be sufficient to support a PHC program.

There are also other problems besides the non-availability of funds. One can expect extensive involvement of the community, as this approach demands, only when the community feels an acute need

for such services. In rural Bangladesh health has a lower priority than other essential needs such as food, clothing and shelter. Moreover, general literacy level in the population is so low that it will require real intensive, involved and time consuming effort to motivate the people into taking responsibilities of their own health. Several experimental health programs in the country tried to develop a non-profit health insurance program for the rural community and were unsuccessful. As such, motivating people to shoulder their own health responsibilities at this stage is likely to face ample of problems.

Alternative IV: Combination of Government and Community Resources

It is evident from the options above that neither the government of Bangladesh, nor the rural community has enough resources to support and sustain a valid PHC program. Thus one is inclined to look into the possibilities of putting both the resources together and work out a practicable plan that can fulfil at least the basic requirements of a PHC program. The idea is to expect only what is possible within the limitations of the two parties concerned and build in enough flexibility into the system so that necessary adjustments can be made according to each local situations.

The common people in the rural community may not be able to raise adequate cash to support a PHC program, but they can make many other contributions that have plenty of cash value. For example,

they can raise a piece of land for a PHC clinic site or put in physical labor for building the clinic facility. This way the capital investments by the government, which are usually phenomenal in amount and have been the major thrust of the governments program, can be kept low. The money thus saved can be used for improving the training, supplies and supervision for the program. There may not even be need for having a permanent clinic building. The community can be given the responsibility to select one existing facility- a school room or a other public utility place, that can be used part time for clinic activity.

The community can further be motivated and involved to select a few persons among them to work part time as PHC providers. In this regard, one can particularly think about the traditional birth attendants, employment of whom has come up as a priority suggestion in the delphi survey. The selected persons can then be trained by the government and placed in their own community with a part time salary. As in the case of selection process, the community should have some control over their activities, so that proper action can be taken if they are found to be ineffective.

As for the clinic population ratio, there can be one for each 'ward', which, as mentioned earlier is the lowest unit of civil administration, and has an elected representative. It is sometimes convenient to develop a system in a situation which already has an existing infrastructure that is understood by people. The population

of ward is 6,500, which not too far from the ratio of 5,000 population as it was suggested in the delphi survey. According to this ratio the need for clinics comes down to 13,000, which is 4,000 less than what was calculated for the one for 5,000 population ratio.

As mentioned earlier, the greater part of the government's involvement should be in strengthening the health education, training, supervision, supplies and quality control of the PHC system. At the same time there is need for improving the referral system from the ward upwards to the upazilla health complex level, so that people can feel that it is a part of the same PHC system and thereby have better trust in it. This particular approach is certainly not immune from the operational problems that were discussed in the earlier approaches, yet at each instance they are somewhat counterbalanced by either by the community or the governmental system. The government mechanism obviously has to practice a much decentralized approach and admit ample of flexibility into its system, but these will most likely work in their favor, because their responsibilities will also be shared by the community.

Discussion and Recommendations

This study has illustrated that there are a number of factors that play a significant role in determining the overall utilization of medical care services and the choice of care providers when people are in need for such services. It has shown that 78 per cent of the people utilize some kind of medical care from outside sources when they are seriously ill. The utilization rate is much less (66 per cent) in case of terminal illness. There is also an ample difference in the choice of practitioners between the two events.

Three fourths of the population tend to seek care of modern medicine both during serious illness and terminal illness - a finding largely contradictory to the popular belief that majority of the population in developing countries resort to indigenous medicine during sickness. Two thirds of the modern medicine dispensed, however, is provided by Daktars (the unlicensed practitioners of biomedicine), while the remaining one third is provided by the official practitioners of formal PHC system. A completely different pattern of utilization emerges when it comes to childbirth events where the provider spectrum is exclusively dominated (92 per cent) by traditional mid-wives. This is evidently because people consider pregnancy and child birth to be part of a natural process, completely unrelated to sickness, and traditional mid-wives are the persons specifically designated to attend to these needs.

The study has also demonstrated some of the reasons why a formal primary health care system plays a relatively minor role in the provision of curative services to a population, in spite of its technological and organizational superiority. Results of the problem analyses and solution development process through Delphi group technique were fairly consistent in this regard. Some of these findings have important implications for PHC services in Bangladesh. These will be discussed using the same explanatory model presented by Andersen (1968) and Kohn and White (1976).

A. Predisposing Factors

The age of an individual clearly stands out to be the most important factor both in the utilization of medical care services and the choice of practitioners in cases of serious illness. The lowest use of medical services is seen among children below 5 years of age; use increases with age. This is particularly inconsistent with the findings of the developed countries where children are distinctly the greater utilizers of health services than the adults.

An age differential, however, does not exist during terminal illness. Nor does it exist during childbirth where 98 per cent of the cases use some kind of provider anyway.

In the choice of providers, the children with serious illness are found to be using the services of indigenous practitioners and homeopaths significantly more than the other age groups. This finding is true in case of terminal illness as well. Utilization of CHP is significantly higher for older people while the utilization of Daktar is maximum for people in the working age. These findings suggest that the CHP facilities are not ideal for people who are in the working age or for children who usually have to be accompanied by an adult member. The facilities are more applicable for people who have less demand on their time. The need for immediate access to therapy by the sick working adults, and at the same time, the ready availability of the Daktars certainly make the latter the most popular source of care in the community. In addition, since the Daktars belong to the same community, they seem to have a better social tie, a better trust of the people and a better provider-patient relationship than the providers of the formal PHC system.

Levels of education and occupation also show a positive association with utilization. These findings may reflect the fact that working members of the family have better incentives to get well quickly than the non working members. The majority of the people in rural Bangladesh have to depend on daily wages for subsistence. The loss of a job even for a day may mean that the family has to borrow from others or go unfed. Extreme shortage of paid jobs, a high dependency ratio in the population and the non-existence of any form of social security system make the means of subsistence highly

vulnerable. In such situations, the adults, particularly the poor, cannot afford to remain sick for a long time. Thus they are more likely to utilize medical care during illness.

The sex difference in the rate of utilization or in the choice of the medical care provider was not found to be significant except for higher utilization among males in the working age group (15-44 years). This has important public health implication because the same age group is also the child bearing age for women, when their need for medical services is usually high. Lower utilization of medical care by the women of this age group particularly reflects on the neglect of maternal and child health (MCH) care by the population.

The people who have higher education and more stable occupations are more likely to utilize the services of a Doktor than the CHP. The opposite is true for the uneducated and people in less stable occupations. This practice by the affluent is contradictory to their earlier expressed opinion, where they showed higher preference for the CHP. This may indicate that CHP services were ideally preferred by them, but at the time of actual need they could not use it because of their inconvenience or lack of accessibility of CHP facilities. This finding is further supported by the fact that during terminal illness, utilization of CHP by the affluent becomes much higher than in serious illness. Since the terminal illness resulted in the death of the patient, they can be considered to be more severe in nature

than the general illness. Higher utilization of CHP during that time indicates their better confidence in the system, but they do not tend to utilize it unless it becomes very essential, or have time to use it.

B. Enabling Factors

A majority of the enabling factors considered in this study had a significant association with utilization of medical care services. Among these, socio-economic status of a family (SES) seems to be the most important one. SES has a positive association with utilization. Since SES also has a positive correlation with education and occupation, it is expected that it will display similar influence. Thus, in the choice of provider, for example, the people with higher SES chose the services of Dokter, and the people in the lower SES chose the services of CHP at a significantly higher proportion.

Seasonal variation has also been found to play important role both in medical care utilization and in the choice of care provider. A significantly larger proportion of ill people tend to use the medical care services during the summer and the least during winter. In the choice of provider, however, Daktars are utilized the most during winter while the CHP keeps most busy during the rain. In fact, 61 per cent of the patients seen at the CHP facilities are during the rainy season. Such differences in the utilization between Dokter and CHP can best be explained by economic factors. Daktars,

whose services are costlier than the CHP are more heavily utilized during winter when the productivity and the cash flow is the highest. On the other hand, during the rainy season, when the population has fewer jobs, less money and poorer road conditions, the CHP is utilized more heavily. These findings suggest that when the fiscal means are available, the population prefer Daktars over the CHP which is utilized more when there is little money to pay for their treatment.

The distance of the CHP main centers and sub-centers from households show a negative correlation to their utilization for all kinds of events. Utilization of CHP is the highest for patients who live within a mile from the CHP clinics. The rate of utilization goes down significantly as one moves away from the facilities.

From the findings of enabling factors it becomes apparent that the CHP's physical accessibility may not be up to the community's needs, but it certainly has financial accessibility. Thus the people in the lower SES are found to utilize it more frequently, and its utilization increases during the rain when cash flow in the community becomes low. People seem to overcome the physical accessibility barrier during that time on the face of the need. Also when a CHP facility is available in the midst of other private facilities, the former is usually preferred. But the CHP facilities do not seem to be adequately accessible to the people of Companiganj. One earlier study has shown that the majority of the CHP patients come from

within a mile radius of a facility. On the other hand, only 15 per cent of the population live within a mile radius from the main centers and 40 per cent live within that radius from the sub-centers.

C. Need Factors

The nature of illness, the type of disease and the length of suffering, all have been found to play a significant role in the utilization pattern both in the case of serious illness and terminal illness. There are some distinctive differences, however. In case of serious illness, acute diseases are found to utilize the services the least. The maximum utilization is seen for emergency and accident cases followed by chronic diseases. In case of terminal illness, this order is reversed. In the choice of the practitioners, Daktars and homeopaths were found to encounter acute diseases the most while visits to the CHP was significantly higher for emergencies and accidents or chronic ailments.

Day to day accessibility of the Daktars may help to explain their popularity during acute illness episodes over the CHP. With a total of seven CHP centers catering a population of 120,000, each of which with fixed, daytime clinic hours, it would appear that the patients selected Daktars and homeopaths because of their ready availability at the onset of acute illness episodes. In contrast, emergency and accident cases comprise only five percent of Daktar's practices.

Although the reason for the higher percentage of utilization of CHP for chronic illnesses, accidents and emergencies over acute illness was not verified by the study, it would appear that the CHP's scheduling of hours lent themselves more to the treatment of chronic rather than acute illness episodes, and their reputation among the villagers as a source of modern technologically superior facility made them the choice for accidents and emergencies.

D. Health Service System Factors

Only one of the several health service system factors included in the analysis, i.e. domiciliary visit by the female health worker, was found to have a significantly positive influence on the utilization of CHP. The male field workers were able to make visits to a much larger number of households, but their influence was not found to have any effect. The problem seems to be understandable. Both the male and the female workers followed a "banker's hours" for visiting the households. The former had greater mobility because they travelled by bicycles and were free from any social restrictions on their movements. But once they reached a household, it was difficult for them to establish effective communication because male members were usually away during that hour of the day. The latter, on the other hand, had to travel on foot and observe several restrictions on movement, but they were able to establish a much

better communication with the women in the household who were usually always present and had more concern for the welfare of the household.

As indicated earlier, two thirds of the patients, both during the general illness and terminal illness, resort to modern medical care. Two thirds of these are catered for by the Daktars and the remaining one third by the formal system - CHP. Throughout the analysis a see-saw pattern of utilization between these two sources are observed without affecting the utilization of the indigenous practitioners or the homeopaths. It was apparent that the two latter systems had fixed niche of their own in their society, while the major competition in the provision of medical care consistently existed between Daktar and CHP, out of which the former was always the more successful one by a large margin.

A comparison of the services of the two providers showed that the Daktar's services were much more attractive for their better availability and accessibility at the time of need. Although the CHP services were financially more accessible, organizationally and physically they were not very ideal. Quality of care seems to play relatively a minor role compared to availability and accessibility factors.

E. Predictors of Medical Care Utilization

The results of different multiple regression analyses show that the influence of age of an individual, SES of the family, the seasons of the year and the type of illness turn out to be predictive for most of the equations under consideration. In case of overall utilization of medical care during serious illness, these four variables, along with total number of practitioners in a locality explain more than 30 per cent variance in utilization. The same four variables are also the predictors for utilization of CHP during serious illness, and together they can explain 28 per cent of variance.

In comparing the nature of practice between the CHP and Dokter, however, two factors related to health service delivery i.e. the place and the cost of treatment, stand out to be the most important differentiating factors, although the SES and type of illness are also included in the equation. Together, these four variables are able to explain 82 per cent of variance in the services of the CHP and the Daktars. A further analysis of the data reveals that the distance of the CHP sub-centers from households, the travel time to treatment and the winter season also have significant explanatory power in differentiating the services of the two providers.

F. Solution Development

Majority of the determinant variables identified above in the multiple regression analysis are constraints. A few decision variables that have major predictability, clearly indicate that the services of PHC need to be taken closer to people than they are at present.

Major problem areas of under-utilization identified by the participants of the Delphi survey concerned availability and accessibility of PHC facilities. Other problems included communication between providers of PHC and the community. Suggestions for improvement of PHC utilization, that scored the highest points in the Delphi group process included the establishment of a clinic facility for every 5,000 population, provision of emergency services through the clinics, improvement of supplies to the clinics, establishment of a better rapport between PHC providers and the community, improvement of general awareness of the community regarding PHC and improvement of quality control.

Four alternative solutions for increasing the utilization of PHC services were considered in the light of problem analysis and Delphi group process. These were: a) expansion of PHC clinic facilities by the government, b) inclusion of Daktars into the PHC system, c) motivation of the community regarding self-support for PHC and d) combination of government and community resources. Each

alternative considered had its own problems, mostly arising from limitation of resources, both within the government and the community. As a result, none of the alternatives can be strongly recommended as a solution for improvement of utilization. A combined approach, including resources from the government as well as the community, however, seems to have the maximum feasibility. In making the recommendations, the feasibility questions will be given priority considerations.

G. Policy Implications

The study has demonstrated that the formal primary health care services (CHP) are desirable to the people and it has ample credibility among all the strata of population. This is particularly evident from the expressed preference of the households and the increased utilization of CHP facilities at the time of severe needs such as emergency and accidents, terminal illness among the affluents and complications of pregnancy and labor.

More important is the fact that the PHC seems to reach the poorer section of the people, for whom buying health care would be beyond their means. The PHC services, however, are not available or accessible to the people as they should be at the time of acute need. As a result, it plays a much less significant role in the provision of curative services than it has potentials for.

The study has also shown that the issues of availability and accessibility override all the other factors, including the quality of care. To be more effective, the PHC services need to be taken closer to population than they presently are and they should be kept available even beyond "bankers hours".

Some important health problems such as acute diseases of the respiratory tract and neonatal and childhood diseases remain little affected by the present PHC system. It is well documented by now that next to diarrheal diseases these two are major causes of death among the under fives. Specific programs to address these problems can cut down the mortality and morbidity rates by a significant degree.

The study has also shown that the least utilization of PHC services are being made by the two important vulnerable groups i.e. children under five years age and the mothers, and there are genuine reasons for such under utilization. In order to attract these groups and run an effective program a much more well thought out plan for implementation of proper MCH care will be necessary.

The female field workers have proven themselves to be more effective than the male workers, at least in terms of medical care utilization by the people. With better training and support their services could be made more effective.

High cost of PHC services has been a major limiting factor in its expansion into the community. According to the present policy of the government the services are to be given free of cost. Budgetary provision for the PHC clinics are so low that it is almost impossible to maintain a proper supply of essential drugs. Charging some fee for the services could reduce some financial burden of the PHC system. But considering the possible negative political consequences, governments have carefully stayed away from such suggestions. Findings of this study suggests that charging a reasonable fee for curative services is not likely to meet community resistance as it is feared, provided the goods and services are made available upto clientele satisfaction. The average cost of the most popular provider in community (Daktars) is ten times higher than that of CHP.

H. Conclusion and Recommendations

An insight into the pattern of medical care utilization by the people of rural Bangladesh and some of the factors that determine such utilization has been gained by this study. At the same time, the relative role of formal PHC services in the midst of several other types of medical care providers has also been examined. Several important policy implications for PHC have been derived from the results.

It is evident that in order to enhance better utilization of the PHC facilities they have to be taken closer to the public than they

are at present. The ideal would be to have a PHC clinic within a mile's reach from every locality. This study, as well other studies from Bangladesh (Rahman et. al.,1982, for example) have shown that the maximum utilization of a health center is made by the people living within one mile radius around it. Such close network of PHC clinics, however, is not practical for Bangladesh situations. One PHC clinic for every 5,000 population, as it was suggested in the Delphi survey, also seems to be impractical. However, it may be recommended that there can be at least one such clinic in every 'Ward', which is the smallest unit of civil administration comprising a population of 6,000 - 7,000.

The clinic itself should be simple in structure with locally produced furnishings. It should be located at the best physically accessible place in the ward. A proper site selection is a very important initial step. Hence it may be preferable to have a selection committee, comprising elected representatives, responsible residents and PHC officials, to do the selection. The same committee, in fact, may function as the ward PHC committee to oversee the PHC activities and support its development. In order to encourage local participation and minimize some pressure of the PHC system, the land or a building for the clinics should preferably be donated by the community.

The person in charge of the clinics can be a paramedic, but he must be a permanent resident of the ward with a reputable background.

He should be helped by two part time, trained female workers, preferably trained traditional birth attendants, who should also be permanent residents of the ward. Their main function will be to render domiciliary preventive, promotive and MCH services in the ward as well as to have some responsibilities at the clinic. The domiciliary services of the female workers should be given major thrust, because it is evident from this study that they are clearly the more effective workers than their male counterparts, at least in terms of effecting their medical care utilization.

One of the duties of the paramedics will be attending to emergencies and acute conditions beyond their office hours. As an incentive, he may however be allowed to charge some fee for the services he provides. Timing of the clinic should be decided by the PHC committee. Another important task of the paramedics should be to make regular visits to local institutions, such as schools, offices and market places, in order to make people aware of the PHC facilities. Such awareness drive should also be taken up by the central administration of PHC and disseminate the knowledge through mass media like radio and news papers.

An alternative to the above arrangement is to incorporate the local Daktars into the PHC system. In most cases they fulfil the conditions of the paramedic. In addition they are already established as a doctor in the community. An earlier such attempt by the government of Bangladesh in collaboration with the WHO did not

succeed. After one year of scheduled training the Daktars were found to return to their old practice, with hardly any remnant effect of their earlier training. Nevertheless, many believe that the program was not given a fair chance to succeed and still carries ample of potentials for expansion of PHC program in the country. But their selection, training and support procedures should be thoroughly revised and strictly imposed.

Some thoughts may be given to prioritization of diseases. The diarrheal diseases, the number one killer in the population, certainly deserves special attention and essential means are available to deal with that. But there are others like pneumonia and other acute diseases of the respiratory tract, which are also highly fatal. Specific control and treatment measures for such diseases may prove highly rewarding.

MCH services must also receive priority in the PHC system. It has been shown earlier in the analyses that these two vulnerable groups, mothers and children, seem to derive the least benefit out of the PHC clinics. Services delivered in the clinics do not seem to be very ideal for them. In fact , the knowledge regarding the specific needs and priorities, and the obstacles to utilization of PHC services by these two groups is so little that the development of an efficient program is difficult. They certainly deserve further study.

Further studies may also be of value in determining the role of education on mothers' health care behavior. Results from several developing countries around the world have shown that education of mothers have significant positive influence on her health behavior. Maintenance of essential drugs and other supplies is crucial to establish the credibility of the PHC services in the community. Hence the regular replenishment of those should receive priority. The major point of concern, if the program becomes a success, is the cost of drugs, which may go well beyond the present budgetary limits. In order to control that some kind of charging system may be introduced in the clinics. There may be some initial resistance to the idea, but once the system proves effective, the resistance will pass, because people are paying much more for their medical care in the private sector.

In the light of the above it is hoped that the findings of the study will be of help towards the design and implementation of a much more effective PHC program for Bangladesh as well as other developing countries.

Annexure I

Major Health Related Statistics in Bangladesh

Total population (1985 est.)	100.5 million (Approx)
Average population per sq. mile	1800 (Approx)
G.N.P. per capita	\$ 130 (U.S)
Landless families	over 40 per cent
Doctor population ratio	1:6,200
Nurse population ratio	1:16,000
Crude birth rate (CBR)	39 per thousand
Crude death rate (CDR)	15 per thousand
Crude rate of natural increase (CRNI)	2.4 per cent
Infant mortality rate (IMR)	125 per thousand L.births
Child mortality rate (1-4 yrs)	22 per thousand children
Maternal mortality rate (MMR)	6 per thousand live births
Life expectancy at birth	50 years
Third & second degree malnutrition among children	8.3 per cent
First degree malnutrition among children	36.1 per cent

Sources: The Third Five Year Plan 1986-1990 (draft), Planning Commission, Government of Bangladesh, Dhaka, 1985.
The Second Five Year Plan 1980-1985, Planning Commission, Government of Bangladesh, Dhaka, 1980.
The Statistical Year Book 1979, Bangladesh Bureau of Statistics, Dhaka, 1979.

Annexure IIProbable Factors Responsible for Under-utilization
and Non-utilization of Actual and Potential Health Resources

1. Improper planning and implementation
2. Attitude of health personnel
3. Insufficient awareness of the need for community knowledge
4. Lack of community involvement
5. Disregard for traditional systems and personnel
6. Physical and social inaccessibility
7. Transportation problem
8. People not informed about available health services
9. People not clear of the type of health services available
10. Failure to meet community's expectation
11. Urban and rural disparity
12. Lack of confidence in local health institutions
13. Bypassing phenomenon
14. Staff arrogance or discrimination
15. Unrealistic staffing
16. Inappropriate use of staff time
17. Exhaustive workload on certain staff
18. Job dissatisfaction on the part of certain workers
19. Inappropriate timing for service delivery
20. Untapped community resources such as indigenous systems of medicine, traditional midwives etc.

Source: Djukonovic, V and Mach, E.P. Alternative Approaches to Meeting Basic Health Needs in Developing Countries, WHO, Geneva, 1975.

ANNEXURE IIIList of Participants in the Delphi Survey

<u>Participant</u>	<u>Education</u>	<u>no</u>
<u>A. Government Officials</u>		
Upazilla Health and F.P. Officer	M.B,B.S	1
Medical Officer MCH	-same-	1
Medical Officer	-same-	1
Medical Assistant	Med.Asst.Course	3
Family Planning Assistant	12 th grade	2
Family Welfare Visitor (female)	F.W.V. course	3
Health Inspector	12 th grade	1
Assistant Health Inspector	-same-	1
Sanitary Inspector	10 th grade	1
Family Welfare Assistant (female)	8 th grade	1
Family Welfare Worker	10 th grade	1
	<u>Sub-total</u>	<u>16</u>
<u>B. Private Practitioner</u>		
Daktar	Paramedic course	1
Daktar	10 th grade	2
Daktar	Compounder course	1
Indigenous practitioner	5 th grade	2
Traditional Birth Attendant	None	1
	<u>Sub total</u>	<u>7</u>
<u>C. Members of Community</u>		
Chairman of Union Council	9 th grade	1
Principle of School	M.A.	2
School teacher	M.A.	1
College professor	M.A.	1
Local Elite	B.A.	1
Local elite	6 th grade	1
Farmer	3 rd grade	1
	<u>Sub total</u>	<u>8</u>
	<u>Total</u>	<u>31</u>

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